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The Degree of Aerobiosis in Composting Process Control: Effect of Selective Composting Ecology Parameters on the Respiratory Quotient.

Diplomarbeit

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Abstract

The respiratory quotient (RQ) is known to be different under aerobic than under anaerobic conditions. It may thus be a lumped parameter for measuring the overall effect of the various relevant factors influencing matrix aerobiosis.
An investigation was made to examine the influence of the environmental parameters of moisture content, temperature and oxygen level on the respiratory quotient.
To realise the studies an experimental, computer-controlled system was developed and constructed with featuring eight stainless steel vessels each with a capacity of approximately 18 litres. Three sets of tests, each one concerning one of the three main environmental parameters, were carried out. Used material originated from a composting plant and was adjusted to desired conditions in the laboratory. Forced and pre-conditioned air was used for aeration. Exhaust gases from the reactors were analysed for oxygen and carbon dioxide concentrations. These values and the values of the temperature measurement were transferred automatically to the PC. Respiratory quotients, oxygen uptake and carbon dioxide evolution rates were calculated automatically by computer. Additional parameters like pH and volatile solids were determined.
From general data on respiratory quotients it could be stated that the RQ time course showed a certain similarity in all trials; greater or close to one the first hours of processing followed by a decrease to values smaller than one.

Kurzinhalt

Der Respiratorische Quotient (RQ) hat unter aeroben Verhältnissen einen anderen Wert als unter anaeroben. Deshalb könnte der Respiratorische Quotient als Summenparameter betrachtet werden, mit dem relevante Umweltparameter, die den aeroben Abbauvorgang in der Kompostmatrix beeinflussen, erfaßt werden.
Um den Einfluß der Umweltparameter Wassergehalt, Temperatur und Sauerstoffgehalt auf den RQ zu ermitteln, wurden zu jedem der genannten Parameter eine Versuchsreihe durchgeführt. Dazu werde ein computergesteuertes Versuchssystem entwickelt und konstruiert, daß aus Edelstahl - Versuchsbehältern mit ca. 18 Litern Innenvolumen bestand. Das aus einer Kompostierungsanlage stammende Versuchsmaterial wurde im Labor auf die gewünschten Ausgangsbedingungen gebracht. Zur Belüftung des Materials wurde konditionierte Druckluft mit Raumtemperatur verwendet. Die Abluft der Reaktoren wurde auf Sauerstoff- und Kohlendioxidgehalt analysiert. Der Respiratorische Quotient, der Sauerstoffverbrauch und die Kohlendioxidproduktion pro Masseneinheit wurden automatisch berechnet. Zusätzlich wurden pH-Wert und Glühverlust bestimmt.
Aufgrund der vorliegenden Daten kann festgestellt werden, daß der zeitliche Verlauf des RQ relativ ähnlich ausfällt, am Beginn werden RQ Werte größer oder gleich eins erreicht, dann Werte kleiner als eins.

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Contents

List of Tables

List of figures

List of abbreviations

c.ft.	cubic foot/feet
CER	carbon dioxide evolution rate
deg.	degree
d.m.	dry matter
dry wt.	dry weight
FM	source separated organic fraction of MSW mixed with bulging agent
MSW	municipal solid waste
OCR	oxygen consumption rate
PM	material processed in HerHof boxes for 7 days
RQ	respiratory quotient
VM	final volatile matter
VS	initial volatile solids
v/v	volume parts
w.b.	wet matter basis

1 Introduction

Composting is a controlled biological process carried out by heterotrophic micro-organisms, thus leading into decomposition of high molecular, putrescible compounds of the organic matter into low molecular products. Being a biological process, it is obvious that environmental conditions which enhance microbial activity would also maximise the rate of composting. This microbial activity is principally affected by oxygen availability, temperature levels, free water (usually expressed as moisture content), particle size of the feedstock material, nutrient levels and balance, and pH. These factors are interdependent.

Temperature

Temperature plays an important role in composting. It has great impact on the microbial activity and thus on the rate of decomposition of the organic material. Also other vital processes (e.g. evaporation of water) will be affected by a change in temperature.

Microbial metabolism yields carbon dioxide, water, metabolic organic by-products, and energy. Energy is partly used for growth and reproduction processes, the remainder being given off as heat. Due to the good insulation qualities of the organic material, heat is effectively stored within it thus resulting in elevated temperatures. This process is also termed selfheating.

The heating process is divided in three main phases (GLATHE and FARKASDI, 1964). The first one is characterised by a fast increase of the temperature up to 45 - 50°C due to the metabolism of the mesophilic population. In this stage, the mesophilic organisms reproduce themselves in large quantities because it is their optimum temperature range, which lays between 20 - 35°C. After reaching temperatures of 45 - 50°C, the microbial activity is partially suppressed as a result of the temperature surpassing the maximum tolerable level of this kind of micro-organisms.

In the second phase, the temperature increases up to 60 - 65°C. The heat that is necessary to exceed 50°C is produced by thermophilic micro-organisms. The optimum growing temperatures of the thermophilics lay in the range of 60 - 65°C. Beyond this point their activity substantially diminishes.

In the last phase, temperatures could reach 70 - 80°C, a range where only a few species of thermophilic bacteria can survive.

According to GOTAAS (1956), the microbial activity ceases at temperatures above 70°C. A further increase in temperature may be caused by chemical reactions. Biological decomposition marginally occurs at such conditions, however (HAUG, 1993).

Generally organic materials decompose more rapidly at moderate thermophilic temperatures. Most data, so far available, indicate that the optimum temperature lies between 50 and 60° C (EPSTEIN, 1997).
GOTAAS (1956) found that decomposition rate of biowaste in the thermophilic range is greater than in the mesophilic one. Similarly, maximum microbial activity occurs at the upper mesophilic ranges (McKINLEY and VESTAL, 1985).

Moisture

Water is required in microbial oxidation of organic matter, as micro-organisms are only capable to assimilate dissolved nutrients (VARMA and RAID, 1965; GLATHE, and FARKASDI, 1964).
LASARIDI (1998) mentioned that effective microbial activity for a variety of biological materials occurs within a moisture band of 40% to 60% (w.b.), depending on the type of waste. Similarly GLATHE and FARKASDI (1964) reported optimum range of 40 to 72% (w.b.), depending on material's structure and environmental conditions. Below 40% (w.b.), microbial activity decreases because the material is too dry and above 60% (w.b.) anaerobic conditions may exist because of limited free air space (LASARIDI, 1998). Depending on feedstock characteristics, at a moisture above 60 to 70% (w.b.) moisture, the composting material also can loose its structural stability which, in its turn causes poor aeration conditions. Paper and cardboard loose easily their structural strength while others like straw can tolerate a moisture content up to 80% (w.b.).
SCHULZE (1956) observed the optimum moisture content between 50 and 60% (w.b.), referring generally to composting material.
The „Composting Facility Operating Guide"(1994) recommends a content of 55% (w.b.) moisture.
WILEY and PIERCE (1955) found that the highest temperatures were achieved during composting of municipal solid waste (MSW) with a moisture content of 55 to 69% (w.b.). A 72 to 77% (w.b.) moisture resulted in the lowest temperatures while a 45 to 53% (w.b.) resulted in intermediate temperatures.
REINHART et al. (1993) mentioned that moisture had a significant effect during composting of yard waste and municipal biosolids. Peak temperatures were highly correlated with moisture content.
For a mixture of municipal solid waste and municipal biosolids moisture content is not a limiting factor as long as it remains in a range of 45 to 55% (w.b.) during the active composting stage. The figure of 60% (w.b.) moisture is the upper limit for adequate free air space in windrow composting systems (EPSTEIN, 1997).

Oxygen availability

The biochemical oxidation of composting material is predominantly carried out by aerobic micro-organisms. They can utilise only oxygen which is dissolved in the aqueous phase of the substrate (SCHLEGEL, 1995).
The oxygen, which is already dissolved in the water is consumed in a couple of seconds at high microbial activity levels (SCHLEGEL, 1995). Therefore aeration for matrix oxygenation and concurrent removal of produced carbon dioxide is needed.
Aeration serves also two other purposes: i.e. cooling and drying of the material.
Oxygen consumption is affected by moisture content; REGAN and JERIS (1970) found that the oxygen consumption was greater at 56% (w.b.) than at 85% (w.b.) moisture content. Higher moisture levels imply lower free air space, with free air space being that part of the total pore space that is not filled with water (EPSTEIN 1997). The air flows through the free air pore space and provides the micro-organisms with oxygen dissolved in the aqueous phase.
For municipal solid waste optimum moisture contents of 53 - 65% (w.b.) imply a free air space in a range of 32 - 36% (w.b.) (EPSTEIN, 1997).
Maximum oxygen consumption in composting of municipal solid waste, i.e. maximum biological activity, has been observed at 65% (w.b.) moisture and 30% free air space (EPSTEIN, 1997).

Particle and pore size

Particle and pore size are influencing factors. A higher pore space and a less compact structure, facilitate an air flow at a greater particle surface exposed to air.
Consequently, relatively smaller particles of material can have a higher degradation rate because they have a greater surface area in comparison to their volume. On the other hand, smaller particles could compact more easily, thus excluding oxygen from penetrating into the interior of the composting matrix.
Variations in particle size and moisture content within the matrix can lead to preferential flow paths, causing the development of zones with varying aeration levels. Even homogeneous feedstock material will have variably sized particles and a intricately connected pore structure. Friction between air and particle surface influences the gas velocity distribution so that convection mass transfer dominates only in the large pores, while diffusion dominates in the very small ones (RICHARD, 1997).

2 Literature Review

2.1 Main Components of Biowaste, Breakdown Products and Their RQ Values

Bardos and Lopez-Real (1989), as cited in LASARIDI (1996), divided organic material encountered in composting processes in three main groups referring to their degradability:

Table 2.1: Organic materials encountered in composting (adopted from LASARIDI, 1998)

Group 1 (readily degradable)	sugars, starches, glycogen, pectin, fatty acids, glycerol, lipids, fats, phospholipids, amino acids, nucleic acids, protein
Group 2 (slower to degrade)	hemicellulose, cellulose, chitin, low molecular weight aromatics and aliphatics
Group 3 (usually resistant)	lignocellulose, lignin

Lignocelluloses are a great component of plant material. Plant residues consist on average of 45 - 50% cellulose. Some, like cotton, can have a cellulose content up to 90% (SCHLEGEL, 1995; STOLP, 1988). A great part of lignocellulosic material is made of three groups of compounds, celluloses, pectins and lignins. The ratios of this compounds differ in different materials. Celluloses comprise true cellulose and hemicellulose. Each of the components of the lignocellulosic material require more than one enzyme for its degradation.

Hemicellulose is much more heterogeneous than cellulose. The main sugars forming hemicellulose are the pentoses, xylose and arabinose and the hexoses, glucose, galactose and mannose.

Lignin is an extremely complex and variable material which is a three dimensional polymer.

Lignin is extremely resistant to chemical and enzymatic degradation (WHITNEY and LYNCH, 1996).

Starch and other glucans are predominant plant constituents. Starch can be converted to glucose by acidic hydrolysis or enzymatically. The enzymatic degradation is divided in three types: the phoshorolysis, the hydrolysis and the transglycosylation (SCHLEGEL, 1995).

Proteins can be found in a large extent in organisms. The proteins of dead organism are attacked and broken down by a multitude of fungi and bacteria. Deamination means the liberation of ammonia from an amino acid. Oxidative deamination is the most common type of amino acid catabolism (SCHLEGEL, 1995).

SCHARRER (1950) evaluated that the complete oxidation of one gram protein required 0,94 litres of oxygen and liberated 0,73 litres carbon dioxide and therefore the respiratory quotient was calculated to be 0,777. The RQ of proteins can fluctuate depending on their composition, however.

One gram fat needed for its complete oxidation for example 2,0192 litres oxygen and produced 1,4237 litres carbon dioxide. Thus, the complete reaction had an RQ of 0,707. The RQ can fluctuate, also depending on the chemical composition of the fats, e.g. the composition of the fatty acids.

GRAY (1973) mentioned that different organic compounds have different RQ values. Starch and glucose have an RQ of 1.0, proteins have an RQ of 0,81 and fats have a RQ of approximately 0,71 when completely biodegraded to give carbon dioxide and water.

Respiratory quotients of organic compounds depend rather upon their chemical composition than the end products of the metabolism stated VARMA and RAID (1965). The end products of carbohydrates, fats and protein are the same, yet the RQ values stoichiometrically differ.

Molar concentration or carbon dioxide produced is an indicative of oxidised substrate only stated VARMA and RAID (1965). In contrast, the oxygen consumption represented the part of substrate oxidised as well as the fraction of substrate converted to protoplasm.The authors explained this schematically as shown in Equation 2.1 (adopted from VARMA and RAID, 1965).

$$A + 2\,O_2 \longrightarrow F + 2\,CO_2 \qquad \text{(Eq. 2.1)}$$

$$A \xrightarrow{a} B \xrightarrow{b} C \xrightarrow{c} D \xrightarrow{d} E \xrightarrow{e} F + 2CO_2$$

A certain substance A is oxidised in its final product F and carbon dioxide. This could be stoichiometrically represented in one equation, however, in reality it is a multi-step process. The capital letters stand for different metabolic products and the small letters stand for enzymes, responsible for a conversion. With the aid of all the enzymes, A is converted into its end products. If the reaction is carried out to the last stage, the RQ value will be one. However, if one of the enzymes is poisoned during the formation of a metabolic by-product, the further transformation to the next product may be inhibited or even stopped. In such a case the RQ value differs from the theoretical value.

According to the GLATHE and FARKASDI (1964) the respiratory quotient may be used as a criterion in controlling the composting processes.

If the RQ equals one, the oxygen is used to oxygenate the present carbon. If the RQ is greater than one, more carbon dioxide is emitted at the corresponding amount of oxygen supplied. This indicates that carbon dioxide is produced as a result of anoxic reactions. If the RQ is below one, a small part of the oxygen is consumed for the oxidation of carbohydrates, the remainder being used for the breakdown of proteins, fats and other compounds. The latter compounds contain less chemically-bound oxygen and need more oxygen for their biological degradation than the amount of carbon dioxide produced. Depending on the substrate treated, an increase in RQ may indicate the commencement of anaerobic or anoxic conditions. Conversely, a decreasing value may mean an amplification of aerobic conditions during composting (GLATHE and FARKASDI, 1964).

2.2 Monitoring of Matrix Aerobiosis

In this work, the term aerobiosis refers to whether the oxygen amounts solubilised and thus available to the micro-organisms present in the biofilm are capable of supporting aerobic metabolism. Further, various degrees of aerobiosis may be defined, zero being the one which corresponds to absolute lack of aerobic microbial metabolism. The degree of aerobiosis is a parameter which is influenced by a multitude of process parameters. Direct monitoring of this parameter is really complicated by technical barriers. Alternatively, the degree of aerobiosis might be inferred by monitoring process parameters such as temperature, macropore oxygen concentration etc. However, doing so, the interdependence of the influencing factors and the degree of aerobiosis should be known, which is a very complicated modelling exercise indeed.

The oxygen content of the biofilm could be expressed as a function of the oxygen uptake rate and the oxygen depletion rate. These two variables are lump parameters influenced by others.

Oxygen uptake rate is dependent on the type of substrate and the microbial activity. The type of substrate depends on the type of the feedstock material and the microbial activity course which, in its turn depends on environmental parameters like temperature, moisture, oxygen content and porosity. The feedstock material can be easily adjusted by material pre-conditioning, thus selecting some of the characteristics of the substrate. The microbial activity course is influenced by temperature, moisture, oxygen content, porosity, the microbial community itself and the type of substrate available at the time.

Oxygen depletion rate is determined by the biofilm thickness, temperature, macropore oxygen concentration and gas turbulence which is affected by the aeration velocity.

Biofilm thickness is influenced by the moisture content of the film and by the matter absorbance capacity which depends on the nature of the feedstock material. The moisture content is fixed by the material pre-conditioning. The microbial activity, type of the substrate and the aeration rate affect the temperature course. The amount of oxygen in the macropores could be regulated by the aeration rate and the material's porosity which is determined by material characteristics like particle size and the content of free water in it.

The Respiratory quotient has been contemplated to be a lumped parameter for encapsulating the overall effect of the various factors on matrix aerobiosis, and thus a potential indicator of the degree of matrix aerobiosis.

2.3 The Respiratory Quotient (RQ)

The respiratory quotient is the ratio between carbon dioxide evolved and oxygen consumed in a given time span, as indicated in the following Equation 2.2:

$$RQ = \frac{\text{moles } CO_2 \text{ produced}}{\text{moles } O_2 \text{ consumed}} \qquad \text{(Eq. 2.2)}$$

The ratio could also expressed as a volume to volume ratio:

$$RQ = \frac{\text{Vol. } CO_2 \text{ produced}}{\text{Vol. } O_2 \text{ consumed}} \qquad \text{(Eq. 2.3)}$$

This is possible because one molecule of each gas has the same volume according to Avogadro´s rule. Gaseous substances have a molecular volume of 22.4 litres (at 0°C and 1 bar pressure) which means the equivalent of one mole oxygen as well as one mole carbon dioxide expressed in volume is 22.4 litres (at standard conditions). In general, it is possible to state that one mole of each gas has under the same environmental conditions (i.e. pressure and temperature) the same volume.

Respiratory quotients can be theoretically determined by considering the stoichiometry of an aerobic biochemical reaction (RICHARD, 1997).

Some investigations have found RQ values during composting of ground garbage and municipal solid waste in drum shaped reactors being in the range of 0,6 to 0,91 (WILEY and PIERCE, 1955; SCHULZE, 1960; ATKINSON, 1996).

SCHULZE (1960) composted synthetic garbage (contained bread, oranges, vegetables, papers and ground beef) in a rotating lucite drum. The air supply was adjusted so that at least 2 - 5% oxygen was present in the exhaust gas. The garbage was grinded and contained 61 - 71% moisture. This moisture content was reduced to 50 - 60%during processing. Time needed for completion of the aerobic decomposition cycle was averaging fourteen days. RQ values for the over-all process between 0.8 - 0.9 were achieved with exception of the first three days. During this period the RQ had a value in the range of 1.5 to 1.1. No explanation for this results was given. It may be that the air supply was not correctly adjusted in this first stage, thus promoting anaerobic conditions which led to an increased carbon dioxide production. Peak temperatures of 63°C were reached in the insulated drum. The oxygen consumption rate varied with temperature. The pH-values increased from 5.2 at the beginning to 8.8 at the of the process.

Mixtures of ground yard trimmings (50% by weight), chicken manure (50, 27 and 40% by weight), potato-processing and bakery waste were composted in pilot-scale (208 l), insulated vessels. A 65°C set point controlled a fan aeration system for each vessel. The material was remixed twice a week during a four-week composting period. A 50%, by weight, moisture content was maintained all over the processing time. In the first, most active part of the process, it was found that the system could go completely anaerobic in about one hour at low aeration rates (approximately 0.10 kg air/kg dry matter/h). There was a rapid rise in carbon dioxide level (and a drop in the oxygen level) when the fan switched from a high to a low pre-set aeration rate during the first two weeks of composting. The investigations yielded average respiratory quotients ranging from 0.87 to 0.90 for the whole period, depending on the type of the mix (i.e. percentage of ingredients). Initial pH-values were around 6.0 and by the end all the mixes had a pH of 8.5 (ELWELL et al., 1996).

VARMA and RAID (1965) investigated the production of carbon dioxide as related to oxygen consumption with regard to microbial activity. They remarked that an arbitrary assumption of stoichiometric RQ as unity may be erroneous, because stoichiometry does not always account for intermediate metabolic products. Their experiments involved the examination of biological slime developed in sewage sludge mixed with synthetic sewage at the ratio of 1:3 (by volume). The slime was examined in an air-tight, insulated, rotating drum reactor (8.9 cm inner diameter). Pure oxygen was used to maintain aerobic conditions in the drum. The pH-values varied from 6.2 to 9.7 and from 6.4 to 9.0 at the start and end of a run, respectively. The respiratory quotient during the initial stages of the experiment was less than one and later increased to be greater than one. It was noticed that the respiratory quotient is dependent upon pH of the substrate to some extent. The RQ varied in either side of unity which indicated that the RQ is not always one.

Oxygen consumption represents that part of substrate oxidised to carbon dioxide and water as well as the fraction converted to protoplasm. In contrast, the carbon dioxide produced corresponds to the oxygen consumed for substrate oxidation only (VARMA and RAID, 1965). The authors did not mention further details about the proportion of oxygen necessitated for oxidation and cell growth.

The stoichiometric RQ depends only on the initial and end products and not on the quality of the intermediate products yielded during the course of a reaction. The respiratory quotient of organic material depends upon material chemical composition and is different than that of the sum of the individual organic compounds, constituting an organic substance. The authors concluded that the RQ of biological slimes is not always unity, which means, that a measurement of evolved carbon dioxide cannot used as a precise indicator of aerobic respiration rate (VARMA and RAID, 1965).

TSENG et al. (1996) carried out composting experiments for ATP measurements. A bench-scale reactor, which held eight thin layers of feed material (ground grass, leaf, chopped corn cobs, sand, seed inoculum and newsprint) was used. Individual tests were conducted at 40, 60 and 70°C for 250 hours, and at 50°C for up to 350 hours. The pH values increased from 5.0 to 8.5 while processing. Carbon dioxide evolution and oxygen consumption rates were calculated based on a mass balance surrounding the reactor. RQ was calculated as $RQ_{t1\text{-}t2} = \int R_{CO2}dt/R_{O2}dt$. RQ values were lower at the beginning and at the end of each experiment. High RQ values were achieved during the 100 to 150 hours period. TSENG et al (1996) speculated that this was possibly caused by the elevated temperatures of 70°C which enhanced anaerobic catabolism during this interval and increased the respective RQ values. While RQ values suggested an enhancement of catabolism at 70°C, because anaerobiosis would support catabolism through fermentative decomposition, the results also reflected a change in the microbial community. At temperatures above 60°C thermophilic bacteria make up the active microbial biomass. The authors concluded that this trend agreed with the results of the experiment, which supported at 70°C the lowest levels of biomass measured as ATP.

NAKASAKI et al. (1992) studied the effects of oxygen concentration on composting organics using two kinds of organic wastes, i.e. garbage (mainly food waste) and grass clippings to compare quantitatively the rate of organic matter decomposition under aerobic and anaerobic conditions. Four experimental runs were carried out; one with a inlet oxygen concentration of 20.95 Vol. % (air) and one with an oxygen content of 3 Vol. %, for both types of material. The garbage had a moisture content of 48%, the grass clipping one of 60%. The reaction temperature was maintained at 60°C by regulating the flow rate of the airstream. Carbon dioxide exhaust concentration was continuously monitored with an infrared analyser. Each run lasted for six days.
Carbon dioxide evolution rate showed a large peak at the early stage of the composting process. In a run featuring an inlet oxygen concentration of 3 Vol. %, maximum attainable carbon dioxide concentrations were calculated using an RQ value of 0.7 by assuming that only aerobic reactions occurred. The observed carbon dioxide concentration exceeded the calculated value which confirmed that some carbon dioxide was produced as a result of anaerobic reactions.

NAKASAKI et al. (1985) investigated the effects of temperature on composting sewage sludge at 50, 60 and 70°C. Composting temperatures were kept at these levels by controlling the air flow of the bench-scale autothermal reactor.
Carbon dioxide and oxygen concentration in the exhaust gas of the reactor were measured with an infrared analyser and a paramagnetic analyser, respectively.
The temperature reached the set-point in the first 20 hours; the carbon dioxide evolution also peaked in this interval. Optimal composting temperatures of 60°C for sewage sludge were obtained.
An isolated thermophilic bacterium was investigated because of the highest rates of specific carbon dioxide evolution were reached at temperatures of 70°C although the average number of viable cells was smaller than those at 50 and 60°C. The specific oxygen consumption at 70°C of this bacterium was four times higher than that at 60°C which correspondents with the higher carbon dioxide evolution rate at 70°C.
The report suggested that the carbon dioxide evolution during composting was been attributed to two parallel reactions, i.e. catabolism and anabolism, each having a different activation energy. The one having the higher activation energy became dominant at higher temperature levels. The RQ depends on temperature if the fraction between anabolism and catabolism depends on temperature too, stated NAKASAKI et al. (1985).

An equation was evaluated to express the catabolic degradation of this sewage sludge: $CH_{2,12}N_{0,09}O_{0,52} + 1,2\ O_2 \rightarrow CO_2 + 0,93\ H_2O + 0,09\ NH_3$ which gave an RQ of 0,83, consequently. This formula was obtained applying elementary analysis.
Values of the respiratory quotient obtained in the trial were lower than the theoretical RQ value. They also increased with temperature.

ATKINSON et al. (1996) used two insulated bench-scale reactors to determine biodegradability of municipal solid waste (MSW), primarily office trash, and the effects of nutrient supplementation during six weeks of composting. Material was initially mixed and re-wetted twice a week. Temperature was maintained in the thermophilic range. Moisture content decreased from about 62% to 45% in the first eight days. Two major peaks of carbon dioxide evolution were observed within the first 100 hours, which may have reflected the transition from mesophilic to thermophilic metabolism. After the re-wetting the temperature fell to mesophilic range. Therefore two peaks of carbon dioxide production were obtained.
The supplemented MSW achieved the following RQ values: 0.84 (initial), 0.88 (1^{st} rewet), 0.92 (2^{nd} rewet). The unsupplemented achieved 0.82; 0.93; 0.93; respectively. The change in the respiratory quotient indicates a change in the nature of the substrate being degraded. Modifications in the rate of carbon dioxide evolution may have reflected changes in the composition of the active microbial population.

GOVIND et al. (1997) conducted three separate experiments to test an oxygen uptake and carbon dioxide evolution system, as follows: a) an aqueous biodegradation of phenol, b) a soil slurry biotreatment of soil contaminated with phenol and c) an aqueous biodegradation of crude oil.
The oxygen uptake increased sharp at the beginning then reached a plateau value before it started increasing very slowly. The respiratory quotient was close to one in the beginning. After the oxygen uptake level achieved plateau values, the carbon dioxide evolution amount exceeded the oxygen consumption and the respiratory quotient was greater than one. The increase of the carbon dioxide production was, according to the authors, mainly attributed to the decay and breakdown of the intermediate products of microbial metabolism. Similarly, at the biodegradation of crude oil, the RQ value was slightly less than one before achieving that oxygen uptake plateau value. The consequent higher carbon dioxide evolution rate was once again attributed to the biodegradation of metabolic products.
It was remarked that if the carbon dioxide evolution is only measured every 24 hours, the respiratory quotient would have a significant error, because only an average carbon dioxide evolution rate is obtained.

In a comprehensive study of the performance of a full-scale (45m³) pure oxygen autothermal thermophilic aerobic reactor of a slurry phase sewage sludge dual digestion system, MESSENGER et al. (1993) carried out specific heat yield tests.
Ideal gas laws were applied to calculate the vent gas oxygen or carbon dioxide molar or mass flow rates, assuming that the dry vent gas contained only carbon dioxide and oxygen. From the vent gas oxygen and carbon dioxide mass flow rates and the specific volumetric oxygen supply rate [kg O_2/(m³h)] of the oxygenation system, the respiratory quotient and the oxygen consumption of the sludge mass [kg O_2/h] were calculated.
For heat yield tests, the respiratory quotient varied from 0.53 to 0.85. Examining the data, it was found, that 6 values were outliners which were rejected. The average respiratory quotient for the remaining data was calculated to be 0.66. The low value of the respiratory quotient could not be attributed to carbon dioxide dissolution into the sludge mix because a high partial pressure of carbon dioxide and an increase of H_2CO_3-alkalinity in the reactor were observed. The authors stated that in earlier investigation into autothermal thermophilic aerobic digestion the oxygen consumption [kg O_2/h] was estimated assuming a respiratory quotient equal to 1.0 which could be expected by the stoichiometry of oxidation. MESSENGER et al. (1993) refused the common assumption, which implied the that the dry inlet and air flow equals the dry outlet gas flow and they measured the total volumetric flow rate of the vent gas. Had one been accepted for respiration quotient for this reactor, the volume of the vent gas would have been overestimated, causing the oxygen consumption to be underestimated and an overestimation of the specific biological heat yield by more than 20%.

HARPER et al. (1992) prepared compost for mushroom cultivation in an environmentally controlled composting system of ten tons. At the beginning, ventilation was manually controlled to provide aerobic conditions. Heat peaks were achieved at an initial moisture of 67 to 71% in the range of 55 to 63°C. Carbon dioxide concentrations were measured through a port in exhaust gas section at 4 to 8 hour intervals. Consequently, these values are bulk parameters representative of the exhaust air. At the microsite level the values of carbon dioxide and oxygen concentration may have been significantly different stated the authors. During the constant temperature phases of composting, a 1:1 relationship between carbon dioxide production and oxygen usage was found. At some earlier trials, when operation was less than optimal, oxygen levels during the initial temperature build-up stages sometimes declined to less than 10%. At this oxygen level, carbon dioxide production began to exceed the 1:1 stoichiometric relationship, indicating the presence of local anaerobic conditions.

Undisturbed sediment cores, taken in winter from four lakes of different trophic state were examined concerning aerobic respiration at different temperatures. Aerobic respiration showed a good correlation to oxygen uptake in all cores. The RQ values were calculated from the mean values of carbon dioxide production and oxygen uptake at each temperature for each lake and achieved a range from 0.83 to 0.96 with a mean value for the four lakes of 0.90. The respiratory quotient did not change with the temperature but was slightly higher in the high eutrophic lakes compared with the less eutrophic ones. Aerobic respiration was measured at 5, 10, 15 and 20°C. It was stated that carbon dioxide evolution and oxygen uptake are closely-coupled processes with a RQ around 0.90 (GRANÉLI, 1979).
In contrast to other investigations (TSENG et al. 1996, NAKASAKI et al. 1992) which stated that the respiratory quotient is increasing with increasing temperature, in this case temperature has no influence on RQ. However, only psychrophilic temperatures were involved in the work of GRANÉLI (1979).

RIXON et al. (1968) examined the relation between respiratory quotient, matric suction (i.e. suction of the soil matrix) and free air space for different kinds of soils. Coarse textured soils can drain water at low matric suction because its content of large pores. In contrast, fine textured soils have many small pores which drain at high matric suction. A use of the RQ as an index of aerobic or anaerobic conditions was suggested in this work.
For low matric suction in the soil samples, the RQ values were considerably greater than one and the air filled pore space amounted to approximately 5%. With increasing matric suction a stage was reached at which, within a comparatively narrow range of matric suction, the RQ changed from high values to around one as increased air filled pore space altered from 10% to more than 20%. The changes were related to the clay content of the soils. The observed relationship between RQ, matric suction and air porosity was consistent for all soil types studied. It was noted that the change in matric suction, and thus in air filled pore space, was coinciding with a sudden decrease in RQ values. Also denitrification at low soil suction coincided with high RQ values while denitrification did not occur when the RQ was approximately one. The anaerobic interval, indicated by RQ values in relation to matric suction, is thought to give the likely extent of conditions favourable for denitrification.

FISCHER (1995) examined three kinds of soil at different thermal and moisture conditions with the aim to estimate the level of oxygen uptake and carbon dioxide release. Volumetric respirometers were used to measure it at temperatures of 0, 2, 4 and 8°C under controlled moisture conditions. It was found that the value of the respiratory quotient decreased with growing water content, although the metabolic rate of each type of soil was different. The report remarked that this relationship was valid for all soil types under study at all temperatures. It was noticed that there is a close negative relation between RQ and moisture content in soil.

AIBA and FURUSE (1990) considered some theoretical backgrounds of the RQ measurement in applying fermentor exit gas analysis. It was noted that the deviation of a measurable RQ observed by the exit gas analysis, from the true value of RQ is enlarged considerably as the value of the pH increases. Conversely, measured RQ values for the acidic range represented fairly well the real respiratory quotient. At pH values around 7 and/or less than 5 the deviation of the measured RQ from the real RQ was hardly noticeable. For aerated fermentation, carried out at the alkaline side, gas analysis would give RQ values that differ remarkably from the true values because of medium's storage of carbon dioxide released by the microbes. That means carbon dioxide is chemically-bound by alkaline substances (like ammonia) thus deducing from carbon dioxide concentration in the exhaust gas.

FERTIG (1981) examined the correlation between aeration, heat production, oxygen consumption and carbon dioxide evolution during composting of municipal solid waste in an insulated, cylindrical stainless steel vessel of 88 litres. The material had an initial water content of 50% and the process was executed in two nine-day periods. Temperature, oxygen uptake and carbon dioxide production were continuously measured. Different conditions were simulated in several trials; i.e. (1) trials with varying aeration intensity, (2) trials with varying aeration following the first intensive stage of the process, (3) trials with decreased temperature levels following the first intensive stage of composting and (4) processing at lower temperatures.
Microbial activity in the first forty-eight hours was not influenced by the intensity of aeration. Carbon dioxide evolution and oxygen consumption formed equivalent curves and corresponded with the heat production curve. Three to four peak ranges of carbon dioxide evolution and oxygen consumption were observed. After achieving the first maximum, the temperature decreased and a minimum of microbial respiration activity was found at a temperature range of 51.8 - 53.7°C. During the self heating phase, until maximum temperature was achieved, microbial activity, measured as oxygen depletion and carbon dioxide evolution, was determined at temperature levels in the range of 31.0 - 45.0°C and 57.3 - 63.6°C. The highest oxygen demand was measured as 1.24 - 1.66 l O_2/kg dry mass/hr.

RICHARD (1997) evaluated the effects of temperature, oxygen concentration, moisture and substrate on microbial degradation kinetics using two composting systems: a micro reactor system and a pilot-scale system. Synthetic food waste and anaerobically digested, polymer-dewatered sewage sludge, both mixed with apart of maple wood chips, were utilised as feeding material.
Trials in the micro reactor system were conducted at moisture levels of 35, 45 and 55% for the synthetic food waste mixture and 35, 55 and 60% for the sewage sludge mix. The 45% moisture content resulted in the highest reaction rates for both mixes.
The initial pH of the food waste blend charged in the pilot-scale system, ranged from 5.2 to 6.0. This declined rapidly in the first stage of processing then rose to neutral within seven days and finally stabilised to 8.5 at the end of processing. The pH values of the sewage sludge mixture remained between 6.6 and 8.3 throughout all trials.
Respiratory quotients (measured in the micro-reactors) on a molar base were calculated for each run. RQ values fluctuated significantly, in part as a result of infrequent sampling during the highly variable initial part of the tests. On average, RQ values from 0.9 to 1.03 for synthetic food waste and from 0.86 to 0.94 for the sewage sludge mix were calculated. The higher average RQ values observed in the synthetic food waste mix reactors could be attributed to a higher degradation of carbohydrates rather than to greater anaerobic production of carbon dioxide.
According to the author, it is difficult to compare composting processes based on an average RQ without knowledge of the degradation stoichiometry. There was a considerable fluctuation in RQ values during individual pilot-scale reactor runs. RQ values were calculated during a 48-hour period. The synthetic food waste had an RQ considerably greater than one in the first five days, in contrast the sewage sludge RQ values were consistently less than one in this time period, indicating more extensive aerobic degradation reactions for this substrate. After the first days, the RQ values of both mixtures converged. The high RQ values of the synthetic food waste in the initial stage of processing supported the hypothesis that the acidic phase observed in the bigger reactor is a result of oxygen limitations. The consistent lower RQ values of the sewage sludge mix indicate that this substrate did not demand such a high oxygen supply as the synthetic food waste mix (RICHARD, 1997).
In the micro-reactors the RQ values of the sewage sludge at the start of the run were in the range 1.10 to 1.25 and later they decreased to a lower value and remained there until the measurement ended (42 days). RICHARD (1997) commented that lower RQ values observed during an intermediate period of an experiment may be indicating a higher degradation of proteins and lipids and therefore resulting in a lower aerobic stoichiometric RQ.

RQ values higher than the predicted by aerobic stoichiometry are an indicator of anoxic conditions, since carbon dioxide is produced without a corresponding utilisation of oxygen. RQ values greater than one are a strong reference of anoxic degradation as the highest theoretical stoichiometric RQ for carbohydrates is one (carbohydrates),

RICHARD (1997) noted that the respiratory quotient provides an experimental means of estimating the degree of anaerobic activity, and also separating it from aerobic degradation. Further he derived a method to estimate the anoxic fraction of the total biodegradation. The following Equation 2.4 was used:

$$\frac{CO_{2,anoxic}}{CO_{2,total}} = \frac{RQ_{observed} - RQ_{aerobic}}{RQ_{observed}} \quad \text{(Eq. 2.4)}$$

with

$\frac{CO_{2,anoxic}}{CO_{2,total}}$ = the anoxic part of total biodegradation

$RQ_{observed}$ = measured RQ

$RQ_{aerobic}$ = aerobic stoichiometric RQ

It should be noted that significant degradation of fats and proteins would lower the stoichiometric RQ and thus underestimate the anoxic fraction of total degradation.

DIERING (1979) composted a mixture of municipal solid waste (excluding the inert materials like glass and metals) and raw sewage sludge took place in several trials in four insulated, cylindrical reactors each one with a volume of 0,6 m^3. Temperature, oxygen and carbon dioxide concentration were automatically measured every two hours. Oxygen was supplied by a compressor forcing air from the top to the base of the vessels. The material had a moisture content of 60%. The composting process was completed within 720 hours. Biological activity decreased rapidly after a processing time of 420 hours as indicated by temperature. Measured oxygen and carbon dioxide macropore concentration appeared to be independent from temperature. The highest rates of carbon dioxide production were achieved within the first 24 hours of processing and decreased rapidly after a processing time of around twelve days.

It was stated that a positive influence on the temperature course is only possible if the intensity of aeration was adjusted so that the material RQ values were maintained below one.

In the optimum temperature range, the aeration requirement fluctuated from 1.91 to 6.43 m^3 air/ ton (w.b.)/ h. An average air requirement of 2.5 m^3 air/ ton (w.b.)/ h was evaluated for this mixture which means that the air supply had to be higher in the first, intensive stage of the composting process and could be lower at the end. These experiments showed that the oxygen content (i.e. the amount of oxygen in the macropores) could not be used completely for the oxidation of the feedstock material. DIERING (1979) calculated the respiratory quotient as a volumetric ratio and stated the following:

RQ > 1 more carbon dioxide is produced as oxygen consumed by aerobic respiration, the additional carbon dioxide is produced by anaerobic decomposition

RQ = 1 aerobic conditions, the volume of produced carbon dioxide corresponds to the volume of the consumed oxygen, mainly decomposition of carbohydrates

RQ < 1 good aeration, a part of the oxygen is used to oxidise carbohydrates and the remainder is utilised to degrade the proteins, fats and similar compounds

Assuming RQ = 1, DIERING (1979) calculated a maximum oxygen consumption in the reactor (with an oxygen content in the inlet air of 20.90 %) by using the following Equation 2.5:

$$RQ = 1 = \frac{\text{Vol. } CO_2}{\text{Vol. } O_2} = \frac{X}{20.90 - X} \qquad \text{(Eq. 2.5)}$$

By solving Eq. 2.5 to X, X = 10.45 Vol. % for exhaust oxygen concentration was found. With this results the average oxygen demand of this waste type was determined with 350 g O_2 /ton (w.b.)/hour.
Initial pH values were partially in the acidic range and increased rapidly in the alkaline range of above 8.0.

MOORE (1958) carried out investigations on oxygen uptake rates and respiratory quotients of anaerobically decomposing synthetic garbage (fresh ground vegetables, fruits, potatoes, bread, meat, coffee grounds and newsprint - chopped and mixed manually and then twice ground in a vertical mill grinder). The material contained 68.0% (w.b.) moisture 94.3% (dry wt) volatile matter and had an initial pH of 5.5.

A rotating drum composter with a capacity of 0,75 c.ft. (21 l) was used because a preliminary study had shown that composting in a cylindrical metal container without mixing resulted in a high percentage of composting material becoming so dry that only little decomposition took place. Compressed air at room temperature was used for aeration. Aeration rate was adjusted to maintain an exhaust gas oxygen concentration of 2 - 5%. The aeration rates varied from 0.2 - 15.4 cubic feet of air per pound of initial volatile matter per day (5.6 - 431.2 l air per 453.6 g initial volatile matter per day).

Oxygen uptake rates were calculated by dividing the amounts of used oxygen by the original weight of the volatile matter. The amount of oxygen used was derived from the difference between inlet and exhaust gas concentration.

Oxygen uptake rate was found to be directly proportional to temperature. The study evaluated an oxygen requirement of 18000 - 20000 cubic feet air per ton initial volatile matter per day (540 - 560 m^3 air per 907.2 kg initial volatile matter per day) to satisfy the maximum oxygen demand for aerobic conditions.

MOORE (1958) carried out 9 experiments varying moisture content, input masses, aeration rates and type of material. Each of the experiments lasted two weeks.

Initial pH values of all these trials was in the range of from 4.5 - 6.3 while the end values of pH varied from 8.4 - 9.0. Dry weight and volatile matter losses were around 40% for all trials. Maximum oxygen uptake rates of 1.9 - 6.0 mg O_2 per gram initial volatile matter and hour were achieved.

The respiratory quotients computed by dividing the percentage of carbon dioxide in the exhaust gas by the percentage of used oxygen were seldom exactly one. The average RQ for the overall composting process was close to 0.9.

RQ values were measured daily and had in all these trial a similar time course. In the first two days the RQ achieved a maximum of 1.2 - 1.6 followed by a decrease and ending after 12 - 14 days at values around 0.5 - 0.6.

BACH et al. (1984) composted dewatered sewage sludge in an isothermal reactor. The progress of the reaction was monitored by measurement of carbon dioxide evolution rate. The optimum temperature was found to be around 60° C.

The ratio $\frac{-r_{O_2}}{r_{CO_2}}$, with $-r_{O_2}$ as oxygen consumption rate and r_{CO_2} as carbon dioxide evolution rate, was used to express the time course of reaction rate. This ratio was larger than one in the first stage of composting and became less than one after the

peak of carbon dioxide evolution had passed. This tendency was observed in all trials.
It was stated that an amount of 4% of the total carbon dioxide gas evolved had reacted with ammonia liberated during the composting process, thus compromising RQ measurement.

HINCHEE and ONG (1992) presented an in-situ method to measure the aerobic biodegradation rates of hydrocarbons in contaminated soils. It was noticed that biodegradation rates based on oxygen depletion were generally more reliable (especially for alkaline soils) than rates based on carbon dioxide production. Carbon dioxide produced by microbial respiration was probably converted to carbonate under alkaline conditions.
In-situ respiration rates based on oxygen depletion in the range of 0,02 to 0,99 % (v/v) O_2/hr and rates based on carbon dioxide evolution in the range of 0,001 to 0,18 % (v/v) CO_2/hr were observed.

2.4 Summary

The respiratory quotient depends upon the pH range (VARMA and RAID, 1965). RQ values measured at the acidic range represent fairly well the real RQ, for pH values lower than 5, the RQ values could deviate considerably (AIBA and FURUSE, 1990).

The respiratory quotient of organic materials depends on the chemical composition and digestibility and is different than the additive RQ of the individual constituent (VARMA and RAID, 1965).

The measurement of oxygen consumption and carbon dioxide evolution has to be frequent to avoid errors (GOVIND et al. 1997).

The average RQ was found to be in the range of 0.6-0.91 during composting of of ground garbage and MSW in drum shaped reactors (WILEY and PIERCE, 1955; MOORE, 1958; SCHULZE, 1960; ATKINSON, 1996).

Assuming RQ as one for aerobic degradation may be erroneous because stoichiometry does not always account for intermediate metabolic products (VARMA and RAID, 1965).

At the beginning (24 to 48 hours) of the composting process the RQ values are greater than one followed by a decrease to values less than one (MOORE, 1958, RICHARD, 1997). Lower RQ values during the intermediate period may indicate a higher degradation of proteins and lipids (RICHARD, 1997).

RQ values higher than the stoichiometrical ones could be an indicator for anoxic conditions since carbon dioxide is evolved without a corresponding oxygen use. RICHARD (1997) stated that RQ values greater than one indicate anoxic reactions as the highest stoichiometric RQ is one (for carbohydrates).

3 Aims and Objectives

Composting automatic process control has so far principally involved control actions based on temperature and/or oxygen feedback. Macropore oxygen concentration has conventionally served as an indicator of compost matrix aerobiosis owing to, among others, lack of alternative practical means for measuring aerobiosis. Oxygen macropore concentration is certainly a determinant of matrix aerobiosis, by virtue of its impact on the diffusion driving force, i. e., the oxygen concentration differential between the biofilm and macropore environments. However, other factors are of an equal, if not a greater, importance. Compost particle thickness, porosity (as affected by the amount of free water and particle size) and temperature are additional factors thought to substantially influence the degree of aerobiosis.

The Respiratory Quotient (=mole carbon dioxide produced / mole oxygen consumed, in a determined period) is known to be different under aerobic than under anaerobic conditions. It may thus be a lumped parameter for measuring the overall effect of the various relevant factors influencing matrix aerobiosis. There is apparently a paucity of data concerning RQ studies in composting. To examine the utility of this parameter in process control, it is necessary to investigate how it is influenced by microbiological ecology factors most greatly determining matrix aerobiosis.

The main aim of this work is to investigate the influence of the environmental parameters of moisture content, temperature and oxygen level on the respiratory quotient.

The objectives involved may be categorised as follows:

- Develop and test a laboratory rig to perform the experimental studies.
- Measurement of oxygen and carbon dioxide exhaust levels to calculate the respiratory quotients under variable material temperature, material moisture and exhaust gas oxygen concentration levels.
- Attempt to execute comparative analysis of the data yielded to comment on the potential of employing the RQ as an indicator of matrix aerobiosis.

4 Materials and Methods

4.1 Overview of the Experimental Apparatus

The reactor system was designed to maintain targeted environmental conditions throughout the composting material during a certain period. Cylindrical stainless steel vessels with a diameter of 21,5 cm, a height of 50 cm and a capacity of approximately 18 litres with a working volume of approximately 14 litres (due to the not utilised space below the perforated plate) were used as reactors. These reactors were arranged in eight lines, each comprising two vessels as shown in the Figures 4.1 and 4.2.

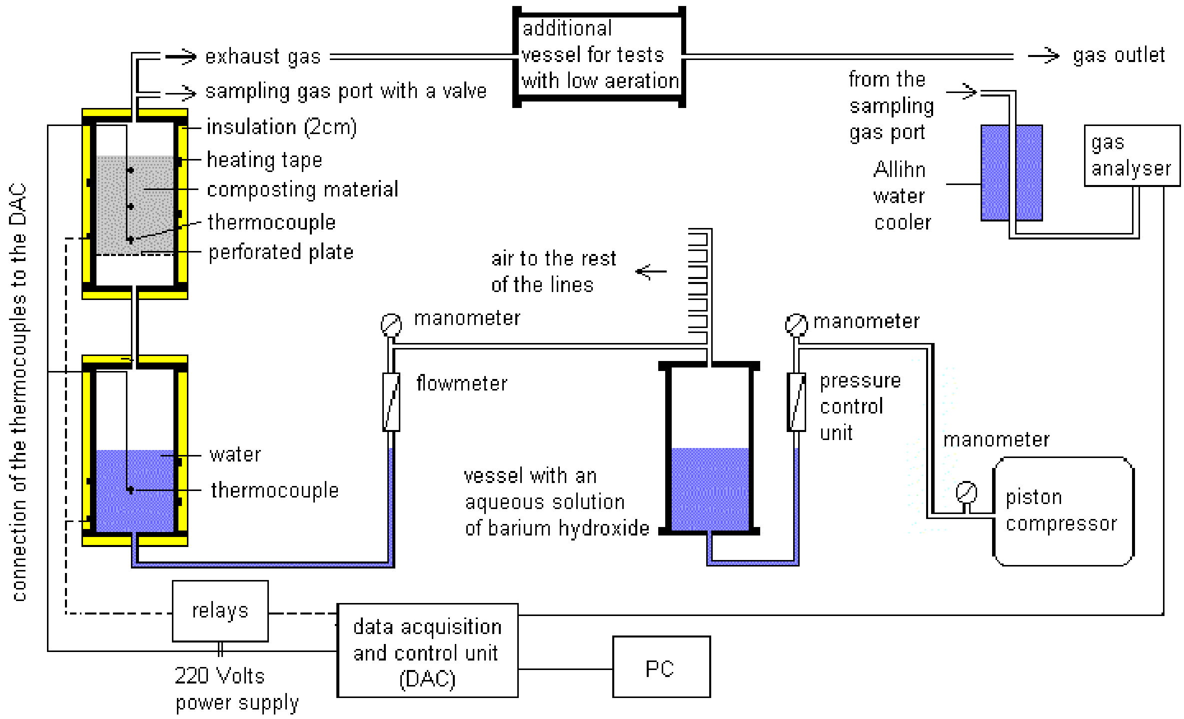

Figure 4.1: Cross-section of the system

The container walls were winded with heating tape consisting of a heating blanket of 1 cm width (type WB/202/100/0027 with an output of 300 Watts) and completely wrapped up with an Isover™ rockwool layer of two centimetres. A whole on the ground panel served as the air inlet and another whole on the lid of the vessel served as the exhaust gas outlet.

The eight lines; each one consisting of two air-tight containers, were connected with insulated plastic tubes with an inner diameter of 6 mm. Each lid and bottom were fixed by eight screws. All pipes connecting the air pre-conditioning vessels with the reactors were insulated with tube insulation material (polyurethane foam). All tubing was 6 mm of inner diameter so that any condensation fell back through the tubing in a reactor or a humidifier, thus not affecting the gas flow.

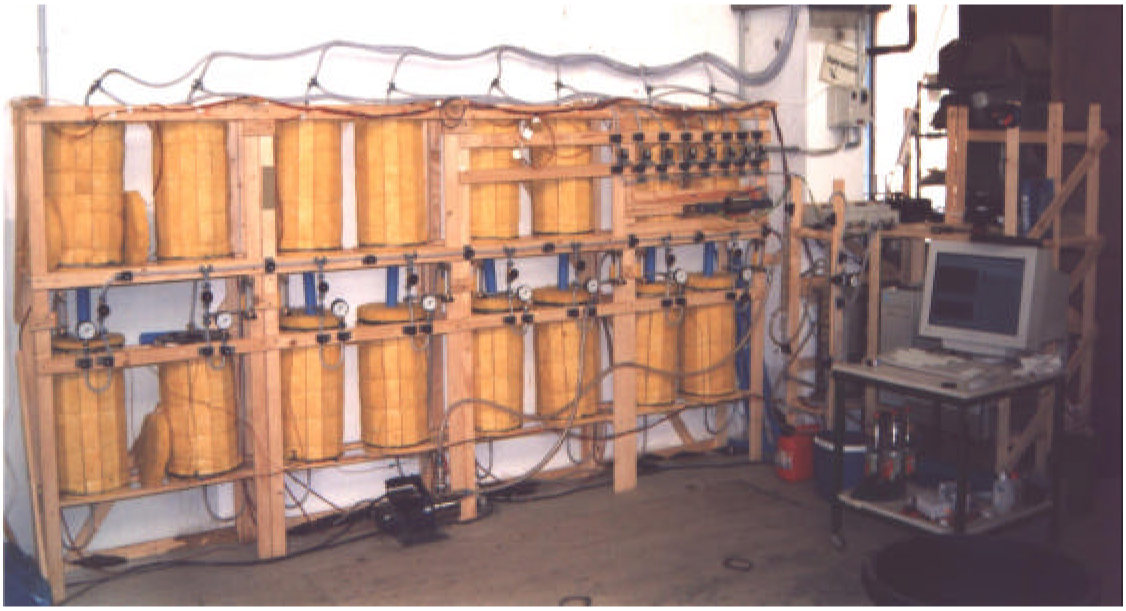

Figure 4.2: View on the system

Air flow rate was separately adjusted for each line by a flowmeter (model 10A 6141F purgemeter, tube FP-1/4-41-G-P-3/37, float FP-SS-14 (CrNi) with a range of 4 - 38 litres air per minute for high aeration rates; model 10A6141 purgemeter, tube FP-1/8-20-P-3/37, float FP-CA- 18 (Carboloy) with a range of 0.6 - 4.4 litres air per minute for medium air flow and model 10A6141 purgemeter, tube FP-1/8-08-P-3/37, float FP-CA-18 (Carboloy) with a range of 0.15 - 1.3 litres air per minute for low flow rates). A manometer to observe and adjust the incoming air pressure was also used. Oxygen was supplied as air, employing a piston compressor (type AC 480-90 D), containing the natural content of 20.95 % by volume oxygen in it. The gas stream was regulated to one bar pressure and the flowrate was adjusted manually using the flowmeters. Flowrate is dependent on pressure and temperature and was exactly calculated by using a PC software developed by the producers of the flowmeters.
The supplied air had to bubble through a separate vessel filled with approximately 16 litres saturated aqueous solution of barium hydroxide to remove the carbon dioxide content of the incoming air. After each run, granules of barium hydroxide were added to the water as long as they were dissolved in the solution. After the carbon dioxide removal the gas stream was split into the eight individual reactor streams.
The lower vessel (approximately 18 litres) contained approximately 16 litres water to minimise moisture losses and changes in temperature levels. This was done by

heating the air to acquire the temperature of the subsequent reactor and water saturating the inlet airstream and this pre-conditioning reactor was equipped with one thermocouple. The heating was also done by wing heating tapes. The upper vessel served as the real reactor and was equipped with three thermocouples positioned in three different heights of the material (Figure 4.3 and 4.4). It had a perforated plate 10 cm above the base to support the composting material and also assist in evenly distributing the inlet air through the latter. The rim of this plate touching the side wall of the vessel was air-tight by silicone to avoid preferential airflow paths through the composting material (Figure 4.3 and 4.4).

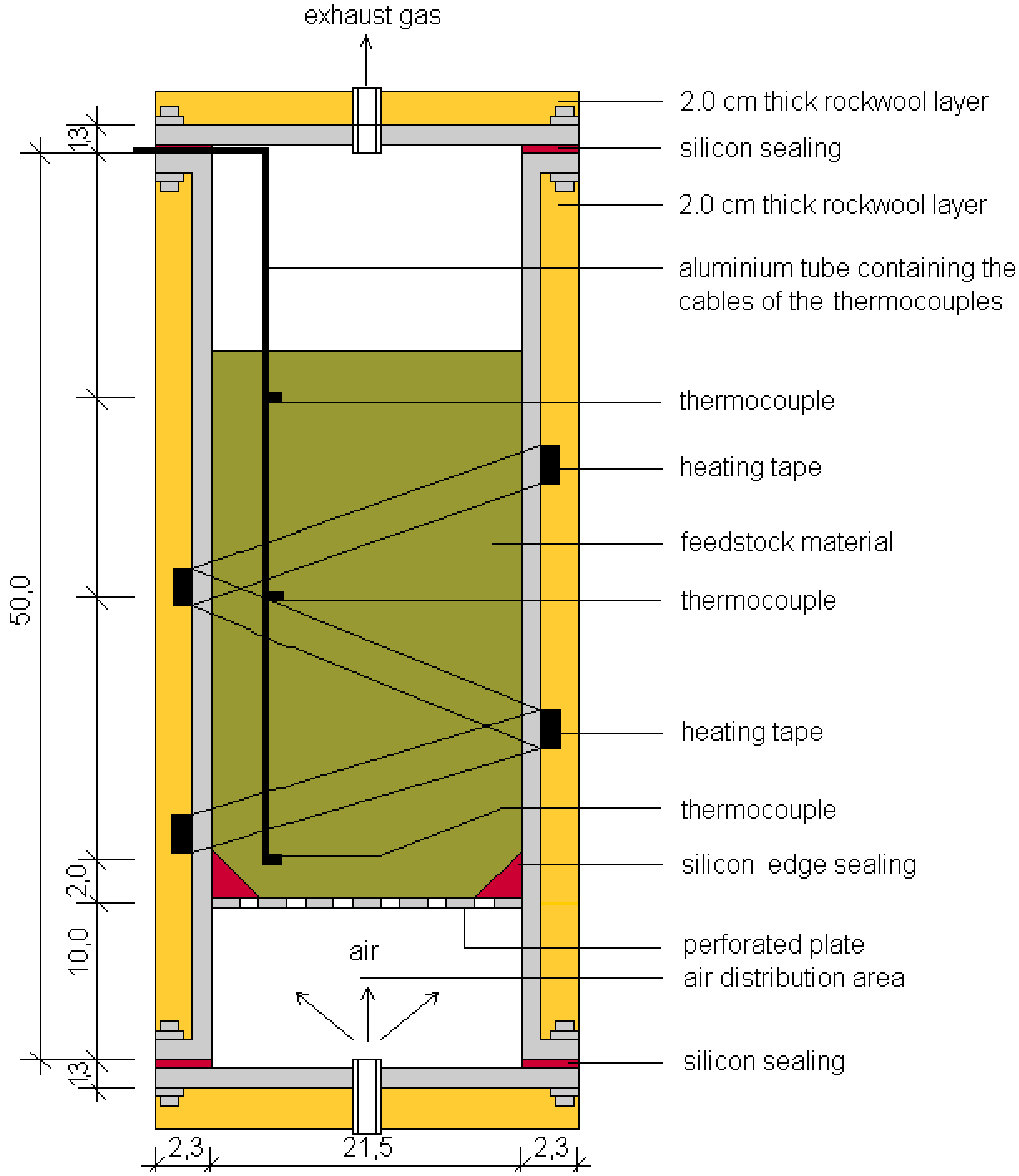

Figure 4.3: Cross-section of a reactor

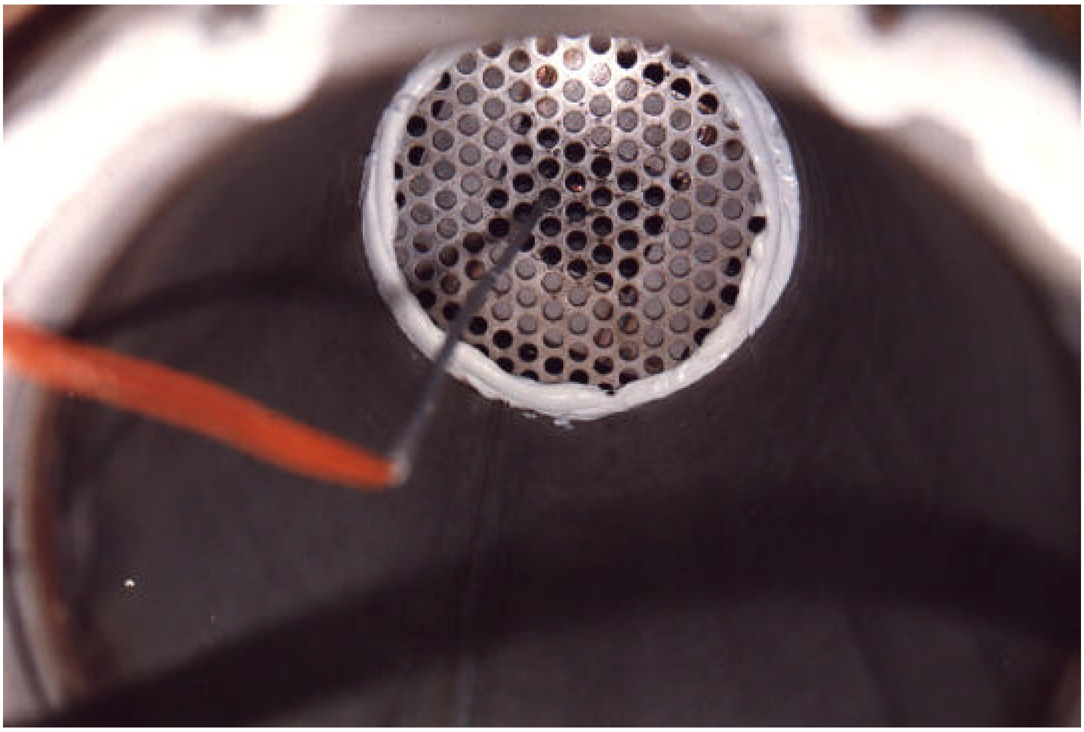

Figure 4.4: View at the interior of a reactor

Each exhaust gas pipe had a junction with valve to drive the sampling gas to the oxygen and carbon dioxide analyser (GD02-O_2 and GD02-CO_2). Before reaching the analysers the gas had to pass a water cooler type Allihn to decrease temperature and to remove the water, thus avoiding damages of the measurement equipment. The water cooler consisted of a 50.0 cm long, hollow glass cylinder with a winding glass tube inside surrounded by flowing water. The cooler was operated using an external pump and a water reservoir.

The sampling port valves were connected to relays to control automatically the sampling intervals and periods by using the PC.

In the reactors, three thermocouples were inserted at depths of approximately 5 cm, 12 cm and 20 cm, respectively, above the perforated plate and had a distance to the side wall of approximately 5 cm. The thermocouples were placed relatively close to the wall of the reactor due to the good insulation qualities of the feedstock material that led to high temperature levels in the sector close to the heating tapes to avoid heat damages of the microbial population. The decision to use three thermocouples in different layers of the material was made to observe the temperature distribution of the material. The reference temperature that was used to regulate the heating process was the average value of these three temperatures. One additional thermocouple was placed in the water containing vessel below. The thermocouples were covered by an aluminium tube with an inner diameter of 3 mm and were sealed using an epoxy resin adhesive thus protecting the thermocouples from the corrosive

material. Cables connecting the thermocouples with the data acquisition unit were conducted through the silicon sealing on the lid of the reactor.
All thermocouples and heating tapes were connected via relays by cables with the data acquisition and control unit HP 3852A and from this unit with the PC.
The HP 3852A operated eight flow-through valves (2/2 way-magnetic valve 1/4 M 214) by relays which successively sampled the eight reactors on a fixed time interval (Figure 4.5).

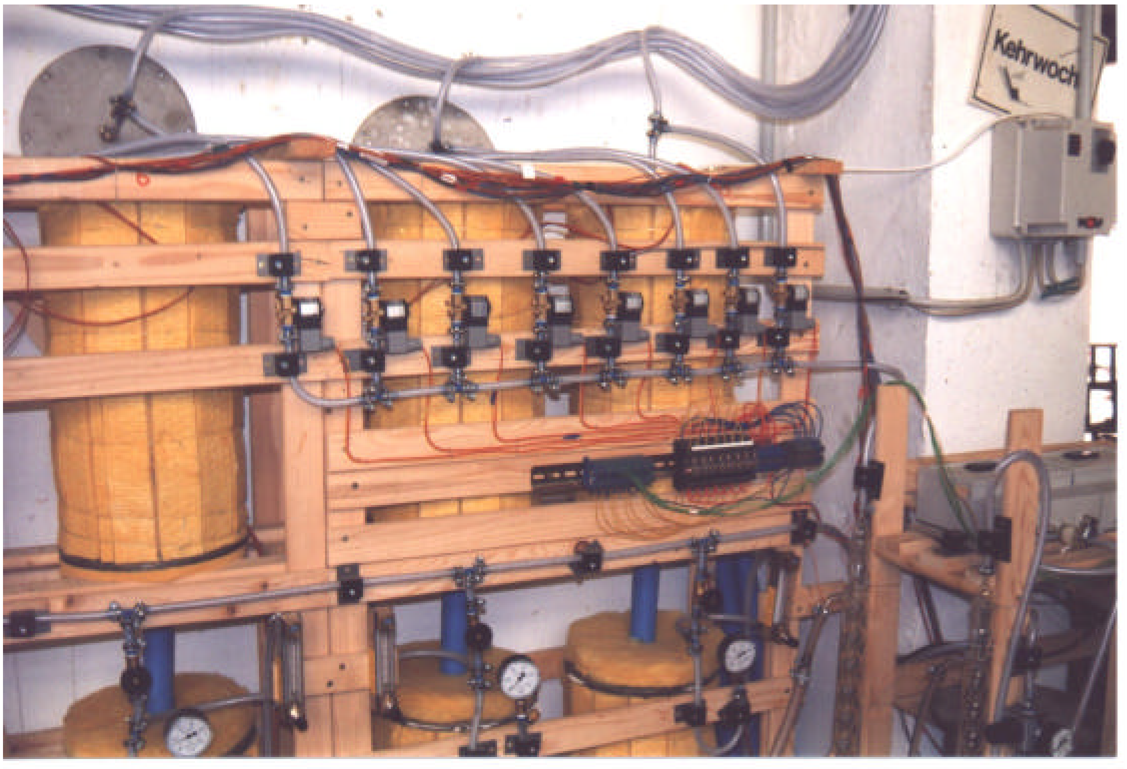

Figure 4.5: Sampling valves

4.2 Hard- and Software

The main part of the computerised equipment was the data acquisition and control unit Hewlett Packard HP 3852A. The task of the data acquisition unit was to measure and to count the data supplied by the experimental system. The HP 3852A received data (voltage levels) from the system through the channels of various plug-in accessories. The instrument routed the data to a voltmeter accessory for measurement and transferred it to the PC. The HP 3852 was also used to switch on or off the relays.
The HP 3852 was programmed from a Pentium II PC over the Hewlett-Packard Interface Bus (HP-IB) using the National Instruments™ program Labview™. This pro-

gram was developed for oxygen , carbon dioxide and temperature measurement and control.

The thermocouples consist of a resistor which yields different voltage levels at different temperatures. This fact was used to obtain an equation to compute the real temperature values. The increase of voltage levels with rising temperature had to be linear so that it was possible to calculate temperature with following equation: T= mx + n with m as the increasing factor of the graph and n as the intersection point of the graph with the temperature axis. The last mentioned figure is different for each thermocouple depending on the length of the wire and the quality of the soldered points. To get the graph, a thermocouple connected with a voltmeter was stuck into a vessel with hot water together with a digital thermometer. While cooling down, the values of temperature and the corresponding volt levels were written in an Excel™ file (Figure 4.6)

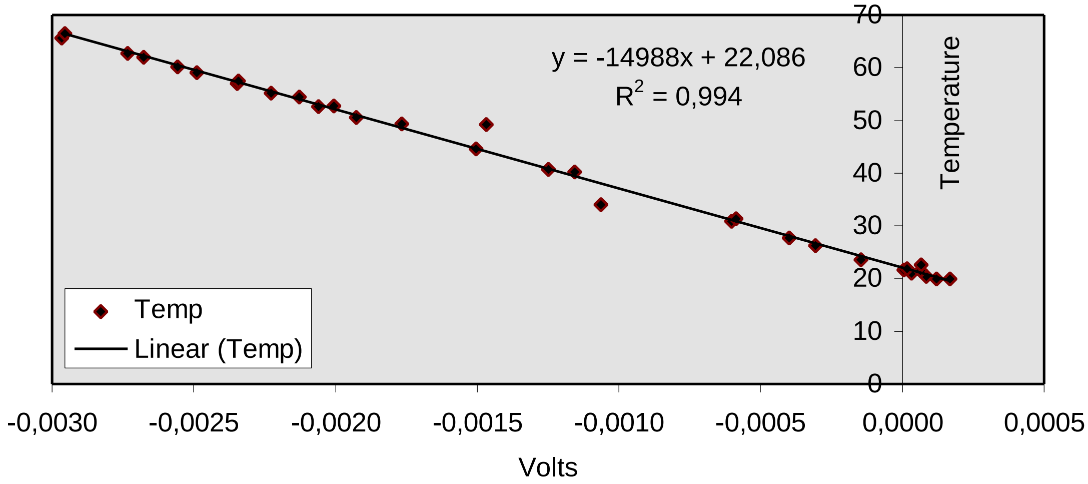

Figure 4.6: Calibration graph

With a special function of the computer program (i.e. linear regression), the corresponding equation was found. The intersection point with the temperature axis was obtained for each thermocouple separately, using water with different temperatures and an exactly working digital thermometer.

The oxygen and carbon dioxide analysers were dedicated to measurement and warning purposes. Both analysers, GD02-O_2 and GD02-CO_2 (producer: TAD Gesellschaft für Elektronik- Systemtechnik mbH), worked by using an electrolytic principle and were able to measure concentrations in the range from 0 - 25% and 0 - 20%, by volume, respectively. The measured gas concentrations were transformed to an analogous signal, i.e. voltage, (between 0 and 10 Volts) which was transferred to the data acquisition unit.

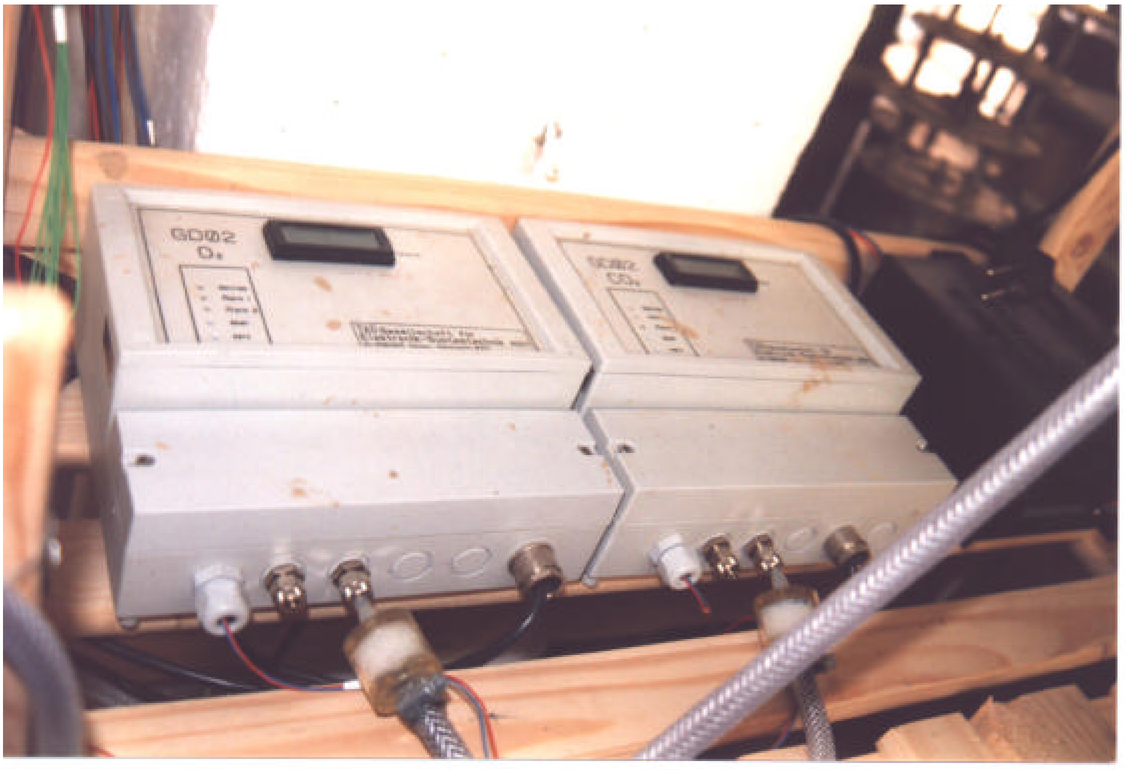

Figure 4.7: Gas analysers

The analysers were adjusted knowing the natural contents of oxygen and carbon dioxide in the air. Sampling the environmental air, the equipment had to show readings of 20.9% oxygen and 0.03% carbon dioxide. Beside this, the carbon dioxide analyser was sequentially readjusted employing a standard calibration gas with a 5%, by volume content of carbon dioxide.

The gas analysis of the preliminary run was carried out with a combined analyser ROSEMONT BINOS 100 2M which was able to measure oxygen and carbon dioxide concentrations simultaneously. This analysing equipment was used because the designated carbon dioxide GD02-O_2 analyser showed irregular measurement values so that it was sent to the producers to check it. For this time interval a Rosemont BINOS 100 2M was utilised. For testing purposes both oxygen analyser were connected to the system to prove similarity of the obtained values. They showed very good accordance of the readings.

4.3 Sample Characteristics Acquisition

The respiratory quotient

was computed according to Equation 4.1:

$$RQ = \frac{CO_{evolved}}{O_{consumed}} = \frac{CO_{2,out}}{20.95 - O_{2,out}} \qquad \text{(Eq. 4.1)}$$

with RQ = respiratory quotient [-]

$CO_{2,out}$ = reading of the carbon dioxide analyser volumetric exhaust gas carbon dioxide concentration [%]

$O_{2,out}$ = reading of the oxygen analyser volumetric exhaust gas oxygen concentration [%]

The calculation and measurement of the moisture content, the volatile solids content and the pH were carried out in accordance of the rules of the Bundesgütegemeinschaft Kompost e.V. (BGK e.V.) described in „Methodenbuch zur Analyse von Kompost“ (1998).

Moisture content

A sample of approximately 1000 to 1500g was filled in a bowl and dried at 105ºC until the weight achieved a constant value (24 to 48 hours). Before and after the drying process, the sample was weighted. With the obtained values the moisture content was calculated according to the Equation 4.2:

$$MC = \frac{M_{wet} - M_{dry}}{M_{wet} - M_{bowl}} \cdot 100 \qquad \text{(Eq. 4.2)}$$

with MC = moisture content [% w.b.]

M_{wet} = weight of the wet sample + weight of the bowl [g]

M_{dry} = weight of the dry sample + weight of the bowl [g]

M_{bowl} = weight of the bowl [g]

Volatile solids content

Approximately 100 g of each at 105ºC dried sample were grinded to a particle size smaller than 0.25 mm and 5 to 10 g of each sample were filled in a porcelain crucible that was annealed and weighted before. The sample was stored in a stove at

550ºC until the weight achieved constant values. During the cooling process before the filling and after the annealing the crucibles were stored in an exsicator. With the weights the volatile solids content was calculated according following Equation 4.3:

$$VS = \frac{M_{dry} - M_{annealed}}{M_{dry} - M_{bowl}} \cdot 100 \qquad \text{(Eq. 4.3)}$$

with VS = volatile solids content [% d.m.]

M_{dry} = weight of the dry sample + weight of the bowl [g]

$M_{annealed}$ = weight of the annealed sample + weight of the bowl [g]

M_{bowl} = weight of the bowl [g]

pH measurement

2 g of each sample were taken and mixed with 200 ml distilled water. After an hour the pH value was measured with calibrated pH-meter.

The oxygen consumption rate (OCR)

was computed according to the following Equation 4.4:

$$OCR = \frac{100 - \frac{O_{2,out} \cdot 100}{20.95}}{100} \cdot \frac{O_{2,in} \cdot 1000}{m \cdot VS / 100} \qquad \text{(Eq. 4.4)}$$

with

$O_{2,\,out}$ = volumetric exhaust gas oxygen concentration in per cent

m = mass of input material in grams

VS = per cent volatile solids initially present in dry matter

$O_{2,\,in}$ = $air_{in} \cdot t \cdot \rho \cdot x$ (Eq. 4.5)

with air_{in} = amount of air in litres per minute

t = 60 minutes per hour

ρ = density of air

= 1.197g/l at 1.0 bar and 18ºC

x = content of oxygen in environmental

= air in mass per cent

23.15%

Equation 4.4 was transformed with the help of equation 4.5 to the following formula:

$$OCR = \frac{100 - \frac{O_{2,out} \cdot 100}{20.95}}{100} \cdot \frac{air_{in} \cdot 60 \cdot 1.197 \cdot \frac{23.15}{100} \cdot 1000}{m \cdot VS / 100} \quad \left[\frac{mg \quad O_2}{g \quad VS \cdot h}\right] \qquad \text{(Eq. 4.6)}$$

The carbon dioxide evolution rate (CER)

The carbon dioxide evolution rate was calculated by using equation 4.7 under the assumption that the carbon dioxide concentration in the inlet air is equal to zero:

$$CER = \frac{air_{in} \cdot t \cdot \rho \frac{CO_{2,out}}{100} \cdot 1000}{m \cdot VS / 100} \quad \left[\frac{mg \quad CO_2}{g \quad VS \cdot h}\right] \qquad \text{(Eq. 4.7)}$$

with

$CO_{2,\,out}$	=	exhaust carbon dioxide concentration in per cent
m	=	mass of input material in grams
VS	=	per cent volatile solids initially present in dry matter
air_{in}	=	$aeration \cdot t \cdot \rho$ (Eq. 4.8)

with	aeration	=	amount of air in litres per minute
	t	=	60 minutes per hour
	ρ	=	density of carbon dioxide
		=	1.831 g/l at 1.0 bar and 18ºC

With Equation 4.8 the Equation 4.7 was transformed to:

$$CER = \frac{aeration \cdot 60 \cdot 1.831 \cdot \frac{CO_{2,out}}{100} \cdot 1000}{m \cdot VS / 100} \quad \left[\frac{mg \quad CO_2}{g \quad VS \cdot h}\right] \qquad \text{(Eq. 4.9)}$$

4.4 Experimental Procedure

Usually material for two runs was brought from the composting plant. This material was treated input material of the HerHof boxes of the plant, i.e. disturbing contents like glass, plastics and metals were sorted out and approximately 20% of shredded wood was added in the composting plant as structure material. The feedstock was stored in the plant in plastic bags and transported within two hours to the laboratory. In the laboratory the material was spread out on the concrete floor, manually re-mixed using a shovel and, if necessary, the moisture content was adjusted by sprinkling water across the material using a watering can. At the end, it was remixed very intensively. After the mixing process a sample was taken to determine the pH value as well as the moisture content. If necessary, extra bulging agent, i.e. wood chips, was added. To reduce moisture content to the desired levels, the material was spread out on the concrete floor until the excess water had evaporated.

In the next step the material was filled in a bucket, weighed it placed manually in the reactor, avoiding negative compression effects and disturbing parts like very big wood pieces, plastics and metal. Usually 4.5 - 6.0 kg (weight depended on moisture content) or around 10 - 12 litres of feedstock material were placed in each of the eight reactors. The remaining material in the bucket was weighted again and with the obtained weights the amount of input material was determined. The reactors were filled almost complete leaving only 5 cm free space below the lid. During the filling process the thermocouples were arranged in the right position. After the first four runs a rubber tube (used for children bikes) under pressure was inserted in the middle of each reactor pressing itself against the smooth inner wall of the reactor thus avoiding an airflow along the inner surface of the vessel. The reactors were closed by fastening the lid on the flange of the reactor using eight screws.

Aeration and heating started immediately after closing the containers. Heating was realised by increasing the temperature slowly at 2-4°C steps up to the desired level to avoid heat damages of the microbial population at the parts of the material exposed to direct contact with the reactor walls. The duration of the heating process depended on the aimed temperature level; the procedure lasted up to 24 hours. Air supply was regulated manually by the flowmeters that way that the targeted oxygen and carbon dioxide levels in the exhaust gas were obtained.

The experiments were carried out for 72 to 140 hours.

At first all experiments were carried out twice. but it was stopped observing that the time courses of the respiratory quotient under the same environmental conditions showed a very good correlation and because of lack of time.

After the testing period, each reactor was opened and emptied manually in a bucket. A sample was taken to determine pH value, moisture content and volatile matter content.

To avoid errors in the gas analysis, the opening times of the valves were relatively long so that a certain amount of sampling gas had to flow through the tubes replacing the gas located in the tubes with the sample before the analysis started.

Temperatures, oxygen and carbon dioxide levels were measured permanently and written in files at two hours intervals for the first 4 runs and at one hour intervals for the remaining trials. The exhaust gas of each reactor was analysed for 15 minutes (Run 1 - 4) and for 7.5 minutes (Run 5 - 13) in succession. At the end of this period

the actual values of oxygen and carbon dioxide were stored internally in the program. After the one or two-hour interval they were written in the file. Temperatures were measured permanently and the average values of the three thermocouples of each reactor was written in the file at the end of the one or two-hour intervals.
The temperature of the water containing vessels was constantly 4ºC higher than that of the accessory reactor to compensate the cooling effect in the tubing and below the lid in spite of the insulation.

4.5 Scheduled Experiments and Used Feedstock Material

At first the influence of temperature and moisture was investigated with trials varying both of them. Experiments scheduled to execution are listed in Table 4.1. Exhaust oxygen levels were maintained between 17 and 19% by adjusting the airflow.
Feedstock characteristics and preparation are given in the same Table 4.1 using the following abbreviations:

FM: fresh material - source separated organic fraction of MSW (biowaste) mixed with around 20% shredded wood

PM: processed material - FM that was treated in HerHof boxes in the composting plant of Langewiesen for seven days

Table 4.1: Experiments featuring moisture and temperature

Code	Run	Moist.	Temp.	Used Material, preparation and Comments
M40T35 M40T50 M40T65 M40T75	1	40% 40% 40% 40%	35ºC 50ºC 65ºC 75ºC	FM that was stored indoors spread out on a concrete floor for 2.5 weeks prior to its use
M50T35 M50T50 M50T65 M50T75	2	50% 50% 50% 50%	35ºC 50ºC 65ºC 75ºC	FM that was stored indoors spread out on a concrete floor for one week prior to its use (same material as used in Run 3)
M55T35 M55T50 M55T65 M55T75	3	55% 55% 55% 55%	35ºC 50ºC 65ºC 75ºC	FM that was stored indoors spread out on a concrete floor for one week prior to its use (same material as used in Run 2)
M60T35 M60T50 M60T65 M60T75	1	60% 60% 60% 60%	35ºC 50ºC 65ºC 75ºC	FM that was stored indoors spread out on a concrete floor for 2.5 weeks prior to its use moisture adjustment by sprinkling water about it (same material as used in Run 1)

M70T35	4	70%	35ºC	
M70T50		70%	50ºC	FM
M70T65		70%	65ºC	(same batch used for Run 2)
M70T75		70%	75ºC	
M50T35A	4a	50%	35ºC	
M50T50A		50%	50ºC	FM
M50T65A		50%	65ºC	(complementary run)
M50T75A		50%	75ºC	
M70T35A	4a	70%	35ºC	
M70T50A		70%	50ºC	FM
M70T65A		70%	65ºC	moisture adjustment by sprinkling water about it
M70T75A		70%	75ºC	(complementary run)

To investigate the effects of temperature and oxygen exhaust concentration on the respiratory quotient the tests listed in Table 4.2 were done: All runs featuring temperature and oxygen levels were carried out with feedstock material that was adjusted to around 50% moisture content.

Table 4.2: Experiments featuring temperature oxygen levels

Code	Run	Temp.	O_2	Used Material and Preparation
OT35	5	35ºC	2%	
		35ºC	4%	PM that was stored for 3 days in a windrow
		35ºC	7%	in the composting plant + 4 days stored in the laboratory
		35ºC	10%	moisture adjustment by sprinkling water about it
		35ºC	15%	addition of 10% (v/v) wood chips as bulging agent
		35ºC	18%	(same material as used in Run 6)
OT50	6	50ºC	2%	
		50ºC	4%	PM that was stored for 3 days in a windrow
		50ºC	7%	in the composting plant
		50ºC	10%	moisture adjustment by sprinkling water about it
		50ºC	15%	10% (v/v) wood chips were added as bulging agent
		50ºC	18%	(same material as used in Run 5)
OT65	7	65ºC	2%	
		65ºC	4%	PM
		65ºC	7%	moisture adjustment by sprinkling water about it
		65ºC	10%	(same material as used for Run 8)
		65ºC	15%	
		65ºC	18%	
OT75	8	75ºC	2%	
		75ºC	4%	
		75ºC	7%	PM
		75ºC	10%	moisture adjustment by sprinkling water about it
		75ºC	15%	(same material as used for Run 7)
		75ºC	18%	

Thirdly, the effect of variable exhaust oxygen concentrations at different moisture levels was examined. Therefore the experiments listed in Table 4.3 were planned. These experiments were carried out at a constant temperature of 50ºC.

Table 4.3: Experiments featuring moisture and oxygen levels

Code	Run	Moist.	O_2	Used Material and Preparation
OM40	9	40%	2%	
		40%	4%	PM that was stored indoors spread out
		40%	7%	on a concrete floor for 48 hours to adjust
		40%	10%	moisture content by drying
		40%	15%	
		40%	18%	
OM50	10	50%	2%	
		50%	4%	PM
		50%	7%	moisture adjustment by sprinkling water about the material
		50%	10%	(same material as used for Run 11)
		50%	15%	
		50%	18%	
OM55	11	55%	2%	
		55%	4%	PM that was stored in the laboratory for 4 days
		55%	7%	moisture adjustment by sprinkling water about the material
		55%	10%	(same material as used for Run 10)
		55%	15%	
		55%	18%	
OM60	12	60%	2%	
		60%	4%	
		60%	7%	PM
		60%	10%	moisture adjustment by sprinkling water about the material
		60%	15%	(same material as used for Run 13)
		60%	18%	
OM70	13	70%	2%	
		70%	4%	
		70%	7%	PM that was stored in the laboratory for 4 days
		70%	10%	moisture adjustment by sprinkling water about the material
		70%	15%	(same material as used for Run 12)
		70%	18%	

Feedstock material characteristics

Used material for the trials originated from the composting plant Langewiesen situated close to Ilmenau. In this plant the source separated organic fraction of MSW is composted together with around 20% (v/v) structure material like branches by employing a HerHof composting system. Table 4.4 provides the obtained data of the input material for each test.

Table 4.4: Characteristics of the input material

Code	Run	initial moisture content [% w.b.]	initial pH	VS [% d.m]
M40T35, 50, 65, 75	1	41.6	7.6	61.4
M50T35, 50, 65, 75	2	49.7	9.4	54.8
M55T35, 50, 65, 75	3	54.3	8.7	57.7
M60T35, 50, 65, 75	1	58.4	7.6	61.4
M70T35, 50, 65, 75	4	69.3	5.5	66.5
M50T35A, 50A, 65A, 75A	4a	52.3	7.1	72.8
M70T35A, 50A, 65A, 75A	4a	68.2	6.9	72.8
OT35	5	55.6	7.8	53.2
OT50	6	51.9	8.7	50.4
OT65	7	53.7	8.8	53.0
OT75	8	52.8	8.8	57.3
OM40	9	44.1	7.8	63.0
OM50	10	52.1	8.6	57.2
OM55	11	56.4	8.7	54.5
OM60	12	60.0	8.6	59.4
OM70	13	68.6	8.6	55.8

4.6 Development of the System

Preliminary investigations were conducted to test the system's general performance and to obtain knowledge about the appropriate flowrates to achieve the desired exhaust gas oxygen and carbon dioxide concentrations.

After the first four experiments another preliminary investigation (Code: OTM) for the tests with different oxygen levels was carried out because the results of the first series of investigation indicated that it was not possible to achieve oxygen levels less than 12% with the flowmeters of the range 4 to 38 litres per minute. A literature research on used aeration rates gave the results listed in Table 4.5.

According to these results the flowrates for the amount of feedstock material used in the experiments were evaluated. On this basis it was decided to use flowmeters with a range from 0.15 to 1.2 litres per minute for the experiments with very low oxygen levels and flowmeters with the range of 0.4 to 4.0 litres per minute for the remaining ones. The preliminary run served to evaluate the optimal material mixtures, flow rates and system configuration to achieve the desired exhaust oxygen levels. For that purpose different materials (Table 4.6), several air flows (Table 4.7) and flow-meters were tested.

Table 4.5: Aeration rates of former investigations

O_2 uptake		conditions temp. (ºC)	moist. (%)	feed-stock material	aeration rate (v/v)		O_2 exhaust concentration (%)	source
3.4		-	42.6		61.7 - 487.7		-	
5.4		-	55.2		142.0- 537.0		2 - 5	
4.5		-	57.7		111.1- 500.0		2 - 5	
4.4	mg O_2 / g VS*h	-	49.0	synthetic garbage	86.4 - 530.9	litres air / kg VS*d	2 - 5	MOORE (1956)
2.5		-	67.3		55.6 - 679.0		5 - 10	
1.9		-	57.1		12.3 - 308.6		2 - 5	
4.6		-	57.0		74.1 - 530.9		2 - 5	
6.0		-	57.0		86.4 - 950.6		5 - 10	
0.46	l O_2 / kg TS*h	70	-		6.5	litres air / kg dm*h	-	FERTIG (1981)
0.31		65	-	MSW	5.95		-	
0.59		80	-		14.1		-	
-	-	-	-	compost	1.1 l/min minimum		10 - 12	HELMER (1973)
-	-	-	-	refuse	3.3 l/(kg*h)		-	
-	-	-	-	MSW			-	

Table 4.6: Conditions of the preliminary run - OTM

Code	Temp.	Used Material, Preparation and Comments
OTM1	50ºC	PM* stored in a windrow for 24 hours
OTM2	50ºC	PM stored in a windrow for 24 hours + 20% (v/v) bulging agent (wood chips)
OTM2	50ºC	PM stored in a windrow for 24 hours + 30% (v/v) bulging agent (wood chips)
OTM4	50ºC	FM kept one week in the laboratory on a concrete floor
OTM5	50ºC	FM kept one week in the laboratory on a concrete floor + 20% wood chips
OTM6	50ºC	PM* stored in a windrow for 24 hours, equipped with a bicycle air tube
OTM7	50ºC	PM* stored in a windrow for 24 hours, equipped with a bicycle air tube
OTM8	50ºC	PM stored in a windrow for 24 hours + 20% (v/v) bulging agent (wood chips)

*see list of abbreviations or chapter 4.6

The reactors of the OTM6 and OTM7 were equipped with a special tubing used as a baffle to avoid short-circuiting of air through material at the side wall interface. This air tubes were placed pressurised halfway between the perforated floor and the re-actors lid. The air supply system of the OTM8 reactor was equipped with a different type of flowmeter which allowed the supply of very low amounts of air. A constant temperature of 50ºC was kept all the time while the 170 hours processing period. Aeration regime was carried out according to Table 4.3 and exact data is given in appendix A.

Table 4.7: Aeration rates in litres per minute

time [hours]	OTM1	OTM2	OTM3	OTM4	OTM5	OTM6	OTM7	OTM8
0 - 44	0.88	0.88	0.88	0.88	0.88	0.88	0.14	0.14
24 - 30	0.88	0.44	0.44	0.88	0.88	0.88	0.14	0.14
30 - 34	0.88	0.44	0.44	0.88	0.88	2.20	0.14	0.14
34 - 164	0.88	0.44	0.44	0.88	0.88	0.88	0.14	0.14

As result of this preliminary test, it was decided to use tubes in the middle layer of the testing material to improve airflow conditions. Another decision was to use treated material and to add a bulging agent, i.e. wood chips, up to a percentage of 10% if the material seems to have a low porosity. It was recognised that the gas analysers did not work correctly at very low air flow rates because they needed a certain amount of sampling gas. If there was not enough airflow trough the material in the reactors, the analyser sucked ambient air trough the exhaust pipe thus distorting the data. To avoid this distortion an additional vessel identical to the ones used as reactors was connected between the reactors operating at low aeration rates and the analysers. In case of sampling the analyser sucked no ambient air but the exhaust of the reactor that contained this additional container. That was tested and it was working well. To avoid any risk of distortion the sampling time of 15 minutes was shortened to 7.5 minutes noticing that after a time span of 2 - 4 minutes the measured gas concentration was stable.

Each reactor was first equipped with a separate exhaust gas tube that joint with the other exhaust tubes after a length of approximately 2 metres forming one tube. After the first experiments two additional valves that closed the exhaust tube, were used at the reactors operating with very low oxygen levels, i.e. very low aeration rates, to supply the gas analysis with sufficient gas to measure correctly. These two valves were operated by the computer and were closed in the sampling interval so that the whole exhaust gas stream had to pass the gas analysers. This turned out to be not an adequate method to supply the analysers with sufficient sampling gas at very low aeration rates so that an additional container was connected with the exhaust outlet of the reactor and, to make sure a correct measurement, all reactors were equipped with a separated exhaust gas pipes. In the sampling interval the gas analyser sucked, in case of lack of sampling gas, the gas from this additional container or the separated exhaust gas tube with a length of approximately 15 m thus analysing only the accessory exhaust gas of each reactor.

At last an additional experiment (Run 4a) was carried out because before running the tests with 41.6 and 58.4% moisture (Run 1) the data acquisition program was modified concerning the oxygen and carbon dioxide measurement. Gas concentrations of the experiments with 50, 55 and 70% moisture were obtained by analysing the exhaust gas of each reactor for 15 minutes. After the sampling and measurement interval the program calculated the average values of oxygen and carbon dioxide concentration within this period and with these average values the RQ was computed. This was changed in such a way that the values from the experiment with 40 and 60% moisture on the oxygen and carbon dioxide concentrations were measured for a 7.5 minute interval but only the last value of each gas analysis was written into the file. No average calculation was carried out. With the measured end values of the gas concentrations the RQ was computed. To prove the comparability of the results, this run was carried out with similar conditions.

5 Experimental Results and Discussion

Complete information about experimental data is given in the appendices in separate tables for each run. The appendix A is designated to the general parameters of each run, appendix B to the oxygen consumption and the carbon dioxide evolution rates.

5.1 Experiments with Varying Moisture and Temperature Levels

RUN 1: Moisture contents of 41.6% and 58.6% at variable temperature levels

This run was done with fresh material (Table 4.4 and 4.7). Treated material had moisture contents of the same range and the material was alkaline (Table 5.1).
Air flow rates was regulated at 1.0 litres per minute and stayed there until the tests were finished. Oxygen exhaust concentration were kept around 18% during this run.
The time course of the RQ graph was following the same pattern; it decreased the first two days, followed by an increase to an intermediate maximum. The graphs fell down to lower values until the fourth day then recovering to end values in the range of 0.80 to 0.86.

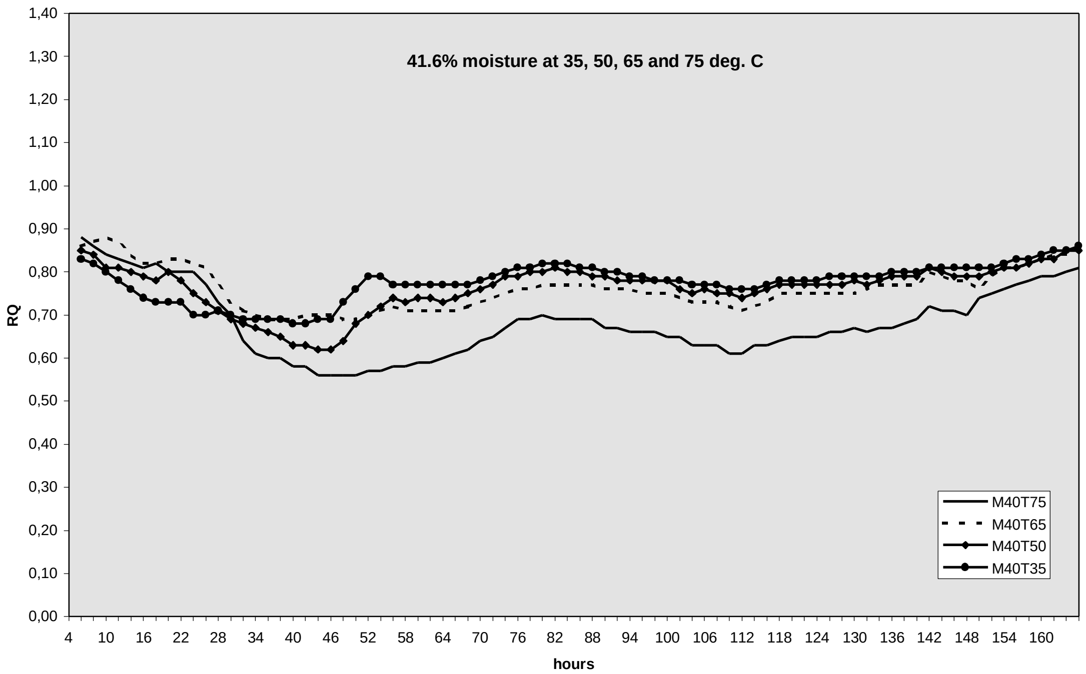

Figure 5.1: Experiments with 41.6% moisture at different temperatures

The material with 41.6% moisture treated at 75ºC (M40T75) achieved the lowest RQ values of the tests with this moisture level. After the fourth day the graphs were close together except that one of the material exposed to high temperatures. The RQ started with values from 0.88 (M40T75) to 0.83 (M40T35), which decreased while a 48 hours interval to a range from 0.56 (M40T65) and 0.69 (M40T35) and then increased to an intermediate maximum followed by a slight decrease and at the end the RQ recovered to values around 0.80 (Figure 5.1).

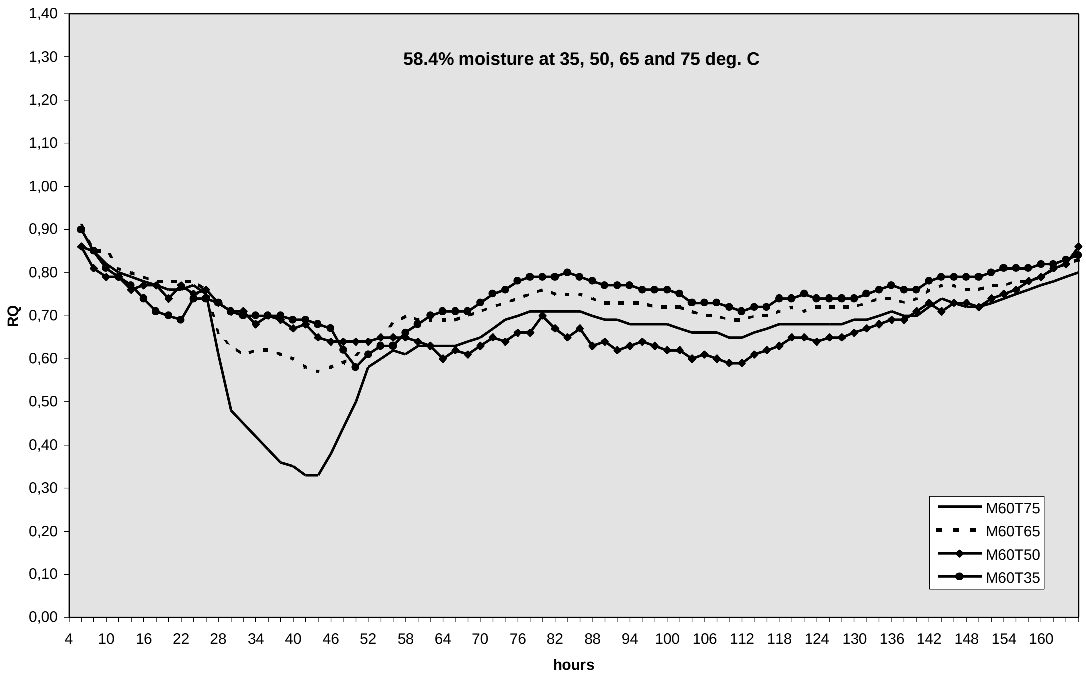

Figure 5.2: Experiments with 58.4% moisture at different temperatures

RQ of the test with 58.6% moisture content (Figure 5.2) started with values around 0.9 decreased in 48 hours to minimal values of around 0.60, increased to second, lower maximum followed by a slight decrease and the trial was stopped while the RQ achieved values only a little below the starting ones. All graphs remained close together except that of the run at 75ºC, which fell down to values around 0.30 while a 48 hours period after initialising the testing process. End values were obtained in the range from 0.80 to 0.86.

Table 5.1: Parameters of run 1

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
M40T35	46.6	8.9	56.0
M40T50	45.6	9.2	58.1
M40T65	40.1	8.8	57.4
M40T75	35.3	7.5	55.8
M60T35	56.0	9.1	55.7
M60T50	54.6	9.0	57.1
M60T65	53.7	8.6	53.1
M60T75	51.5	7.8	55.0

RUN 2: Moisture content of 50% at variable temperature levels

The tests were carried out twice for 138 hours. Air flow was regulated to 0.9 litres per minute for the M50T75 tests and to 1 litre per minute for the remaining reactors. This adjustments gave oxygen concentrations in the exhaust air from 17 to 19 %. Carbon dioxide concentration started at 5%, fell down to around 0.5% and then recovered to values of 1.2 to 1.5%. The development of the respiratory quotients was relatively similar. Peak values were obtained at the start of the process then the RQ values fell down to a minimum followed by a slow increase up to the end of the testing period. At the end of the experiments only little fungi growth in the material was visible.

The RQ graph of the experiments at 35ºC decreased during a 32 hours period to its minimum of 0.20 and achieved end values of 0.58 (M50T35-2) and 0.56 (M50T35-1). Treated material had pH values around 9.5 and nearly the same moisture content (Table 5.2). The repeatability is shown in figure 5.3 and was similar in all experiments carried out twice.

The time course of the RQ of the tests at 50ºC, 65ºC and 75ºC was very similar (Figure 5.4). RQ decreased during the first 34 hours of processing with values of around 0.20 followed by an increase to around 0.55. All end material samples had a pH on the alkaline range and as higher the processing temperature as lower was the final moisture content (Table 5.2).

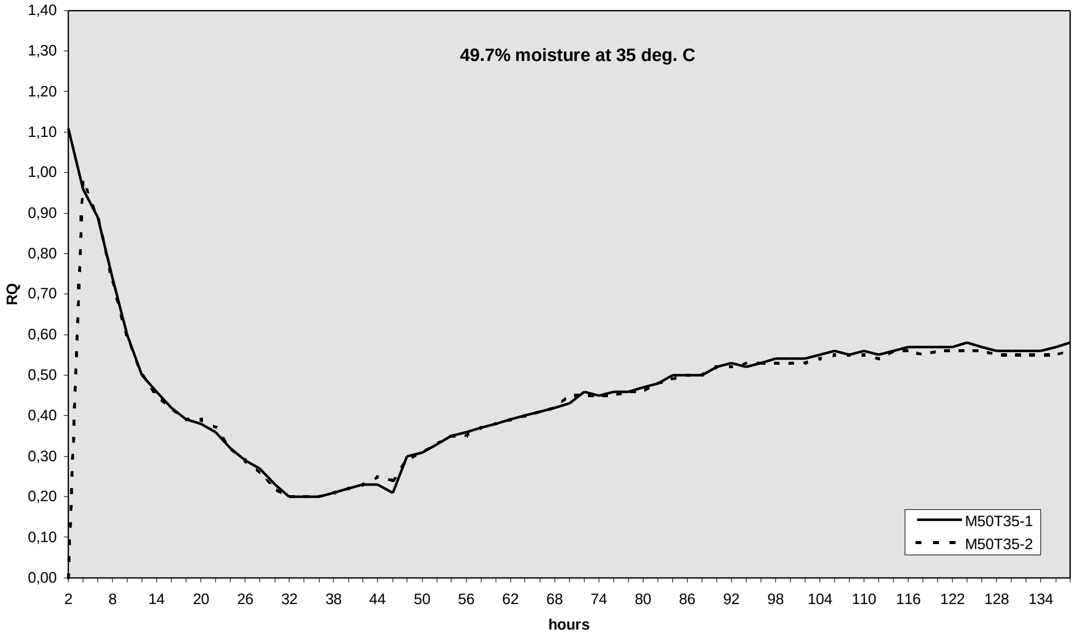

Figure 5.3: Experiments with 49.7% moisture at 35ºC

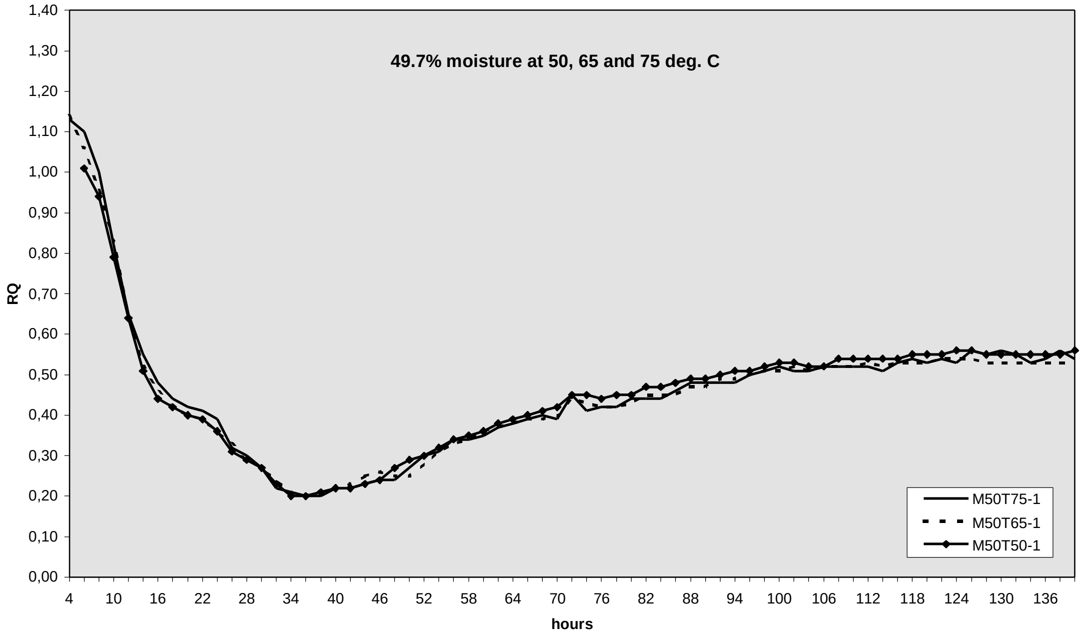

Figure 5.4: Experiments with 49.7% moisture at 50ºC

Table 5.2: Parameters of run 2

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
M50T35-1	44.8	9.4	53.2
M50T35-2	48.2	9.5	49.5
M50T50-1	45.3	9.3	48.6
M50T50-2	42.7	9.4	54.2
M50T65-1	39.5	9.0	50.6
M50T65-2	44.1	9.1	54.3
M50T75-1	33.1	7.9	50.4
M50T75-2	32.0	8.0	50.9

RUN 3: Moisture content of 54.3% at variable temperature levels

The reactors of the M55T75 tests were regulated to 0.9 litre per minute the first day, to 0.5 the remaining time of the experiments. The other reactors were constantly operated at around one litre per minute. These air flows guaranteed exhaust oxygen concentrations in the range from 18 to 20%.

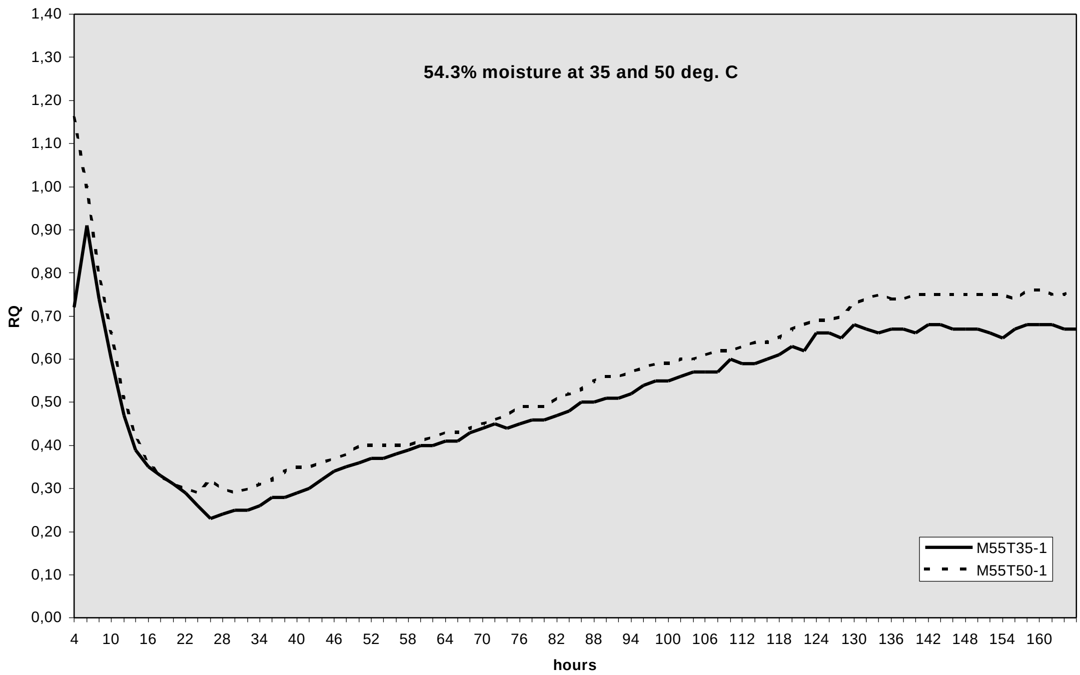

Figure 5.5: Experiments with 54.3% moisture at 35 and 50ºC

Time courses of the RQ graphs did not show great differences to the others obtained in the previous runs except the fact that there was no peak in the first hours of processing. RQ values achieved a minimum in the first 28 to 34 hours of processing followed by a slow recovery to end values between 0.6 to 0.70. The fungi grow observed optically was higher at lower processing temperatures; at 75ºC treated material had no visible fungi growth.

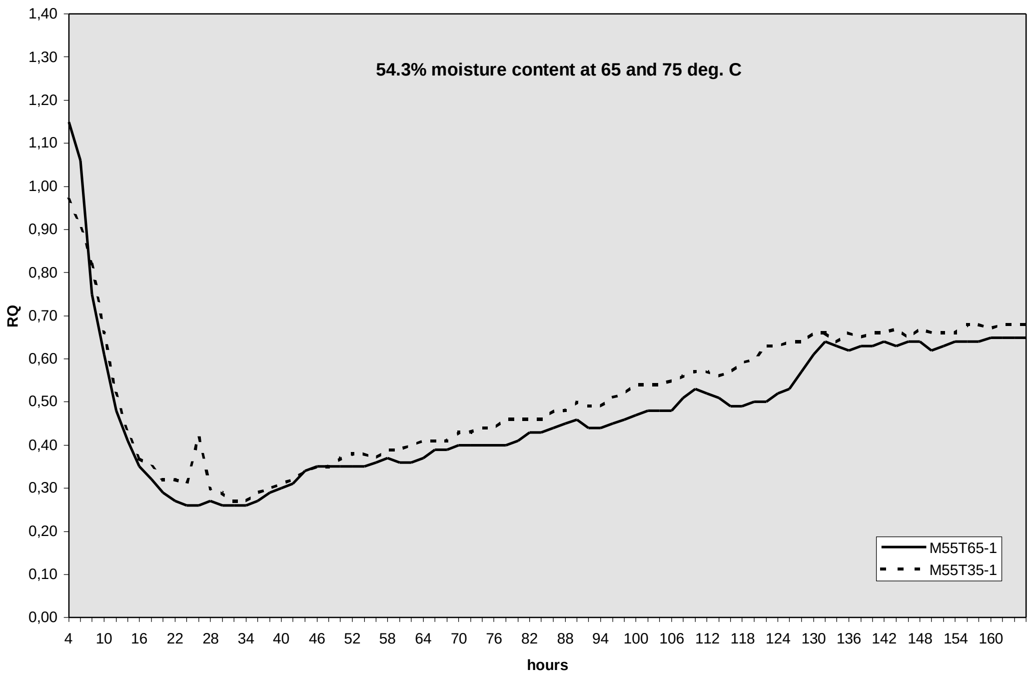

Figure 5.6: Experiments with 54.3% moisture at 65 and 75ºC

The RQ of the material of the experiment at 35ºC decreased relatively fast to around 0.23 as shown in figure 5.5, then increased slowly and stopped at around 0.70. Moisture contents of input and output material showed only little differences (Table 5.3). Final pH values in the alkaline range were obtained.

Figure 5.5 shows the graph of the RQ development of the test at 50ºC which achieved its lowest value of 0.29 after 22 hours followed by a decrease to end values of around 0.75. Final moisture contents were almost equal to the starting ones. End pH was found to be in the alkaline range.

Figure 5.6 represents the RQ time course of the experiment at 65ºC which achieved their minimal values while a 24 hour period. After the minimum the RQ values rose slowly to values of around 0.60. Lower moisture contents of treated material were noticed and pH was on the alkaline side.

The test run at 75ºC (Figure 5.6) produced a relatively similar RQ course. The RQ fell down to 0.28 in a 30 hour interval, then recovering to values of around 0.70 at the end of the testing period. End material was slightly acidic and moisture contents were up to 10% lower than the initial ones (Table 5.3).

Table 5.3: Parameters of run 3

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
M55T35-1	57.9	9.3	53.5
M55T35-2	52.8	9.4	57.3
M55T50-1	54.9	9.4	52.6
M55T50-2	56.6	9.4	53.9
M55T65-1	42.4	7.9	53.4
M55T65-2	49.9	8.8	55.6
M55T75-1	44.4	6.2	57.6
M55T75-2	47.0	6.7	57.3

RUN 4: Moisture content of 69.3% at variable temperature levels

All the trials were carried out twice for 140 hours to check if the results are comparable. Air flow rates were adjusted at around 1 litre per minute and remained there during the whole experiment. This air flow rate gave an exhaust oxygen concentration of around 17 to 20%. Carbon dioxide production was at the beginning around 5%, then decreased to lower values of about 0.5% and at the end it rose again.

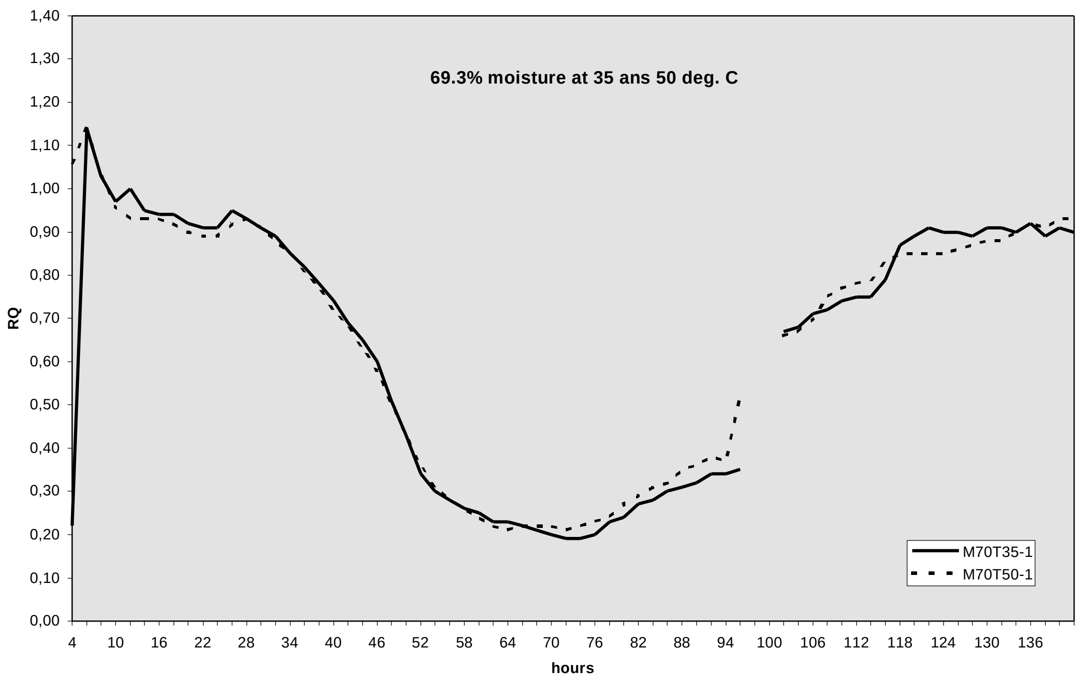

Figure 5.7: Experiments with 69.3 moisture at 35 and 50ºC

The time course of the graphs of the RQ values was relatively similar. In the first four hours the RQ values reached a peak then dropped to a minimum the end of the third or the beginning of the fourth day and then increased slowly to the end of the trial.

There was a malfunction of the gas analysers detected in the time span between the 94th and the 100th hour of processing, therefore no data of this period is available. At the end of these trials a heavy fungi growth was observed in all of the reactors.

The respiratory quotient of the material treated at 35ºC showed a peak of 1.14 in fourth hour, a second one at the end of this day with around 0.95 followed by a decrease which achieved its minimum of 0.19 in the time span between the 68th and the 72nd hour of the process (Figure 5.7). After the minimum the RQ increased up to the end of the experiment and with a RQ of 0.9. The material of the M70T35 trial had the same moisture content as at the start of the trial. The pH values were in the alkaline range (Table 5.4).

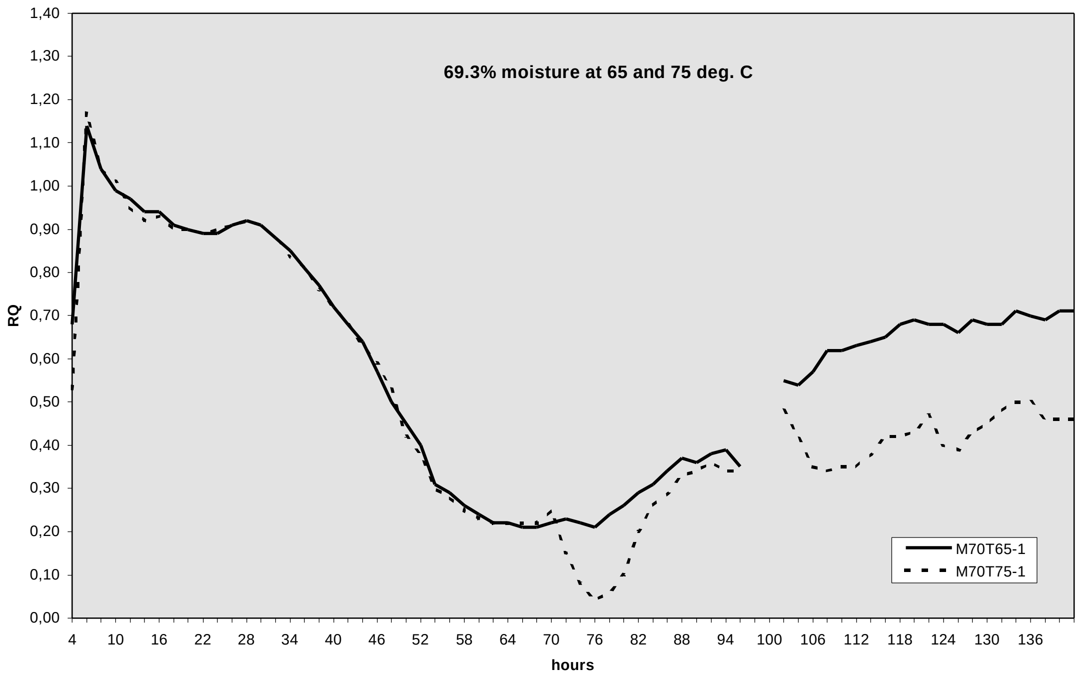

Figure 5.8: Experiments with 69.3% moisture at 65 and 75ºC

The graph of RQ of the experiment at 50ºC as shown in figure 5.7 had two peaks, one immediately after starting and a smaller one of 0.92 after the first day of treatment. Minimum values of 0.21 were achieved at the end of the third day followed by an increase up to 0.93 - 1.03. The end material had a lower moisture content as the input material and the pH values were in alkaline range (Table 5.4).

The material treated at 65ºC (Figure 5.8) achieved two peaks of RQ, one 4 hours and a lower one 26 hours after starting. The second maximum was around 0.91 followed by a decrease to values of about 0.20. The RQ values increased to end values of around 0.70. Treated material had lower moisture contents than the input material and was in the alkaline pH range, too (Table 5.4).
The run at 75ºC (figure 5.8) showed similar results like the previous one, had the first peak in the beginning, the second of 0.92 after the first day but achieved a very low minimum of nearly zero after 74 hours of processing and ended with low values of around 0.40. At the end the material has lower moisture contents than the feedstock material and was only slightly basic (Table 5.4).

Table 5.4: Parameters of run 4

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
M70T35-1	69.3	8.9	60.8
M70T35-2	70.4	8.6	61.4
M70T50-1	66.1	8.9	59.0
M70T50-2	67.6	8.9	59.7
M70T65-1	54.4	8.5	58.7
M70T65-2	59.9	8.3	60.1
M70T75-1	58.1	8.4	62.3
M70T75-2	59.0	7.9	63.5

RUN 4a: Complementary experiments with moisture contents of 52.3 and 68.2% at variable temperature levels

The material that was treated at high temperatures (75 and 65ºC) had moisture losses of around 10% after finishing the experimental process. Material processed at lower temperatures had relatively similar moisture contents. The pH values were in the acidic range (Table 5.6).
Aeration was regulated as shown in table 5.5.

Table 5.5: Aeration rates of run 4a (litres air per minute)

time [hours]	M70 T75A	M70 T65A	M70 T50A	M70 T35A	M50 T75A	M50 T65A	M50 T50A	M50 T35A
0 - 13	3.96	3.96	4.40	4.40	3.52	3.52	1.90	1.90
13 - 22	3.96	3.96	4.40	4.40	4.40	4.40	1.90	1.90
22 - 38	3.96	3.96	4.40	4.40	4.40	4.40	1.90	1.90
38 - 45	3.96	3.96	4.40	4.40	3.96	3.96	1.90	3.80
45 - 63	3.30	3.30	4.40	4.40	3.52	3.52	1.90	3.80
63 - 86	3.08	3.30	4.40	4.40	3.08	3.52	1.90	3.80
86 - 135	2.64	3.30	4.40	4.40	1.76	3.52	1.90	3.80

With these aeration rates all the reactors were maintained at oxygen concentrations between 18 and 20%.
The RQ values of the experiment with a moisture content of 70% at 75ºC (M70T75A) started with around 0.80 and decreased within the testing period to values of around 0.39.
The trial at 65ºC (M70T65A) had the same principal RQ time course, peaked in the first 5 hours and then decreased to around 0.41.

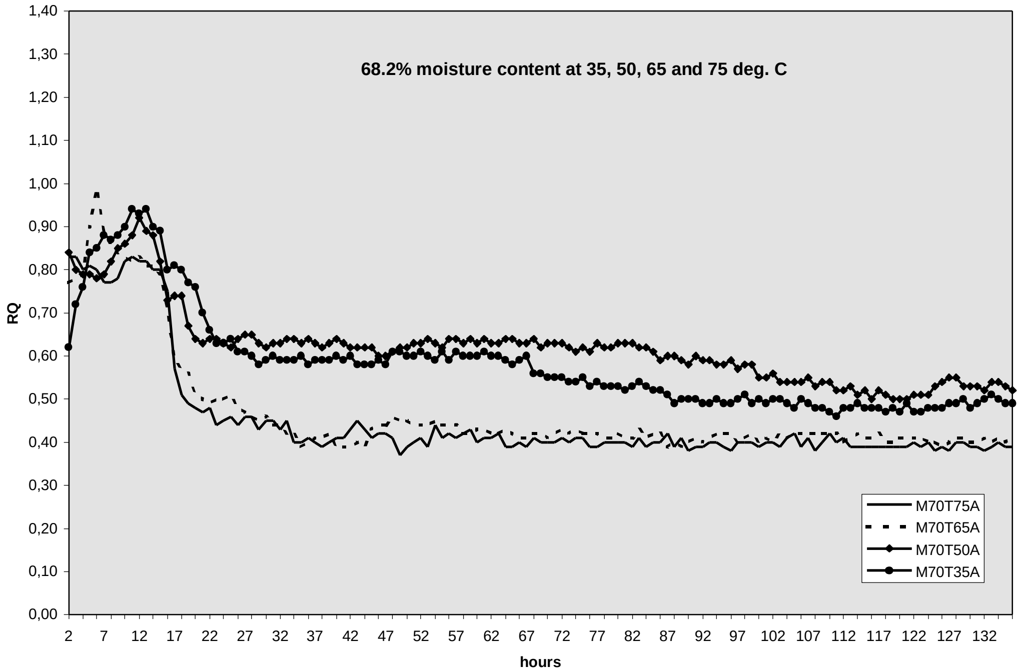

Figure 5.9: Experiments with 68.2% moisture at variable temperature levels

The material of the treated at a temperature of 50ºC achieved in the first hours RQ values of around 0.80, increased to top values of around 0.90 within a 10 hour interval and finally it fell down to around 0.53.
The reactor of the M70T35 trial could not been maintained at 35ºC because the selfheating capacity of the material that led to temperature of around 45ºC. These conditions produced an RQ peak of 0.94 within a 10 hour period after initialising the process. After the achieving maximum values the RQ values decreased to around 0.50 (Figure 5.9).
The material with 50% moisture content treated at 75ºC (M50T75A) achieved its maximum RQ of 0.99 within a 8 hours interval. After that the RQ values decreased slowly to 0.46.

RQ values of the material treated at 65ºC (M50T65A) peaked after 14 hours with 0.80, the decreased to minimal values of 0.42 and recovered at the end to values of around 0.55.

RQ of the M50T50A trial started with around 0.60 increased to its maximum of 0.79 within 12 hours and achieved at the end values of around 0.50.

The temperature of the reactor containing the material of the M50T35A trial could not been maintained at the desired level of 35ºC because of the selfheating of the fresh material. The RQ time course of was similar but this material achieved in the 30 hours of processing constantly higher values than the material of the M50T50A experiment. After that the RQ values were lower than that mentioned before. The maximum RQ was achieved in the first hours with a value of 0.88, at the end values of around 0.41 (Figure 5.10).

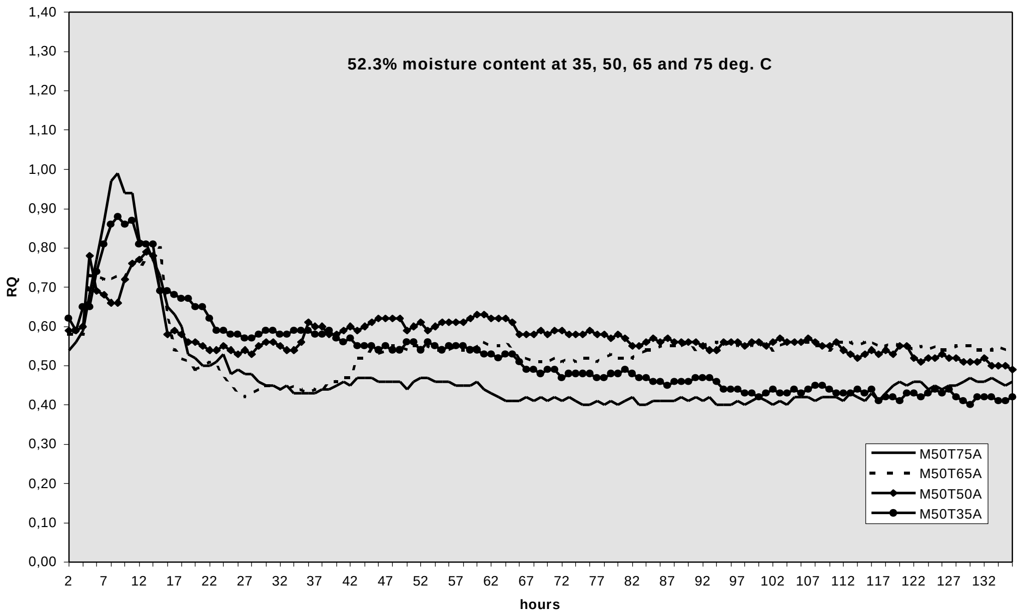

Figure 5.10: Experiments with 52.3% moisture at variable temperature levels

Table 5.6: Parameters of run 4a

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
M70T35A	70.3	6.6	72.6
M70T50A	68.8	6.4	65.0
M70T65A	63.3	4.9	69.7
M70T75A	61.4	4.9	72.7
M50T35A	54.7	7.2	71.0
M50T50A	52.4	7.4	66.3
M50T65A	49.1	5.4	68.2
M50T75A	46.3	4.8	70.1

DISCUSSION

The general time course of the moisture and temperature varying experiments was relatively similar; starting with high RQ values, decreasing to a minimum value and recovering at the end. Calculated RQ values were found to be in the same range as reported by other investigators (WILEY and PIERCE, 1955; SCHULZE, 1960; ATKINSON, 1996) with the exception of the very low minimum values. No reports about this phenomenon of the first hours of processing were found in the literature available to the author. RICHARD (1997) mentioned that lower RQ values during an intermediate period may pointing at higher degradation of proteins and lipids, but low RQ values achieved in the experiments were too low for being the result degradation of proteins with an RQ of around 0.78 (SCHARRER, 1950). It is supposed that it could be attributed to the anabolism of the microbial population, i.e. to the development and reproducing themselves thus consuming oxygen and converting it in their own biomass without evolving a correspondent amount of carbon dioxide. The pH development was the same as mentioned in preliminary reports (SCHULZE, 1960; RICHARD, 1997). Initial pH values of fresh material were determined in the acidic range and changed within the processing time to the alkaline side. The material that was dried to achieve desired moisture levels altered rapidly the pH values to the alkaline side within the drying process and remained alkaline.

The experiments with 40 and 60% moisture content just as the complementary trials with 50 and 70% moisture content, did not achieve such low minimum values than the other tests. This may be a result of the seasonal influences on the input material but on the other hand the very low RQ values obtained in the previous experiments may be an experimental error caused by the system, i.e. the average calculation for oxygen and carbon dioxide concentrations and the sampling method, i.e. all exhaust tubes converged in one pipe.

The results of the complementary run were not employed in this part because the run was carried out with the purpose to prove the comparability of the RQ time courses.

The RQ of the material with 40% moisture showed no distinct minimum.

Temperature conditions in this 140-hours testing period were apparently not so decisive for the RQ time course, the RQ graphs were found to lay close together for trials with equal moisture conditions (Figure 5.4 - 5.7) with the exception of the test with 70% moisture containing material. The RQ graphs of this test laid close together the first 94 hours interval and then diverged extremely; the material treated at 75ºC achieved the lowest RQ values followed by the material of the reactor maintained at 65ºC. The conclusions of TSENG et al. (1995) and NAKASAKI (1985) that the RQ is increasing with higher temperatures could not been proved for these experiments.

Moisture levels seemed to have some impact on the time needed to achieve the minimum values of the respiratory quotient. At general the RQ is higher with higher moisture contents.

Data concerning final moisture contents indicated that the preconditioning system did not work satisfactory at temperature levels of 65 and 75ºC. It is supposed that the drying process of the material was intensified by the position of the heating tapes (winded round the reactors).

From all trials involving variation of moisture and temperature, the material with an initial moisture content of 55% achieved at first their minimum values followed by the material with 50% moisture content. This may indicate under the assumption that the low RQ values are caused by the anabolism of the micro-organisms, that the environmental conditions were very suitable (Figure 5.11).

RQ values greater than one were only achieved in the first 10 hours of processing. That in contrast to preliminary studies that reported RQ values greater than on for more than one day or more (SCHULZE, 1960). The material with moisture content of 70% had the highest RQ values the first two days of processing followed by the material with 60% and 40% moisture. 50 and 55% moisture containing material achieved the lowest RQ levels in the first 28 hours interval. At the end of the testing period the 70% moisture containing material achieved the highest and the material with 50% moisture the lowest RQ levels.

The high initial RQ levels of the material with high moisture contents could be caused by the lumpy structure of this very wet material which possibly prevented an adequate oxygen supply and formed zones with anoxic conditions thus producing additional carbon dioxide. The oxygen concentrations were maintained relatively constant in the range between 17 and 20% so that the high final RQ values probably were caused by less production of carbon dioxide thus less microbial activity. The material with an intermediate moisture content (50, 55%) showed an increase of carbon dioxide evolution that may indicate more biological activity.

TSENG et al. (1996) achieved high RQ levels while processing at high temperatures (70ºC) and speculated that it was caused by enhanced catabolism. This conclusion could not been proved for the obtained results.

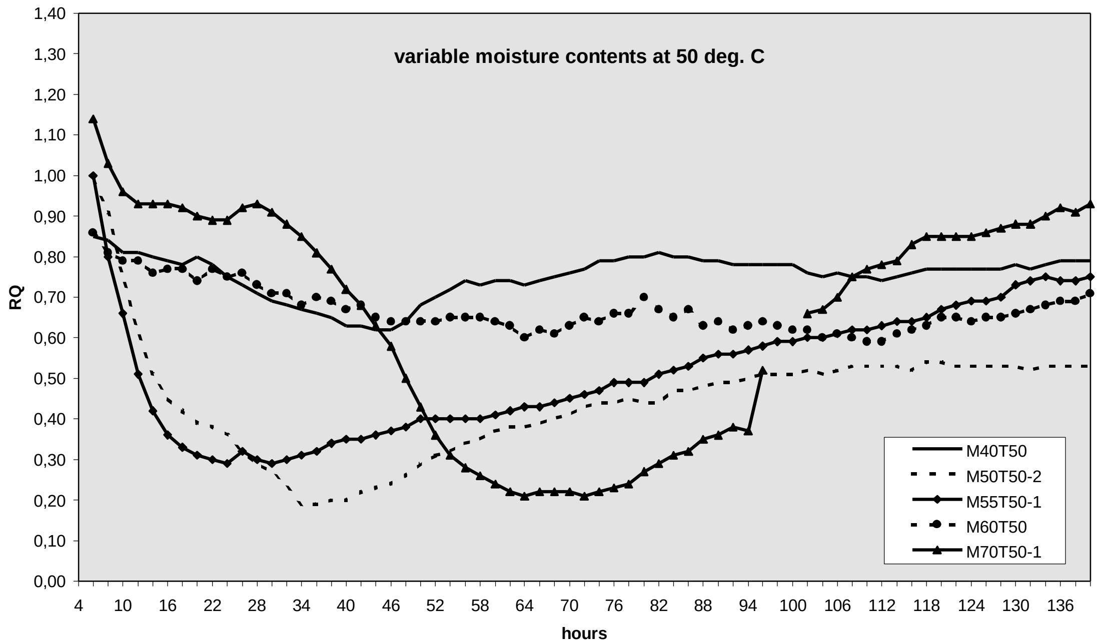

Figure 5.11: Experiments with different moisture contents at 50ºC

5.2 Experiments with Varying Oxygen Exhaust Levels and Temperature Conditions

RUN 5: Variable oxygen levels at 35ºC

Treated material had similar moisture contents and was little bit more alkaline (Table 5.8). The trials were carried out for 72 hours. Flow rates were regulated according to table 5.7.

Table 5.7: Aeration rates of run 5 (litres per minute)

time [hours]	OT35-1	OT35-2	OT35-3	OT35-4	OT35-5	OT35-6	OT35-7	OT35-8
0 - 3	1.9	1.5	1.1	1.3	1.8	0.9	0.27	0.24
3 - 19	3.8	1.5	1.1	1.3	1.8	0.9	0.24	0.14
19 - 65	1.9	1.5	0.6	0.9	0.9	0.4	0.24	0.07
65 - 72	1.9	1.3	0.6	0.9	0.6	0.9	0.24	0.27

The desired low exhaust oxygen levels could only partially been achieved, very low oxygen concentrations like 2 or 4% were not achieved.

The oxygen level of the OT35-1 material was maintained relatively constant at 16 to 17%. This concentration produced an RQ peak value of 1.04 in the first 4 hours of processing followed by a slow decrease to values around 0.80.

The materials of the trials from OT35-2 to OT35-6 achieved relatively similar oxygen exhaust gas concentrations which were between 13 and 14% the first 24 hours and stayed at 14 to 16% the remaining time of the processing period. Subsequently, the graphs of the RQ were similar; all of them achieved their maximum of around 1.00 in a 4 to 6 hours range, then the RQ fell down slowly to values in the range of 0.80 to 0.83 (Figure 5.12 for OT35-1 to OT35-4 and Figure 5.13 for OT35-5 to OT35-8).

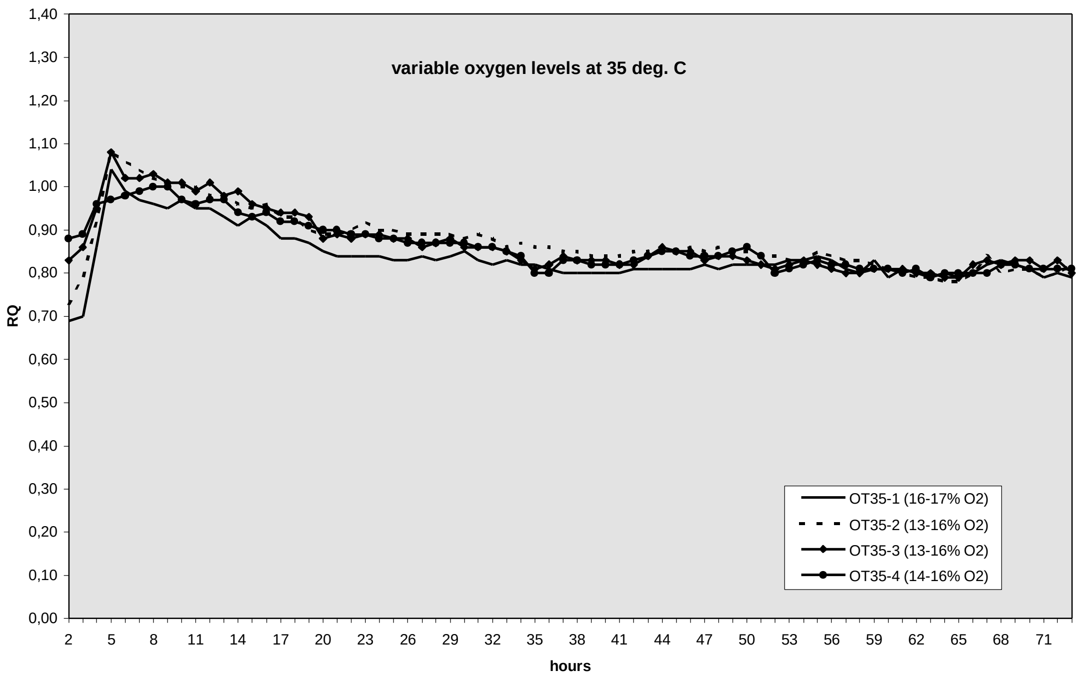

Figure 5.12: Experiments at 35ºC with varying exhaust oxygen levels

The material of the OT35-7 experiment achieved an exhaust oxygen concentration of 10 to 11% the first day, of 11 to 12% the second and of around 13 % the remaining testing time. This caused top RQ values of 1.16 in 15 hours interval after starting followed by a decrease to an RQ around 1.00.

The material of the OT35-8 trial had the lowest oxygen levels of this run, which were measured to be between 8 and 9% the first day then it rose to 9 to 11% while the second 24 hours and stayed at around 12% for the rest of processing. The material had high RQ values of about one at the beginning which increased while a 6 hour interval to a maximum of about 1.23. After that it decreased to RQ values around 1.00 and finished with 0.9 (Figure 5.13).

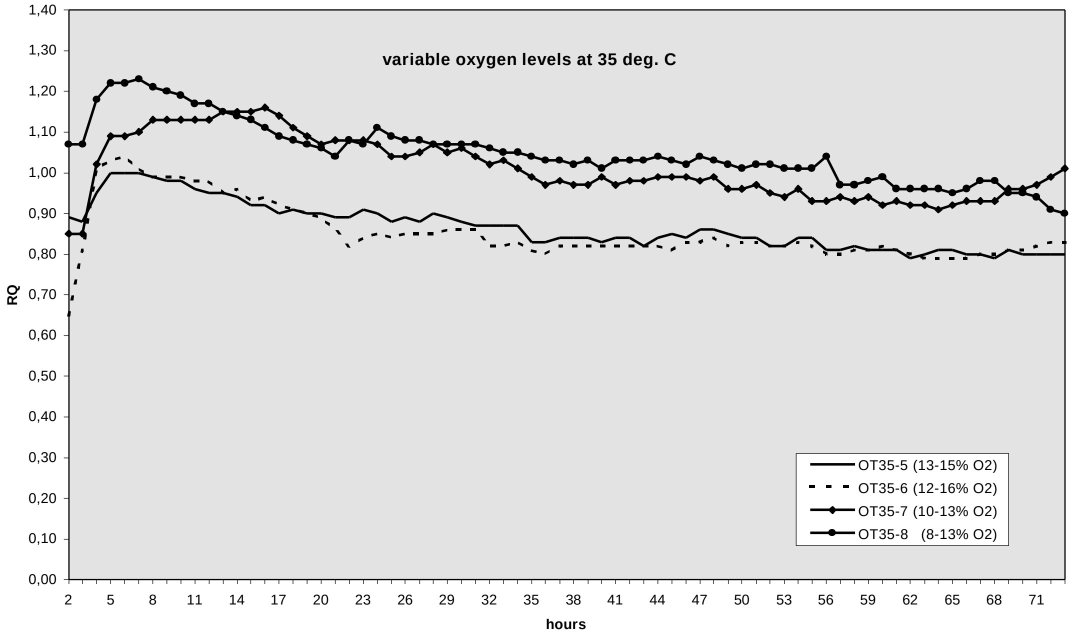

Figure 5.13: Experiments at 35ºC with varying exhaust oxygen levels

Table 5.8: Parameters of run 5

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OT35-1	56.9	9.2	48.7
OT35-2	58.6	9.3	46.8
OT35-3	57.6	9.2	49.9
OT35-4	56.4	9.1	47.1
OT35-5	58.1	9.2	52.6
OT35-6	58.0	9.1	52.8
OT35-7	56.0	9.1	52.3
OT35-8	54.8	9.2	51.8

RUN 6: Variable oxygen levels at 50ºC

At the end of the testing period the material had similar moisture contents and the pH was in the alkaline range (Table 5.10). This test was run for 90 hours. The air flow rates used are given in Table 5.9.

Table 5.9: Aeration rates of run 6 (litres per minute)

time [hours]	OT50-1	OT50-2	OT50-3	OT50-4	OT50-5	OT50-6	OT50-7	OT50-8
0 - 14	4.4	2.2	0.4	0.3	-	-	0.3	0.1
14 - 40	4.4	2.8	0.2	0.2	-	-	0.1	0.05
40 - 62	4.4	2.6	1.1	0.6	-	-	0.05	0.5
62 - 90	4.4	1.8	0.6	0.3	-	-	0.3	0.2

The desired low levels of exhaust oxygen concentration were not achieved.

The material of the OT50-1 test achieved an oxygen concentration of 15% in the first time, then values between 16 and 17%. The respiratory quotient had a peak of 0.84 in the first 24 hours, then decreased to values around 0.60. OT50-2 had similar oxygen conditions but produced only a maximum RQ of 0.76. The RQ values of this material were at general lower than that of the preliminary mentioned test but converged at the end of the testing period.

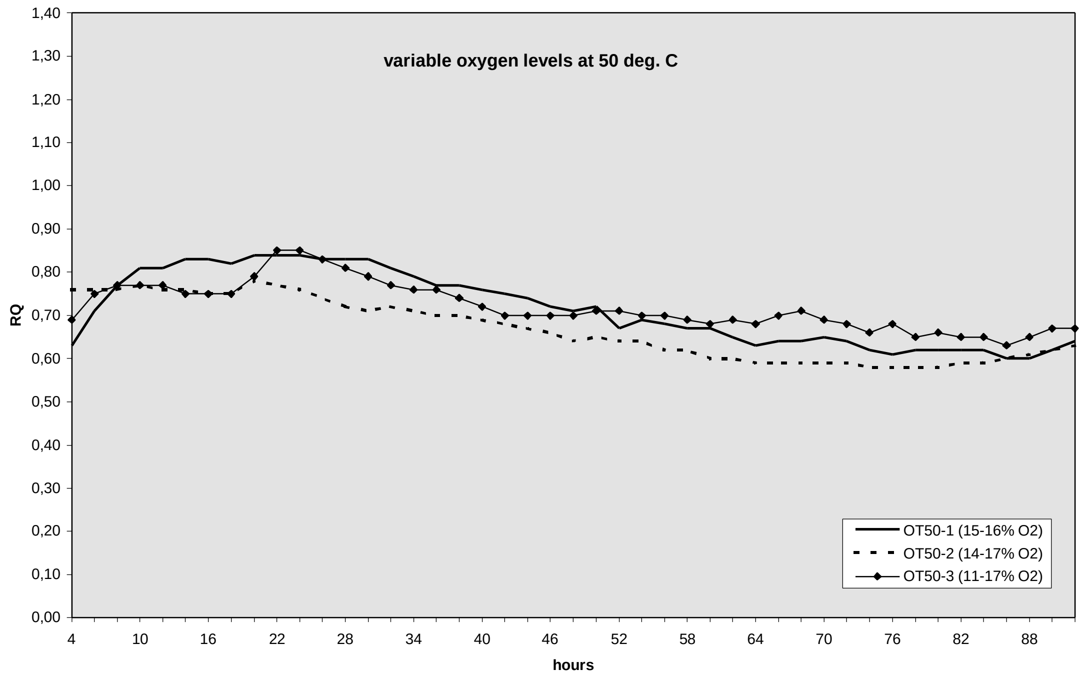

Figure 5.14: Experiments at 50ºC with varying exhaust oxygen levels

The materials of the OT50-3 and 4 tests had an exhaust oxygen concentration from 13 to 15% the first day and between 15 and 16% the remaining time. The time course of RQ graphs was relatively similar; maximum RQ values were achieved in first 24 hours of testing with 0.84 (OT50-3) and 0.87 (OT50-4) followed by a decrease to values between 0.64 and 0.70.

The material of the OT50-7 trial achieved exhaust oxygen concentrations between 9 and 11% in the first 24 hours and between 11 and 14% the following time. These conditions produced a maximum RQ of 1.12 in a 24 hours period followed by a slow decrease to end values of 0.74 (Figure 5.15).

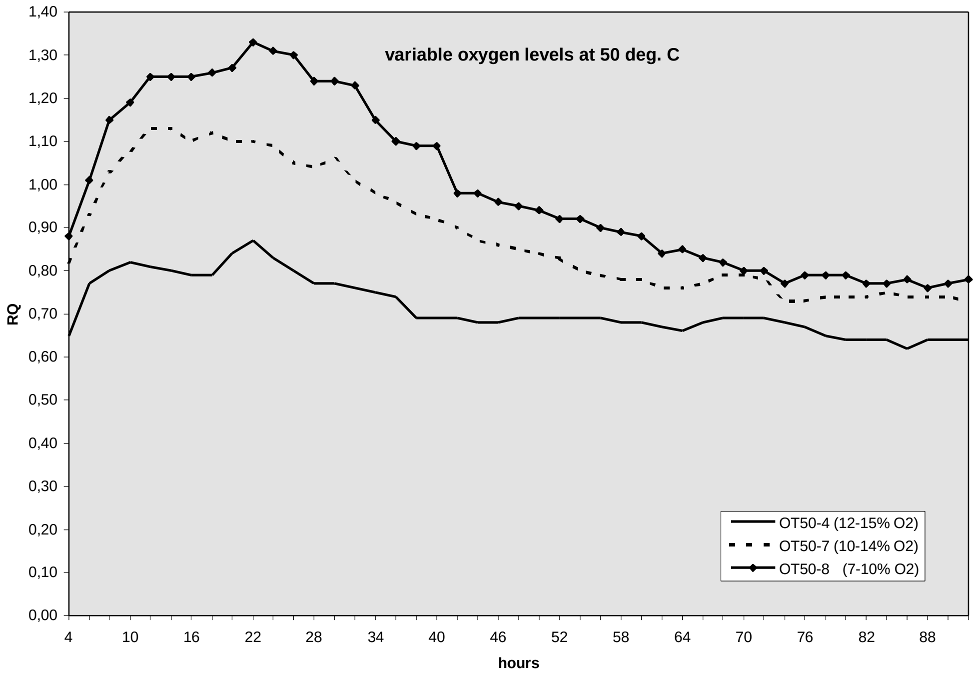

Figure 5.15: Experiments at 50ºC with varying exhaust oxygen levels

The reactor containing the OT50-8 material had the lowest oxygen levels of this run with around 7% the first day, 8 to 9% the second and around 10% from hour 48 to hour 62 and around 7% the remaining processing time. These concentrations gave a peak in the first 24 hours with values around 1.30. After the maximum a decrease to values below one was noticed. At the end of processing the graphs converged to finish with an RQ of around 0.8 (Figure 5.15).

Table 5.10: Parameters of run 6

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OT50-1	49.3	9.3	45.8
OT50-2	53.3	9.3	50.1
OT50-3	55.9	7.9	48.1
OT50-4	52.9	7.9	51.6
OT50-5	-	-	-
OT50-6	-	-	-
OT50-7	49.2	8.1	51.0
OT50-8	49.5	8.3	51.0

RUN 7: Variable oxygen exhaust levels at 65ºC

The run was operated for 83 hours. At the end of the trials the compost had similar moisture content and alkaline pH was measured (Table 5.12).
The flowrates employed are shown in Table 5.11.

Table 5.11: Aeration rates of run 7 (litres per minute)

time [hours]	OT65-1	OT65-2	OT65-3	OT65-4	OT65-5	OT65-6	OT65-7	OT65-8
0 - 3	7.60	3.52	1,32	0,44	0,88	0,66	0,68	0,27
3 - 6	9.50	3,96	1,32	0,88	0,88	0,66	0,68	0,41
6 - 8	11.40	4,46	1,32	0,88	0,88	0,66	0,68	0,61
8 - 14	13.30	4,40	1,32	0,88	0,88	0,66	0,68	0,61
14 - 17	11.40	4,40	0,88	0,88	0,88	0,66	0,54	0,41
17 - 38	11.40	3,08	0,88	0,88	0,88	0,66	0,27	0,14
38 - 83	11.40	1,76	0,66	0,44	0,66	0,44	0,27	0,27

The OT65-1 and 2 trials achieved similar oxygen exhaust concentrations of around 15 to 16% the first day and around 16% the remaining time. RQ values started with 0.97 (OT65-1) and 0.85 (OT65-2) and decreased slowly to 0.60 (OT65-1) and 0.58 (OT65-2).

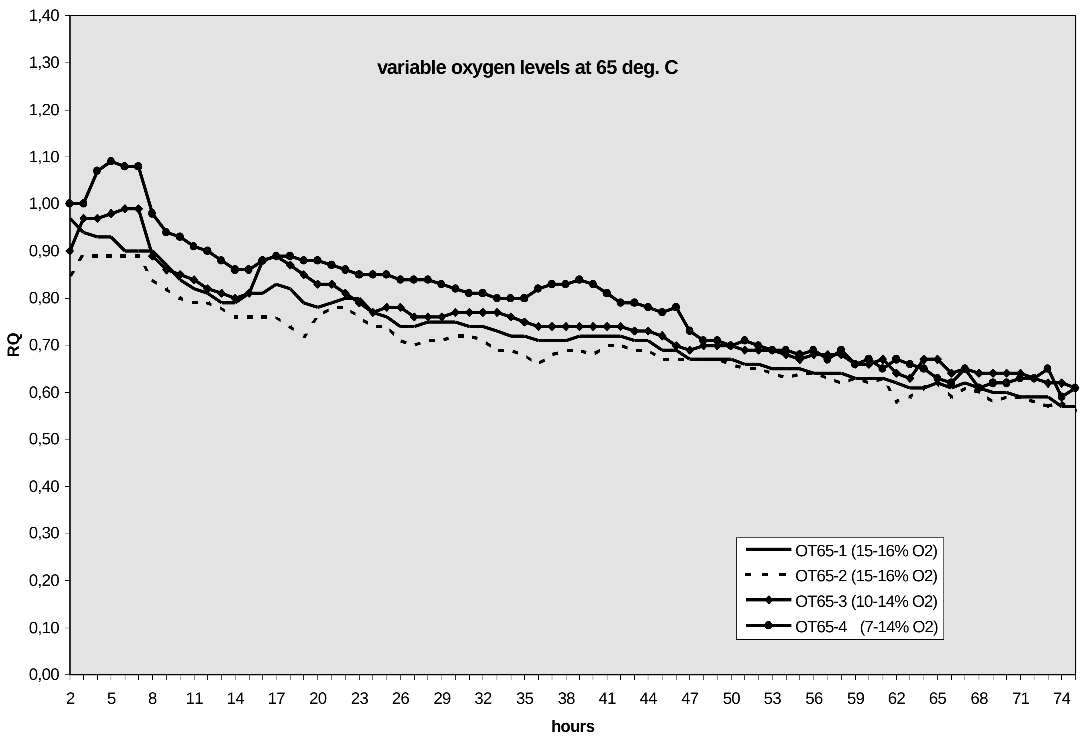

Figure 5.16: Experiments at 65ºC with varying exhaust oxygen levels

The material of the OT65-3 test maintained oxygen concentrations of around 9 to 11% the first day and the remaining time between 12 and 13%. These conditions gave a maximum RQ of 0.99 in the first hours of processing followed by a decrease and a second peak of 0.89. After that second one the RQ lowered down to final values around 0.63.

The reactor containing the material of the OT65-4 experiment achieved exhaust oxygen levels of 7 to 9% the first 20 hours, the remaining time between 11 and 14%. This produced an RQ maximum of 1.09 in the first 4 hours of testing followed by a decrease to values of around 0.63 (Figure 5.16).

The material of the OT65-5 experiment had at the beginning an exhaust oxygen concentration of 5% that increased while the second day of processing to around 9% and in the last testing stage to values between 10 and 11%. The RQ graph formed a peak with 1.08 in the first time of processing followed by another maximum of 0.98. After the second peak the RQ fell down slowly to values of around 0.70.

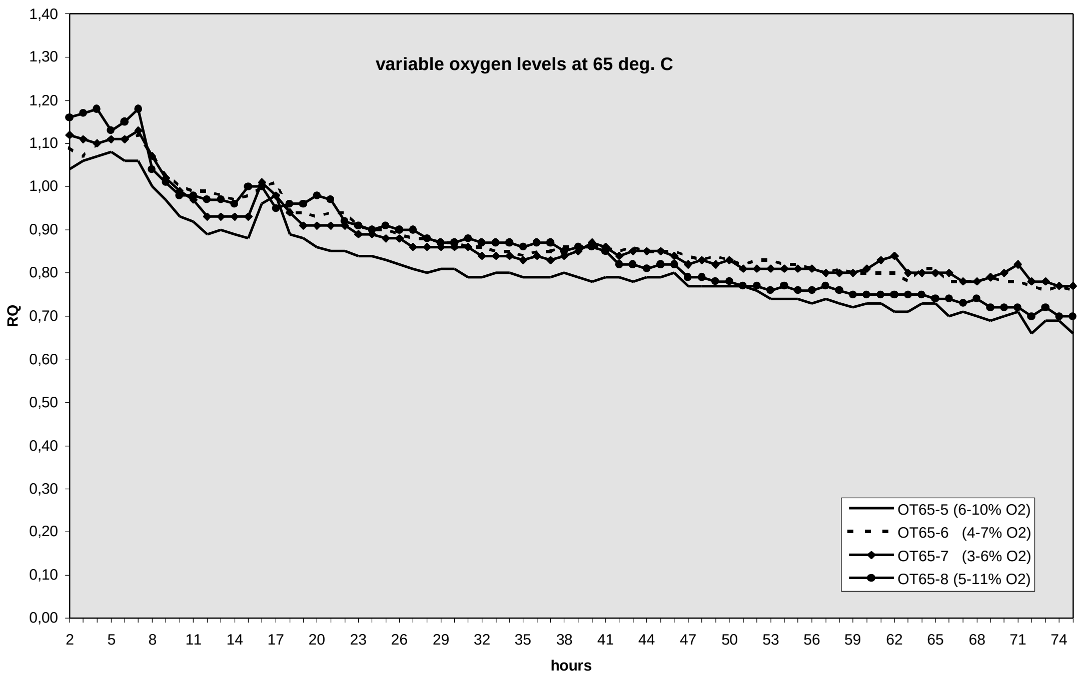

Figure 5.17: Experiments at 65ºC with varying exhaust oxygen levels

Exhaust oxygen concentration of the reactor containing the material of the OT65-6 test were slightly lower than that mentioned before. It could be maintained while the first 24 hours between 4 and 5%, then it rose to 9 - 10% and remained at this level up to the end. An RQ maximum of 1.12 was obtained in the first hours of testing. Finishing the process, end values of around 0.80 were measured. The OT65-7 test had oxygen concentrations of 4 to 6% during the whole testing period, which gave a maximum RQ of 1.13 in a short time span after starting the process. At the end RQ values of 0.77 were measured.

Oxygen exhaust levels of the OT65-8 experiment were maintained at 5 to 10% the first day and around 10% the remaining testing period. RQ achieved top values of 1.18 right after the beginning and decreased after it to values of around 0.72 (Figure 5.17).

Table 5.12: Parameters of run 7

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OT65-1	50.3	9.2	48.7
OT65-2	57.8	9.0	46.8
OT65-3	49.7	9.0	49.9
OT65-4	56.2	9.2	47.1
OT65-5	53.8	9.1	52.6
OT65-6	51.5	9.2	52.8
OT65-7	49.9	7.9	52.3
OT65-8	54.0	8.5	51.8

RUN 8: Variable oxygen levels at 75ºC

Treated material had moisture contents of the same range and was slightly alkaline (Table 5.14). The run was carried out for 73 hours. Aeration regime is given in Table 5.13.

Table 5.13: Aeration rates of run 8 (litres per minute)

time [hours]	OT75-1	OT75-2	OT75-3	OT75-4	OT75-5	OT75-6	OT75-7	OT75-8
0 - 24	0.85	1.76	1.32	1.10	-	0.66	0.61	-
24 - 40	0.85	1.76	1.32	0.66	-	0.44	0.47	-
40 - 73	0.85	0.88	0.66	0.44	-	0.22	0.27	-

The OT75-1 trial had at the beginning an oxygen content of around 16% that increased up to the end to almost 20%. The RQ started with 0.52 to increase to a maximum of 0.70 in the first seven hours then decreased to minimum values of 0.30 and rose to end values of 0.50.

The rOT75-2 and 3 tests had relatively similar oxygen conditions, at the start around 6%, that increased fast to 16 to 18%. This produced RQ peak values of 0.83 (OT75-2) and 0.93 (OT75-3) during the first day of treatment. The time course of these graphs was similar for all tests. Minimum values of 0.38 (OT75-2) and 0.39 (OT75-3) followed by an increase to end values of 0.61 (OT75-2) and 0.59 (OT75-3) were measured (Figure 5.18).

The OT75-4 experiment started with an exhaust oxygen concentration of around 3% that increased to around 6% the first 20 hours and achieved oxygen concentrations of 14 to 16% the next 24 hour time span. The remaining test period it had an oxygen content between 18 and 19% in the exhaust gas. These conditions produced a peak value of 0.89 in the first seven hours of the testing process followed by a decrease to 0.45. At the end of the test the material had RQ values of around 0.60 (Figure 5.19).

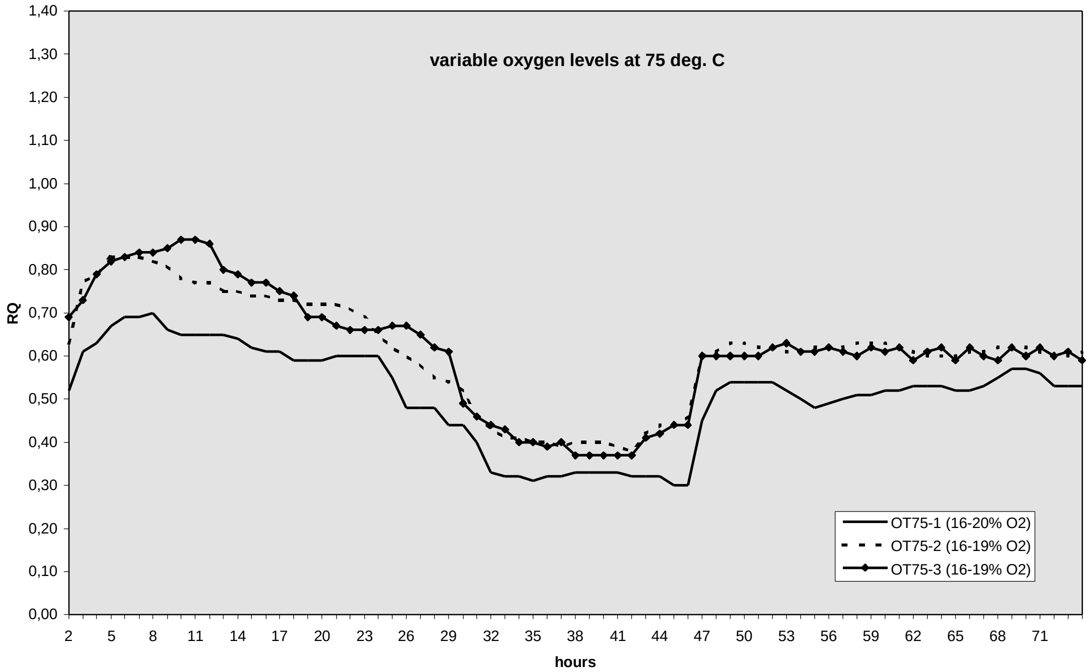

Figure 5.18: Experiments at 75ºC with varying exhaust oxygen levels

The lowest exhaust oxygen concentrations were obtained by the reactors containing the material of the OT75-6 with 3% and OT75-7 with around 2%. These conditions could be maintained the first 24 hours, after this period the oxygen concentration rose to 10 - 12%. The last 24 hours the oxygen levels were measured at 13 to 15%. According to the similarity of the exhaust oxygen levels, the graphs of these reactors lay close together (Figure 5.19). The principal time course of the RQ graph is the same as in the other trials. RQ achieved maximum values of 0.99 (OT75-6) and 1.06 (OT75-7) in a time span of 4 hours, decreased slowly to minimum values of around 0.60 and finally it was calculated to be around 0.77. (OT75-6) and 0.74 (OT75-7).
A serious malfunction of the equipment belonging to the reactor of the OT75-5 and OT75-8 was detected so that the data of these reactors was kept out.

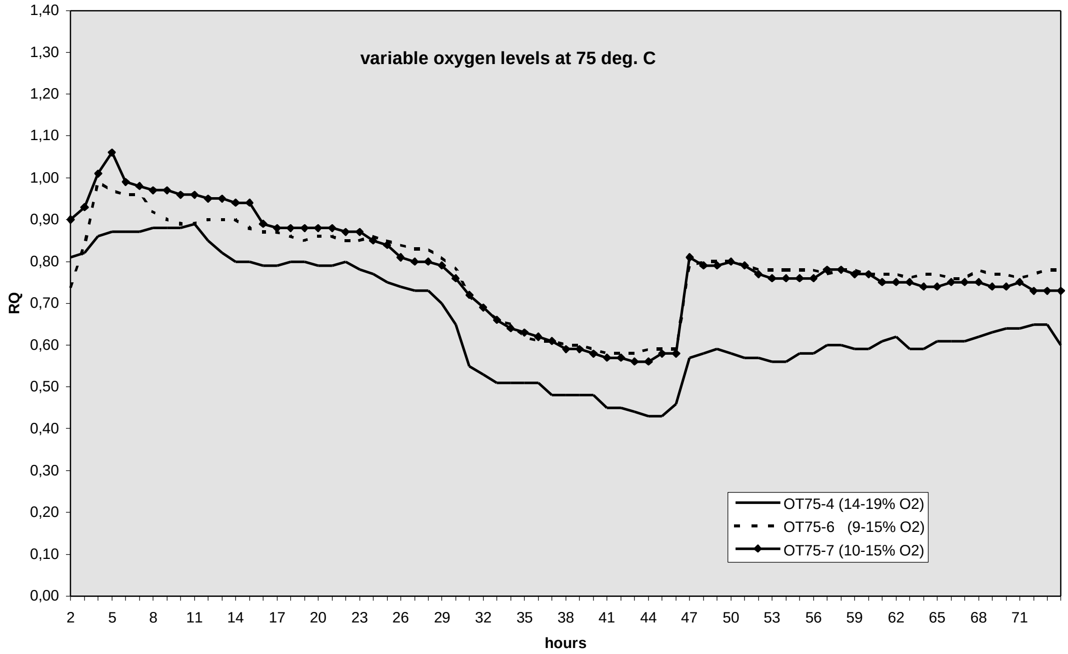

Figure 5.19: Experiments at 75ºC with varying exhaust oxygen levels

Table 5.14: Parameters of run 8

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OT75-1	50.4	7.4	50.2
OT75-2	53.4	7.3	47.5
OT75-3	47.9	7.3	47.6
OT75-4	46.7	7.2	51.0
OT75-5	-	-	-
OT75-6	53.4	7.8	51.1
OT75-7	49.6	7.9	46.5
OT75-8	-	-	-

DISCUSSION

The RQ time courses showed a certain similarity; RQ peak values were achieved in the first hours of processing followed by a slow decrease within the remaining testing period. The trials were carried out with treated biowaste that may explain the qualitatively different time course of the RQ in comparison to preliminary discussed experiments.

The comparison of the results of these experiments turned out to be relatively complicated because sometimes the desired oxygen levels could not been achieved

generally or were only maintained for a certain time interval or in a range around the aimed value. The input material sometimes possessed a high self-heating capacity that led to elevated temperatures up to 50ºC so that the desired temperature level of 35ºC could been achieved only in the last stage of testing.
The pH development was according to that mentioned in preliminary reports; initial and final pH were in the alkaline range, the alkalinity increased slightly within the processing time. At high oxygen concentrations of around 17% the RQ levels were higher at lower temperatures. These results were in contrast to that reported by TSENG (1996) and NAKASAKI (1985) and confirmed the results of the preliminary moisture and temperature conditions varying experiments.

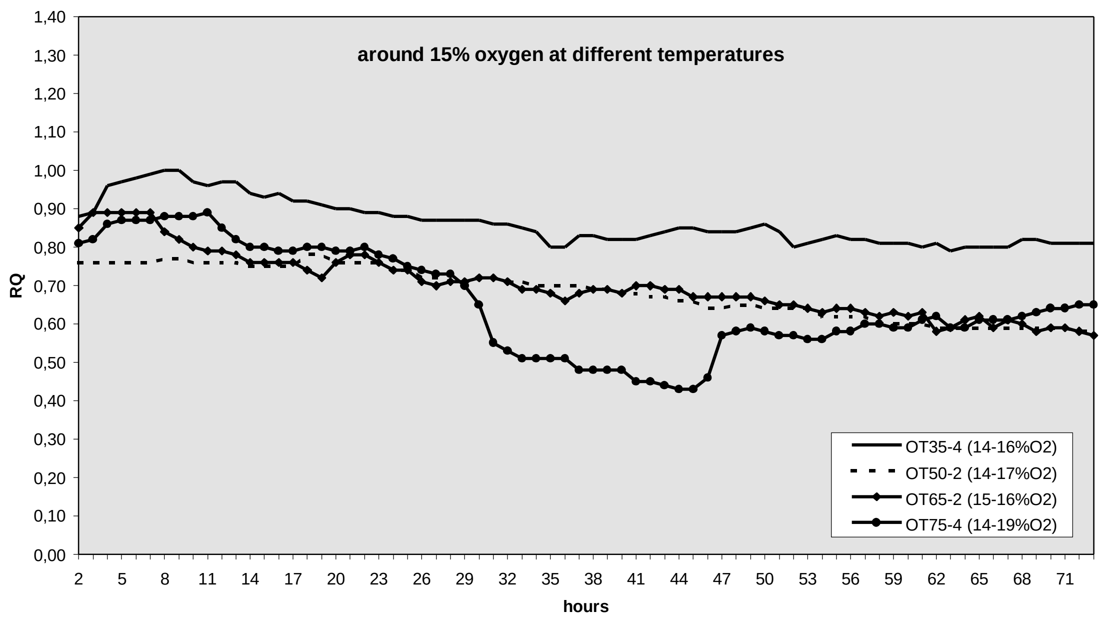

Figure 5.20: Experiments with around 15% oxygen content at variable temperature levels

The material treated at 35ºC had at all tested oxygen concentrations constantly the highest RQ levels while the material processed at 75ºC had the lowest ones. At the end of the testing process the final RQ levels were relatively close together except that one of the test at 35ºC that was considerably greater.
At the tests with oxygen concentrations of around 15% the same effect was observed with the difference that the material treated at 75ºC showed only in an intermediate interval considerable differences in the RQ levels.
With an oxygen concentration of around 10% similar results were noticed. The RQ levels of the tests at 65 and 75ºC and in the same way the levels of the trials at 35 and 50ºC were close together for the first 30 hours. Final RQ levels of the trials at

50 and 75ºC laid close together. The test with 65ºC achieved the lowest RQ levels at these oxygen conditions.
At around 7% oxygen in the reactor the material treated at 50ºC achieved the highest RQ levels in the first 30 hours then the graph converged to the graph of the material treated at 65ºC.

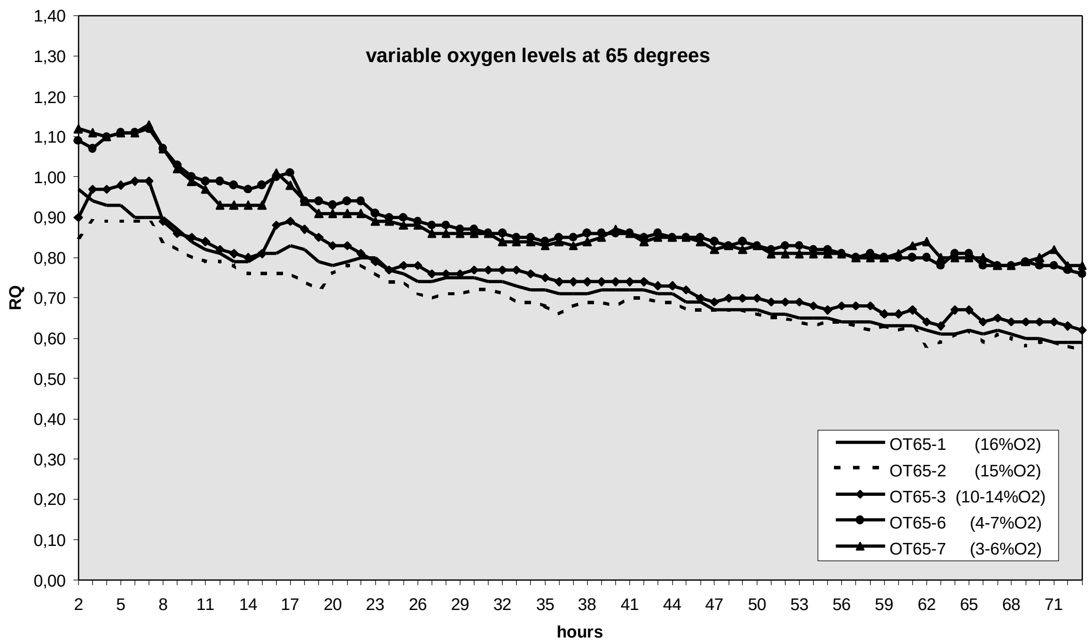

Figure 5.21: Experiments with variable oxygen concentrations at 65ºC

The respiratory quotient of all the temperature and oxygen levels varying tests was higher at lower oxygen concentration. It was supposed that anoxic conditions were dominating causing high carbon dioxide evolution thus producing high RQ values. The calculated RQ values of all tests showed a good correspondence to RQ values obtained by similar experiments reported in the literature (WILEY and PIERCE, 1955; SCHULZE, 1960; ATKINSON, 1996; RICHARD, 1997). The RQ values mentioned in preliminary reports were considerably higher than one for the first day of processing. RQ peak values obtained in these tests were found in the same range but not for a time span greater than 14 hours, that may caused by the different types of feedstock material used.
The high RQ levels at low oxygen concentration of materials treated at 75ºC indicate the existence of anoxic zones in the composting matrix thus the production of additional carbon dioxide.

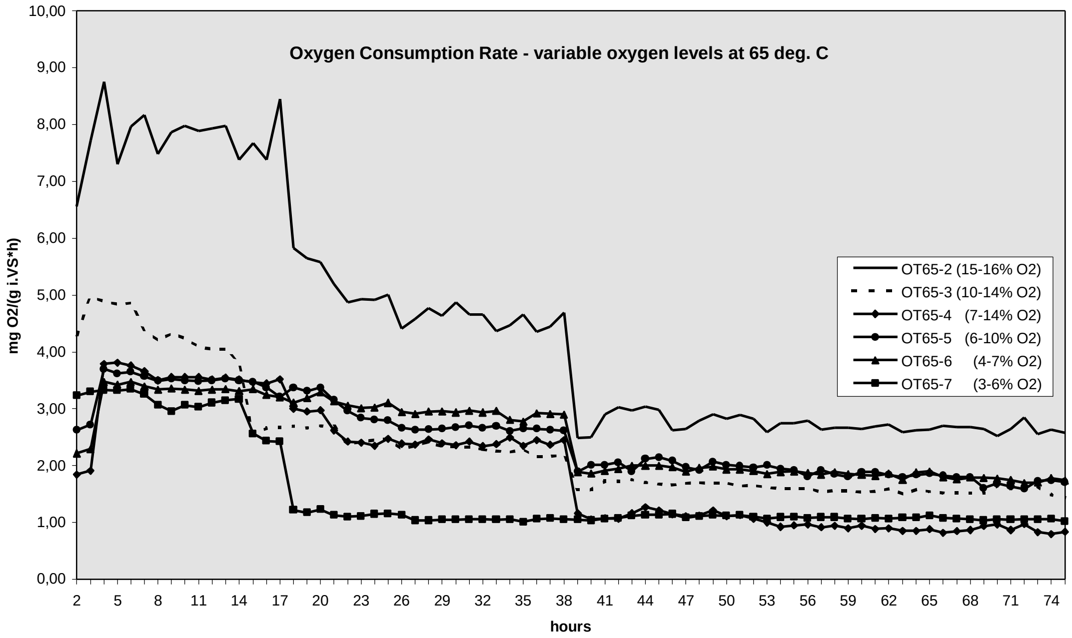

Figure 5.22: Oxygen consumption rates of test with variable oxygen concentrations at 65ºC

Oxygen consumption and carbon dioxide evolution rates were calculated for these experiments and showed relatively similar time course. The highest oxygen consumption rates were achieved in the first 24 hours of processing due to the high aeration rates, i.e. the large amount of supplied oxygen. Within the processing time the oxygen consumption rate decreased. The tests carried out at moderate temperatures (50 and 65ºC) and that with high oxygen concentrations had the highest uptake rates. Oxygen consumption and carbon dioxide evolution rates fluctuated considerably as depending on the airflow (Equations 4.3 and 4.6).

Oxygen consumption rates were higher at higher temperature levels, as reported by MOORE (1958) but at extreme temperature levels it decreased; maximum uptake was calculated at 65ºC. Oxygen consumption rates in the range from 0.5 to 9 mg O_2/(g VS·h) were obtained. Carbon dioxide evolution rates showed a very good correspondence and were slightly higher than the oxygen consumption rates Figure 5.22 and 5.23).

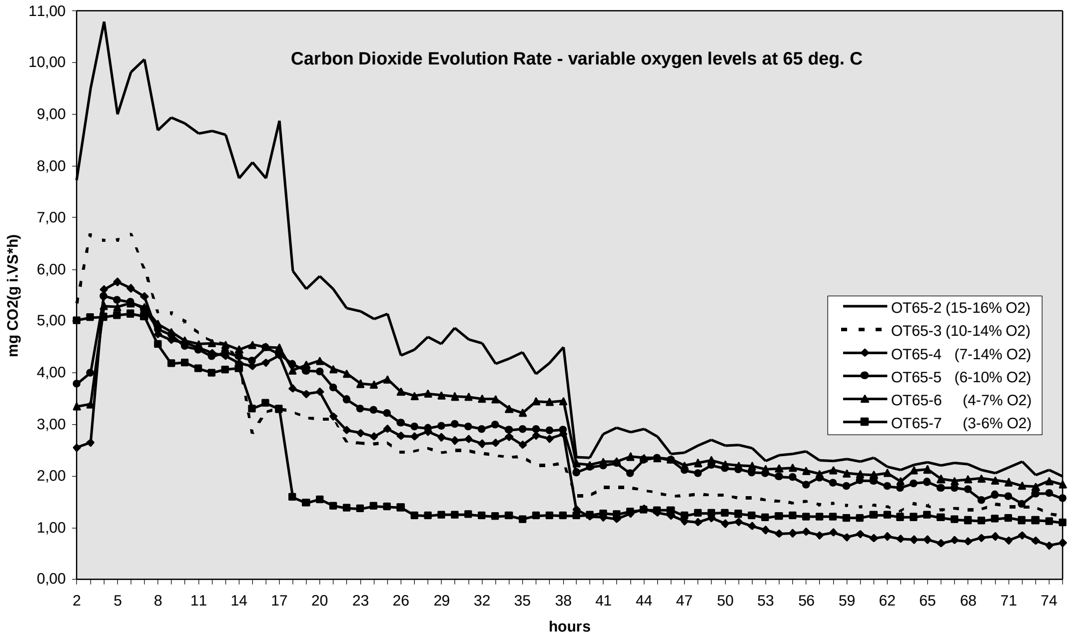

Figure 5.23: Carbon dioxide evolution rates of test with variable oxygen concentrations at 65ºC

5.3 Experiments with Varying Oxygen Exhaust Levels at Different Moisture Conditions

RUN 9: Varying oxygen levels at 44.1% moisture

The experiment was done for a 74 hour period at a temperature of 50ºC. Final moisture contents were slightly higher than the initial ones (Table 5.16). Aeration regime was managed according to Table 5.15.

Table 5.15: Aeration rates of run 9 (litres per minute)

time [hours]	OM40-1	OM40-2	OM40-3	OM40-4	OM40-5	OM40-6	OM40-7	OM40-8
0 - 6	3.80	4.40	3.52	-	2.64	2.42	1.35	1.35
6 - 15	3.80	3.96	2.64	-	1.32	1.32	1.35	1.35
15 - 18	3.80	3.96	2.20	-	1.32	0.88	1.35	1.22
18 - 23	3.80	3.52	1.98	-	0.88	0.88	1.35	1.22
23 - 40	3.80	3.08	1.54	-	0.88	0.88	1.35	1.22
40 - 45	3.80	3.08	1.54	-	0.88	0.88	1.35	1.22
45 - 66	3.80	2.64	1.32	-	0.88	0.88	1.08	0.81
66 - 74	3.80	1.76	1.32	-	0.88	0.88	1.08	0.81

The material of the OM40-1 test was managed to contain between 18 and 19% oxygen in the exhaust gas the complete testing period. RQ started with 0.60 and decreased slowly to values of around 0.44.

The exhaust oxygen content of reactor containing the material of the OM40-2 trial was maintained in the range from 15 to 16% the experimental time. These conditions produced an initial RQ of around 0.70 that fluctuated while the processing and ended with an value of 0.68 around that showed only a little difference to the initial ones.

The OM40-3 experiment had oxygen concentrations between 10 and 13%, mainly around 11% the complete testing interval which gave initial RQ values of around 0.80 that decreased within 25 hours to around 0.70 followed by an increase to RQ values similar to the initial ones and at the end an RQ of around 0.73 was achieved.

Data of test OM40-4 were not available as a result of tubing leakage.

Oxygen concentrations of the OM40-5 trial fluctuated from 2 to 8% the first 24 hours, between 4 and 7% the second day and between 8 and 12% the last day. Initial RQ values of around 0.85 were calculated that decreased slightly followed by a recovery to values of around 0.90 after 35 hours of processing. After the peak the RQ decreased slowly and achieved end values of around 0.84 (Figure 5.24).

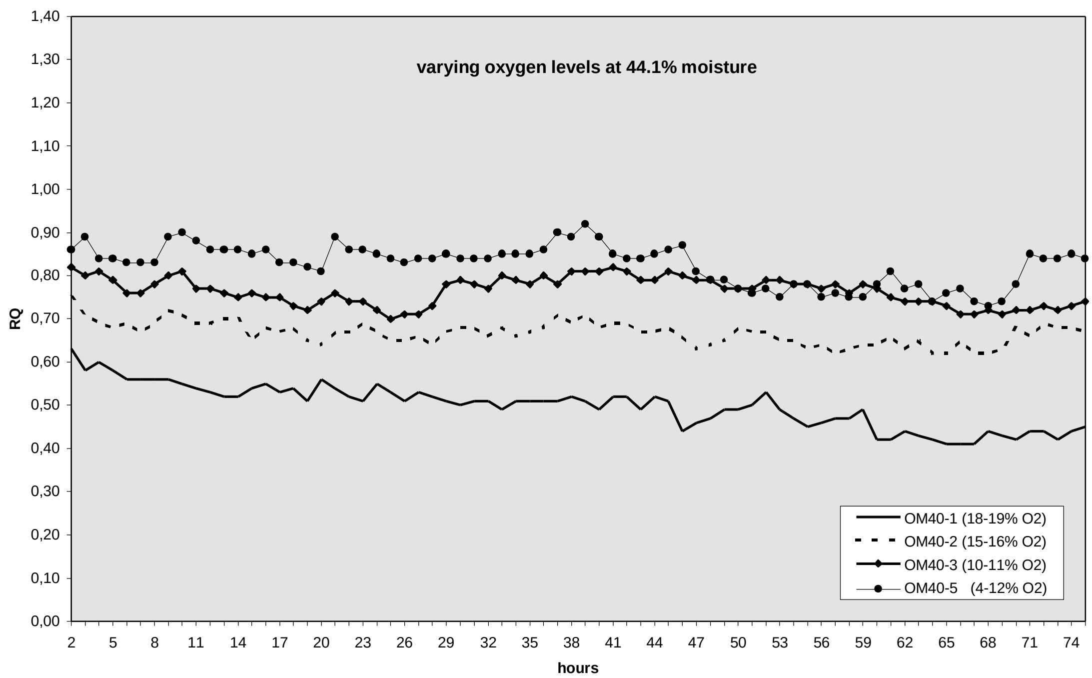

Figure 5.24: Experiments with 44.1% moisture and varying oxygen levels

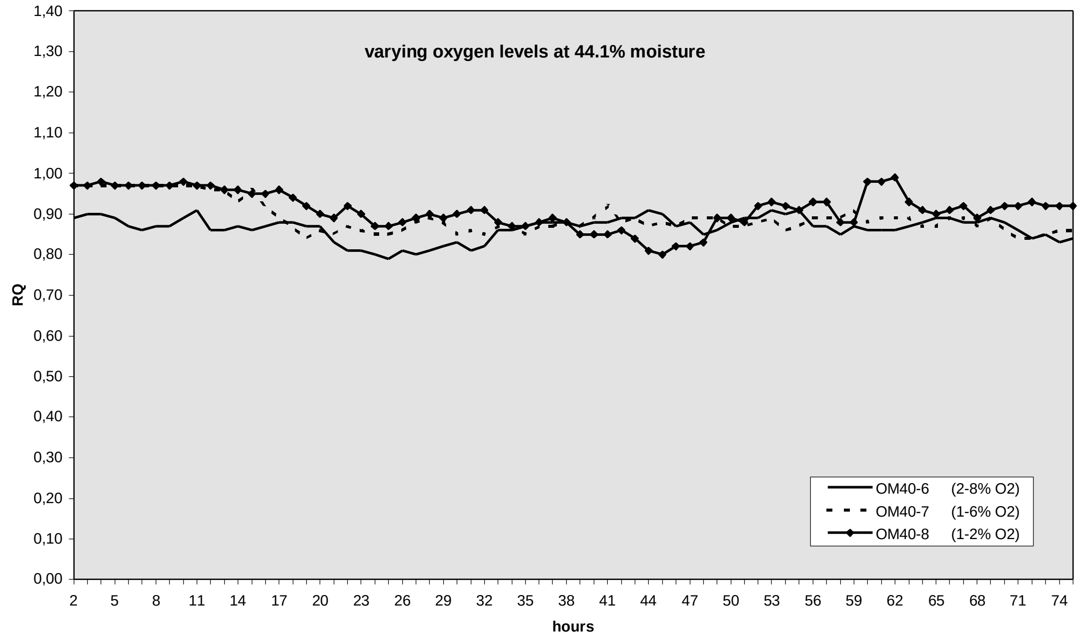

Figure 5.25: Experiments with 44.1% moisture and varying exhaust levels

The material of the OM40-6 experiment was regulated to oxygen concentrations of 2 to 6% the first 24 hours, to 5 to 7% the next 24 hours and to around 6% the remaining time. Initial RQ values of around 0.90 were calculated and the remaining process the RQ values fluctuated between 0.80 and 0.90.

The reactors of the OM40-7 and 8 tests were maintained at very low oxygen concentrations of around 1% the first 24 hours, the OM40-7 trial had 4 to 6% and OM40-8 experiment between 1 and 2 % the remaining processing time. RQ time course was relatively similar for the first day, starting with values of around 0.97 followed by a slight decrease to values of around 0.89. Final RQ values of around 0.86 (OM40-7) and 0.92 (OM40-8) were obtained (Figure 5.25).

Table 5.16: Parameters of run 9

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OM40-1	48.9	9.3	53.3
OM40-2	47.3	9.1	51.2
OM40-3	46.7	9.0	51.6
OM40-4	-	-	-
OM40-5	46.9	9.3	53.0
OM40-6	46.3	9.3	49.4
OM40-7	48.0	9.4	53.8
OM40-8	47.9	9.4	54.2

RUN 10: Varying oxygen levels at 52.1% moisture - OM50

The tests were carried out for 74 hours at a temperature level of 50ºC. Final moisture contents differed not significantly from that at the beginning (Table 5.18). Air was supplied according to Table 5.17.

Table 5.17: Aeration rates of run 10 (litres per minute)

time [hours]	OM50-1	OM50-2	OM50-3	OM50-4	OM50-5	OM50-6	OM50-7	OM50-8
0 - 5	1.95	1.98	1.54	1.10	0.88	1.32	0.68	0.54
5 - 19	2.75	3.08	2.64	1.10	0.88	1.32	0.68	0.54
19 - 51	2.75	3.08	2.64	1.10	0.88	1.32	1.08	0.54
51 . 66	2.75	2.64	1.76	1.10	0.88	1.32	0.54	0.54
66 - 74	2.75	2.64	1.76	0.88	0.88	1.32	0.54	0.27

The material of the test OM50-1 was maintained at exhaust oxygen concentrations from 19 to 20% the whole testing period. The RQ started with 0.67 decreased slowly to around 0.45 and remained at this level up to the end of the trial.

The OM50-2 trial had an oxygen concentration of 14 to 16 % the first 24 hours and between 16 and 17% oxygen the remaining 50 hours in the exhaust gas. The RQ graph peaked right after initialising the process with 0.83 followed by a slow decrease to end values of around 0.60 (Figure 5.26).

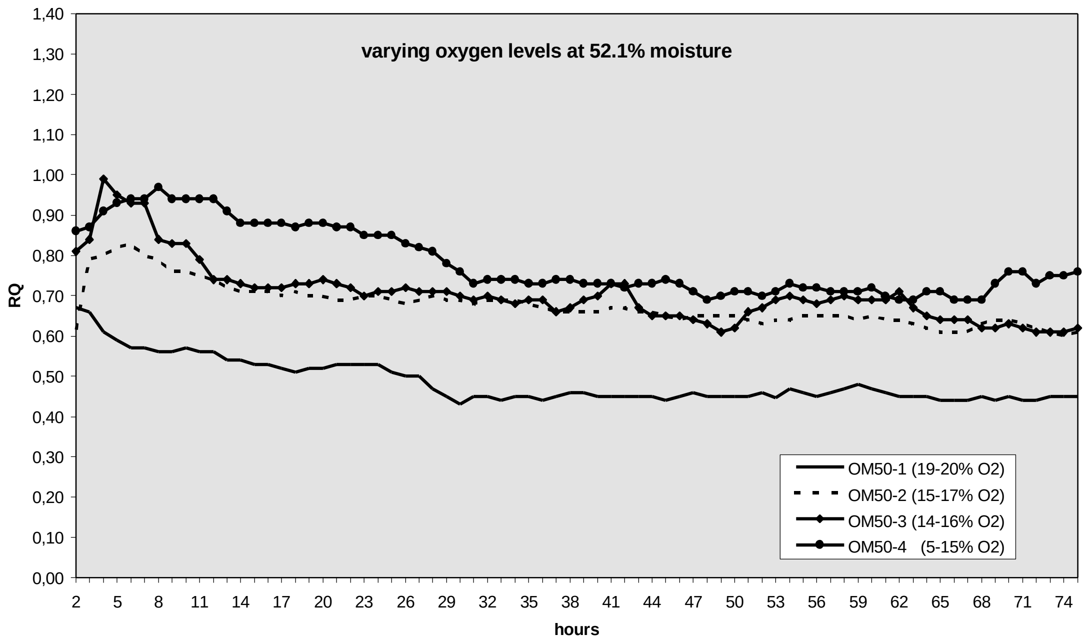

Figure 5.26: Experiments with 52.1% moisture and varying oxygen levels

12 to 16% oxygen in the exhaust gas and 16 to 17% the remaining time span were measured for OM50-3. These concentrations caused starting RQ of 0.81 that increased rapidly to the top value of 0.99. After achieving the maximum, the RQ decreased to around 0.70 and finished with values around 0.70.

The material of the OM50-4 experiment was operated at 4 to 8% oxygen the first 20 hours, between 10 and 13% the next 20 hours and between 13 and 15 the remaining testing period. The RQ graph started with 0.86, rose rapidly to the maximum of 0.97 and then it decreased to values in the range from 0.70 to 0.74. At the end the RQ remained at values of around 0.75 (Figure 5.26).

The OM50-5 test was regulated to contain between 2 and 4% oxygen the first day, between 5 and 10% the following 24 hours and between 10 and 12% the last 26 hours. These conditions resulted in a starting RQ of 0.55 that rose to its maximum of 1.01 within a 8 hours interval after starting followed by a decrease to values in the range from 0. 82 to 0.85. Final RQ values of around 0.80 were obtained.

Oxygen exhaust contents of OM50-6 were measured at 4% at the beginning, increased within a 40 hour interval to around 8% and remained around 10% the rest of the time. RQ moved fast from 0.71 to maximum values of 0.95 the it decreased slowly to around 0.88 (Figure 5.27).

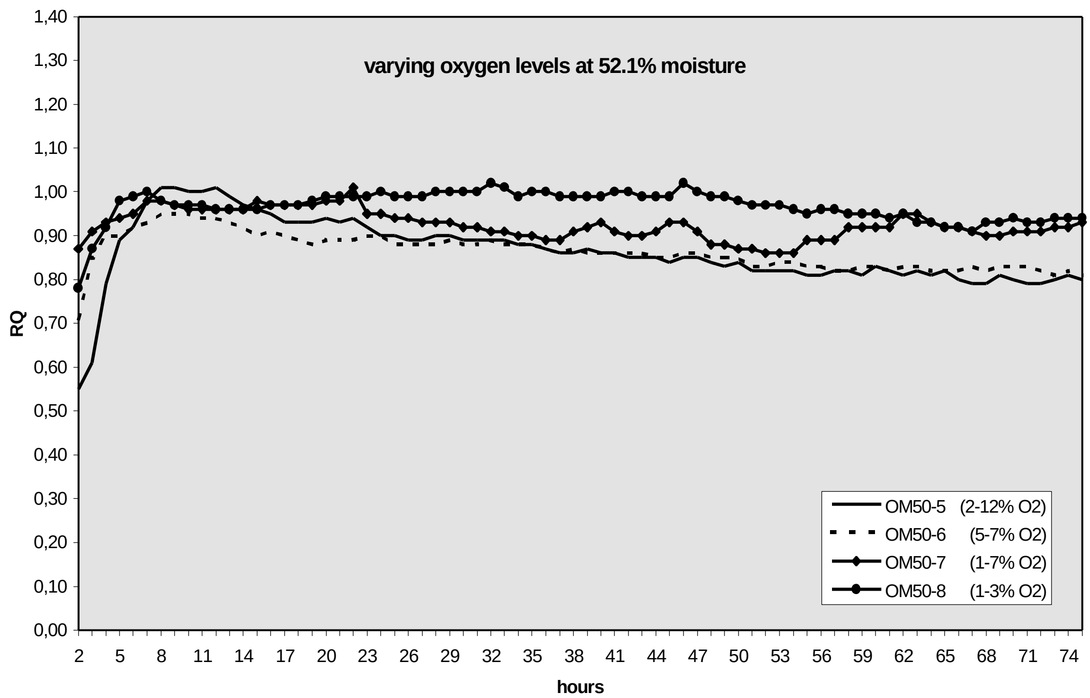

Figure 5.27: Experiments with 52.1% moisture and varying oxygen levels

The OM50-7 test achieved exhaust oxygen levels between 1 and 4% the first day, between 3 and 8% the second day and in the range from 4 to 5% the last 26 hours. An initial RQ of was calculated that increased within a short time to top values from 0.98 to 1.01. After achieving the maximum a slow decrease was noticed. The last day a slight increase to values of around 0.95 was calculated. These high values were maintained up to the end (0.92).

The OM50-8 trial was operated at around 1% oxygen in the exhaust for 24 hours, between 1 and 2% the following day and in the range from 3 to 5% the last day. These conditions produced high RQ values of around one a two day interval that decreased in the last stage of the experiment to values of around 0.94 (Figure 5.27).

Table 5.18: Parameters of run 10

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OM50-1	50.9	9.2	51.3
OM50-2	52.1	8.8	54.6
OM50-3	52.8	9.3	52.4
OM50-4	51.5	9.2	52.7
OM50-5	50.8	9.4	53.2
OM50-6	52.4	9.3	53.0
OM50-7	49.3	9.1	56.6
OM50-8	50.4	9.1	53.4

RUN 11: Varying oxygen levels at 56.4% moisture

The trials were carried out for 74 hours at a temperature of 50ºC. Treated material had moisture contents in the same range in comparison with the initial ones (Table 5.20). Aeration regime was managed according to Table 5.19.

Table 5.19: Aeration rates of run 11 (litres per minute)

time [hours]	OM55-1	OM55-2	OM55-3	OM55-4	OM55-5	OM55-6	OM55-7	OM55-8
0 - 3	4.00	3.08	1.76	1.32	2.20	0.88	0.74	0.54
3 - 6	4.00	3.30	2.20	1.32	1.76	1.10	0.68	0.74
6 - 20	4.00	3.52	2.64	1.76	1.76	1.10	0.68	0.95
20 - 44	4.00	3.52	2.42	1.32	1.76	1.10	0.68	0.95
44 - 68	4.00	3.08	1.76	0.88	0.88	0.88	0.41	0.81
68 - 74	4.00	2.64	1.32	0.88	0.88	0.88	0.41	0.54

The material of the OM55-1 trial was maintained at relatively constant 19 to 20% oxygen in the exhaust gas. The RQ started with around 0.60 and decreased very slowly to values of around 0.45 within the 3-day testing period.

The OM55-2 trial achieved oxygen concentrations between 17 and 18% all the time that produced initial RQ values of around 0.75 that decreased to around 0.60 within a 74 hours interval.

Air flow of the OM55-3 experiment was regulated to around 16% oxygen concentration which gave a relatively similar RQ time course. RQ started with a peak of 0.92, decreased fast to values of around 0.78 and then it fell down slowly to end values of around 0.66.

The OM55-4 experiment achieved oxygen exhaust levels in the range between 11 and 14% that produced slightly higher RQ values than that of the OM55-3 trial. At the beginning RQ readings of 0.84 were obtained then the RQ decreased slowly to final values of around 0.72 (Figure 5.28).

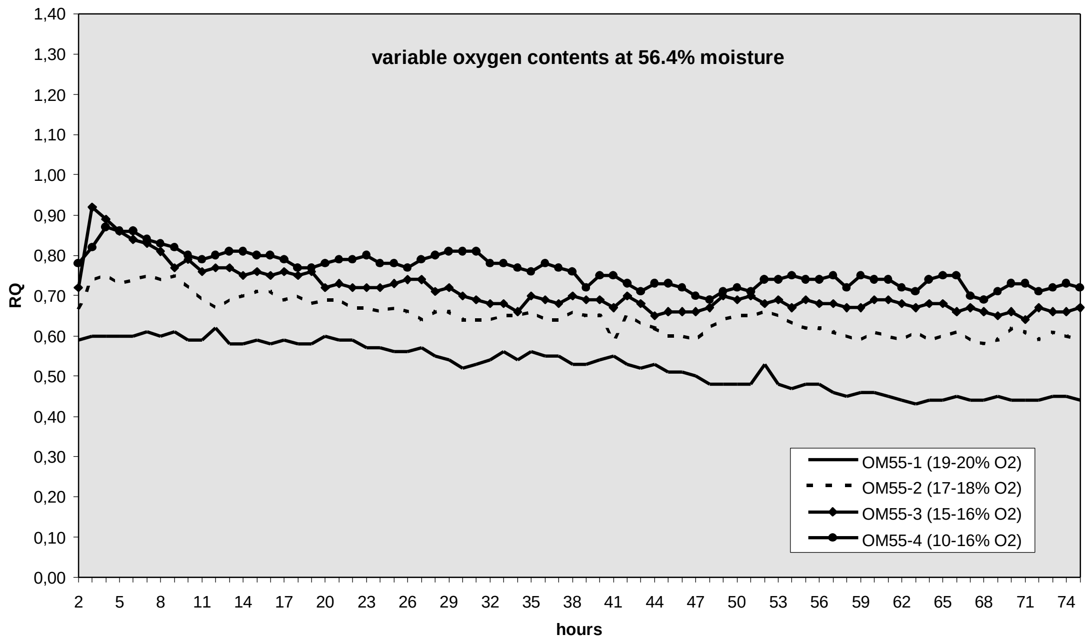

Figure 5.28: **Experiments with 56.4% moisture and varying oxygen levels**

The material of the OM55-5 test was kept at around 12% oxygen the first day, between 12 and 14% the following 24 hours interval and between 10 and 12% the remaining time. Initial RQ values of around 0.85 were obtained that decreased within a 24 hour period to around 0.75 and that recovered at the end to values of around 0.78.

The OM55-6 test was regulated to contain around 7% oxygen the whole testing period. RQ values of 0.95 were calculated for the first hours followed by a very slow decrease to end values of around 0.85.

Exhaust oxygen concentrations of around 2% for reactor containing the material of the OM55-7 experiment and of around 4% for reactor of the OM55-8 test were maintained the complete testing interval. The RQ values of the OM55-7 experiment were constantly higher than that of OM55-8 (Figure 5.29). The RQ started with around 1.00 for both, this level was maintained for a 24 hour interval then the RQ decreased very slowly to final values of around 0.94 (Om55-7) and 0.85 (OM55-8).

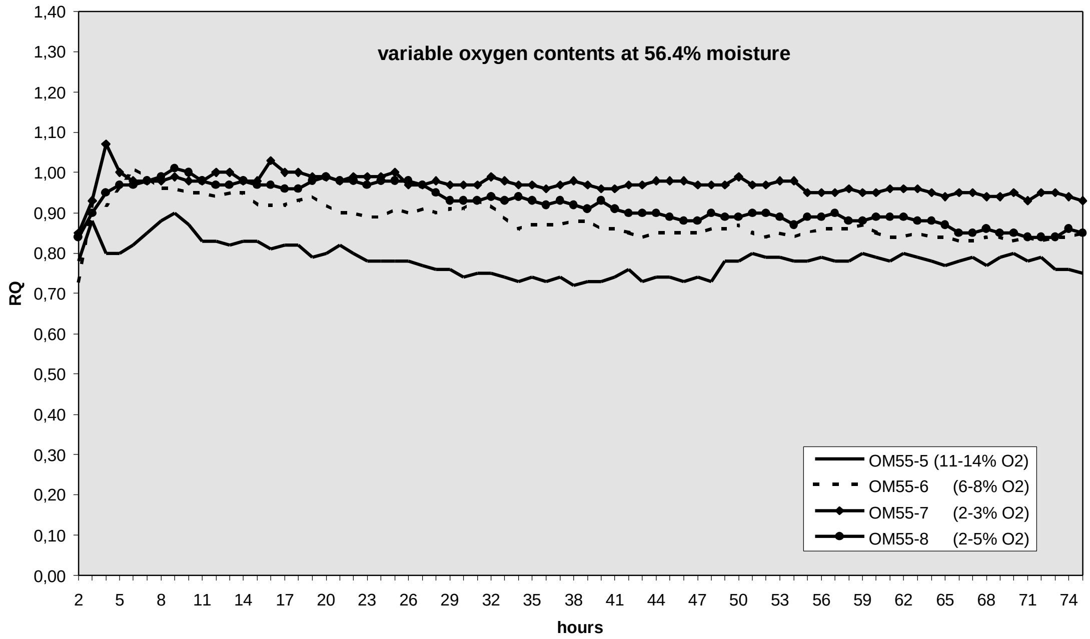

Figure 5.29: Experiments with 56.4% moisture and varying oxygen levels

Table 5.20: Parameters of run 11

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OM55-1	60.0	9.4	53.3
OM55-2	58.2	9.2	52.4
OM55-3	57.4	9.1	52.0
OM55-4	53.9	9.3	50.9
OM55-5	58.9	9.3	52.7
OM55-6	58.5	9.4	50.8
OM55-7	55.2	9.2	52.1
OM55-8	57.9	9.2	53.6

RUN 12: Varying oxygen levels at 60% moisture

The tests were run for 80 hours at 50ºC. Moisture contents did not principally change with processing and final pH values was found on the alkaline side (Table 5.22). Flow rate regulation was done according the following table 5.21.

Table 5.21: Aeration rates of run 12 (litres per minute)

time [hours]	OM60-1	OM60-2	OM60-3	OM60-4	OM60-5	OM60-6	OM60-7	OM60-8
0 - 3	1.90	3.08	1.54	1.32	-	-	0.54	0.34
3 - 7	1.90	3.08	1.54	1.32	-	-	0.54	0.14
7 - 9	1.90	2.20	1.54	1.32	-	-	0.54	0.41
9 - 19	1.90	2.20	2.20	1.10	-	-	0.41	0.34
19 - 28	1.90	2.20	2.20	1.10	-	-	0.41	0.34
28 - 80	1.90	2.20	2.20	1.10	-	-	0.27	0.14

Leaks were detected in the tubing of the reactors of the OM60-5 and 6 tests that falsified measured gas concentration. For that reason the data of these two reactors were not available.

The OM60-1 material had relatively constant exhaust oxygen levels between 16 and 17% all the testing period. RQ started with 0.62, achieved its maximum of 0.70 in the first hours to decrease to end values of 0.30. The OM60-2 experiment had slightly lower oxygen levels of between 15 and 16%, and achieved generally higher RQ values than the material of the OM60-1 test. The RQ graph peaked with 0.80 in a time span of 8 hours after the start. After the maximum the RQ went down to end values of around 0.39.

The OM60-3 and 4 trials had relatively similar oxygen conditions which increased the first day from 4 to 10% and remained there until the test were stopped. This produced maximum values of 1.03 (OM60-3) and 1.00 (OM60-4) in the first hours of processing. After achieving the maximum the RQ graph decreased for a time span of 20 hours followed by a second maximum of 0.92 (OM60-3) and 1.02 (OM60-4). The end values were calculated to around 0.70 (Figure 5.30).

The reactor containing the material of the OM60-7 test achieved oxygen concentrations of 5 to 6% the first day and then remained at 10 to 12% until the experiment was stopped. Maximum RQ values of 1.00 to 1.17 were obtained in a 23 hour interval after starting the trial, followed by a slow decrease to end values of around 0.90.

The OM60-8 trial had relatively constant exhaust oxygen levels of 10 to 11% that produced an RQ maximum of 1.19 in the first 9 hours of processing. After a slow decrease end values of around 0.70 were achieved (Figure 5.31).

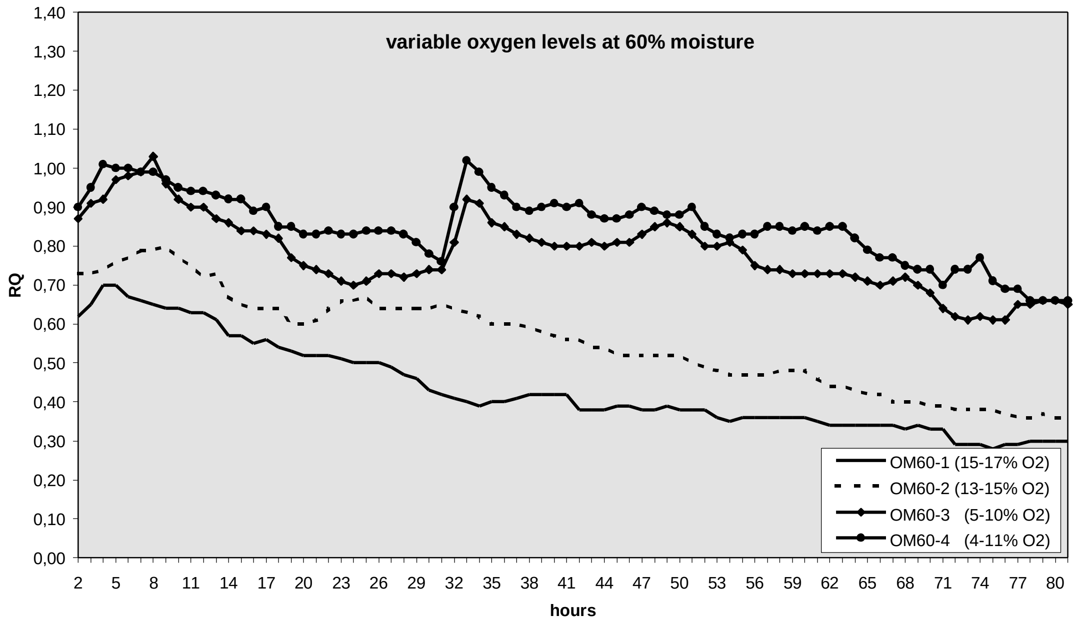

Figure 5.30: Experiments with 60% moisture and varying oxygen levels

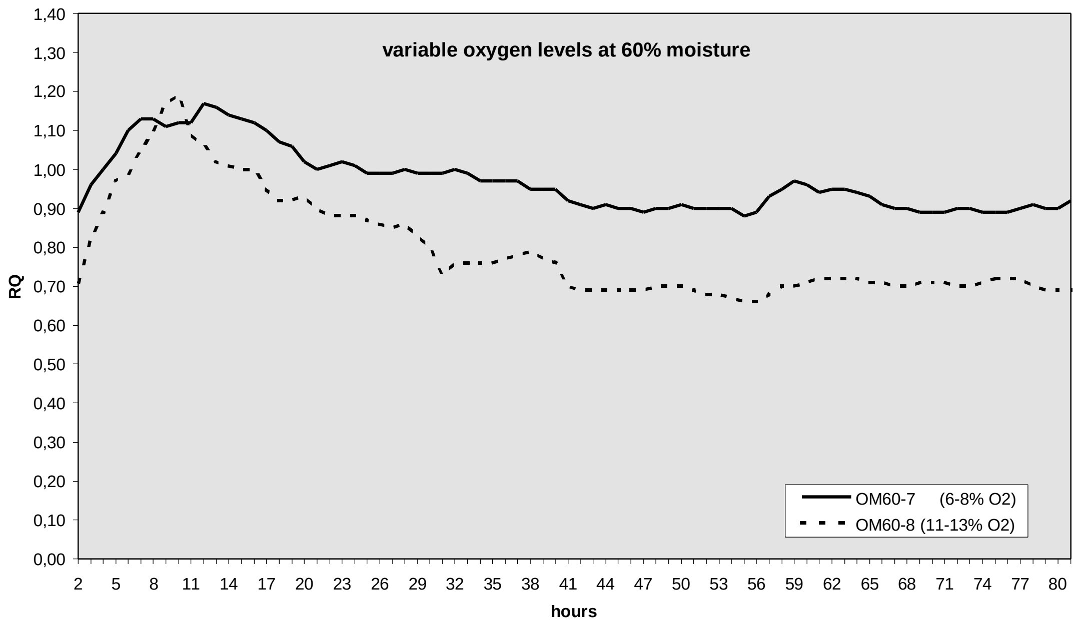

Figure 5.31: Experiments with 60% moisture and varying oxygen levels

Table 5.22: Parameters of run 12

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OM60-1	58.2	8.3	52.4
OM60-2	62.5	8.4	54.0
OM60-3	55.4	8.0	57.1
OM60-4	61.2	8.1	53.0
OM60-5	-	-	-
OM60-6	-	-	-
OM60-7	57.1	9.0	57.1
OM60-8	59.5	8.4	57.3

RUN 13: Varying oxygen levels at 68.6% moisture

Within the processing time of 90 hours the moisture content did not change significantly and final pH was measured in the alkaline range (Table 5.24). Aeration regime was carried out as shown in Table 5.23.

Table 5.23: Aeration rates of run 13 (litres per minute)

time [hours]	OM70-1	OM70-2	OM70-3	OM70-4	OM70-5	OM70-6	OM70-7	OM70-8
0 - 15	2.75	3.08	1.98	0.88	0.88	1.32	0.61	0.41
15 - 25	2.75	3.08	1.98	0.88	0.66	1.10	0.54	0.34
25 - 41	3.80	2.86	1.98	0.88	0.66	1.10	0.54	0.47
41 - 63	3.80	2.42	1.76	0.88	0.66	1.10	0.54	0.54
63 - 90	2.75	2.20	1.32	0.66	0.44	0.66	0.54	0.61

The OM70-1 experiment was maintained at relative constant exhaust oxygen levels between 16 and 18% the whole testing period. RQ started with values around 0.60 decreased slowly to around 0.40 and recovered at the end to values in the range of 0.40 to 0.50.

The reactors containing the material of the OM70-2 and 3 tests had relatively similar exhaust oxygen levels of around 16% the whole run with the exception of the first 31 hours. In that interval OM70-2 achieved oxygen concentrations of 15% and the oxygen content of the OM70-3 trial was measured between 13 and 14%. RQ values of experiment OM70-2 were lower in the starting phase than that of the OM70-3 test but converged after the first half of processing time and at the end RQ values of the same range were obtained.

The OM70-4 trial achieved an exhaust oxygen concentration from 4 to 7% the first 24 hours, between 8 and 9% the following 24 hours and around 11% the remaining time. The RQ started with values greater than one, decreased for 15 hours and achieved after that a maximum value of 1.27 followed by a slow decrease to end values of around 0.77 (Figure 5.32).

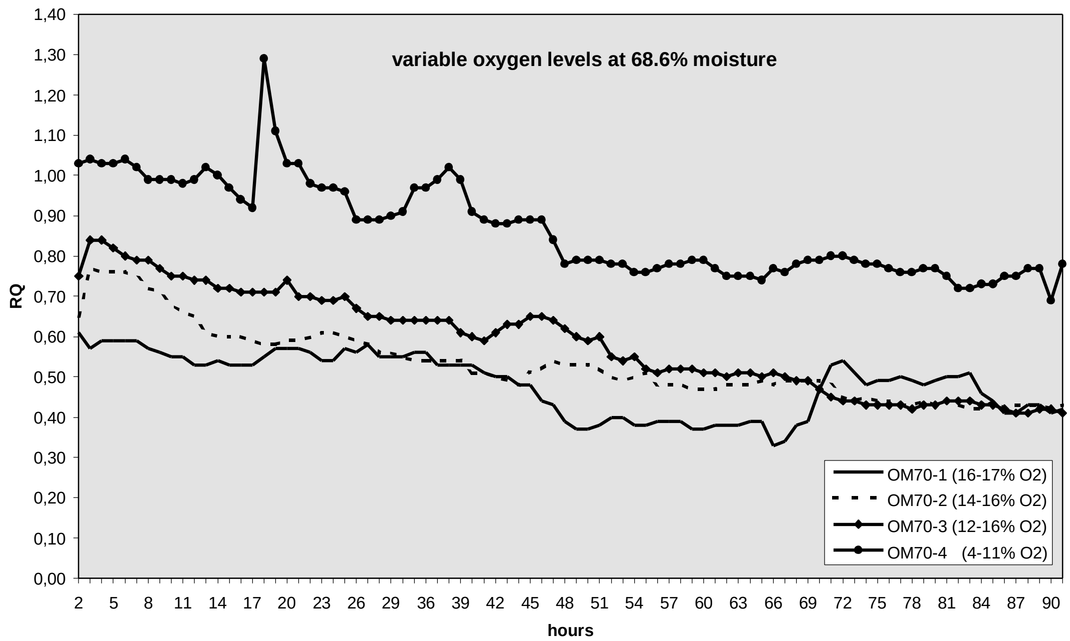

Figure 5.32: Experiments with 68.6% moisture and varying oxygen levels

Oxygen concentration of reactor containing the material of the OM70-5 test was maintained between 5 and 7% within the whole 90 hour testing period. The RQ achieved its maximum of 1.05 to 1.06 in an 8 hour interval after initialising the process, followed by a slight decrease to 0.98 and another, higher peak of 1.09, then the RQ values fell down to around 0.82 and remained there up to the end.

The OM70-6 experiment was regulated to oxygen concentration from 4 to 7% the first day, the rest of processing time concentrations between 7 and 10% were measured. Time course of the RQ graph was similar to that achieved by OM70-5 but the RQ values of this run were constantly lower.

The OM70-7 trial achieved the lowest exhaust oxygen concentration of this run. It was maintained at around 1% for 58 hours then it decreased to around 2%. These condition resulted in relatively constant RQ values of around one with no distinct maximum.

The reactor of experiment OM70-8 was operated at 4 to 5% oxygen the first day then at concentration between 1 and 4%. The highest values of RQ were obtained with this test. RQ started with 1.19 and remained in this range for 9 hours followed by a decrease to 1.13. After that it rose again to the next peak with a maximum value of 1.22 and the it moved to end values of around 0.90 (Figure 5.33).

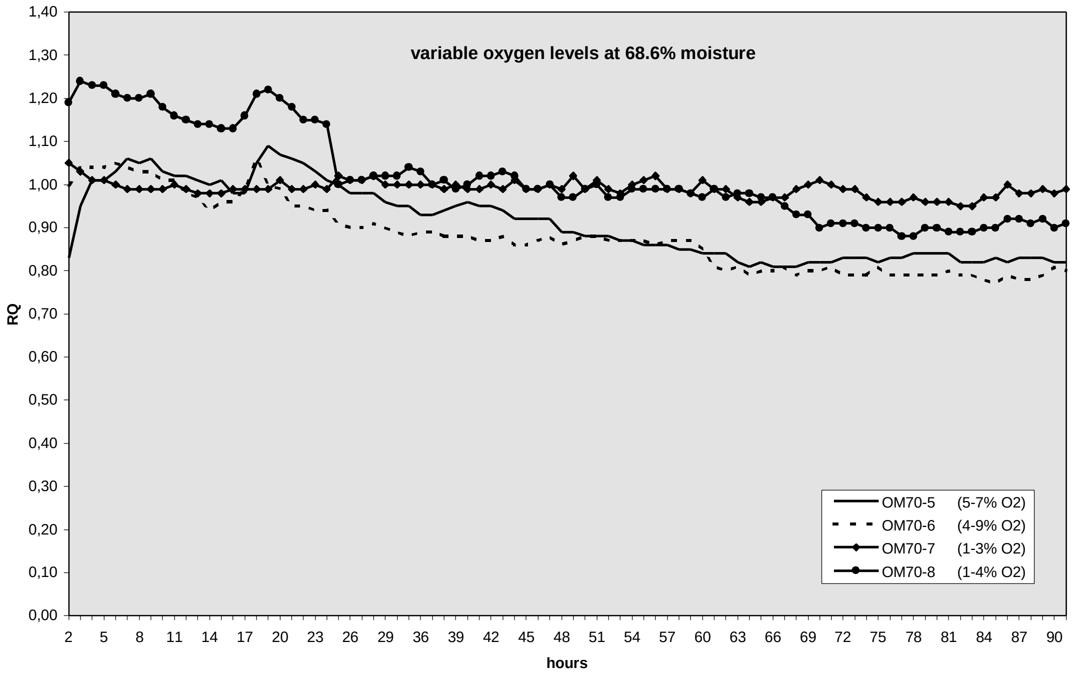

Figure 5.33: Experiments with 68.6% moisture and varying oxygen levels

Table 5.24: Parameters of run 13

Code	final moisture content [% w.b.]	final pH	VM [% d.m]
OM70-1	62.5	8.8	54.9
OM70-2	66.3	9.3	53.4
OM70-3	62.3	9.3	55.7
OM70-4	66.8	9.4	54.5
OM70-5	66.1	9.3	53.9
OM70-6	67.3	9.2	54.2
OM70-7	65.0	9.3	49.7
OM60-8	65.3	9.2	52.7

DISCUSSION

The time course of the RQ development was relatively similar; top values were achieved in the first hours of processing followed by a slow decrease up to the end of the testing period. Desired oxygen levels were sometimes not achieved due to the variable reactivity of the treated material. The pH development was equal to that mentioned before. Generally, the RQ levels were higher at lower oxygen concentrations because the lack of oxygen caused partially anoxic conditions thus increasing the RQ value. RQ values greater than one, even with very low exhaust oxygen concentrations, were seldom achieved and only shortly after initialising the process by material with high moisture contents.

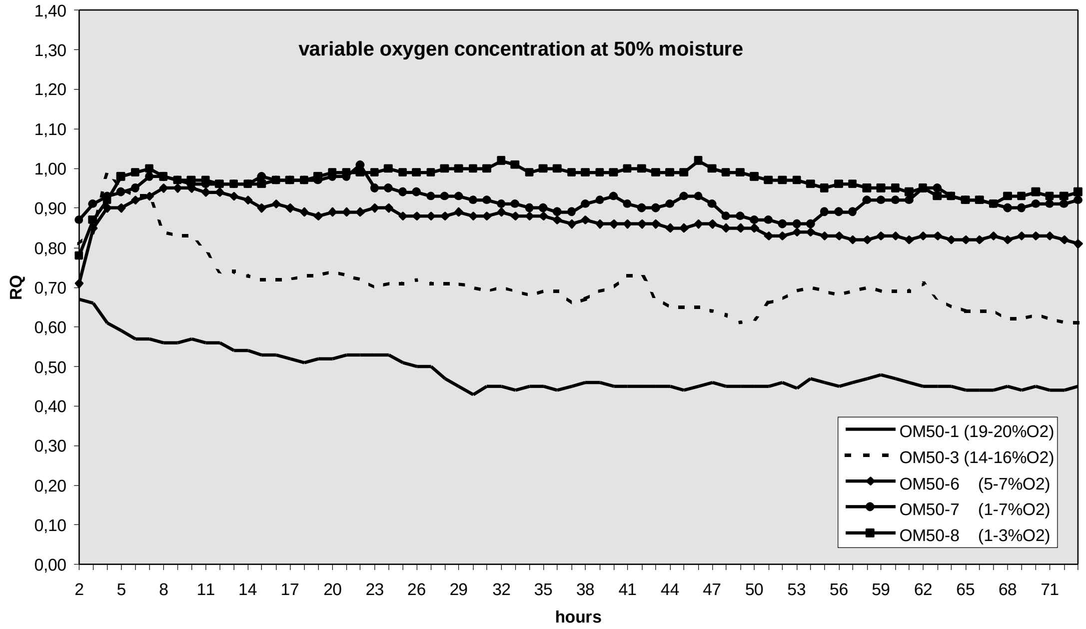

Figure 5.34: Experiments with 50% moisture contents at varying oxygen levels

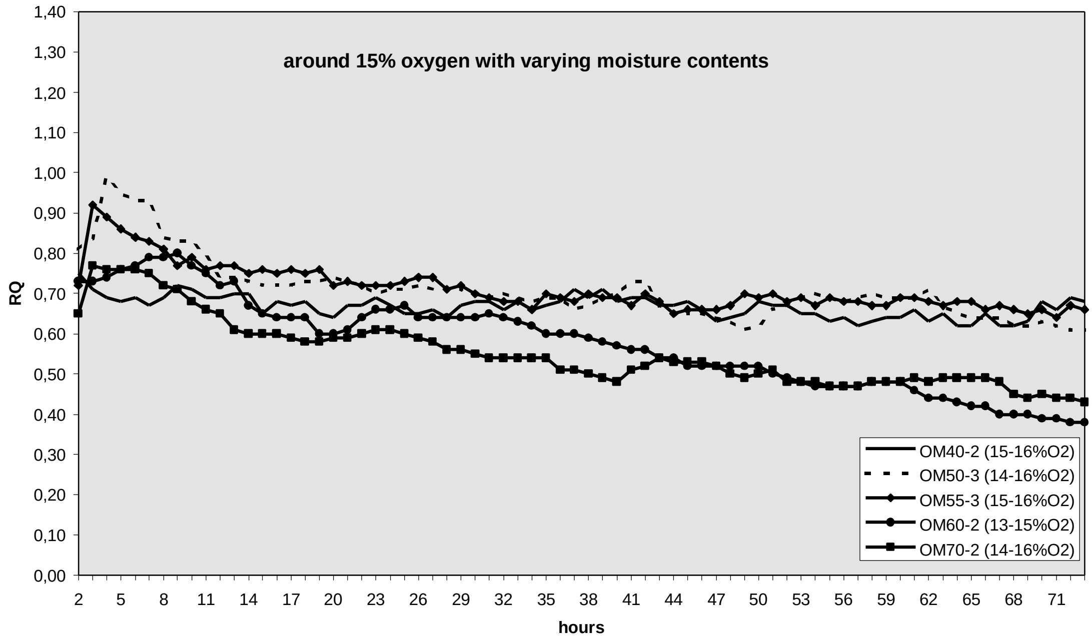

Figure 5.35: Experiments with different moisture contents at around 15% oxygen content

RQ levels at around 17% and different moisture levels were found relatively close together in the first 24 hour interval and then the graphs diverged, materials with less moisture (40, 50 and 55%) achieved slightly higher final RQ levels.
Material maintained at around 15% oxygen showed the same effect but the material with lower moisture contents (40, 50 and 55%) achieved constantly higher RQ levels. At 10% oxygen concentration the RQ levels were found close together from the second day of processing, the first 24 hours RQ values greater than one were achieved by material with 60% moisture. RQ levels of material treated with an oxygen concentration of around 7% converged from the second day on and differed only in the first 24 hours remarkably. In this time span the material with high moisture contents produced the highest RQ with values greater than one. The same effect was noticed at oxygen levels of 4 and 2%. The material with moisture contents of 60 and 70% achieved RQ values considerably greater than one in the first 20 hours, after that interval the RQ levels converged and finished close together. Similar results obtained MOORE (1958) with experiments in a rotating drum with exhaust oxygen concentrations from 2 - 5%.

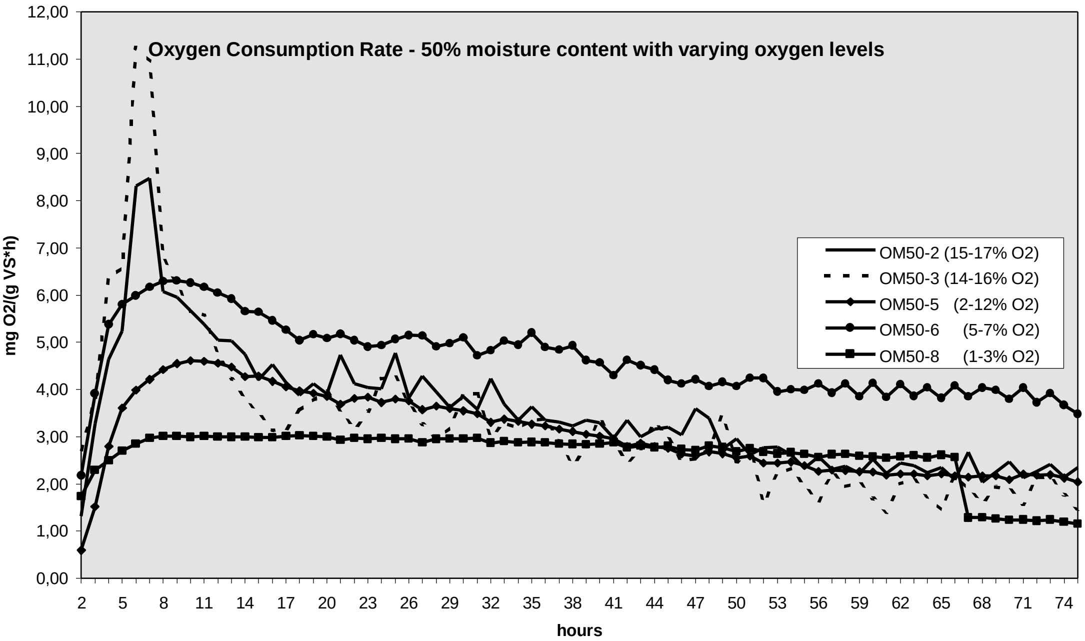

Figure 5.36: Oxygen consumption rates of tests with variable oxygen concentrations and 50% moisture content

Oxygen consumption and carbon dioxide evolution rates fluctuated considerably, each change of aeration intensity caused a leap in the time course of the graphs.
Highest oxygen consumption rates from 5 - 11 mg O_2/(g VS·h)were achieved with oxygen concentrations in the range from around 7 to around 17% and with moisture

contents from 50 to 60%. This moisture condition are known to be ideal for composting processes making these results suitable.

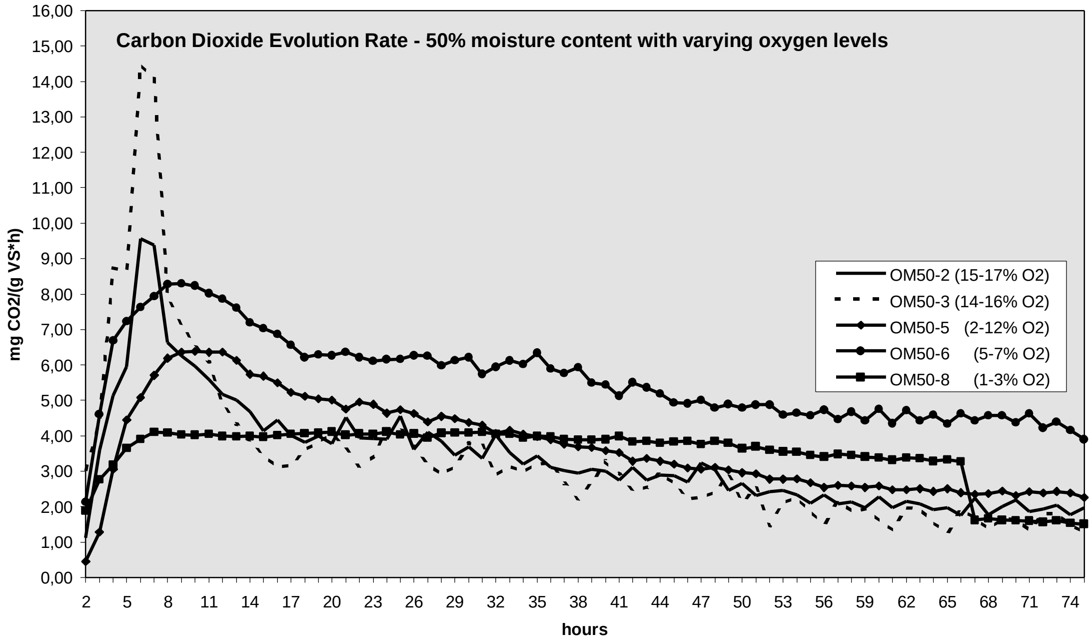

Figure 5.37: Carbon dioxide evolution rates of tests with variable oxygen concentrations and 50% moisture

6 Summary

Aim of the submitted work was to investigate the influence of the environmental parameters of temperature, oxygen and moisture levels on the respiratory quotient that may be a lumped parameter to monitor the matrix aerobiosis of a composting process. Based on a literature research a computer-controlled experimental system consisting of eight reactors with preliminary air conditioning vessels was developed and constructed.

Preliminary investigations were carried out obtain general information about system performance and needed equipment. Used material originated from a composting plant and was adjusted to desired levels manually. Three series of tests were realised, one for each of the environmental parameters mentioned above.

First the influence of temperature levels and moisture contents was investigated by varying both conditions. This resulted in relatively similar time course of the respiratory quotient for all of these experiments; high RQ values at the beginning of the process followed by a decrease to a minimum values and recovering at the end. Calculated RQ values were in the same range as reported by preliminary investigations with the exception of the minima. Temperature conditions were not found to have great impact on the time course of the respiratory quotient; obtained RQ graphs of trials with similar moisture contents showed only little differences. Moisture levels had a certain influence on the time needed to achieve the RQ minimum values. The respiratory quotient is generally higher with higher moisture contents. RQ values greater than one were achieved in the first hours of processing which forms a contrast to results reported by former investigations.

To examine the impact of oxygen and temperature levels on the RQ time course several runs with varying conditions were carried out. The time courses of the RQ showed similar development, peak values were achieved in the first hours of processing flowed by a slow decrease. At high oxygen exhaust concentrations the RQ levels were higher at lower temperatures. The respiratory quotients achieved higher values at lower exhaust oxygen concentrations. The calculated RQ values showed a good similarity with values obtained by comparable experiments mentioned in the literature. Oxygen consumption and carbon dioxide evolution rates fluctuated considerably depending on the air supply. Highest rates were achieved during the first day of processing followed by a decrease.

The last series of tests were designated to investigate the influence of oxygen level and moisture content on the RQ time course. The time course of these experiments was always relatively similar to that mentioned above, generally the RQ levels were also higher at lower oxygen concentrations. RQ values greater than one were sel-

dom achieved and only in the first hours of processing. The highest oxygen consumption rates were obtained at high aeration intensity.
Sometimes it was not possible to achieve desired oxygen exhaust concentrations partially due to the variable reactivity of the material and the construction of the gas sampling system, that allowed to check the gas concentration of a single reactor only during the sampling time of the very same one and not a permanent monitoring of gas concentrations. This fact led to difficulties in adjusting the adequate airflow for desired oxygen exhaust levels. This could be avoided by using a computer-operated automatic air flow control system (computerised flowmeter like a BROOKS flowmeter 5860S).
Additional work could be to investigate the long term development of the respiratory time course with similar type of material.

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SELBSTSTÄNDIGKEITSERKLÄRUNG

Hiermit erkläre ich, Matthias Klauß, daß ich die vorliegende Arbeit selbstständig und nur unter Zuhilfenahme der im Literaturverzeichnis aufgeführten Werke geschrieben habe.

Weimar, den 17.12 1999 Matthias Klauß

Appendix A

Table A1: Preliminary run - OTM1-8

time	temperatures of the reactor [°C]								oxygen content [%]							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
2	50,2	49,2	49,1	49,6	50,0	50,1	50,4	49,2	5,58	4,98	7,62	3,82	2,69	2,05	1,89	1,76
4	50,3	49,4	49,6	49,6	50,9	50,1	50,0	49,5	3,96	3,60	6,68	3,30	2,83	2,11	1,80	1,65
6	49,7	49,1	49,1	49,6	49,9	50,4	49,2	49,3	4,75	3,50	2,96	1,78	2,31	7,93	8,79	5,73
8	50,3	49,3	49,1	49,5	50,0	50,1	50,0	49,6	6,93	7,19	7,46	4,02	3,95	9,39	9,52	6,17
10	49,8	49,3	49,1	49,5	50,5	49,4	50,2	49,6	6,95	7,53	7,68	4,31	4,05	4,57	3,56	2,71
12	50,3	49,1	49,3	49,3	50,7	49,4	49,0	49,2	5,80	4,86	4,16	2,74	3,54	3,40	3,03	2,40
14	49,5	49,2	49,1	49,2	50,9	49,2	49,7	49,5	5,71	5,07	4,64	3,22	4,00	3,78	3,53	2,65
16	49,7	49,2	49,3	49,2	50,8	49,7	50,0	49,3	6,19	5,62	4,95	3,74	4,55	4,24	3,76	2,76
18	49,3	49,4	49,2	49,8	50,3	49,4	49,0	49,2	7,37	6,08	5,22	4,09	4,97	4,40	3,80	2,85
20	49,1	49,0	49,2	49,3	49,6	49,8	49,7	49,5	7,55	6,29	5,42	4,35	5,66	4,87	4,16	3,11
22	49,4	49,5	49,5	49,0	50,3	49,5	49,6	49,3	6,90	6,37	5,60	4,84	6,06	5,11	4,44	3,31
24	49,7	49,9	49,8	49,3	49,4	49,4	48,9	49,4	7,84	6,57	5,84	4,89	6,00	5,06	4,29	3,16
26	49,9	49,0	49,0	9,4	49,8	49,5	49,3	49,6	6,82	6,23	5,62	5,11	6,51	6,50	5,55	3,95
28	49,5	49,6	49,5	49,2	50,6	49,7	50,0	49,6	6,95	6,77	6,17	5,28	6,68	6,60	5,86	4,00
30	50,3	49,3	49,2	49,1	49,5	49,9	49,8	49,1	7,08	6,86	6,19	5,55	6,90	6,90	6,02	4,24
32	49,8	49,4	49,3	49,1	49,6	49,2	49,7	49,2	7,04	6,93	6,39	6,02	7,41	7,13	6,33	4,35
34	49,3	49,4	49,3	49,3	49,6	49,1	49,9	49,4	7,46	7,26	6,84	6,40	7,77	7,62	6,37	4,46
36	49,2	48,9	49,0	49,1	49,6	49,3	49,2	49,5	7,81	7,66	7,17	6,88	8,12	7,72	6,59	4,58
38	49,7	49,2	49,4	49,4	49,3	49,0	49,9	49,7	8,79	8,28	7,41	7,21	8,43	8,06	7,01	4,76
40	50,6	49,4	49,2	49,1	50,2	49,9	49,1	49,3	8,81	8,48	7,62	7,53	8,85	8,06	6,86	4,80
42	50,3	49,4	49,0	49,1	49,6	49,2	49,4	49,5	8,34	8,24	7,59	7,62	8,86	8,32	7,22	4,89
44	50,7	49,2	48,9	49,3	49,2	49,0	49,8	49,2	8,66	8,50	7,95	8,06	9,26	8,50	7,53	5,09
46	50,4	49,3	49,4	49,5	50,0	49,0	49,0	49,0	8,35	8,54	7,95	8,32	9,57	8,79	7,46	5,17
48	49,2	49,7	48,9	49,1	49,2	49,5	49,7	49,0	8,54	8,75	8,17	8,33	9,54	8,66	7,31	4,93
50	49,9	48,9	49,1	49,4	49,8	49,0	49,9	49,5	8,03	8,17	7,64	8,03	9,23	8,50	7,35	4,89
52	49,1	49,5	49,2	49,5	49,5	50,1	49,0	49,5	8,46	8,70	8,15	8,54	9,66	8,95	7,97	5,18
54	49,9	49,4	49,3	49,5	49,2	49,7	49,8	49,0	9,12	9,14	8,39	8,86	10,07	9,19	8,10	5,48
56	50,0	49,2	49,5	49,2	49,6	49,7	49,8	49,4	9,10	9,35	8,91	9,41	10,50	9,46	8,41	5,60
58	49,3	49,3	49,2	49,5	49,0	49,7	49,9	49,4	8,94	9,34	8,92	9,61	10,68	9,65	8,68	5,73
60	49,6	49,6	49,4	49,8	49,5	49,0	49,7	49,0	9,36	9,68	9,34	10,07	11,05	10,01	8,81	6,02
62	50,6	49,5	49,3	49,4	49,1	49,9	49,8	48,9	10,19	10,19	9,72	10,38	11,40	10,25	9,39	6,35
64	50,0	49,3	49,4	49,2	50,2	49,6	49,0	49,0	9,79	10,25	9,92	10,72	11,74	10,43	9,25	6,26
66	49,6	49,5	49,5	49,5	49,0	49,4	49,8	49,3	9,85	10,47	10,21	11,09	12,01	10,72	9,74	6,53
68	48,9	49,6	49,4	49,2	49,1	49,8	49,0	49,4	10,05	10,58	10,21	11,30	12,38	11,12	9,74	6,51
70	49,0	49,2	49,1	49,5	49,0	49,4	49,7	48,9	10,54	10,92	10,50	11,63	12,60	11,32	10,18	6,97
72	49,8	49,2	49,1	49,1	50,3	49,7	49,9	49,8	11,00	11,27	10,79	11,76	12,83	11,51	10,19	6,99
74	50,7	49,2	49,5	49,3	49,3	49,3	49,7	49,2	10,78	11,29	10,90	11,80	12,62	11,09	10,17	6,86
76	49,5	49,2	49,1	49,1	49,5	50,0	49,9	49,2	10,08	10,76	10,61	11,74	12,74	11,52	10,19	6,97
78	49,4	49,0	49,5	49,2	49,7	49,0	49,9	49,2	10,65	11,16	10,86	11,91	12,93	11,27	10,28	7,01
80	49,5	49,2	49,4	49,3	49,6	49,1	48,9	49,3	10,74	11,23	10,87	12,03	13,03	11,76	10,34	6,88
82	50,7	49,4	49,5	49,6	50,0	49,1	49,8	49,3	11,34	11,74	11,43	12,42	13,34	11,63	10,70	7,24
84	50,4	49,5	49,3	49,1	49,1	49,8	49,6	49,5	11,16	11,67	11,25	12,53	13,51	11,98	10,89	7,28
86	50,0	49,2	49,2	49,5	49,0	49,9	49,8	49,7	11,21	11,56	11,41	12,76	13,85	12,18	11,16	7,50
88	49,4	49,3	49,3	49,5	49,9	49,6	49,5	49,2	11,14	11,77	11,45	12,85	13,93	12,29	11,21	7,63
90	49,1	49,1	49,2	49,1	50,4	49,6	49,6	49,4	11,41	11,80	11,92	13,16	14,20	12,69	11,25	7,77
92	50,5	49,3	49,6	49,5	49,0	49,6	49,5	49,6	11,98	12,49	12,25	13,49	14,37	12,85	11,01	7,63
94	50,1	49,2	49,2	49,6	49,9	49,4	50,0	49,5	11,80	12,43	12,03	13,45	14,53	12,94	11,67	8,04
96	49,0	49,5	49,1	49,3	49,7	49,0	49,0	49,7	11,76	12,51	12,29	13,64	14,69	13,00	11,60	7,75
98	51,0	49,4	49,0	49,5	49,9	49,0	49,6	49,8	12,07	12,74	12,36	13,67	14,69	13,04	12,11	8,04
100	50,7	49,8	49,3	49,1	49,2	49,8	49,2	50,1	11,92	12,40	12,29	13,56	14,57	12,80	11,78	7,93
102	50,3	49,3	49,6	49,4	49,8	49,6	50,1	49,0	11,89	12,31	12,43	13,71	14,66	13,09	11,65	7,97
104	50,5	49,4	49,2	49,6	49,6	49,2	49,0	49,0	11,85	12,60	12,38	13,76	14,80	12,91	11,60	7,93
106	49,7	49,1	49,0	49,3	50,3	49,2	49,9	49,5	11,74	12,63	12,65	13,98	14,97	13,02	11,92	8,19
108	50,1	49,1	49,1	49,2	49,7	49,8	49,1	49,9	12,05	12,91	12,73	14,15	14,95	13,45	11,96	7,95
110	50,4	49,6	49,1	49,2	49,1	49,7	49,4	49,6	12,38	12,96	12,67	14,13	15,02	13,27	12,20	8,24
112	50,3	49,1	49,1	49,0	49,7	49,3	49,2	49,7	12,14	12,89	12,60	14,22	15,18	13,41	12,02	8,23
114	49,1	49,3	49,6	49,1	49,6	49,2	49,0	49,7	12,20	13,11	13,27	14,53	15,35	13,40	12,47	8,39
116	50,2	49,3	49,3	49,4	50,0	49,3	49,8	49,7	12,34	13,29	13,11	14,55	15,48	13,51	12,58	8,65
118	50,1	49,1	49,1	49,4	49,4	49,0	49,8	49,2	12,80	13,55	13,35	14,75	15,57	13,80	12,42	8,43
120	49,0	49,1	49,2	49,0	49,1	49,1	49,7	49,5	12,60	13,44	13,51	14,82	15,73	13,91	12,43	8,63
122	49,8	49,4	49,7	49,5	49,9	49,2	49,4	49,5	12,91	13,69	13,42	14,80	15,64	13,62	12,62	8,72
124	49,5	49,1	49,0	49,2	49,7	49,3	49,4	49,5	12,78	12,98	13,00	14,47	15,37	12,87	11,56	7,79
126	49,6	49,1	49,4	49,3	49,9	49,8	50,0	49,7	12,36	12,91	12,74	14,46	15,39	13,13	11,58	7,81
128	49,5	49,1	49,2	49,4	49,5	49,2	49,0	49,7	12,47	13,18	12,71	14,44	15,35	13,04	11,27	7,55
130	49,7	49,0	49,5	49,4	49,6	49,6	49,9	49,2	12,47	13,04	12,93	14,47	15,44	13,18	11,85	8,01
132	49,5	49,3	49,4	49,4	49,8	49,0	49,3	49,7	12,33	13,04	12,91	14,77	15,71	13,13	11,58	7,81
134	49,7	49,0	49,3	49,7	50,5	49,8	49,7	49,1	12,73	13,29	13,13	14,67	15,64	13,31	11,89	8,10
136	49,5	49,3	49,2	49,3	49,7	49,1	49,9	49,7	12,42	13,09	13,14	14,89	15,66	13,60	12,22	7,90
138	49,8	49,1	49,4	49,5	49,5	49,0	49,5	49,5	12,38	13,56	13,40	14,97	15,86	13,69	11,67	7,72
140	49,0	49,0	49,2	49,4	50,2	49,3	49,9	49,7	12,62	13,29	13,51	15,09	15,91	13,80	12,14	7,99
142	48,9	49,4	49,3	49,4	49,4	49,4	49,5	49,9	12,69	13,75	13,40	15,11	15,91	13,31	11,94	8,17
144	49,6	49,0	49,0	49,5	49,7	49,1	48,9	49,8	12,74	13,57	13,49	15,13	16,04	13,62	12,22	8,19
146	49,9	49,4	49,1	49,0	49,6	49,8	49,7	50,3	12,51	13,27	13,13	14,80	15,77	13,25	12,20	8,12
148	49,4	49,2	49,0	49,5	49,6	49,8	48,9	49,6	12,62	13,42	13,42	15,04	15,84	13,62	11,63	7,92
150	50,1	49,4	49,2	49,4	49,4	49,5	49,8	49,8	12,51	13,51	13,45	14,91	15,77	13,65	12,25	8,17
152	49,5	49,1	49,1	49,1	49,9	49,4	49,3	49,5	12,73	13,67	13,55	15,04	15,80	13,45	11,96	7,95
154	49,7	49,5	49,4	49,0	50,0	48,9	49,8	49,0	12,80	13,66	13,60	15,20	16,01	13,58	12,29	8,37
156	49,9	49,2	49,2	49,5	49,6	49,7	49,8	49,1	12,73	13,76	13,91	15,39	16,08	13,76	12,03	8,28
158	49,1	49,3	49,1	49,1	49,5	49,3	49,7	49,0	13,00	13,75	13,69	15,28	16,06	13,55	12,07	8,39
160	50,0	49,4	49,4	49,2	49,7	49,1	49,9	49,6	13,02	14,02	13,86	15,40	16,17	13,78	12,60	8,63
162	49,5	49,0	48,9	49,6	49,9	49,3	49,8	49,1	12,84	13,76	13,71	15,31	16,19	14,17	12,54	8,64
164	50,0	49,3	49,2	49,4	49,0	49,6	49,7	49,0	12,98	13,91	13,93	15,55	16,35	13,73	12,67	8,77
166	49,4	49,4	49,3	49,0	49,5	49,1	49,8	49,4	13,31	14,04	14,09	15,53	16,28	14,20	12,96	8,74

time	carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
2																
4																
6																
8																
10																
12																
14																
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44																
46																
48																
50																
52																
54																
56																
58																
60	10,60	10,21	10,52	9,73	8,80	9,90			0,91	0,91	0,90	0,90	0,89	0,90		
62	9,78	9,72	10,13	9,50	8,51	9,62			0,91	0,90	0,90	0,90	0,89	0,90		
64	10,05	9,61	9,96	9,21	8,23	9,48			0,90	0,90	0,90	0,90	0,89	0,90		
66	10,04	9,42	9,69	8,81	7,93	9,19			0,90	0,90	0,90	0,90	0,89	0,90		
68	9,89	9,34	9,70	8,66	7,63	8,85			0,91	0,90	0,90	0,90	0,89	0,90		
70	9,48	9,07	9,43	8,31	7,43	8,65	9,83		0,91	0,90	0,90	0,89	0,89	0,90	0,92	
72	9,08	8,78	9,18	8,31	7,28	8,50	9,93		0,91	0,91	0,90	0,90	0,89	0,90	0,91	
74	9,22	8,74	9,10	8,23	7,47	8,95	9,93		0,91	0,90	0,90	0,90	0,90	0,90	0,92	
76	9,94	9,30	9,39	8,26	7,35	8,54	9,95		0,91	0,91	0,91	0,90	0,90	0,91	0,92	
78	9,41	8,91	9,17	8,11	7,18	8,75	9,85		0,91	0,91	0,91	0,90	0,90	0,91	0,92	
80	9,41	8,85	9,19	7,98	7,09	8,30	9,82		0,92	0,91	0,91	0,90	0,89	0,90	0,92	
82	8,84	8,39	8,65	7,66	6,84	8,45	9,45		0,92	0,91	0,91	0,90	0,90	0,90	0,93	
84	8,92	8,39	8,81	7,63	6,69	8,13	9,22		0,91	0,91	0,91	0,90	0,90	0,91	0,92	
86	8,81	8,51	8,64	7,37	6,38	7,93	8,95		0,90	0,91	0,91	0,90	0,90	0,91	0,92	
88	8,91	8,31	8,62	7,27	6,32	7,82	8,92		0,91	0,91	0,91	0,90	0,90	0,90	0,91	
90	8,70	8,31	8,17	7,03	6,07	7,48	8,89		0,91	0,91	0,91	0,90	0,90	0,90	0,92	
92	8,21	7,68	7,90	6,68	5,92	7,29	9,10		0,91	0,91	0,91	0,90	0,90	0,90	0,92	
94	8,25	7,68	8,06	6,72	5,77	7,21	8,43		0,90	0,90	0,91	0,90	0,90	0,90	0,91	
96	8,24	7,60	7,83	6,57	5,64	7,20	8,59		0,90	0,90	0,90	0,90	0,90	0,90	0,91	
98	8,10	7,49	7,83	6,59	5,69	7,23	8,13		0,91	0,91	0,91	0,90	0,91	0,91	0,92	
100	8,23	7,82	7,90	6,70	5,79	7,45	8,46		0,91	0,91	0,91	0,91	0,91	0,91	0,92	
102	8,28	7,92	7,79	6,60	5,75	7,22	8,66		0,91	0,92	0,91	0,91	0,91	0,91	0,92	
104	8,34	7,64	7,87	6,54	5,59	7,37	8,72		0,92	0,91	0,92	0,91	0,91	0,92	0,93	
106	8,47	7,63	7,60	6,37	5,46	7,26	8,34		0,92	0,92	0,92	0,91	0,91	0,92	0,93	
108	8,18	7,36	7,53	6,21	5,47	6,83	8,35		0,92	0,92	0,92	0,91	0,91	0,91	0,92	
110	7,89	7,33	7,59	6,23	5,42	7,03	8,09		0,92	0,92	0,92	0,91	0,91	0,91	0,93	
112	8,03	7,34	7,65	6,14	5,27	6,89	8,30		0,91	0,91	0,92	0,91	0,91	0,92	0,93	
114	7,99	7,16	7,01	5,82	5,10	6,88	7,79		0,91	0,91	0,91	0,91	0,91	0,91	0,93	
116	7,86	6,97	7,13	5,79	4,95	6,75	7,66		0,91	0,91	0,91	0,91	0,91	0,91	0,92	
118	7,44	6,71	6,90	5,62	4,88	6,50	7,82		0,91	0,91	0,91	0,91	0,91	0,91	0,92	
120	7,56	6,78	6,75	5,53	4,71	6,40	7,80		0,91	0,90	0,91	0,90	0,90	0,91	0,92	
122	7,35	6,62	6,86	5,56	4,82	6,66	7,65		0,91	0,91	0,91	0,90	0,91	0,91	0,92	
124	7,42	7,25	7,22	5,84	5,04	7,36	8,60		0,91	0,91	0,91	0,90	0,91	0,91	0,92	
126	7,73	7,26	7,42	5,85	5,01	7,06	8,51		0,90	0,90	0,90	0,90	0,90	0,91	0,91	
128	7,63	6,98	7,42	5,86	5,04	7,09	8,74		0,90	0,90	0,90	0,90	0,90	0,90	0,91	
130	7,59	7,09	7,18	5,74	4,93	6,92	8,14		0,90	0,90	0,90	0,89	0,90	0,89	0,90	
132	7,62	7,01	7,15	5,52	4,69	6,92	8,33		0,88	0,89	0,89	0,89	0,90	0,89	0,89	
134	7,29	6,81	6,95	5,50	4,71	6,77	8,05		0,89	0,89	0,89	0,88	0,89	0,88	0,89	
136	7,49	6,92	6,92	5,40	4,71	6,52	7,77		0,88	0,88	0,89	0,89	0,89	0,89	0,89	
138	7,51	6,51	6,68	5,28	4,51	6,39	8,18		0,88	0,88	0,89	0,89	0,89	0,89	0,89	
140	7,29	6,74	6,55	5,13	4,43	6,27	7,73		0,88	0,88	0,88	0,88	0,88	0,88	0,88	
142	7,25	6,33	6,63	5,13	4,42	6,69	7,90		0,88	0,88	0,88	0,88	0,88	0,88	0,88	
144	7,16	6,46	6,56	5,08	4,33	6,44	7,69		0,87	0,88	0,88	0,87	0,88	0,88	0,88	
146	7,38	6,74	6,89	5,36	4,56	6,80	7,77		0,87	0,88	0,88	0,87	0,88	0,88	0,88	
148	7,36	6,66	6,69	5,23	4,53	6,52	8,32		0,88	0,88	0,89	0,88	0,88	0,89	0,89	
150	7,48	6,58	6,63	5,30	4,58	6,46	7,76		0,89	0,88	0,89	0,88	0,89	0,89	0,89	
152	7,28	6,43	6,55	5,18	4,53	6,62	8,00		0,88	0,88	0,89	0,88	0,88	0,88	0,89	
154	7,20	6,44	6,46	5,04	4,35	6,49	7,65		0,88	0,88	0,88	0,88	0,88	0,88	0,89	
156	7,22	6,30	6,18	4,86	4,27	6,32	7,87		0,88	0,88	0,88	0,88	0,88	0,88	0,88	
158	7,00	6,32	6,37	4,98	4,30	6,49	7,82		0,88	0,88	0,88	0,88	0,88	0,88	0,88	
160	6,97	6,06	6,24	4,84	4,20	6,27	7,33		0,88	0,87	0,88	0,87	0,88	0,88	0,88	
162	7,09	6,27	6,35	4,92	4,18	5,95	7,39		0,87	0,87	0,88	0,87	0,88	0,88	0,88	
164	6,94	6,12	6,14	4,72	4,02	6,28	7,24		0,87	0,87	0,88	0,87	0,88	0,87	0,88	
166	6,66	6,03	5,99	4,68	4,07	5,89	7,00		0,87	0,87	0,87	0,87	0,87	0,87	0,88	

Table A2: Run 1 - M40T35, 50, 65, 75 (R1-R4) and M60T35, 50, 65, 75 (R5-R6)

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
2	47,2	46,4	43,9	38,6	44,7	44,4	53,8	43,1	11,21	14,94	18,36	16,36	11,47	8,69	6,81	5,90	8,84	5,49	2,06	2,97	5,94	8,50	9,60	10,10								
4	51,7	49,5	46,8	40,0	48,3	47,3	52,9	47,0	11,87	12,97	15,49	16,93	15,68	15,96	14,90	16,25	7,99	6,88	4,64	3,34	4,54	4,52	5,19	4,25	0,88	0,86	0,85	0,83	0,86	0,91	0,86	0,90
6	52,5	53,1	50,3	40,0	51,9	51,4	50,5	47,0	11,61	13,01	15,64	16,83	15,41	15,50	16,92	15,62	8,08	6,94	4,44	3,38	4,71	4,64	3,26	4,55	0,86	0,87	0,84	0,82	0,85	0,85	0,81	0,85
8	51,0	53,8	49,0	38,6	52,1	51,7	51,8	44,7	13,40	11,59	17,44	17,53	16,60	16,80	17,84	16,70	6,37	8,21	2,84	2,73	3,59	3,52	2,47	3,45	0,84	0,88	0,81	0,80	0,82	0,85	0,79	0,81
10	51,4	53,2	49,8	37,6	51,5	51,4	49,2	42,4	14,63	12,22	17,48	18,28	17,25	17,21	18,16	17,77	5,26	7,61	2,80	2,08	2,97	3,04	2,21	2,51	0,83	0,87	0,81	0,78	0,80	0,81	0,79	0,79
12	51,8	51,3	49,5	36,5	51,7	51,4	50,5	40,1	15,27	13,89	17,71	18,72	17,60	17,44	18,73	18,56	4,66	5,96	2,58	1,70	2,64	2,80	1,70	1,83	0,82	0,84	0,80	0,76	0,79	0,80	0,76	0,77
14	51,3	51,8	49,6	35,5	52,1	51,3	53,6	38,2	15,63	14,96	17,90	19,02	17,85	17,69	18,69	19,07	4,34	4,93	2,40	1,44	2,41	2,57	1,73	1,39	0,81	0,82	0,79	0,74	0,78	0,79	0,77	0,74
16	51,6	51,1	49,1	34,2	51,4	51,2	50,7	36,3	16,09	15,31	17,98	19,20	18,03	17,84	18,77	19,37	3,97	4,61	2,31	1,27	2,24	2,42	1,68	1,12	0,82	0,82	0,78	0,73	0,77	0,78	0,77	0,71
18	58,0	57,8	49,0	35,3	56,7	56,2	55,2	36,9	16,03	15,49	18,18	19,07	17,97	17,81	19,07	19,50	3,96	4,55	2,22	1,38	2,27	2,45	1,40	1,02	0,80	0,83	0,80	0,73	0,76	0,78	0,74	0,70
20	56,7	57,0	49,7	35,2	56,3	56,3	50,2	36,9	15,93	15,63	18,31	19,00	18,16	17,91	18,79	18,70	4,02	4,42	2,05	1,43	2,13	2,39	1,67	1,55	0,80	0,83	0,78	0,73	0,76	0,78	0,77	0,69
22	61,6	61,4	50,3	34,1	61,1	61,1	55,3	36,3	16,26	15,54	18,48	18,97	18,47	18,61	18,70	18,44	3,77	4,46	1,86	1,38	1,92	1,82	1,68	1,85	0,80	0,82	0,75	0,70	0,77	0,78	0,75	0,74
24	66,4	65,2	50,9	35,5	66,3	65,2	55,3	36,0	18,15	17,10	18,50	18,74	18,95	19,00	18,15	18,39	2,14	3,14	1,79	1,55	1,50	1,47	2,14	1,89	0,77	0,81	0,73	0,70	0,75	0,76	0,76	0,74
26	71,0	64,9	50,8	35,1	71,0	65,3	53,5	35,9	18,40	17,88	18,64	18,61	19,83	19,41	18,27	18,36	1,86	2,38	1,65	1,66	0,68	1,02	1,97	1,89	0,73	0,77	0,71	0,71	0,61	0,66	0,73	0,73
28	71,0	65,2	49,9	35,7	71,3	65,5	56,8	35,9	18,43	18,11	18,74	18,52	20,01	19,51	18,41	18,37	1,76	2,08	1,52	1,70	0,45	0,92	1,80	1,83	0,70	0,73	0,69	0,70	0,48	0,63	0,71	0,71
30	71,3	65,4	50,3	35,3	71,1	65,5	51,0	35,8	18,76	18,23	18,77	18,52	20,00	19,39	18,44	18,33	1,40	1,94	1,47	1,69	0,43	0,95	1,79	1,84	0,64	0,71	0,68	0,69	0,45	0,61	0,71	0,70
32	71,1	65,0	50,8	35,6	71,0	65,5	54,4	35,7	18,98	18,43	18,81	18,63	20,08	19,31	18,89	18,49	1,20	1,76	1,44	1,60	0,36	1,02	1,39	1,72	0,61	0,70	0,67	0,69	0,42	0,62	0,68	0,70
34	71,1	65,3	50,4	35,1	71,2	65,0	56,2	35,6	19,03	18,42	18,94	18,67	20,13	19,26	18,64	18,42	1,16	1,75	1,33	1,56	0,32	1,05	1,62	1,77	0,60	0,69	0,66	0,69	0,39	0,62	0,70	0,70
36	71,1	65,3	50,7	35,4	71,2	65,4	53,4	35,4	19,12	18,41	19,00	18,62	20,15	19,26	18,71	18,40	1,10	1,76	1,26	1,61	0,29	1,03	1,54	1,78	0,60	0,69	0,65	0,69	0,36	0,61	0,69	0,70
38	71,3	65,2	50,8	35,0	71,0	65,6	56,5	35,1	19,19	18,41	19,02	18,64	20,16	19,29	18,87	18,47	1,02	1,75	1,22	1,58	0,28	0,99	1,38	1,72	0,58	0,69	0,63	0,68	0,35	0,60	0,67	0,69
40	71,3	65,0	50,6	35,2	71,2	65,3	53,6	34,8	19,19	18,21	19,07	18,58	20,15	19,32	18,70	18,38	1,02	1,91	1,18	1,62	0,27	0,95	1,52	1,77	0,58	0,70	0,63	0,68	0,33	0,58	0,68	0,69
42	71,0	65,1	50,5	35,3	71,0	65,6	56,6	34,6	19,28	18,19	19,10	18,50	20,16	19,37	18,94	18,48	0,94	1,93	1,16	1,70	0,26	0,90	1,30	1,68	0,56	0,70	0,62	0,69	0,33	0,57	0,65	0,68
44	75,1	64,9	50,8	36,0	75,1	65,2	49,5	38,1	19,30	18,14	19,17	18,55	19,78	18,54	18,06	18,06	0,93	1,97	1,11	1,67	0,46	1,41	1,85	1,94	0,56	0,70	0,62	0,69	0,38	0,58	0,64	0,67
46	75,4	65,0	49,9	35,5	74,9	65,4	53,3	37,8	19,10	17,74	18,95	18,40	19,04	18,35	17,96	18,12	1,04	2,12	1,28	1,86	0,84	1,53	1,91	1,75	0,56	0,69	0,64	0,73	0,44	0,59	0,64	0,62
48	75,0	65,3	50,9	35,4	75,3	65,1	56,9	38,1	19,05	17,82	18,68	18,21	19,67	18,54	18,05	18,33	1,06	2,16	1,54	2,08	0,64	1,47	1,45	1,52	0,56	0,69	0,68	0,76	0,50	0,61	0,64	0,58
50	75,1	65,0	50,0	35,0	75,0	65,4	50,4	38,0	18,99	18,40	18,32	18,28	19,07	19,00	18,20	18,69	1,12	1,79	1,84	2,10	1,09	1,25	1,76	1,38	0,57	0,70	0,70	0,79	0,58	0,64	0,64	0,61
52	74,8	65,3	51,0	35,6	75,0	65,4	52,5	37,7	19,10	18,23	18,10	18,10	19,35	19,02	18,22	18,55	1,05	1,93	2,05	2,25	0,96	1,25	1,77	1,51	0,57	0,71	0,72	0,79	0,60	0,65	0,65	0,63
54	74,8	65,1	50,2	35,4	75,1	65,2	53,8	37,4	18,95	18,05	17,88	16,99	18,99	18,20	19,06	18,24	1,16	2,10	2,27	3,07	1,22	1,87	1,24	1,71	0,58	0,72	0,74	0,77	0,62	0,68	0,65	0,63
56	75,2	65,2	51,2	35,2	75,1	65,5	54,0	37,2	18,99	18,09	17,91	17,14	18,88	18,31	19,05	18,34	1,14	2,04	2,22	2,94	1,30	1,85	1,23	1,72	0,58	0,71	0,73	0,77	0,61	0,70	0,65	0,66
58	75,6	65,2	50,1	35,4	75,1	65,5	55,2	36,8	18,99	18,14	17,98	17,28	18,95	18,41	19,13	18,43	1,16	2,00	2,19	2,82	1,25	1,77	1,16	1,71	0,59	0,71	0,74	0,77	0,63	0,69	0,64	0,68
60	74,9	65,1	50,9	35,2	75,2	65,6	54,0	36,4	18,99	18,18	17,96	17,36	18,99	18,49	19,17	18,51	1,16	1,97	2,21	2,76	1,23	1,70	1,13	1,71	0,59	0,71	0,74	0,77	0,63	0,69	0,63	0,70
62	75,6	65,2	50,4	35,5	75,3	65,5	54,6	35,8	19,10	18,22	18,01	17,43	19,03	18,58	19,34	18,60	1,11	1,94	2,16	2,71	1,21	1,63	0,96	1,67	0,60	0,71	0,73	0,77	0,63	0,69	0,60	0,71
64	75,0	65,3	51,2	35,1	74,8	65,2	54,6	35,3	19,08	18,27	18,06	17,48	19,05	18,60	19,30	18,65	1,14	1,90	2,13	2,66	1,20	1,63	1,02	1,63	0,61	0,71	0,74	0,77	0,63	0,69	0,62	0,71
66	75,6	65,0	50,7	35,0	75,1	65,3	54,4	36,2	19,12	18,31	18,06	17,52	19,07	18,65	19,36	18,70	1,15	1,89	2,16	2,64	1,20	1,60	0,97	1,60	0,62	0,72	0,75	0,77	0,64	0,70	0,61	0,71
68	75,2	65,0	50,2	35,0	75,1	65,5	55,2	35,5	19,10	18,30	18,01	17,42	19,06	18,64	19,37	18,56	1,19	1,94	2,24	2,75	1,24	1,63	0,99	1,75	0,64	0,73	0,76	0,78	0,65	0,71	0,63	0,73
70	75,7	65,4	50,9	35,9	75,1	65,3	54,2	35,1	19,14	18,31	18,00	17,34	19,04	18,65	19,34	18,58	1,19	1,95	2,28	2,86	1,29	1,65	1,04	1,78	0,65	0,74	0,77	0,79	0,67	0,72	0,65	0,75
72	75,3	65,0	50,9	35,0	74,9	65,2	55,3	35,7	19,19	18,44	18,10	17,37	19,07	18,73	19,47	18,66	1,18	1,87	2,24	2,86	1,29	1,62	0,95	1,75	0,67	0,75	0,79	0,80	0,69	0,73	0,64	0,76
74	74,8	65,1	51,3	35,1	75,0	65,4	53,7	35,6	19,19	18,48	18,10	17,43	19,11	18,76	19,48	18,62	1,22	1,87	2,27	2,84	1,28	1,62	0,98	1,81	0,69	0,76	0,79	0,81	0,70	0,74	0,66	0,78
76	74,8	65,3	50,2	35,3	75,0	64,9	54,5	35,2	19,30	18,57	18,17	17,56	19,14	18,84	19,65	18,71	1,14	1,82	2,22	2,76	1,27	1,59	0,86	1,77	0,69	0,76	0,80	0,81	0,71	0,75	0,66	0,79
78	74,8	65,0	51,0	35,0	75,1	65,5	54,8	35,3	19,39	18,61	18,26	17,72	19,22	18,87	19,61	18,79	1,09	1,80	2,16	2,63	1,22	1,57	0,93	1,71	0,70	0,77	0,80	0,82	0,71	0,76	0,70	0,79
80	75,6	65,4	50,0	35,4	75,3	65,3	53,9	35,1	19,41	18,65	18,35	17,79	19,27	18,99	19,71	18,84	1,07	1,77	2,10	2,58	1,19	1,48	0,83	1,68	0,69	0,77	0,81	0,82	0,71	0,75	0,67	0,79
82	75,7	65,1	51,2	35,6	75,0	65,5	54,9	35,0	19,46	18,68	18,35	17,83	19,29	19,03	19,79	18,92	1,02	1,75	2,09	2,55	1,18	1,44	0,75	1,62	0,69	0,77	0,80	0,82	0,71	0,75	0,65	0,80
84	75,2	65,2	50,2	35,2	75,0	65,4	53,9	35,0	19,45	18,68	18,37	17,88	19,30	19,04	19,75	18,94	1,04	1,75	2,06	2,49	1,17	1,42	0,80	1,59	0,69	0,77	0,80	0,81	0,71	0,75	0,67	0,79
86	75,5	65,3	51,2	35,1	75,1	65,3	54,6	35,4	19,45	18,70	18,40	17,92	19,30	19,08	19,83	18,94	1,03	1,73	2,02	2,44	1,16	1,38	0,71	1,57	0,69	0,77	0,79	0,81	0,70	0,74	0,63	0,78
88	75,6	65,0	50,2	35,8	75,0	65,2	54,0	35,3	19,46	18,64	18,38	17,97	19,30	19,03	19,77	18,95	1,00	1,76	2,02	2,39	1,14	1,40	0,76	1,54	0,67	0,76	0,79	0,80	0,69	0,73	0,64	0,77
90	75,5	65,4	51,0	35,3	75,2	65,3	54,1	35,2	19,45	18,66	18,41	18,02	19,27	19,03	19,80	18,90	1,00	1,74	1,99	2,33	1,15	1,40	0,72	1,58	0,67	0,76	0,78	0,80	0,69	0,73	0,62	0,77
92	74,9	65,5	50,8	35,3	75,0	65,5	54,3	35,2	19,43	18,63	18,44	18,01	19,26	19,00	19,77	18,90	1,01	1,75	1,97	2,33	1,16	1,42	0,75	1,57	0,66	0,76	0,78	0,79	0,68	0,73	0,63	0,77
94	75,4	65,4	50,8	35,9	75,1	65,5	54,0	35,3	19,43	18,53	18,34	17,97	19,23	18,99	19,74	18,87	1,01	1,82	2,04	2,35	1,17	1,42	0,77	1,58	0,66	0,75	0,78	0,79	0,68	0,73	0,64	0,76
96	75,4	65,2	50,7	35,8	75,1	65,3	54,0	36,2	19,43	18,56	18,31	17,93	19,20	18,92	19,73	18,76	1,00	1,80	2,05	2,37	1,19	1,47	0,77	1,67	0,66	0,75	0,78	0,78	0,68	0,72	0,63	0,76
98	75,9	65,2	51,1	35,2	75,1	65,1	53,8	35,5	19,38	18,53	18,34	17,89	19,18	18,86	19,71	18,62	1,02	1,82	2,02	2,39	1,19	1,50	0,78	1,77	0,65	0,75	0,78	0,78	0,68	0,72	0,62	0,76
100	75,7	65,3	50,0	35,3	75,3	65,5	53,5	35,4	19,41	18,56	18,49	17,93	19,19	18,94	19,73	18,78	0,99	1,77	1,88	2,36	1,18	1,44	0,75	1,63	0,65	0,74	0,76	0,78	0,67	0,72	0,62	0,75
102	75,8	65,1	51,1	35,2	75,0	65,6	53,3	36,2	19,39	18,60	18,47	18,00	19,21	19,01	19,76	18,84	0,98	1,72	1,87	2,28	1,15	1,37	0,72	1,54	0,63	0,73	0,75	0,77	0,66	0,71	0,60	0,73
104	75,7	64,9	50,4	35,5	75,0	65,5	53,4	35,2	19,41	18,62	18,47	18,05	19,20	19,00	19,78	18,79	0,97	1,70	1,87	2,23	1,15	1,37	0,71	1,58	0,63	0,73	0,76	0,77	0,66	0,70	0,61	0,73
106	75,0	65,5	50,6	35,3	75,2	65,5	53,2	35,6	19,45	18,72	18,51	18,08	19,18	19,00	19,78	18,93	0,95	1,63	1,83	2,19	1,16	1,36	0,71	1,47	0,63	0,73	0,75	0,77	0,66	0,70	0,60	0,73
108	75,3	64,9	50,9	35,7	74,9	65,5	53,2	36,1	19,46	18,71	18,57	18,13	19,19	19,04	19,78	18,91	0,90	1,62	1,78	2,14	1,14	1,32	0,69	1,46	0,61	0,72	0,75	0,76	0,65	0,69	0,59	0,72
110	75,8	65,4	50,3	35,4	75,3	65,5	53,3	35,3	19,50	18,72	18,56	18,19	19,24	19,08	19,79	19,00	0,88	1,60	1,77	2,11	1,12	1,29	0,69	1,38	0,61	0,71	0,74	0,76	0,65	0,69	0,59	0,71
112	75,7	64,9	51,3	35,2	75,0	65,2	53,3	35,3	19,54	18,75	18,65	18,24	19,29	19,11	19,84	19,05	0,88	1,59	1,72	2,07	1,10	1,28	0,67	1,37	0,63	0,72	0,75	0,76	0,66	0,70	0,61	0,72
114	75,5	65,5	50,3	35,3	74,9	65,3	52,7	35,6	19,57	18,85	18,69	18,31	19,33	19,16	19,87	19,11	0,87	1,53	1,71	2,03	1,08	1,25	0,66	1,33	0,63	0,73	0,76	0,77	0,67	0,70	0,62	0,72
116	75,8	65,3	50,6	35,2	75,1	65,4	53,3	35,3	19,59	18,80	18,70	18,31	19,35	19,20	19,91	19,17	0,87	1,60	1,73	2,05	1,08	1,24	0,66	1,31	0,64	0,75	0,77	0,78	0,68	0,71	0,63	0,74
118	74,8	65,3	50,0	35,6	74,9	65,4	53,5	35,3	19,65	18,87	18,81	18,35	19,39	19,23	19,92	19,24	0,85	1,56	1,65	2,02	1,06	1,23	0,67	1,26	0,65	0,75	0,77	0,78	0,68	0,72	0,65	0,74
120	75,3	65,2	50,6	35,2	74,8	65,4	53,3	35,2	19,63	18,93	18,83	18,42	19,43	19,27	19,93	19,23	0,86	1,52	1,63	1,97	1,04	1,20	0,66	1,28	0,65	0,75	0,77	0,78	0,68	0,71	0,65	0,75
122	75,5	64,9	51,3	35,3	75,1	64,9	53,4	35,7	19,63	18,91	18,87	18,46	19,43	19,28	19,94	19,24	0,86	1,53	1,60	1,95	1,04	1,19	0,65	1,27	0,65	0,75	0,77	0,78	0,68	0,72	0,64	0,74
124	75,7	65,7	50,0	35,8	75,2	65,3	53,2	35,7	19,63	18,92	18,87	18,49	19,43	19,30	19,94	19,22	0,87	1,52	1,60	1,94	1,04	1,18	0,65	1,29	0,66	0,75	0,77	0,79	0,68	0,72	0,65	0,74
126	75,4	65,5	50,5	35,5	74,9	65,5	53,4	36,3	19,67	18,93	18,93	18,53	19,44	19,33	19,96	19,26	0,85	1,52	1,56	1,91	1,03	1,16	0,65	1,25	0,66	0,75	0,77	0,79	0,68	0,72	0,65	0,74
128	75,9	65,5	50,8	35,4	75,1	65,0	53,7	35,0	19,70	18,94	18,96	18,58	19,45	19,35	19,97	19,26	0,84	1,52	1,55	1,88	1,03	1,15	0,65	1,25	0,67	0,75	0,78	0,79	0,69	0,72	0,66	0,74
130	75,7	64,9	50,0	35,7	75,0	65,4	53,5	35,3	19,76	19,00	18,94	18,60	19,46	19,34	19,96	19,37	0,79	1,48	1,55	1,85	1,03	1,17	0,66	1,19	0,66	0,76	0,77	0,79	0,69	0,73	0,67	0,75
132	74,9	65,5	50,8	35,0	75,3	65,4	53,5	35,6	19,76	19,04	18,98	18,62	19,46	19,36	19,98	19,34	0,80	1,47	1,54	1,85	1,04	1,17	0,66	1,23	0,67	0,77	0,78	0,79	0,70	0,74	0,68	0,76
134	74,8	65,6	51,0	35,8	75,0	65,3	53,5	35,5	19,76	19,02	19,04	18,63	19,47	19,38	19,99	19,32	0,80	1,50	1,50	1,85	1,04	1,16	0,66	1,25	0,67	0,77	0,79	0,80	0,71	0,74	0,69	0,77
136	75,3	65,0	50,3	35,1	75,0	65,2	53,4	35,4	19,78	19,01	19,05	18,65	19,51	19,41	20,00	19,35	0,80	1,50	1,50	1,84	1,01	1,13	0,65	1,22	0,68	0,77	0,79	0,80	0,70	0,73	0,69	0,76
138	75,8	64,9	50,9	35,3	75,1	65,1	53,9	37,0	19,78	19,09	19,01	18,65	19,53	19,39	19,99	19,40	0,81	1,42	1,53	1,85	1,00	1,15	0,68	1,18	0,69	0,77	0,79	0,80	0,70	0,74	0,71	0,76
140	75,7	65,0	51,0	35,2	75,2	65,5	50,5	35,6	19,65	18,85	18,86	18,52	19,47	19,33	19,96	19,05	0,94	1,68	1,69	1,97	1,06	1,23	0,72	1,49	0,72	0,80	0,81	0,81	0,72	0,76	0,73	0,78
142	75,9	65,4	50,8	35,2	75,2	65,4	52,1	35,4	19,74	19,07	18,98	18,48	19,40	19,36	20,07	19,24	0,86	1,47	1,58	2,01	1,14	1,23	0,62	1,36	0,71	0,79	0,80	0,81	0,74	0,77	0,71	0,79
144	75,7	65,5	50,1	35,6	75,1	65,3	53,4	35,5	19,77	19,06	19,06	18,54	19,43	19,38	20,00	19,33	0,83	1,49	1,50	1,95	1,12	1,21	0,69	1,27	0,71	0,78	0,79	0,81	0,73	0,77	0,73	0,79
146	74,8	65,2	51,0	35,0	75,2	65,3	53,2	35,1	19,74	19,22	19,12	18,59	19,50	19,38	19,98	19,31	0,85	1,36	1,45	1,91	1,04	1,19	0,71	1,29	0,70	0,78	0,79	0,81	0,72	0,76	0,73	0,79
148	75,0	65,3	51,0	35,8	75,2	65,3	53,2	35,3	19,38	18,94	19,14	18,60	19,52	19,44	20,02	19,39	1,16	1,54	1,43	1,91	1,03	1,15	0,68	1,22	0,74	0,76	0,79	0,81	0,72	0,76	0,72	0,79
150	75,6	65,4	50,5	35,9	75,1	65,4	53,1	35,2	19,36	18,80	19,15	18,62	19,49	19,45	20,04	19,41	1,19	1,68	1,43	1,89	1,07	1,15	0,67	1,22	0,75	0,79	0,80	0,81	0,73	0,77	0,74	0,80
152	75,7	65,3	51,2	35,3	75,1	65,5	53,0	35,4	19,30	18,74	19,21	18,67	19,51	19,48	20,07	19,45	1,26	1,78	1,40	1,88	1,07	1,14	0,66	1,21	0,76	0,81	0,81	0,82	0,74	0,77	0,75	0,81
154	75,9	64,9	50,5	35,1	75,0	65,7	53,2	35,0	19,35	18,80	19,22	18,72	19,55	19,51	20,09	19,47	1,23	1,75	1,41	1,86	1,05	1,12	0,65	1,20	0,77	0,81	0,81	0,83	0,75	0,78	0,76	0,81
156	74,7	65,6	51,2	35,7	75,3	65,2	53,3	35,8	19,37	18,87	19,28	18,75	19,57	19,53	20,11	19,49	1,22	1,71	1,37	1,84	1,04	1,11	0,65	1,19	0,78	0,82	0,82	0,83	0,76	0,78	0,78	0,81
158	75,1	65,4	50,2	35,4	75,1	65,4	53,2	36,1	19,41	18,82	19,28	18,80	19,60	19,59	20,15	19,51	1,21	1,78	1,38	1,80	1,04	1,08	0,64	1,18	0,79	0,83	0,83	0,84	0,77	0,79	0,79	0,82
160	75,4	65,2	51,2	35,3	75,2	65,4	52,9	36,1	19,41	18,84	19,33	18,87	19,66	19,65	20,18	19,55	1,21	1,76	1,35	1,76	1,01	1,05	0,62	1,15	0,79	0,84	0,83	0,85	0,78	0,81	0,81	0,82
162	75,9	64,9	49,9	35,8	75,4	64,9	53,0	35,7	19,50	18,99	19,34	18,88	19,68	19,67	20,20	19,64	1,16	1,65	1,36	1,77	1,00	1,05	0,62	1,09	0,80	0,84	0,85	0,85	0,79	0,82	0,82	0,83
164	75,9	65,4	50,4	35,4	75,2	65,5	52,9	36,0	19,42	18,99	19,35	18,88	19,68	19,65	20,21	19,60	1,24	1,68	1,36	1,78	1,01	1,07	0,63	1,13	0,81	0,86	0,85	0,86	0,80	0,83	0,86	0,84

Table A3: Run 2 - M50T35, 50, 65, 75

time	temperatures of the reactor [°C]								oxygen content [%]							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R2	R4	R5	R6	R7	R8
2	46,4	40,6	39,5	38,3	38,9	39,0	35,3	35,2	16,61	17,55	17,98	17,18	14,91	15,59	15,73	18,52
4	46,7	44,1	39,9	39,8	39,3	38,8	35,3	35,4	16,17	16,86	17,48	16,70	17,85	18,03	18,43	18,43
6	46,2	45,3	39,3	40,4	39,1	37,9	35,2	35,4	16,32	16,51	17,47	16,67	17,84	18,22	18,60	18,58
8	47,4	47,3	40,9	40,4	41,4	40,5	35,0	35,4	16,91	15,64	17,84	17,13	18,12	18,52	18,83	18,76
10	46,3	46,3	40,2	40,3	41,0	40,7	34,8	35,1	17,20	16,90	18,32	17,71	18,44	18,63	19,03	18,97
12	47,7	46,3	40,4	40,4	40,7	40,9	34,4	34,8	17,75	17,66	18,57	17,98	18,69	18,80	19,13	19,11
14	46,4	46,0	40,8	40,1	40,6	40,4	34,1	34,6	17,76	17,82	18,65	17,99	18,78	18,87	19,18	19,14
16	47,6	46,1	40,3	40,0	41,2	40,8	34,2	34,7	17,73	17,94	18,72	18,05	18,89	18,90	19,18	19,14
18	46,6	46,1	41,7	40,5	40,6	40,1	34,1	33,8	18,05	18,09	18,81	18,19	19,03	18,99	19,27	19,22
20	53,6	51,3	44,0	43,4	44,2	43,5	36,5	35,0	17,64	17,89	18,50	17,91	18,82	18,87	19,17	19,23
22	52,5	51,1	43,2	43,2	43,3	43,3	35,8	34,7	17,97	17,36	18,01	17,21	18,34	18,37	18,46	18,48
24	56,3	54,3	46,5	46,2	46,1	46,5	35,4	34,6	17,77	17,17	18,04	17,22	18,23	18,21	18,56	18,58
26	57,0	57,3	50,0	50,1	50,3	50,3	37,3	37,6	18,06	17,33	18,13	17,28	18,33	18,33	18,59	18,65
28	62,8	63,1	56,9	57,2	50,0	50,0	36,2	36,7	18,29	17,60	18,12	17,49	18,40	18,36	18,40	18,37
30	70,6	71,9	64,5	62,6	50,3	50,1	35,5	35,5	18,72	18,18	18,74	18,30	18,66	18,49	18,56	18,61
32	70,8	71,0	64,0	63,3	50,3	50,1	35,8	34,9	18,88	18,40	19,19	18,89	18,97	18,73	18,76	18,80
34	70,8	71,1	64,0	63,5	50,6	50,4	35,2	34,2	19,12	18,61	19,40	19,17	19,16	18,88	18,91	18,92
36	71,2	71,0	64,0	63,5	50,1	50,2	35,5	33,6	19,30	18,77	19,53	19,32	19,34	19,03	19,03	19,04
38	71,0	71,0	64,5	63,2	50,5	50,1	34,8	33,4	19,47	18,91	19,64	19,39	19,46	19,15	19,09	19,10
40	71,5	71,1	64,2	63,4	50,0	50,1	35,1	33,4	19,55	19,00	19,71	19,41	19,56	19,25	19,19	19,22
42	71,2	71,1	64,2	63,2	50,1	50,0	34,1	33,2	19,65	19,07	19,81	19,43	19,65	19,34	19,24	19,27
44	73,9	74,2	62,5	62,6	50,2	50,3	34,7	34,2	19,68	19,17	19,89	19,46	19,72	19,40	19,19	19,29
46	73,7	74,1	62,2	62,5	50,4	50,2	33,3	32,9	18,75	18,43	19,39	19,03	19,16	19,13	18,56	18,29
48	73,9	74,3	62,2	62,5	50,1	50,1	34,4	32,2	18,81	18,39	19,15	18,69	18,41	18,57	18,49	18,54
50	73,8	74,2	61,9	63,2	50,3	50,1	34,0	32,4	18,72	18,38	19,04	18,60	18,38	18,55	18,45	18,50
52	74,9	75,2	65,2	65,0	50,2	50,1	33,5	32,3	18,58	18,39	19,04	18,56	18,40	18,57	18,48	18,51
54	74,9	75,2	64,9	64,7	50,3	50,1	33,3	32,7	18,76	18,50	19,08	18,64	18,48	18,64	18,59	18,64
56	75,1	75,1	65,2	66,0	50,2	50,1	33,5	32,4	18,72	18,52	19,07	18,57	18,53	18,69	18,59	18,62
58	74,9	75,1	65,3	65,0	50,0	50,0	33,2	32,3	18,67	18,52	19,06	18,44	18,54	18,77	18,68	18,70
60	75,4	75,0	65,6	65,3	50,2	50,3	33,1	32,1	18,74	18,56	19,03	18,38	18,49	18,83	18,75	18,77
62	75,1	75,3	65,6	65,1	50,5	50,1	33,4	32,3	18,90	18,69	19,20	18,52	18,59	18,87	18,80	18,86
64	75,1	75,5	65,2	65,1	50,1	50,1	33,0	32,6	18,87	18,71	19,21	18,63	18,73	18,95	18,83	18,85
66	73,8	75,2	64,0	64,7	50,9	51,3	35,4	32,1	19,03	18,77	19,20	18,61	18,70	18,96	18,85	18,91
68	75,3	74,8	65,2	64,4	50,4	50,3	38,3	36,5	18,74	18,45	18,97	18,40	18,47	18,71	18,56	18,75
70	75,0	75,3	65,0	65,4	50,2	50,1	36,6	35,0	17,76	17,59	18,35	17,65	17,92	18,19	17,62	17,61
72	75,2	75,2	64,9	64,8	50,1	50,1	35,7	34,3	18,45	17,82	18,50	17,76	17,77	18,02	17,73	17,92
74	74,8	75,2	65,4	65,7	50,7	50,0	34,9	34,2	18,50	17,99	18,67	18,21	18,12	18,30	17,99	18,14
76	75,0	75,3	65,4	64,8	50,5	50,1	34,1	34,6	18,59	18,11	18,70	18,27	18,20	18,40	18,17	18,26
78	74,8	75,3	64,0	64,0	50,4	50,1	35,2	37,4	18,46	18,13	18,77	18,19	18,27	18,45	18,23	18,33
80	75,5	75,0	64,0	64,6	50,1	50,1	34,0	35,8	18,49	17,99	18,71	18,16	18,26	18,46	18,18	18,07
82	75,5	74,9	63,9	63,9	50,4	50,0	35,6	35,7	18,73	18,16	18,81	18,34	18,26	18,49	18,22	18,35
84	75,6	75,0	63,9	64,7	50,5	50,1	34,3	35,3	18,58	18,18	18,82	18,35	18,41	18,61	18,24	18,38
86	75,7	75,3	64,0	65,0	50,1	50,2	33,6	35,3	18,62	18,22	18,77	18,26	18,43	18,66	18,34	18,48
88	75,2	74,9	65,0	64,8	50,2	50,0	35,0	35,5	18,74	18,34	18,87	18,30	18,31	18,59	18,40	18,56
90	75,2	75,2	64,0	64,7	50,5	50,3	33,4	35,1	18,70	18,33	18,85	18,35	18,36	18,64	18,34	18,48
92	74,8	75,2	64,7	64,3	50,5	50,3	34,0	36,1	18,81	18,38	18,89	18,34	18,38	18,63	18,36	18,52
94	75,3	75,4	65,6	65,9	50,0	50,1	34,3	35,1	18,65	18,23	18,81	18,27	18,25	18,51	18,12	18,42
96	75,0	75,1	65,4	65,0	50,2	50,3	34,8	35,3	18,53	18,14	18,68	18,16	18,12	18,47	18,02	18,31
98	75,6	75,5	65,2	65,6	50,7	50,0	33,5	35,5	18,45	17,98	18,58	18,05	18,04	18,40	17,92	18,20
100	74,3	75,4	65,8	65,6	50,2	50,2	34,7	35,9	18,52	18,02	18,65	18,02	18,02	18,43	17,97	18,22
102	74,9	75,4	65,2	64,8	50,1	50,1	33,8	35,7	18,48	17,96	18,57	18,04	18,00	18,44	17,95	18,21
104	75,5	75,4	65,7	66,7	50,5	50,0	35,2	35,1	18,61	18,03	18,64	18,10	18,04	18,52	18,07	18,35
106	74,9	75,1	65,7	64,9	50,4	50,1	33,9	35,4	18,46	18,03	18,66	18,09	18,07	18,54	18,00	18,37
108	75,7	75,4	65,6	66,4	50,2	50,1	34,8	35,4	18,64	18,11	18,70	18,15	18,09	18,60	18,07	18,34
110	74,9	75,4	65,8	65,3	50,5	50,3	33,8	35,7	18,60	18,02	18,68	18,20	18,16	18,62	18,05	18,38
112	75,1	75,2	65,8	66,7	50,5	50,1	35,0	35,2	18,78	18,15	18,72	18,21	18,20	18,71	18,17	18,42
114	75,5	75,4	65,5	65,0	50,2	50,1	33,4	35,3	18,70	18,13	18,74	18,22	18,24	18,72	18,15	18,42
116	75,6	75,1	65,0	65,6	50,4	50,2	34,6	35,3	18,60	18,21	18,80	18,21	18,23	18,71	18,17	18,43
118	75,6	75,1	65,7	66,1	50,2	50,0	34,0	35,3	18,50	17,96	18,63	18,14	18,11	18,55	17,83	18,17
120	74,6	75,2	64,8	64,9	50,0	50,1	36,9	35,8	18,47	17,91	18,58	18,06	17,96	18,40	17,69	18,11
122	75,6	74,9	65,1	65,9	50,0	50,1	35,3	35,3	18,31	17,52	18,39	17,89	17,84	18,27	17,46	17,96
124	75,6	75,4	65,6	64,5	50,1	50,3	36,2	35,5	18,00	17,64	18,44	17,95	17,82	18,33	17,60	18,05
126	75,6	75,1	64,9	64,8	50,3	50,1	36,2	35,3	17,93	17,67	18,43	17,98	17,80	18,38	17,68	18,00
128	75,4	75,1	64,9	65,9	50,5	50,0	36,1	35,2	17,97	17,68	18,45	17,91	17,73	18,39	17,65	18,01
130	75,1	74,9	65,7	67,3	50,2	50,0	36,4	35,5	18,07	17,68	18,48	17,94	17,76	18,42	17,64	18,06
132	75,9	75,4	65,7	65,4	50,2	50,0	36,5	35,3	18,19	17,66	18,52	18,02	17,88	18,49	17,75	18,15
134	75,3	75,0	65,0	66,1	50,1	50,2	36,4	35,5	18,17	17,73	18,55	18,13	17,99	18,57	17,78	18,16
136	75,3	75,3	65,0	65,3	50,3	50,2	36,3	35,2	18,46	17,68	18,67	18,14	18,00	18,67	17,65	18,24
138	75,2	75,6	65,3	65,6	50,3	50,2	36,6	35,5	18,68	17,66	18,60	18,15	18,02	18,80	17,62	18,20

time	carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R2	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
2	4,90	3,44	3,38	4,44	13,15	11,45	5,81	0,56	1,13	1,01	1,14	1,18	0,00	0,00	1,11	0,00
4	5,27	4,36	3,67	4,72	3,14	2,89	2,42	2,46	1,10	1,07	1,06	1,11	1,01	0,99	0,96	0,98
6	4,63	4,47	3,33	4,20	2,92	2,48	2,08	2,11	1,00	1,01	0,96	0,98	0,94	0,91	0,89	0,89
8	3,33	4,76	2,59	3,19	2,22	1,81	1,57	1,61	0,82	0,90	0,83	0,83	0,79	0,75	0,74	0,73
10	2,44	2,86	1,72	2,15	1,60	1,41	1,16	1,17	0,65	0,71	0,65	0,66	0,64	0,61	0,60	0,59
12	1,76	1,83	1,24	1,58	1,16	1,09	0,91	0,92	0,55	0,56	0,52	0,53	0,51	0,51	0,50	0,50
14	1,54	1,50	1,05	1,38	0,96	0,93	0,81	0,82	0,48	0,48	0,46	0,47	0,44	0,45	0,46	0,45
16	1,41	1,34	0,94	1,25	0,85	0,86	0,75	0,76	0,44	0,44	0,42	0,43	0,42	0,42	0,42	0,42
18	1,20	1,20	0,85	1,12	0,76	0,77	0,66	0,68	0,42	0,42	0,40	0,41	0,40	0,39	0,39	0,39
20	1,36	1,27	0,95	1,24	0,82	0,80	0,68	0,66	0,41	0,41	0,39	0,41	0,39	0,38	0,38	0,39
22	1,16	1,39	1,06	1,42	0,93	0,94	0,88	0,92	0,39	0,39	0,36	0,38	0,36	0,36	0,36	0,37
24	1,02	1,28	0,95	1,25	0,85	0,87	0,76	0,76	0,32	0,34	0,33	0,33	0,31	0,32	0,32	0,32
26	0,86	1,10	0,83	1,11	0,77	0,77	0,67	0,67	0,30	0,30	0,29	0,30	0,29	0,29	0,29	0,29
28	0,71	0,92	0,78	1,03	0,69	0,69	0,68	0,68	0,27	0,27	0,27	0,30	0,27	0,27	0,27	0,26
30	0,50	0,67	0,53	0,67	0,52	0,55	0,54	0,52	0,22	0,24	0,24	0,25	0,23	0,23	0,23	0,22
32	0,43	0,53	0,37	0,42	0,40	0,43	0,43	0,42	0,21	0,21	0,21	0,20	0,20	0,19	0,20	0,20
34	0,37	0,44	0,31	0,36	0,35	0,40	0,40	0,40	0,20	0,19	0,20	0,20	0,20	0,19	0,20	0,20
36	0,32	0,41	0,30	0,33	0,33	0,38	0,38	0,38	0,20	0,19	0,21	0,20	0,21	0,20	0,20	0,20
38	0,32	0,40	0,29	0,32	0,32	0,36	0,38	0,38	0,22	0,20	0,22	0,21	0,22	0,20	0,21	0,21
40	0,30	0,40	0,28	0,33	0,31	0,37	0,38	0,38	0,22	0,21	0,23	0,22	0,22	0,22	0,22	0,22
42	0,30	0,41	0,28	0,35	0,30	0,38	0,39	0,38	0,23	0,22	0,25	0,23	0,23	0,23	0,23	0,23
44	0,30	0,42	0,28	0,36	0,30	0,37	0,41	0,42	0,24	0,24	0,26	0,24	0,24	0,24	0,23	0,25
46	0,53	0,72	0,39	0,50	0,48	0,47	0,51	0,65	0,24	0,29	0,25	0,26	0,27	0,26	0,21	0,24
48	0,58	0,75	0,46	0,63	0,72	0,68	0,73	0,71	0,27	0,29	0,25	0,28	0,29	0,29	0,30	0,29
50	0,66	0,80	0,53	0,70	0,78	0,74	0,77	0,75	0,30	0,31	0,28	0,30	0,30	0,31	0,31	0,31
52	0,74	0,84	0,59	0,77	0,83	0,77	0,81	0,81	0,31	0,33	0,31	0,32	0,32	0,32	0,33	0,33
54	0,75	0,85	0,61	0,79	0,84	0,79	0,83	0,81	0,34	0,35	0,33	0,34	0,34	0,34	0,35	0,35
56	0,77	0,86	0,64	0,84	0,85	0,79	0,85	0,81	0,34	0,36	0,34	0,35	0,35	0,35	0,36	0,35
58	0,80	0,88	0,67	0,91	0,87	0,81	0,84	0,83	0,35	0,36	0,36	0,36	0,36	0,37	0,37	0,37
60	0,83	0,90	0,71	0,95	0,93	0,81	0,83	0,83	0,37	0,38	0,37	0,37	0,38	0,38	0,38	0,38
62	0,77	0,87	0,67	0,92	0,92	0,80	0,85	0,81	0,38	0,39	0,38	0,38	0,39	0,38	0,39	0,39
64	0,81	0,90	0,67	0,91	0,90	0,79	0,85	0,85	0,39	0,40	0,39	0,39	0,40	0,39	0,40	0,40
66	0,77	0,89	0,69	0,93	0,92	0,80	0,86	0,83	0,40	0,41	0,39	0,40	0,41	0,40	0,41	0,41
68	0,86	1,02	0,80	1,04	1,04	0,92	0,99	0,91	0,39	0,41	0,40	0,41	0,42	0,41	0,42	0,42
70	1,42	1,56	1,14	1,49	1,36	1,19	1,44	1,50	0,45	0,46	0,44	0,45	0,45	0,43	0,43	0,45
72	1,03	1,41	1,05	1,43	1,44	1,29	1,47	1,36	0,41	0,45	0,43	0,45	0,45	0,44	0,46	0,45
74	1,02	1,32	0,95	1,20	1,25	1,16	1,34	1,27	0,42	0,44	0,42	0,44	0,44	0,44	0,45	0,45
76	0,99	1,28	0,93	1,19	1,23	1,14	1,28	1,21	0,42	0,45	0,42	0,45	0,45	0,45	0,46	0,45
78	1,08	1,29	0,93	1,26	1,21	1,10	1,26	1,20	0,44	0,46	0,43	0,45	0,45	0,44	0,46	0,46
80	1,09	1,41	1,00	1,31	1,25	1,11	1,31	1,32	0,44	0,47	0,45	0,47	0,47	0,44	0,47	0,46
82	0,97	1,33	0,96	1,22	1,28	1,17	1,32	1,25	0,44	0,48	0,45	0,47	0,47	0,47	0,48	0,48
84	1,10	1,34	0,97	1,24	1,21	1,11	1,34	1,27	0,46	0,49	0,45	0,48	0,48	0,47	0,50	0,49
86	1,11	1,37	1,02	1,32	1,23	1,10	1,30	1,23	0,48	0,50	0,47	0,49	0,49	0,48	0,50	0,50
88	1,07	1,32	0,99	1,31	1,30	1,14	1,29	1,20	0,48	0,51	0,47	0,49	0,49	0,49	0,50	0,50
90	1,09	1,33	1,02	1,31	1,30	1,12	1,35	1,27	0,48	0,51	0,49	0,50	0,50	0,49	0,52	0,52
92	1,03	1,33	1,00	1,32	1,31	1,15	1,37	1,26	0,48	0,52	0,49	0,51	0,51	0,50	0,53	0,52
94	1,14	1,41	1,07	1,37	1,37	1,24	1,47	1,35	0,50	0,52	0,50	0,51	0,51	0,51	0,52	0,53
96	1,25	1,48	1,17	1,46	1,47	1,27	1,56	1,40	0,51	0,53	0,51	0,52	0,52	0,51	0,53	0,53
98	1,29	1,56	1,22	1,55	1,54	1,31	1,64	1,45	0,52	0,53	0,51	0,53	0,53	0,51	0,54	0,53
100	1,25	1,54	1,19	1,56	1,54	1,31	1,60	1,45	0,51	0,52	0,52	0,53	0,53	0,52	0,54	0,53
102	1,27	1,60	1,23	1,53	1,52	1,29	1,62	1,46	0,51	0,53	0,51	0,53	0,52	0,51	0,54	0,53
104	1,21	1,56	1,19	1,51	1,52	1,26	1,57	1,39	0,52	0,53	0,52	0,53	0,52	0,52	0,55	0,54
106	1,31	1,55	1,20	1,54	1,55	1,28	1,64	1,41	0,52	0,53	0,52	0,54	0,54	0,53	0,56	0,55
108	1,20	1,54	1,18	1,50	1,55	1,25	1,59	1,43	0,52	0,54	0,52	0,54	0,54	0,53	0,55	0,55
110	1,23	1,58	1,20	1,46	1,50	1,23	1,61	1,41	0,52	0,54	0,53	0,53	0,54	0,53	0,56	0,55
112	1,11	1,51	1,17	1,46	1,48	1,18	1,54	1,37	0,51	0,54	0,52	0,53	0,54	0,53	0,55	0,54
114	1,19	1,54	1,18	1,49	1,47	1,17	1,57	1,41	0,53	0,55	0,53	0,54	0,54	0,52	0,56	0,56
116	1,27	1,49	1,13	1,48	1,49	1,20	1,58	1,40	0,54	0,54	0,53	0,54	0,55	0,54	0,57	0,56
118	1,29	1,65	1,22	1,52	1,56	1,28	1,77	1,52	0,53	0,55	0,53	0,54	0,55	0,54	0,57	0,55
120	1,33	1,68	1,27	1,60	1,65	1,34	1,85	1,58	0,54	0,55	0,54	0,55	0,55	0,53	0,57	0,56
122	1,39	1,92	1,38	1,71	1,74	1,41	1,97	1,67	0,53	0,56	0,54	0,56	0,56	0,53	0,57	0,56
124	1,64	1,84	1,35	1,65	1,76	1,40	1,94	1,62	0,56	0,56	0,54	0,55	0,56	0,53	0,58	0,56
126	1,67	1,83	1,34	1,63	1,74	1,37	1,86	1,65	0,55	0,56	0,53	0,55	0,55	0,53	0,57	0,56
128	1,65	1,85	1,34	1,68	1,77	1,36	1,86	1,63	0,56	0,57	0,53	0,55	0,55	0,53	0,56	0,55
130	1,58	1,81	1,30	1,65	1,75	1,32	1,86	1,59	0,55	0,55	0,53	0,55	0,55	0,52	0,56	0,55
132	1,46	1,81	1,28	1,61	1,68	1,30	1,80	1,53	0,53	0,55	0,53	0,55	0,55	0,53	0,56	0,55
134	1,51	1,80	1,27	1,56	1,63	1,26	1,78	1,55	0,54	0,56	0,53	0,55	0,55	0,53	0,56	0,55
136	1,40	1,79	1,20	1,53	1,63	1,20	1,87	1,50	0,56	0,55	0,53	0,55	0,55	0,53	0,57	0,55
138	1,22	1,85	1,24	1,54	1,63	1,14	1,92	1,55	0,54	0,56	0,53	0,55	0,56	0,53	0,58	0,56

Table A4: Run 3 - M55T35, 50, 65, 75

time	temperatures of the reactor [°C]							
hours	R1	R2	R3	R4	R5	R6	R7	R8
2	49,3	40,5	49,3	49,0	49,3	49,2	55,3	49,1
4	50,4	40,8	51,0	50,3	52,2	52,6	51,7	50,5
6	50,2	39,9	50,2	50,3	51,0	51,0	49,9	50,3
8	50,0	39,3	50,4	50,0	54,4	53,1	49,9	50,2
10	50,2	37,7	50,5	50,0	56,6	56,3	50,0	50,6
12	50,3	37,1	50,0	50,3	56,7	55,5	51,2	49,9
14	50,4	36,2	50,4	50,2	56,6	56,1	52,6	50,5
16	50,2	35,5	50,3	50,4	56,7	55,9	53,7	50,5
18	50,5	37,6	50,4	50,3	56,5	56,2	53,7	50,4
20	50,7	36,1	52,1	52,3	57,1	57,8	53,4	52,5
22	51,1	38,6	51,1	50,5	65,2	65,0	52,3	56,9
24	44,5	36,6	50,3	49,9	65,1	65,3	56,3	56,1
26	40,9	35,9	50,5	50,4	65,2	65,1	71,1	69,1
28	38,0	36,7	50,0	50,3	65,2	65,0	69,7	69,1
30	36,9	36,1	50,1	50,1	65,0	65,2	69,8	69,1
32	36,6	35,8	50,1	50,3	65,0	65,3	69,8	69,1
34	36,5	35,3	50,2	50,4	65,1	64,9	70,0	69,1
36	36,4	36,2	50,1	50,2	65,3	65,1	69,9	69,2
38	36,6	35,7	50,7	50,3	65,3	65,2	68,9	69,5
40	36,7	37,8	50,0	50,4	65,2	65,4	68,6	68,9
42	36,4	37,0	50,5	50,3	65,3	65,1	69,6	69,2
44	36,3	36,1	50,7	50,3	65,0	65,5	69,9	69,1
46	36,3	36,1	50,5	50,1	65,5	65,2	68,9	69,5
48	35,8	35,1	50,6	49,9	65,1	64,9	74,8	75,1
50	36,1	35,7	50,7	50,5	65,2	65,0	75,3	75,0
52	36,4	37,4	50,7	50,0	65,0	65,3	75,3	74,9
54	36,5	36,6	50,0	50,5	65,0	65,6	74,7	74,7
56	36,8	35,7	49,9	50,5	65,3	65,4	74,7	74,9
58	36,1	37,8	50,1	50,3	65,2	65,0	74,6	74,6
60	36,7	36,6	50,6	50,6	65,2	64,9	74,6	75,1
62	36,7	35,4	50,7	50,1	65,2	66,7	74,7	75,1
64	36,8	35,8	50,5	50,2	65,3	65,1	74,7	75,5
66	36,4	38,0	50,2	50,1	65,2	65,7	74,6	75,1
68	36,4	36,5	50,2	50,5	65,0	65,4	74,8	75,0
70	36,0	35,0	50,0	50,3	65,0	65,5	74,7	75,2
72	36,3	36,5	50,3	50,4	65,2	65,5	74,7	75,0
74	36,5	35,3	50,6	50,4	65,4	65,7	74,9	75,2
76	36,5	35,5	50,6	50,6	65,0	64,8	74,8	75,0
78	36,3	36,1	50,0	50,4	65,5	64,9	75,4	75,1
80	36,7	35,1	50,5	50,3	65,0	65,2	74,7	75,0
82	36,7	35,1	50,1	50,1	65,2	65,2	74,8	75,0
84	36,8	36,9	50,5	50,4	65,3	65,1	74,6	75,1
86	36,6	35,4	50,2	50,1	65,0	64,9	75,4	75,3
88	36,6	35,5	50,1	50,9	65,0	64,9	75,2	75,1
90	36,6	36,6	50,5	50,4	65,4	65,1	75,0	75,2
92	36,7	37,0	52,6	51,6	65,9	66,3	76,5	76,7
94	35,9	35,3	50,3	49,9	65,4	65,7	75,3	75,1
96	36,3	37,9	50,3	49,9	65,1	64,9	75,4	75,1
98	36,5	36,4	50,7	50,3	65,1	64,8	74,6	75,0
100	36,3	36,5	50,0	50,0	65,3	65,5	74,6	74,9
102	36,9	35,9	50,6	50,3	65,1	65,5	75,3	75,1
104	36,7	37,6	50,4	50,2	65,0	65,1	74,6	75,4
106	36,9	36,2	49,9	50,6	65,1	65,2	75,5	75,0
108	36,3	35,2	50,7	50,5	65,3	65,8	74,7	75,1
110	36,7	35,1	50,3	50,1	65,1	65,3	75,2	75,0
112	36,6	35,4	50,2	50,1	65,2	65,2	74,7	75,1
114	36,6	35,3	49,9	50,5	65,3	65,4	74,9	75,1
116	36,1	35,9	50,1	50,1	65,0	65,6	75,4	75,2
118	36,4	38,1	50,7	50,0	65,3	64,9	74,7	75,0
120	36,3	36,1	50,5	50,5	65,1	65,7	75,2	75,0
122	36,6	35,2	50,5	50,4	65,2	64,9	75,4	75,0
124	36,2	36,2	50,4	50,5	65,3	65,4	74,7	75,0
126	36,5	36,1	50,0	50,4	65,3	65,0	75,4	75,0
128	35,5	36,2	50,8	50,0	65,3	64,8	75,2	75,1
130	35,6	35,3	50,6	50,0	65,2	65,0	75,1	75,0
132	35,1	35,1	50,6	50,7	65,2	65,6	74,6	75,0
134	35,4	35,6	50,5	49,9	65,4	65,4	74,9	75,1
136	35,2	36,5	50,5	50,0	65,0	65,0	75,5	75,2
138	35,3	35,0	50,5	50,3	65,2	64,9	75,7	75,2
140	35,6	35,3	50,2	50,9	65,2	64,9	75,5	75,0
142	35,9	35,9	50,7	50,2	65,3	64,8	75,1	75,0
144	35,2	35,0	50,7	49,9	65,4	64,8	75,6	75,1
146	35,4	35,2	50,9	50,1	65,1	65,5	75,2	75,1
148	35,7	35,7	50,3	50,7	65,1	65,2	75,3	75,0
150	35,4	36,4	50,8	50,1	65,3	65,8	74,6	74,9
152	35,4	35,2	50,7	50,5	65,1	65,8	75,4	75,1
154	35,1	36,8	50,4	50,9	65,3	64,9	75,6	75,2
156	35,3	35,4	50,7	50,8	64,9	64,8	75,0	75,1
158	35,5	35,7	50,8	50,1	65,0	65,6	74,6	75,0
160	35,0	35,2	50,4	50,2	65,1	65,2	74,8	75,0
162	35,1	36,1	50,8	50,9	65,1	64,9	74,7	75,2
164	35,7	36,2	54,0	53,0	65,7	66,0	77,5	76,8

time	oxygen content [%]							
hours	R1	R2	R3	R4	R5	R6	R7	R8
2	20,38	14,25	16,93	18,52	19,62	20,08	11,01	15,33
4	18,02	17,84	16,25	16,76	17,77	18,03	17,04	16,78
6	17,63	17,38	16,76	17,06	17,63	17,56	16,93	17,31
8	17,93	17,94	17,11	17,43	17,85	17,82	17,34	17,63
10	18,20	18,33	17,55	17,81	18,26	18,18	17,55	17,95
12	18,35	18,54	17,86	18,05	18,65	18,63	17,85	18,31
14	18,52	18,77	18,11	18,21	18,90	18,87	18,23	18,49
16	18,63	18,92	18,24	18,29	18,96	18,95	18,37	18,62
18	18,69	18,99	18,31	18,37	19,02	18,99	18,37	18,70
20	18,68	18,94	18,33	18,44	19,06	19,00	18,40	18,72
22	18,33	18,81	18,33	18,39	18,99	19,03	18,33	18,74
24	16,65	16,25	18,06	18,30	19,24	19,17	16,77	18,32
26	19,01	19,07	17,96	18,32	19,89	19,61	17,98	18,45
28	19,24	19,24	18,16	18,43	20,10	19,61	18,62	18,79
30	19,29	19,24	18,30	18,55	20,12	19,64	18,83	18,95
32	19,31	19,31	18,38	18,64	20,26	19,66	18,89	18,97
34	19,41	19,36	18,43	18,71	20,26	19,68	19,00	19,06
36	19,43	19,38	18,53	18,76	20,24	19,70	19,02	19,16
38	19,39	19,34	18,55	18,79	20,21	19,69	19,06	19,08
40	19,39	19,40	18,54	18,81	20,21	19,67	19,00	19,14
42	19,31	19,21	18,55	18,80	20,21	19,69	18,92	19,03
44	19,32	19,29	18,57	18,82	20,20	19,67	18,98	18,96
46	19,39	19,36	18,59	18,86	20,20	19,71	19,08	19,04
48	19,41	19,43	18,58	18,87	20,21	19,72	19,06	18,94
50	19,37	19,40	18,62	18,84	20,18	19,71	19,03	19,00
52	19,15	19,24	18,64	19,04	20,11	19,58	19,06	18,96
54	19,00	19,09	18,61	19,28	20,11	19,50	18,95	18,95
56	19,06	19,14	18,60	19,32	20,13	19,50	18,87	18,94
58	19,11	19,21	18,64	19,36	20,14	19,56	18,98	18,98
60	19,00	19,07	18,65	19,37	20,15	19,55	18,97	18,87
62	19,05	19,17	18,68	19,36	20,15	19,59	19,02	18,76
64	19,10	19,24	18,73	19,35	20,17	19,65	19,02	18,97
66	19,12	19,24	18,76	19,32	20,18	19,62	18,93	18,82
68	19,03	19,09	18,73	19,34	20,19	19,59	18,99	18,75
70	19,12	19,19	18,72	19,37	20,20	19,63	18,99	18,90
72	19,11	19,27	18,59	19,30	20,20	19,62	18,97	18,79
74	18,88	19,01	18,59	19,24	20,18	19,49	18,90	18,73
76	18,96	19,16	18,62	19,23	20,15	19,52	19,00	18,82
78	18,93	19,11	18,62	19,21	20,17	19,51	18,99	18,70
80	18,91	19,07	18,62	19,19	20,17	19,52	18,99	18,74
82	18,98	19,16	18,69	19,21	20,17	19,55	18,88	18,74
84	19,02	19,20	18,76	19,22	20,20	19,58	19,01	18,78
86	18,96	19,10	18,77	19,25	20,22	19,58	18,97	18,76
88	19,06	19,23	18,80	19,24	20,29	19,63	19,08	18,80
90	19,06	19,21	18,82	19,25	20,31	19,65	18,98	18,80
92	19,12	19,21	18,83	19,26	20,36	19,69	18,95	18,77
94	19,12	19,21	18,64	19,13	20,30	19,62	18,98	18,63
96	18,88	19,06	18,53	19,05	20,19	19,45	18,91	18,68
98	18,74	18,92	18,57	19,08	20,18	19,40	18,94	18,52
100	18,87	19,02	18,67	19,08	20,18	19,43	18,89	18,57
102	18,97	19,09	18,70	19,08	20,19	19,42	18,87	18,54
104	18,86	19,04	18,70	19,07	20,30	19,39	18,96	18,70
106	18,86	18,99	18,72	19,09	20,38	19,42	18,90	18,63
108	19,00	19,10	18,75	19,14	20,35	19,49	19,01	18,61
110	19,15	19,26	18,83	19,17	20,26	19,55	19,01	18,70
112	19,11	19,26	18,88	19,23	20,26	19,53	19,08	18,71
114	19,08	19,19	18,91	19,27	20,40	19,53	19,02	18,71
116	19,06	19,18	18,89	19,22	20,49	19,50	19,08	18,72
118	18,99	19,12	18,90	19,28	20,49	19,50	19,11	18,76
120	18,88	18,92	18,77	19,30	20,47	19,45	18,97	18,59
122	18,94	19,02	18,74	19,14	20,36	19,37	19,01	18,49
124	18,97	19,07	18,83	19,12	20,34	19,41	19,06	18,57
126	18,86	19,03	18,73	19,01	20,10	19,59	18,92	18,42
128	18,61	18,51	18,39	18,88	19,50	20,08	18,62	18,08
130	18,79	18,74	18,31	18,88	19,45	20,29	18,64	18,04
132	18,81	18,72	18,45	18,95	19,54	20,40	18,69	18,13
134	18,89	18,81	18,51	19,06	19,56	20,31	18,76	18,13
136	18,83	18,71	18,53	19,10	19,59	20,36	18,72	17,99
138	18,89	18,71	18,54	19,16	19,63	20,41	18,81	18,11
140	18,95	18,89	18,53	19,23	19,62	20,44	18,93	18,17
142	18,97	18,88	18,62	19,26	19,57	20,41	18,93	18,25
144	18,90	18,75	18,63	19,26	19,54	20,36	18,78	18,33
146	18,92	18,86	18,50	19,15	19,54	20,40	18,89	18,15
148	18,91	18,83	18,43	19,11	19,50	20,37	18,85	18,06
150	18,87	18,67	18,46	19,18	19,47	20,36	18,82	17,95
152	18,88	18,66	18,46	19,18	19,46	20,41	18,68	18,08
154	18,93	18,83	18,57	19,22	19,43	20,37	18,88	18,21
156	18,91	18,62	18,52	19,25	19,44	20,44	18,82	18,07
158	19,02	18,84	18,64	19,26	19,47	20,37	18,91	18,22
160	19,05	18,84	18,74	19,34	19,49	20,43	18,89	18,23
162	19,10	18,95	18,81	19,36	19,50	20,50	18,96	18,26
164	19,04	18,73	18,72	19,35	19,48	20,45	18,87	18,20

time	carbon dioxide content [%]							
hours	R1	R2	R3	R4	R5	R6	R7	R8
2	2,66	2,66	4,71	4,05	3,35	2,79	3,56	3,93
4	2,45	2,73	3,35	2,98	2,51	2,58	3,30	3,00
6	1,80	1,77	2,51	2,22	1,90	1,95	2,37	2,26
8	1,28	1,20	1,74	1,56	1,30	1,34	1,76	1,68
10	1,00	0,90	1,30	1,19	0,93	0,91	1,35	1,24
12	0,85	0,76	1,02	0,98	0,72	0,74	1,00	1,07
14	0,76	0,64	0,89	0,90	0,63	0,64	0,90	0,92
16	0,70	0,56	0,83	0,81	0,56	0,57	0,83	0,84
18	0,66	0,56	0,78	0,76	0,52	0,53	0,81	0,81
20	0,68	0,57	0,77	0,75	0,50	0,50	0,81	0,76
22	0,97	1,26	0,93	0,78	0,44	0,44	1,76	1,10
24	0,46	0,44	0,90	0,77	0,28	0,34	0,90	0,86
26	0,42	0,42	0,81	0,72	0,22	0,34	0,68	0,64
28	0,42	0,44	0,79	0,69	0,22	0,35	0,57	0,56
30	0,42	0,44	0,79	0,70	0,18	0,36	0,56	0,55
32	0,42	0,44	0,81	0,71	0,19	0,36	0,57	0,56
34	0,43	0,44	0,81	0,72	0,21	0,37	0,58	0,55
36	0,45	0,48	0,83	0,74	0,22	0,38	0,58	0,58
38	0,47	0,49	0,85	0,76	0,23	0,39	0,62	0,60
40	0,53	0,61	0,87	0,79	0,25	0,40	0,70	0,67
42	0,56	0,60	0,89	0,80	0,26	0,40	0,69	0,72
44	0,55	0,57	0,90	0,80	0,26	0,40	0,65	0,69
46	0,55	0,56	0,95	0,82	0,26	0,40	0,70	0,73
48	0,58	0,55	0,94	0,84	0,27	0,41	0,73	0,75
50	0,66	0,65	0,93	0,75	0,29	0,43	0,71	0,78
52	0,75	0,73	0,94	0,64	0,30	0,46	0,74	0,79
54	0,74	0,70	0,95	0,63	0,30	0,47	0,80	0,80
56	0,74	0,69	0,94	0,61	0,29	0,45	0,77	0,79
58	0,79	0,77	0,95	0,63	0,29	0,47	0,79	0,87
60	0,78	0,75	0,97	0,65	0,30	0,47	0,79	0,92
62	0,77	0,73	0,96	0,67	0,30	0,45	0,79	0,86
64	0,78	0,73	0,96	0,70	0,30	0,48	0,82	0,91
66	0,84	0,83	1,01	0,71	0,30	0,50	0,85	0,96
68	0,82	0,78	1,03	0,71	0,30	0,50	0,85	0,92
70	0,81	0,71	1,11	0,74	0,30	0,52	0,87	0,96
72	0,92	0,87	1,15	0,78	0,31	0,60	0,90	1,02
74	0,91	0,83	1,15	0,81	0,32	0,59	0,89	1,00
76	0,93	0,87	1,15	0,84	0,32	0,61	0,91	1,10
78	0,96	0,89	1,18	0,86	0,34	0,63	0,91	1,08
80	0,95	0,87	1,18	0,87	0,34	0,62	0,96	1,12
82	0,96	0,87	1,16	0,88	0,33	0,62	0,93	1,11
84	1,00	0,95	1,19	0,89	0,33	0,65	0,95	1,13
86	0,97	0,91	1,20	0,90	0,30	0,61	0,93	1,11
88	0,97	0,91	1,20	0,91	0,29	0,61	0,97	1,16
90	0,95	0,91	1,21	0,91	0,26	0,59	0,99	1,20
92	0,98	0,91	1,35	0,99	0,30	0,65	1,01	1,32
94	1,15	1,01	1,43	1,05	0,35	0,76	1,06	1,27
96	1,22	1,11	1,40	1,04	0,36	0,79	1,09	1,39
98	1,18	1,07	1,36	1,05	0,37	0,79	1,11	1,35
100	1,12	1,03	1,35	1,06	0,37	0,82	1,13	1,38
102	1,19	1,07	1,36	1,06	0,32	0,84	1,09	1,31
104	1,19	1,13	1,38	1,08	0,29	0,81	1,15	1,39
106	1,17	1,08	1,36	1,09	0,32	0,81	1,11	1,41
108	1,06	0,97	1,34	1,09	0,36	0,77	1,11	1,36
110	1,09	0,99	1,32	1,06	0,35	0,79	1,05	1,37
112	1,12	1,07	1,31	1,03	0,27	0,79	1,10	1,40
114	1,16	1,09	1,35	1,06	0,22	0,81	1,11	1,43
116	1,24	1,16	1,36	1,02	0,23	0,82	1,11	1,42
118	1,28	1,29	1,49	1,05	0,24	0,84	1,25	1,57
120	1,33	1,27	1,53	1,20	0,30	0,91	1,21	1,65
122	1,31	1,23	1,46	1,22	0,32	0,92	1,21	1,56
124	1,36	1,29	1,54	1,30	0,48	0,79	1,30	1,66
126	1,59	1,73	1,87	1,45	0,89	0,47	1,53	1,95
128	1,45	1,55	1,96	1,46	0,97	0,37	1,52	2,00
130	1,42	1,53	1,87	1,42	0,89	0,31	1,46	1,97
132	1,38	1,48	1,79	1,32	0,87	0,36	1,43	1,96
134	1,42	1,57	1,79	1,30	0,85	0,32	1,45	2,09
136	1,36	1,59	1,80	1,28	0,84	0,30	1,41	1,97
138	1,36	1,45	1,82	1,22	0,85	0,30	1,34	1,94
140	1,34	1,46	1,75	1,20	0,87	0,32	1,35	1,89
142	1,38	1,59	1,74	1,20	0,91	0,33	1,41	1,81
144	1,35	1,44	1,84	1,27	0,90	0,30	1,37	1,93
146	1,36	1,54	1,88	1,30	0,91	0,32	1,39	2,01
148	1,38	1,65	1,88	1,26	0,93	0,32	1,41	2,08
150	1,35	1,63	1,86	1,25	0,95	0,31	1,51	2,00
152	1,36	1,50	1,76	1,22	0,98	0,33	1,40	1,95
154	1,38	1,70	1,85	1,20	0,97	0,29	1,45	2,05
156	1,31	1,50	1,75	1,21	0,97	0,34	1,38	1,93
158	1,28	1,53	1,66	1,13	0,95	0,30	1,39	1,93
160	1,24	1,45	1,61	1,11	0,94	0,26	1,36	1,90
162	1,28	1,63	1,70	1,14	0,95	0,28	1,41	1,96
164	1,28	1,63	1,70	1,14	0,95	0,28	1,41	1,96

time	Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8
2	0,72	0,95	1,16	1,07	1,15	0,89	0,97	1,04
4	0,91	0,86	1,00	0,97	1,06	0,96	0,91	0,94
6	0,74	0,76	0,80	0,77	0,75	0,76	0,82	0,82
8	0,60	0,59	0,66	0,63	0,61	0,62	0,66	0,68
10	0,47	0,46	0,51	0,50	0,48	0,48	0,52	0,56
12	0,39	0,37	0,42	0,41	0,41	0,39	0,43	0,47
14	0,35	0,35	0,36	0,36	0,35	0,35	0,37	0,44
16	0,33	0,32	0,33	0,34	0,32	0,32	0,35	0,39
18	0,31	0,29	0,31	0,32	0,29	0,29	0,32	0,37
20	0,29	0,28	0,30	0,30	0,27	0,27	0,32	0,36
22	0,26	0,27	0,29	0,29	0,26	0,26	0,31	0,34
24	0,23	0,27	0,32	0,29	0,26	0,25	0,42	0,42
26	0,24	0,24	0,30	0,29	0,27	0,25	0,30	0,34
28	0,25	0,25	0,29	0,29	0,26	0,26	0,29	0,30
30	0,25	0,26	0,30	0,29	0,26	0,26	0,27	0,28
32	0,26	0,27	0,31	0,30	0,26	0,28	0,27	0,28
34	0,28	0,28	0,32	0,32	0,27	0,28	0,29	0,30
36	0,28	0,28	0,34	0,33	0,29	0,30	0,30	0,31
38	0,29	0,30	0,35	0,34	0,30	0,30	0,31	0,31
40	0,30	0,32	0,35	0,35	0,31	0,30	0,32	0,33
42	0,32	0,35	0,36	0,37	0,34	0,32	0,34	0,35
44	0,34	0,36	0,37	0,37	0,35	0,31	0,35	0,36
46	0,35	0,36	0,38	0,38	0,35	0,32	0,35	0,36
48	0,36	0,37	0,40	0,39	0,35	0,33	0,37	0,37
50	0,37	0,35	0,40	0,40	0,35	0,33	0,38	0,39
52	0,37	0,38	0,40	0,39	0,35	0,31	0,38	0,39
54	0,38	0,39	0,40	0,38	0,36	0,31	0,37	0,39
56	0,39	0,39	0,40	0,38	0,37	0,33	0,39	0,40
58	0,40	0,39	0,41	0,39	0,36	0,32	0,39	0,40
60	0,40	0,41	0,42	0,40	0,36	0,34	0,40	0,42
62	0,41	0,42	0,43	0,41	0,37	0,35	0,41	0,42
64	0,41	0,42	0,43	0,42	0,39	0,35	0,41	0,43
66	0,43	0,43	0,44	0,43	0,39	0,36	0,41	0,43
68	0,44	0,44	0,45	0,44	0,40	0,37	0,43	0,44
70	0,45	0,45	0,46	0,45	0,40	0,38	0,43	0,45
72	0,44	0,43	0,47	0,45	0,40	0,39	0,44	0,44
74	0,45	0,45	0,49	0,46	0,40	0,41	0,44	0,46
76	0,46	0,46	0,49	0,47	0,40	0,41	0,46	0,47
78	0,46	0,47	0,49	0,48	0,41	0,42	0,46	0,49
80	0,47	0,47	0,51	0,49	0,43	0,44	0,46	0,49
82	0,48	0,49	0,52	0,50	0,43	0,44	0,46	0,51
84	0,50	0,50	0,53	0,51	0,44	0,45	0,48	0,51
86	0,50	0,51	0,55	0,52	0,45	0,47	0,48	0,51
88	0,51	0,53	0,56	0,53	0,46	0,46	0,50	0,52
90	0,51	0,52	0,56	0,53	0,44	0,47	0,49	0,54
92	0,52	0,52	0,57	0,54	0,44	0,47	0,49	0,55
94	0,54	0,52	0,58	0,54	0,45	0,49	0,51	0,57
96	0,55	0,54	0,59	0,55	0,46	0,51	0,52	0,56
98	0,55	0,55	0,59	0,55	0,47	0,51	0,54	0,57
100	0,56	0,55	0,60	0,56	0,48	0,52	0,54	0,57
102	0,57	0,55	0,60	0,56	0,48	0,53	0,54	0,57
104	0,57	0,56	0,61	0,57	0,48	0,54	0,55	0,58
106	0,57	0,58	0,62	0,58	0,51	0,53	0,56	0,60
108	0,60	0,59	0,62	0,60	0,53	0,55	0,57	0,60
110	0,59	0,57	0,63	0,61	0,52	0,55	0,57	0,61
112	0,59	0,59	0,64	0,61	0,51	0,56	0,56	0,61
114	0,60	0,61	0,64	0,61	0,49	0,56	0,57	0,63
116	0,61	0,62	0,65	0,61	0,49	0,56	0,59	0,64
118	0,63	0,63	0,67	0,61	0,50	0,57	0,60	0,65
120	0,62	0,64	0,68	0,63	0,50	0,56	0,63	0,67
122	0,66	0,66	0,69	0,66	0,52	0,58	0,63	0,67
124	0,66	0,66	0,69	0,66	0,53	0,60	0,64	0,65
126	0,65	0,68	0,70	0,67	0,57	0,58	0,64	0,66
128	0,68	0,71	0,73	0,70	0,61	0,55	0,66	0,68
130	0,67	0,70	0,74	0,71	0,64	0,56	0,66	0,69
132	0,66	0,69	0,75	0,71	0,63	0,57	0,64	0,70
134	0,67	0,69	0,74	0,70	0,62	0,57	0,66	0,69
136	0,67	0,70	0,74	0,71	0,63	0,54	0,65	0,70
138	0,66	0,71	0,75	0,71	0,63	0,56	0,66	0,69
140	0,68	0,70	0,75	0,71	0,64	0,59	0,66	0,70
142	0,68	0,71	0,75	0,71	0,63	0,58	0,67	0,70
144	0,67	0,72	0,75	0,71	0,64	0,56	0,65	0,69
146	0,67	0,69	0,75	0,71	0,64	0,55	0,67	0,69
148	0,67	0,73	0,75	0,71	0,62	0,54	0,66	0,69
150	0,66	0,73	0,75	0,71	0,63	0,55	0,66	0,70
152	0,65	0,71	0,75	0,71	0,64	0,57	0,66	0,70
154	0,67	0,71	0,74	0,70	0,64	0,57	0,68	0,71
156	0,68	0,73	0,76	0,71	0,64	0,57	0,68	0,71
158	0,68	0,71	0,76	0,72	0,65	0,59	0,67	0,71
160	0,68	0,72	0,75	0,70	0,65	0,57	0,68	0,71
162	0,67	0,72	0,75	0,70	0,65	0,56	0,68	0,71
164	0,67	0,74	0,76	0,71	0,65	0,56	0,68	0,71

Table A5: Run 4 - M70T35, 50, 65, 75

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R2	R4	R5	R6	R7	R8	R1	R2	R2	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
2	35,4	32,5	32,7	30,5	31,3	32,0	33,0	34,4	18,17	14,64	17,02	18,89	12,41	11,12	10,20	9,26	0,62	1,92	4,17	2,28	5,78	5,90	5,70	5,91	0,22	0,30	1,06	1,11	0,68	0,60	0,53	0,51
4	34,7	32,4	32,7	31,1	31,2	32,1	32,8	33,5	16,92	18,12	16,65	16,66	15,92	15,63	15,76	15,77	4,58	3,27	4,89	4,81	5,74	6,16	6,08	6,10	1,14	1,15	1,14	1,12	1,14	1,16	1,17	1,18
6	35,7	34,9	34,8	34,5	35,0	34,7	35,1	34,3	14,72	16,62	13,79	13,24	12,86	12,76	13,16	13,15	6,39	4,44	7,35	7,98	8,44	8,49	8,14	8,07	1,03	1,02	1,03	1,04	1,04	1,04	1,04	1,03
8	37,7	38,9	38,6	38,7	36,2	38,5	39,0	36,9	14,33	15,84	14,71	12,01	11,11	10,05	10,40	12,56	6,43	4,86	6,02	8,75	9,77	10,79	10,69	8,41	0,97	0,95	0,96	0,98	0,99	0,99	1,01	1,00
10	40,0	42,0	41,0	40,7	40,4	40,6	41,4	41,1	14,17	16,09	16,45	14,39	13,42	12,24	12,08	10,85	6,76	4,51	4,18	6,23	7,27	8,35	8,42	9,73	1,00	0,93	0,93	0,95	0,97	0,96	0,95	0,96
12	41,5	42,8	41,6	41,0	41,4	41,1	41,8	42,2	15,60	16,93	17,35	16,81	16,54	16,83	17,31	17,11	5,08	3,79	3,35	3,89	4,17	3,84	3,33	3,53	0,95	0,94	0,93	0,94	0,94	0,93	0,92	0,92
14	42,2	42,6	41,6	40,9	40,9	41,1	41,6	41,8	16,43	17,58	17,89	17,44	17,43	17,56	17,92	17,83	4,27	3,14	2,86	3,24	3,31	3,14	2,80	2,88	0,94	0,93	0,93	0,92	0,94	0,93	0,93	0,92
16	43,1	42,7	42,3	41,7	40,9	41,7	42,0	42,0	16,58	17,63	17,90	17,35	17,62	17,61	17,99	17,93	4,12	3,02	2,81	3,26	3,04	3,04	2,67	2,76	0,94	0,91	0,92	0,90	0,91	0,91	0,90	0,91
18	41,6	41,3	41,0	41,1	39,4	40,4	40,8	41,7	16,22	17,26	17,49	16,80	17,31	17,22	17,74	17,65	4,35	3,29	3,09	3,73	3,26	3,35	2,89	2,96	0,92	0,89	0,90	0,90	0,90	0,90	0,90	0,90
20	43,1	42,4	42,7	42,3	40,4	41,7	41,6	41,7	15,76	16,80	16,98	16,12	16,82	16,92	17,41	17,22	4,73	3,68	3,53	4,33	3,68	3,66	3,16	3,36	0,91	0,89	0,89	0,90	0,89	0,91	0,89	0,90
22	45,2	44,3	47,1	46,8	48,2	47,4	47,0	45,2	16,20	16,95	17,00	16,15	16,78	17,12	17,63	17,65	4,33	3,57	3,53	4,31	3,72	3,56	3,00	2,98	0,91	0,89	0,89	0,90	0,89	0,93	0,90	0,90
24	46,3	45,1	49,1	47,9	48,1	47,6	48,5	49,5	15,96	16,81	16,84	16,13	16,94	16,87	17,28	17,35	4,75	3,84	3,80	4,41	3,64	3,70	3,33	3,27	0,95	0,93	0,92	0,91	0,91	0,91	0,91	0,91
26	47,1	45,7	50,1	49,3	48,7	48,3	50,1	49,8	15,53	16,56	16,59	15,73	16,55	16,50	16,79	16,77	5,06	4,07	4,06	4,85	4,05	4,13	3,83	3,84	0,93	0,93	0,93	0,93	0,92	0,93	0,92	0,92
28	47,9	46,0	50,5	49,9	49,4	48,8	51,0	49,9	15,42	16,46	16,47	15,57	16,45	16,40	16,65	16,63	5,05	4,11	4,08	4,93	4,08	4,16	3,90	3,86	0,91	0,91	0,91	0,92	0,91	0,92	0,91	0,89
30	49,0	46,6	51,0	50,3	50,1	49,3	51,5	50,3	15,30	16,41	16,48	15,52	16,45	16,37	16,64	16,64	5,03	4,01	3,95	4,84	3,97	4,06	3,81	3,79	0,89	0,88	0,88	0,89	0,88	0,89	0,88	0,88
32	50,0	47,1	51,3	50,5	50,4	49,4	51,8	50,9	15,25	16,41	16,53	15,54	16,48	16,39	16,62	16,60	4,86	3,85	3,76	4,65	3,80	3,87	3,65	3,66	0,85	0,85	0,85	0,86	0,85	0,85	0,84	0,84
34	51,0	47,5	51,4	50,7	50,7	49,5	52,1	51,4	15,31	16,46	16,58	15,55	16,56	16,50	16,70	16,67	4,65	3,64	3,55	4,42	3,57	3,62	3,42	3,44	0,82	0,81	0,81	0,82	0,81	0,81	0,81	0,80
36	51,2	47,1	50,7	50,4	50,4	48,9	51,5	51,3	15,36	16,55	16,67	15,55	16,63	16,59	16,74	16,72	4,38	3,40	3,29	4,20	3,32	3,36	3,21	3,22	0,78	0,77	0,77	0,78	0,77	0,77	0,76	0,76
38	51,6	46,9	50,6	50,5	50,1	48,4	51,1	51,5	15,43	16,66	16,75	15,51	16,72	16,68	16,83	16,82	4,07	3,14	3,04	4,00	3,06	3,08	2,97	2,97	0,74	0,73	0,72	0,74	0,72	0,72	0,72	0,72
40	52,0	46,6	50,5	50,6	50,0	48,2	50,9	51,4	15,46	16,79	16,84	15,52	16,82	16,77	16,93	16,87	3,77	2,85	2,81	3,75	2,80	2,83	2,74	2,72	0,69	0,68	0,68	0,69	0,68	0,68	0,68	0,67
42	47,7	42,0	47,4	47,4	48,3	48,4	48,9	48,7	15,53	16,93	16,95	15,60	16,92	16,86	17,03	17,02	3,50	2,57	2,54	3,46	2,56	2,62	2,47	2,48	0,65	0,64	0,63	0,65	0,64	0,64	0,63	0,63
44	49,0	42,5	49,1	49,4	52,1	52,7	52,6	53,3	15,51	16,94	16,88	15,46	16,80	16,76	16,94	16,97	3,25	2,34	2,37	3,23	2,38	2,47	2,36	2,33	0,60	0,58	0,58	0,59	0,57	0,59	0,59	0,59
46	50,4	43,4	50,0	49,8	52,5	52,1	52,1	52,5	15,51	17,05	16,89	15,37	16,57	16,54	16,86	17,09	2,78	1,96	2,03	2,84	2,19	2,18	2,15	2,13	0,51	0,50	0,50	0,51	0,50	0,49	0,53	0,55
48	51,2	43,5	49,6	50,3	56,5	56,1	56,0	56,2	15,21	16,82	16,90	15,99	17,00	17,25	16,98	16,66	2,44	1,75	1,72	2,28	1,76	1,63	1,68	1,77	0,43	0,42	0,43	0,46	0,45	0,44	0,42	0,41
50	51,3	42,9	49,2	50,0	56,8	56,2	56,0	56,4	16,88	17,86	17,77	17,08	17,85	18,41	18,60	18,74	1,36	1,10	1,15	1,52	1,23	1,02	0,89	0,79	0,34	0,35	0,36	0,39	0,40	0,40	0,38	0,36
52	51,5	42,6	49,4	50,2	57,1	56,1	56,0	56,3	17,00	18,12	18,16	17,63	18,15	18,53	18,49	18,47	1,17	0,87	0,85	1,02	0,88	0,73	0,75	0,74	0,30	0,31	0,31	0,31	0,31	0,30	0,30	0,30
54	51,1	42,1	49,1	50,2	56,6	56,0	56,0	56,6	16,98	18,11	18,15	17,70	18,10	18,42	18,33	18,28	1,09	0,80	0,79	0,93	0,82	0,70	0,73	0,74	0,28	0,28	0,28	0,29	0,29	0,28	0,28	0,28
56	50,8	41,6	49,2	50,2	57,0	56,1	56,1	56,2	17,04	18,14	18,22	17,77	18,17	18,40	18,36	18,36	1,02	0,73	0,72	0,85	0,73	0,65	0,65	0,61	0,26	0,26	0,26	0,27	0,26	0,26	0,25	0,24
58	50,4	41,3	49,3	50,0	57,1	56,1	56,1	56,9	17,15	18,25	18,31	17,85	18,27	18,40	18,47	18,47	0,94	0,64	0,64	0,77	0,65	0,60	0,56	0,54	0,25	0,24	0,24	0,25	0,24	0,24	0,23	0,22
60	50,1	41,2	49,3	50,1	57,2	56,3	56,0	56,6	17,24	18,35	18,41	17,95	18,37	18,45	18,60	18,60	0,87	0,56	0,57	0,70	0,57	0,54	0,51	0,52	0,23	0,21	0,22	0,23	0,22	0,22	0,22	0,22
62	49,2	40,7	49,2	50,0	57,0	56,1	56,0	57,3	17,39	18,45	18,48	18,05	18,48	18,53	18,68	18,72	0,82	0,52	0,53	0,64	0,53	0,52	0,49	0,49	0,23	0,21	0,21	0,22	0,22	0,21	0,22	0,22
64	48,5	40,4	49,5	50,1	57,0	56,2	56,1	57,0	17,53	18,56	18,55	18,14	18,54	18,58	18,83	18,80	0,75	0,52	0,52	0,59	0,51	0,51	0,46	0,47	0,22	0,22	0,22	0,21	0,21	0,22	0,22	0,22
66	43,7	36,7	50,6	49,9	60,9	61,0	60,9	61,5	17,69	18,67	18,63	18,22	18,61	18,71	18,96	18,91	0,70	0,50	0,50	0,55	0,49	0,49	0,44	0,44	0,21	0,22	0,22	0,20	0,21	0,22	0,22	0,22
68	43,6	37,1	50,8	50,2	61,3	61,3	61,1	61,4	18,20	19,06	18,85	18,35	19,01	19,15	19,38	19,48	0,56	0,42	0,46	0,53	0,43	0,42	0,39	0,36	0,20	0,22	0,22	0,20	0,22	0,23	0,25	0,25
70	43,4	37,9	50,3	50,0	65,0	65,0	66,2	66,5	18,45	19,30	18,91	18,48	19,57	19,90	20,04	20,05	0,47	0,36	0,43	0,50	0,32	0,21	0,13	0,14	0,19	0,22	0,21	0,20	0,23	0,20	0,15	0,16
72	43,0	38,5	50,2	50,1	65,1	65,1	66,1	66,5	18,59	19,38	19,18	18,74	19,79	20,11	20,16	20,13	0,45	0,33	0,39	0,47	0,26	0,15	0,06	0,05	0,19	0,21	0,22	0,21	0,22	0,19	0,08	0,06
74	42,2	38,5	50,7	50,1	65,1	64,8	66,0	66,4	18,89	19,52	19,40	19,00	19,98	20,34	20,41	20,37	0,42	0,32	0,35	0,44	0,21	0,05	0,02	0,02	0,20	0,22	0,23	0,23	0,21	0,08	0,04	0,04
76	41,2	38,2	50,3	50,0	65,4	65,3	66,0	66,5	19,03	19,56	19,47	19,06	19,97	20,30	20,43	20,42	0,44	0,34	0,36	0,44	0,23	0,07	0,03	0,03	0,23	0,24	0,24	0,23	0,24	0,11	0,06	0,05
78	40,6	38,2	50,0	50,0	65,2	64,9	66,0	66,5	19,04	19,57	19,50	19,11	19,91	20,20	20,34	20,37	0,46	0,36	0,38	0,46	0,27	0,14	0,06	0,05	0,24	0,26	0,27	0,25	0,26	0,19	0,10	0,09
80	39,6	37,7	50,0	50,0	65,0	65,1	66,1	66,1	19,15	19,60	19,55	19,20	19,89	20,15	20,31	20,34	0,49	0,39	0,41	0,48	0,31	0,20	0,13	0,12	0,27	0,29	0,29	0,28	0,29	0,26	0,20	0,20
82	38,9	37,5	50,5	50,1	65,5	65,1	66,1	66,3	19,21	19,63	19,61	19,24	19,89	20,17	20,27	20,29	0,49	0,41	0,42	0,49	0,33	0,23	0,18	0,17	0,28	0,31	0,31	0,29	0,31	0,29	0,26	0,26
84	38,4	37,4	50,0	50,1	65,6	65,2	66,3	66,5	19,29	19,70	19,66	19,27	19,91	20,16	20,27	20,30	0,49	0,42	0,42	0,51	0,35	0,25	0,20	0,20	0,30	0,33	0,32	0,30	0,34	0,32	0,29	0,30
86	37,4	36,7	50,6	50,2	65,1	65,1	66,2	66,1	19,35	19,75	19,70	19,31	19,94	20,17	20,28	20,30	0,49	0,42	0,43	0,52	0,37	0,27	0,22	0,20	0,31	0,35	0,35	0,32	0,37	0,35	0,33	0,30
88	36,8	36,3	50,4	50,1	65,4	65,1	66,2	66,5	19,43	19,79	19,71	19,36	19,93	20,17	20,29	20,28	0,49	0,42	0,44	0,52	0,37	0,27	0,23	0,22	0,32	0,36	0,36	0,32	0,36	0,35	0,34	0,33
90	33,2	33,3	50,7	50,3	65,1	65,0	66,1	66,1	19,50	19,85	19,77	19,41	19,94	20,17	20,26	20,29	0,49	0,42	0,44	0,52	0,38	0,28	0,25	0,22	0,34	0,38	0,38	0,34	0,38	0,36	0,36	0,34
92	32,4	32,6	50,2	50,1	65,0	65,1	66,0	66,1	19,51	19,87	19,70	19,33	19,94	20,17	20,24	20,27	0,49	0,40	0,46	0,56	0,39	0,30	0,24	0,25	0,34	0,37	0,37	0,34	0,39	0,38	0,34	0,36
94	39,6	37,5	50,8	50,3	65,4	64,9	71,3	71,3	19,54	19,95	20,15	20,06	20,29	20,36	20,41	20,36	0,49	0,37	0,42	0,27	0,23	0,22	0,18	0,19	0,35	0,37	0,52	0,31	0,35	0,37	0,34	0,32
96	39,6	36,6	50,8	50,1	65,3	65,0	71,1	71,8	20,72	20,67	20,71	20,82	20,86	20,85	20,85	20,84																
98	38,9	35,8	50,0	50,2	65,8	65,6	75,1	75,5	20,88	20,88	20,88	19,87	20,51	20,69	20,80	20,86																
100	37,9	35,1	50,7	50,2	65,5	64,9	75,0	75,5	18,96	19,86	19,96	19,02	19,96	20,21	20,34	20,35	1,34	0,71	0,65	1,21	0,54	0,41	0,29	0,27	0,67	0,65	0,66	0,62	0,55	0,56	0,48	0,45
102	37,2	34,7	50,5	50,2	65,5	65,0	70,1	70,5	19,04	19,70	19,47	18,98	19,97	20,19	20,33	20,38	1,30	0,83	0,99	1,40	0,53	0,39	0,26	0,22	0,68	0,67	0,67	0,71	0,54	0,51	0,42	0,39
104	36,5	34,4	50,0	50,3	65,7	65,0	70,0	70,8	19,11	19,71	19,52	19,02	20,05	20,24	20,40	20,44	1,30	0,84	1,00	1,43	0,52	0,37	0,19	0,15	0,71	0,68	0,70	0,74	0,57	0,52	0,35	0,29
106	36,0	34,1	50,9	50,1	65,7	65,1	70,2	70,7	19,18	19,78	19,60	19,14	20,11	20,28	20,45	20,49	1,28	0,84	1,01	1,41	0,52	0,37	0,17	0,12	0,72	0,72	0,75	0,78	0,62	0,55	0,34	0,27
108	35,3	34,6	50,5	50,4	65,4	65,2	70,0	70,9	19,28	19,86	19,64	19,22	20,11	20,30	20,47	20,50	1,23	0,80	1,01	1,40	0,52	0,37	0,17	0,15	0,74	0,73	0,77	0,81	0,62	0,57	0,35	0,33
110	34,4	34,7	50,1	50,4	65,6	65,3	70,2	70,8	19,38	19,87	19,64	19,24	20,12	20,27	20,46	20,47	1,19	0,81	1,03	1,42	0,53	0,38	0,17	0,15	0,75	0,75	0,78	0,83	0,63	0,55	0,35	0,30
112	35,9	34,6	49,9	50,3	65,5	65,0	70,0	70,4	19,41	19,86	19,62	19,25	20,10	20,28	20,43	20,45	1,16	0,81	1,05	1,44	0,54	0,39	0,20	0,15	0,75	0,74	0,79	0,85	0,64	0,59	0,38	0,29
114	35,8	35,1	50,0	50,4	65,3	65,0	70,1	70,9	19,36	19,90	19,66	19,25	20,10	20,30	20,48	20,49	1,25	0,83	1,07	1,49	0,55	0,40	0,20	0,15	0,79	0,79	0,83	0,88	0,65	0,61	0,42	0,33
116	38,1	36,1	50,4	50,5	65,3	65,2	70,4	70,7	19,10	19,75	19,52	19,00	20,04	20,28	20,42	20,46	1,62	0,93	1,21	1,73	0,62	0,42	0,22	0,17	0,87	0,78	0,85	0,89	0,68	0,63	0,42	0,35
118	38,2	35,5	50,0	50,1	65,3	64,9	70,1	70,5	18,73	19,65	19,46	18,87	20,05	20,27	20,43	20,47	1,99	1,06	1,26	1,89	0,62	0,41	0,22	0,17	0,89	0,81	0,85	0,91	0,69	0,61	0,43	0,36
120	37,2	34,7	50,4	50,2	65,3	65,0	70,2	70,7	18,88	19,69	19,55	19,03	20,19	20,34	20,49	20,51	1,88	1,06	1,19	1,81	0,52	0,39	0,22	0,17	0,91	0,84	0,85	0,95	0,68	0,63	0,47	0,39
122	35,9	34,2	50,7	50,1	65,9	65,1	70,0	70,5	19,10	19,73	19,61	19,11	20,19	20,31	20,46	20,50	1,67	1,04	1,14	1,72	0,52	0,37	0,19	0,17	0,90	0,85	0,85	0,94	0,68	0,58	0,40	0,37
124	34,6	34,8	50,0	50,0	65,8	65,3	70,2	70,3	19,29	19,82	19,66	19,15	20,17	20,32	20,45	20,50	1,49	0,97	1,11	1,70	0,52	0,37	0,20	0,15	0,90	0,86	0,86	0,94	0,66	0,58	0,39	0,32
126	36,5	34,5	50,0	50,3	65,5	65,1	70,2	70,5	19,42	19,85	19,68	19,20	20,20	20,35	20,49	20,52	1,36	0,94	1,11	1,68	0,52	0,38	0,20	0,15	0,89	0,86	0,87	0,96	0,69	0,63	0,43	0,34
128	35,7	34,2	50,2	50,2	65,6	64,9	70,1	70,8	19,37	19,87	19,71	19,21	20,19	20,34	20,46	20,50	1,44	0,94	1,09	1,66	0,52	0,39	0,22	0,15	0,91	0,87	0,88	0,96	0,68	0,65	0,45	0,32
130	34,6	34,2	50,3	50,4	65,5	65,3	70,2	70,5	19,41	19,91	19,71	19,27	20,20	20,36	20,49	20,51	1,41	0,92	1,09	1,63	0,52	0,39	0,22	0,16	0,91	0,88	0,88	0,97	0,68	0,66	0,48	0,35
132	35,7	34,3	50,0	50,0	65,5	65,0	69,9	70,7	19,52	19,96	19,72	19,31	20,22	20,38	20,51	20,52	1,29	0,91	1,10	1,65	0,52	0,39	0,22	0,17	0,90	0,92	0,90	1,00	0,71	0,69	0,50	0,40
134	34,8	34,3	49,9	50,4	65,7	65,2	70,2	70,8	19,51	19,96	19,78	19,32	20,21	20,36	20,51	20,52	1,32	0,89	1,07	1,67	0,52	0,39	0,22	0,17	0,92	0,90	0,92	1,03	0,70	0,67	0,50	0,40
136	35,9	34,0	50,0	50,0	65,5	65,4	70,3	71,0	19,51	19,96	19,79	19,32	20,19	20,34	20,47	20,49	1,28	0,87	1,06	1,68	0,53	0,39	0,22	0,17	0,89	0,88	0,91	1,03	0,69	0,65	0,46	0,38
138	34,3	34,4	50,8	50,1	65,1	65,0	70,3	70,6	19,54	19,96	19,81	19,28	20,18	20,35	20,47	20,49	1,28	0,86	1,06	1,72	0,54	0,39	0,22	0,17	0,91	0,87	0,93	1,03	0,71	0,66	0,46	0,37
140	38,1	34,8	49,9	50,0	65,8	64,8	69,9	70,6	19,53	19,97	19,81	19,24	20,17	20,36	20,47	20,42	1,28	0,88	1,06	1,76	0,55	0,39	0,22	0,17	0,90	0,90	0,93	1,03	0,71	0,66	0,46	0,33

Table A6: Run 4a - M50T35A, 50A, 65A, 75A and M70T35A, 50A, 65A, 75A

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	r5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	46,2	45,9	47,8	44,4	41,3	40,2	40,4	37,1	19,39	19,39	19,38	19,40	19,38	19,33	18,84	18,37	1,29	1,20	1,32	0,96	0,85	0,94	1,24	1,60	0,83	0,77	0,84	0,62	0,54	0,58	0,59	0,62
2	44,9	45,2	48,6	46,2	41,1	39,6	41,6	37,0	19,48	19,46	18,37	19,72	18,71	19,16	18,64	17,80	1,22	1,16	2,06	0,89	1,25	1,04	1,36	1,86	0,83	0,78	0,80	0,72	0,56	0,58	0,59	0,59
3	44,4	44,6	48,2	46,2	42,1	39,4	41,6	36,8	19,43	19,63	19,67	19,67	18,15	18,99	18,57	17,26	1,22	1,04	1,01	0,97	1,65	1,14	1,43	2,40	0,80	0,79	0,79	0,76	0,59	0,58	0,60	0,65
4	50,2	50,3	52,2	45,1	44,3	49,0	51,1	36,7	19,72	19,74	19,29	19,46	17,67	18,69	18,38	18,54	1,00	1,09	1,31	1,25	2,23	1,65	2,00	1,57	0,81	0,90	0,79	0,84	0,68	0,73	0,78	0,65
5	48,6	49,5	52,8	44,3	44,3	48,2	50,8	37,3	19,38	19,40	18,38	19,04	17,75	19,38	19,27	18,27	1,26	1,53	2,00	1,62	2,46	1,15	1,16	1,98	0,80	0,99	0,78	0,85	0,77	0,73	0,69	0,74
6	47,3	48,4	52,5	43,6	44,2	46,2	48,9	37,7	18,99	19,04	17,09	18,71	18,27	19,65	19,28	18,12	1,51	1,70	3,05	1,97	2,33	0,94	1,14	2,29	0,77	0,89	0,79	0,88	0,87	0,72	0,68	0,81
7	48,0	47,7	52,3	43,1	44,1	44,4	47,1	38,4	18,40	18,60	16,03	18,27	18,66	19,65	19,08	18,07	1,96	2,02	4,03	2,33	2,22	0,94	1,23	2,48	0,77	0,86	0,82	0,87	0,97	0,72	0,66	0,86
8	47,4	47,0	52,2	42,8	44,4	43,2	45,8	38,6	17,46	18,17	15,02	17,80	18,89	19,58	18,84	17,90	2,72	2,34	5,04	2,77	2,04	1,00	1,39	2,68	0,78	0,84	0,85	0,88	0,99	0,73	0,66	0,88
9	48,3	48,5	52,1	42,3	44,6	46,1	44,4	38,9	16,99	17,75	14,94	17,26	18,89	19,09	18,65	17,66	3,25	2,66	5,17	3,32	1,94	1,36	1,66	2,83	0,82	0,83	0,86	0,90	0,94	0,73	0,72	0,86
10	47,9	48,0	52,1	42,3	44,1	45,4	49,3	39,6	16,23	17,11	14,40	16,74	18,91	18,89	17,40	17,31	3,92	3,15	5,76	3,96	1,92	1,57	2,70	3,17	0,83	0,82	0,88	0,94	0,94	0,76	0,76	0,87
11	47,1	47,3	51,7	42,3	44,3	44,2	49,6	40,0	16,18	16,96	14,97	16,27	18,86	18,78	16,94	16,88	3,91	3,31	5,50	4,35	1,71	1,63	3,09	3,30	0,82	0,83	0,92	0,93	0,82	0,75	0,77	0,81
12	47,2	47,9	51,5	42,5	44,0	43,3	48,8	40,7	16,13	16,89	14,53	15,78	18,91	18,64	16,62	16,41	3,95	3,29	5,71	4,86	1,65	1,78	3,42	3,68	0,82	0,81	0,89	0,94	0,81	0,77	0,79	0,81
13	47,2	48,3	51,5	43,0	44,3	45,4	48,2	41,8	16,13	16,52	15,12	15,34	18,74	18,08	16,30	15,90	3,86	3,59	5,13	5,05	1,70	2,21	3,63	4,09	0,80	0,81	0,88	0,90	0,77	0,77	0,78	0,81
14	50,3	50,9	50,9	43,4	51,1	48,1	49,9	42,4	16,07	16,69	14,88	14,99	18,81	17,84	18,44	18,05	3,90	3,37	4,98	5,30	1,56	2,49	1,73	2,00	0,80	0,79	0,82	0,89	0,73	0,80	0,69	0,69
15	54,1	53,9	50,3	43,9	53,5	53,6	52,9	43,2	17,90	18,74	16,64	16,24	19,35	19,73	19,30	17,97	2,29	1,57	3,15	3,77	1,04	0,77	0,96	2,06	0,75	0,71	0,73	0,80	0,65	0,63	0,58	0,69
16	54,1	53,9	50,0	44,5	53,4	51,5	50,7	43,7	19,74	19,59	16,77	16,00	19,48	19,82	19,35	17,88	0,69	0,80	3,09	4,01	0,93	0,61	0,94	2,09	0,57	0,59	0,74	0,81	0,63	0,54	0,59	0,68
17	53,7	53,0	51,9	45,3	56,2	51,4	53,1	44,2	19,73	19,45	16,84	15,83	19,60	19,71	19,11	17,88	0,62	0,86	3,04	4,10	0,81	0,64	1,07	2,06	0,51	0,57	0,74	0,80	0,60	0,52	0,58	0,67
18	56,9	57,0	51,6	45,9	56,3	58,1	51,8	44,3	19,72	19,42	17,58	16,10	19,68	19,75	19,21	17,88	0,60	0,86	2,26	3,73	0,67	0,61	0,97	2,06	0,49	0,56	0,67	0,77	0,53	0,51	0,56	0,67
19	56,5	56,8	51,1	46,9	56,2	57,6	50,4	44,7	19,92	19,78	17,78	16,08	19,75	19,99	19,28	17,93	0,49	0,60	2,03	3,70	0,62	0,47	0,94	1,96	0,48	0,51	0,64	0,76	0,52	0,49	0,56	0,65
20	61,7	61,3	50,3	46,8	62,1	61,6	54,0	44,6	19,92	19,85	18,12	18,17	19,73	19,93	19,06	18,07	0,48	0,55	1,78	1,95	0,61	0,51	1,04	1,87	0,47	0,50	0,63	0,70	0,50	0,50	0,55	0,65
21	65,7	65,5	50,4	46,7	65,0	66,1	52,4	44,8	20,05	20,02	18,25	17,78	19,75	20,07	19,19	18,17	0,43	0,46	1,73	2,09	0,60	0,45	0,95	1,72	0,48	0,49	0,64	0,66	0,50	0,51	0,54	0,62
22	69,1	64,8	51,8	46,6	69,1	65,3	50,3	44,3	19,95	20,12	18,10	17,80	19,87	20,07	19,29	18,30	0,44	0,41	1,82	1,98	0,55	0,44	0,90	1,56	0,44	0,50	0,64	0,63	0,51	0,50	0,54	0,59
23	70,0	65,6	51,6	46,7	72,0	64,7	53,3	44,6	19,72	20,07	18,15	17,86	20,01	20,07	19,06	18,34	0,55	0,44	1,76	1,95	0,50	0,41	1,04	1,54	0,45	0,50	0,63	0,63	0,53	0,47	0,55	0,59
24	72,2	65,2	50,9	46,7	72,4	66,0	51,9	44,4	20,00	20,17	18,27	17,97	19,75	20,04	19,18	18,30	0,44	0,40	1,66	1,91	0,58	0,41	0,96	1,54	0,46	0,51	0,62	0,64	0,48	0,45	0,54	0,58
25	71,9	65,3	50,3	46,6	72,2	66,1	50,2	44,4	20,00	20,22	18,35	18,01	19,86	19,93	19,26	18,29	0,42	0,35	1,66	1,79	0,53	0,44	0,90	1,54	0,44	0,48	0,64	0,61	0,49	0,43	0,53	0,58
26	72,1	65,0	50,0	46,6	72,3	65,4	53,9	44,6	20,11	20,17	18,44	18,05	20,12	19,82	19,02	18,25	0,39	0,37	1,63	1,77	0,40	0,47	1,04	1,54	0,46	0,47	0,65	0,61	0,48	0,42	0,54	0,57
27	71,9	65,5	52,3	46,6	72,0	65,2	52,4	44,4	20,16	20,19	18,27	18,09	20,19	19,95	19,13	18,22	0,36	0,35	1,74	1,72	0,36	0,43	0,96	1,56	0,46	0,46	0,65	0,60	0,48	0,43	0,53	0,57
28	71,9	64,8	52,0	46,4	72,4	64,5	50,4	44,4	20,17	19,77	18,25	18,12	20,24	19,89	19,21	18,17	0,34	0,53	1,70	1,64	0,33	0,47	0,96	1,61	0,43	0,45	0,63	0,58	0,46	0,44	0,55	0,58
29	72,1	65,4	51,3	46,2	72,3	65,7	53,6	44,6	20,05	20,12	18,30	18,17	20,22	19,97	18,93	18,13	0,40	0,38	1,64	1,64	0,33	0,44	1,13	1,66	0,45	0,46	0,62	0,59	0,45	0,45	0,56	0,59
30	72,1	64,9	50,8	46,2	72,0	66,0	52,2	44,8	20,20	20,12	18,38	18,23	20,24	19,92	19,02	18,07	0,34	0,37	1,62	1,63	0,32	0,46	1,08	1,70	0,45	0,44	0,63	0,60	0,45	0,45	0,56	0,59
31	71,9	65,4	50,5	46,2	72,0	65,9	50,7	45,4	20,22	20,14	18,49	18,26	20,23	19,87	19,06	18,01	0,31	0,36	1,55	1,59	0,32	0,48	1,04	1,71	0,43	0,44	0,63	0,59	0,44	0,44	0,55	0,58
32	72,2	65,1	50,0	46,1	72,2	66,3	53,6	45,6	20,19	20,11	18,49	18,24	20,24	19,87	18,77	17,95	0,34	0,35	1,57	1,60	0,32	0,48	1,18	1,74	0,45	0,42	0,64	0,59	0,45	0,44	0,54	0,58
33	72,1	65,4	52,1	46,1	72,2	66,6	52,3	45,6	20,12	20,14	18,26	18,26	20,22	19,87	18,84	17,92	0,33	0,34	1,72	1,59	0,31	0,49	1,14	1,79	0,40	0,42	0,64	0,59	0,43	0,45	0,54	0,59
34	72,0	65,2	52,0	46,2	72,1	66,4	51,0	45,8	20,12	20,02	18,15	18,25	20,24	19,87	18,89	17,85	0,33	0,36	1,76	1,62	0,31	0,48	1,15	1,83	0,40	0,39	0,63	0,60	0,43	0,44	0,56	0,59
35	72,1	65,4	51,3	46,0	72,0	66,6	53,2	45,9	20,12	20,05	18,18	18,26	20,22	19,85	18,59	17,83	0,34	0,36	1,77	1,56	0,31	0,47	1,44	1,84	0,41	0,40	0,64	0,58	0,43	0,43	0,61	0,59
36	72,0	65,1	50,9	46,1	72,1	66,4	52,4	46,0	20,17	20,07	18,23	18,25	20,20	19,85	18,59	17,80	0,31	0,36	1,71	1,59	0,32	0,48	1,42	1,83	0,40	0,41	0,63	0,59	0,43	0,44	0,60	0,58
37	71,9	65,3	50,3	46,1	72,3	66,5	51,1	46,1	20,22	20,10	18,27	18,23	20,22	19,82	18,61	17,74	0,28	0,35	1,66	1,60	0,32	0,50	1,40	1,86	0,39	0,41	0,62	0,59	0,44	0,44	0,60	0,58
38	72,2	65,1	50,7	45,7	72,1	66,3	50,9	45,9	20,12	20,02	18,32	18,25	20,22	19,78	18,57	17,70	0,33	0,39	1,66	1,59	0,32	0,54	1,38	1,92	0,40	0,42	0,63	0,59	0,44	0,46	0,58	0,59
39	74,1	65,0	52,5	45,4	74,1	66,5	51,4	45,6	20,10	19,97	18,00	18,23	20,22	19,75	18,27	18,24	0,35	0,38	1,89	1,63	0,33	0,55	1,55	1,54	0,41	0,39	0,64	0,60	0,45	0,46	0,58	0,57
40	73,9	65,4	52,1	45,4	74,1	66,2	50,2	44,9	20,07	20,02	17,86	18,25	20,12	19,72	18,24	18,28	0,36	0,36	1,95	1,59	0,38	0,58	1,60	1,50	0,41	0,39	0,63	0,59	0,46	0,47	0,59	0,56
41	74,1	65,0	51,8	45,6	75,1	66,3	52,5	44,9	20,10	19,92	17,88	18,22	20,09	19,72	17,83	18,30	0,37	0,40	1,90	1,64	0,39	0,58	1,87	1,51	0,43	0,39	0,62	0,60	0,45	0,47	0,60	0,57
42	75,1	65,3	51,0	45,4	75,3	65,7	51,5	43,8	20,02	19,95	17,97	18,15	20,09	19,64	18,17	18,27	0,42	0,40	1,85	1,62	0,40	0,68	1,64	1,47	0,45	0,40	0,62	0,58	0,47	0,52	0,59	0,55
43	75,0	65,0	50,4	45,2	75,2	64,9	50,6	43,6	20,05	19,87	18,02	18,15	20,09	19,63	18,14	18,25	0,39	0,42	1,82	1,62	0,40	0,69	1,69	1,49	0,43	0,39	0,62	0,58	0,47	0,52	0,60	0,55
44	75,0	65,5	50,3	45,6	75,0	65,5	53,0	44,0	20,08	19,97	18,03	18,07	20,09	19,60	17,80	18,27	0,36	0,42	1,81	1,67	0,40	0,73	1,92	1,47	0,41	0,43	0,62	0,58	0,47	0,54	0,61	0,55
45	75,1	65,0	50,1	45,8	75,2	66,5	52,9	44,2	20,09	19,97	18,02	18,05	20,09	19,65	17,78	18,25	0,36	0,43	1,76	1,71	0,40	0,69	1,97	1,46	0,42	0,44	0,60	0,59	0,46	0,53	0,62	0,54
46	75,0	65,4	50,0	45,9	75,2	66,0	52,1	44,1	20,12	20,05	18,01	18,03	20,14	19,65	17,81	18,30	0,35	0,40	1,76	1,69	0,37	0,70	1,95	1,46	0,42	0,44	0,60	0,58	0,46	0,54	0,62	0,55
47	75,2	65,1	50,9	45,9	75,2	66,0	51,8	44,2	20,07	20,07	17,93	18,05	20,21	19,62	17,76	18,30	0,36	0,40	1,84	1,77	0,34	0,73	1,98	1,43	0,41	0,46	0,61	0,61	0,46	0,55	0,62	0,54
48	75,1	65,4	51,1	45,9	75,1	66,2	51,4	44,2	19,97	20,02	17,83	18,03	20,17	19,57	18,00	18,30	0,36	0,42	1,93	1,78	0,36	0,76	1,83	1,43	0,37	0,45	0,62	0,61	0,46	0,55	0,62	0,54
49	75,1	65,1	50,9	45,9	75,0	65,9	51,0	44,1	20,04	20,02	17,80	18,02	20,07	19,55	17,98	18,32	0,35	0,42	1,95	1,76	0,39	0,76	1,75	1,47	0,39	0,45	0,62	0,60	0,44	0,54	0,59	0,56
50	75,0	65,3	50,9	45,9	75,0	66,4	51,0	44,0	20,02	19,95	18,06	18,00	20,15	19,52	17,95	18,35	0,37	0,44	1,82	1,77	0,37	0,79	1,80	1,46	0,40	0,44	0,63	0,60	0,46	0,55	0,60	0,56
51	75,0	65,4	50,9	45,9	75,1	66,5	51,0	44,0	20,07	19,97	17,78	17,98	20,17	19,54	17,86	18,32	0,36	0,43	2,00	1,81	0,37	0,78	1,88	1,42	0,41	0,44	0,63	0,61	0,47	0,55	0,61	0,54
52	75,1	65,1	50,8	45,9	75,0	66,7	51,0	43,8	20,03	19,97	17,75	17,93	20,17	19,50	17,78	18,36	0,36	0,43	2,05	1,81	0,37	0,80	1,87	1,45	0,39	0,44	0,64	0,60	0,47	0,55	0,59	0,56
53	75,1	65,4	50,8	45,8	75,1	66,3	51,0	43,9	20,09	20,02	17,73	17,93	20,16	19,50	17,73	18,38	0,38	0,42	2,03	1,78	0,36	0,78	1,93	1,41	0,44	0,45	0,63	0,59	0,46	0,54	0,60	0,55
54	75,0	64,9	50,9	45,8	75,2	66,7	51,2	43,9	20,10	19,95	17,70	17,92	20,17	19,46	17,68	18,39	0,35	0,44	2,02	1,85	0,36	0,80	1,99	1,38	0,41	0,44	0,62	0,61	0,46	0,54	0,61	0,54
55	75,2	65,4	51,1	45,8	75,1	66,3	51,4	44,1	20,11	19,97	17,63	17,90	20,17	19,45	17,58	18,39	0,35	0,43	2,12	1,80	0,36	0,81	2,06	1,41	0,42	0,44	0,64	0,59	0,46	0,54	0,61	0,55
56	75,0	65,0	51,2	45,8	75,3	66,2	51,6	44,0	20,12	19,97	17,63	17,84	20,19	19,40	17,51	18,40	0,34	0,43	2,12	1,90	0,34	0,85	2,10	1,40	0,41	0,44	0,64	0,61	0,45	0,55	0,61	0,55
57	75,2	65,1	51,2	45,9	75,3	66,7	51,9	43,7	20,12	19,93	17,61	17,84	20,19	19,36	17,38	18,43	0,35	0,43	2,10	1,87	0,34	0,86	2,18	1,39	0,42	0,42	0,63	0,60	0,45	0,54	0,61	0,55
58	75,1	65,5	51,5	45,8	75,2	66,8	52,1	44,0	20,12	19,96	17,56	17,83	20,20	19,39	17,31	18,44	0,36	0,42	2,17	1,87	0,34	0,84	2,26	1,36	0,43	0,42	0,64	0,60	0,45	0,54	0,62	0,54
59	75,1	64,8	51,4	45,9	75,2	66,2	52,3	43,6	20,12	19,94	17,51	17,83	20,21	19,35	17,23	18,44	0,33	0,43	2,17	1,87	0,34	0,88	2,34	1,36	0,40	0,43	0,63	0,60	0,46	0,55	0,63	0,54
60	75,1	65,4	51,5	45,9	75,1	66,6	52,3	43,6	20,07	19,92	17,47	17,76	20,22	19,32	17,11	18,47	0,36	0,44	2,23	1,95	0,32	0,91	2,42	1,31	0,41	0,43	0,64	0,61	0,44	0,56	0,63	0,53
61	75,0	64,9	51,8	45,9	75,2	66,4	52,6	43,7	20,12	19,90	17,42	17,93	20,22	19,33	17,04	18,49	0,34	0,44	2,22	1,81	0,31	0,89	2,42	1,30	0,41	0,42	0,63	0,60	0,43	0,55	0,62	0,53
62	75,1	65,3	51,8	46,0	75,2	66,6	52,8	43,4	20,12	19,88	17,36	17,73	20,22	19,26	16,97	18,52	0,35	0,45	2,26	1,93	0,31	0,93	2,47	1,26	0,42	0,42	0,63	0,60	0,42	0,55	0,62	0,52
63	74,9	65,2	52,0	46,0	75,2	66,2	52,9	43,6	20,10	19,91	17,29	17,73	20,22	19,26	16,86	18,49	0,33	0,45	2,34	1,90	0,30	0,95	2,54	1,30	0,39	0,43	0,64	0,59	0,41	0,56	0,62	0,53
64	75,0	64,9	52,0	46,2	75,1	66,3	52,6	43,0	20,05	19,85	17,24	17,68	20,17	19,21	17,67	18,54	0,35	0,46	2,37	1,90	0,32	0,94	2,00	1,28	0,39	0,42	0,64	0,58	0,41	0,54	0,61	0,53
65	75,0	65,3	52,3	46,3	75,0	66,7	52,7	43,3	20,00	19,85	17,15	17,65	20,17	19,19	17,65	18,52	0,38	0,45	2,39	1,95	0,32	0,92	1,91	1,24	0,40	0,41	0,63	0,59	0,41	0,52	0,58	0,51
66	75,0	65,4	52,4	46,3	75,1	66,2	52,4	42,8	19,98	19,83	17,11	17,58	20,09	19,20	18,10	18,99	0,38	0,46	2,42	2,02	0,36	0,91	1,65	0,96	0,39	0,41	0,63	0,60	0,42	0,52	0,58	0,49
67	75,2	64,9	52,6	46,1	74,9	65,8	52,4	42,6	20,00	19,81	17,58	18,22	19,97	19,13	18,12	19,03	0,39	0,48	2,16	1,53	0,40	0,93	1,64	0,94	0,41	0,42	0,64	0,56	0,41	0,51	0,58	0,49
68	75,0	65,4	52,8	46,1	75,0	65,7	52,3	42,2	20,00	19,85	17,66	18,25	20,00	19,06	18,10	19,06	0,38	0,46	2,04	1,51	0,40	0,96	1,68	0,91	0,40	0,42	0,62	0,56	0,42	0,51	0,59	0,48
69	75,0	65,4	52,9	46,1	75,3	64,9	52,4	41,9	20,00	19,80	17,61	18,32	19,97	19,06	18,10	19,11	0,38	0,47	2,10	1,45	0,40	0,96	1,65	0,90	0,40	0,41	0,63	0,55	0,41	0,51	0,58	0,49
70	75,0	64,9	53,2	46,1	75,0	65,7	52,3	41,5	20,00	19,85	17,58	18,27	20,00	19,04	18,09	19,16	0,38	0,46	2,12	1,47	0,40	0,99	1,69	0,88	0,40	0,42	0,63	0,55	0,42	0,52	0,59	0,49
71	75,0	65,3	53,5	46,3	75,1	66,5	52,5	41,4	19,98	19,80	17,53	18,34	20,00	19,02	18,07	19,18	0,40	0,49	2,15	1,44	0,39	0,98	1,70	0,83	0,41	0,43	0,63	0,55	0,41	0,51	0,59	0,47
72	75,1	65,4	53,8	46,5	75,2	66,9	52,5	41,2	20,00	19,82	17,50	18,30	20,00	19,01	18,05	19,18	0,38	0,47	2,14	1,43	0,40	1,01	1,68	0,85	0,40	0,42	0,62	0,54	0,42	0,52	0,58	0,48
73	75,2	65,0	54,1	46,6	75,2	66,6	52,4	40,9	20,02	19,80	17,46	18,30	20,00	18,99	18,03	19,23	0,38	0,49	2,13	1,43	0,39	1,00	1,69	0,83	0,41	0,43	0,61	0,54	0,41	0,51	0,58	0,48
74	75,1	65,5	54,4	46,9	75,3	66,1	52,5	40,8	20,01	19,80	17,43	18,40	20,00	18,99	18,02	19,26	0,39	0,48	2,18	1,40	0,38	1,02	1,70	0,81	0,41	0,42	0,62	0,55	0,40	0,52	0,58	0,48
75	75,0	65,1	54,5	47,2	75,0	66,6	52,4	40,6	19,90	19,82	17,41	18,33	20,00	18,94	18,02	19,28	0,41	0,47	2,16	1,39	0,38	1,05	1,73	0,80	0,39	0,42	0,61	0,53	0,40	0,52	0,59	0,48
76	74,9	65,0	54,6	47,1	75,1	66,6	52,2	40,3	20,00	19,80	17,41	18,32	20,01	18,94	18,02	19,29	0,37	0,48	2,23	1,42	0,39	1,03	1,70	0,78	0,39	0,42	0,63	0,54	0,41	0,51	0,58	0,47
77	75,0	65,4	54,6	47,1	75,2	66,3	52,0	40,0	20,00	19,80	17,39	18,42	20,00	18,89	18,02	19,35	0,38	0,47	2,21	1,34	0,38	1,07	1,70	0,75	0,40	0,41	0,62	0,53	0,40	0,52	0,58	0,47
78	74,9	64,9	54,5	47,3	75,2	66,0	51,9	39,8	20,00	19,80	17,41	18,44	20,00	18,89	18,02	19,37	0,38	0,47	2,19	1,33	0,39	1,09	1,67	0,76	0,40	0,41	0,62	0,53	0,41	0,53	0,57	0,48
79	75,1	65,4	54,7	47,5	75,0	66,5	52,0	39,8	20,00	19,81	17,42	18,43	20,00	18,84	18,01	19,40	0,38	0,48	2,22	1,34	0,38	1,10	1,71	0,74	0,40	0,42	0,63	0,53	0,40	0,52	0,58	0,48
80	75,0	65,3	54,8	47,6	75,2	66,3	51,9	39,6	20,02	19,76	17,41	18,49	19,98	18,86	18,05	19,41	0,37	0,49	2,23	1,28	0,40	1,09	1,65	0,75	0,40	0,41	0,63	0,52	0,41	0,52	0,57	0,49
81	75,1	65,0	54,7	47,6	75,0	66,4	51,7	39,4	19,92	19,79	17,46	18,52	20,02	18,78	18,02	19,45	0,40	0,48	2,20	1,29	0,39	1,13	1,61	0,72	0,39	0,41	0,63	0,53	0,42	0,52	0,55	0,48
82	75,0	65,3	54,8	47,8	75,0	66,8	51,6	39,4	20,02	19,80	17,48	18,54	20,00	18,79	18,01	19,48	0,38	0,49	2,15	1,30	0,38	1,14	1,62	0,69	0,41	0,43	0,62	0,54	0,40	0,53	0,55	0,47
83	75,1	65,0	54,7	47,7	75,2	66,5	51,4	38,9	20,00	19,75	17,51	18,57	19,93	18,79	18,05	19,50	0,37	0,49	2,13	1,26	0,41	1,17	1,62	0,68	0,39	0,41	0,62	0,53	0,40	0,54	0,56	0,47
84	75,0	65,1	54,5	47,6	75,3	66,3	51,1	38,8	20,00	19,75	17,53	18,62	19,97	18,74	18,07	19,55	0,38	0,50	2,09	1,21	0,40	1,19	1,64	0,64	0,40	0,42	0,61	0,52	0,41	0,54	0,57	0,46
85	75,0	65,4	54,6	47,7	75,1	66,6	51,0	38,4	20,00	19,77	17,56	18,64	20,00	18,71	18,05	19,55	0,38	0,50	2,00	1,20	0,39	1,23	1,62	0,64	0,40	0,42	0,59	0,52	0,41	0,55	0,56	0,46
86	75,2	65,0	54,4	47,2	74,9	66,1	50,7	38,3	20,02	19,71	17,61	18,69	20,00	18,69	18,07	19,62	0,39	0,48	2,00	1,15	0,39	1,24	1,64	0,60	0,42	0,39	0,60	0,51	0,41	0,55	0,57	0,45
87	75,0	64,9	54,0	46,8	75,2	66,6	51,4	37,9	19,80	19,71	17,61	18,74	20,00	18,58	17,97	19,38	0,45	0,50	2,00	1,08	0,39	1,30	1,67	0,72	0,39	0,40	0,60	0,49	0,41	0,55	0,56	0,46
88	75,0	65,0	53,9	46,4	75,1	66,0	51,1	37,3	19,87	19,70	17,68	18,81	19,95	18,62	17,88	19,45	0,44	0,49	1,93	1,07	0,42	1,28	1,72	0,69	0,41	0,39	0,59	0,50	0,42	0,55	0,56	0,46
89	75,0	65,4	54,0	46,5	75,3	66,2	51,2	37,8	19,85	19,72	17,68	18,83	19,93	18,59	17,95	19,48	0,42	0,49	1,90	1,06	0,42	1,32	1,68	0,68	0,38	0,40	0,58	0,50	0,41	0,56	0,56	0,46
90	75,0	65,0	54,2	46,4	75,1	65,3	51,0	37,8	19,86	19,72	17,68	18,87	19,95	18,54	18,02	19,50	0,43	0,50	1,96	1,04	0,42	1,30	1,64	0,68	0,39	0,41	0,60	0,50	0,42	0,54	0,56	0,47
91	75,2	65,5	54,3	46,3	74,9	65,5	50,9	37,6	19,89	19,69	17,72	18,89	19,94	18,44	18,09	19,53	0,41	0,50	1,91	1,01	0,41	1,38	1,57	0,67	0,39	0,40	0,59	0,49	0,41	0,55	0,55	0,47
92	75,2	64,9	54,2	46,1	75,0	65,5	50,5	37,4	19,90	19,72	17,75	18,92	19,94	18,42	18,12	19,55	0,42	0,50	1,89	0,99	0,42	1,42	1,53	0,66	0,40	0,41	0,59	0,49	0,42	0,56	0,54	0,47
93	75,0	65,1	54,2	46,0	75,1	65,8	50,4	37,2	19,89	19,70	17,75	18,98	19,95	18,37	18,20	19,58	0,42	0,53	1,86	0,98	0,40	1,44	1,49	0,63	0,40	0,42	0,58	0,50	0,40	0,56	0,54	0,46
94	75,0	65,4	54,0	45,7	75,0	65,8	52,4	37,0	19,89	19,79	17,76	19,01	19,95	18,39	17,90	19,60	0,41	0,49	1,85	0,95	0,40	1,41	1,71	0,59	0,39	0,42	0,58	0,49	0,40	0,55	0,56	0,44
95	75,0	65,0	54,0	45,7	75,1	65,6	52,1	36,9	19,90	19,74	17,83	19,06	19,96	18,37	17,78	19,65	0,40	0,51	1,84	0,93	0,40	1,44	1,78	0,57	0,38	0,42	0,59	0,49	0,40	0,56	0,56	0,44
96	75,1	65,3	53,9	45,5	75,1	65,2	51,4	36,6	19,90	19,75	17,85	19,07	19,97	18,32	17,95	19,65	0,42	0,48	1,77	0,94	0,40	1,45	1,68	0,57	0,40	0,40	0,57	0,50	0,41	0,55	0,56	0,44
97	75,1	65,4	53,7	45,1	75,1	64,9	50,8	36,3	19,87	19,73	17,91	19,13	19,90	18,29	18,12	19,65	0,43	0,50	1,76	0,93	0,42	1,49	1,56	0,56	0,40	0,41	0,58	0,51	0,40	0,56	0,55	0,43
98	75,1	65,1	53,7	45,0	75,2	65,9	50,5	36,4	19,92	19,68	17,95	19,18	19,97	18,32	18,27	19,71	0,41	0,53	1,74	0,87	0,40	1,45	1,50	0,53	0,40	0,42	0,58	0,49	0,41	0,55	0,56	0,43
99	75,0	65,4	53,5	44,7	75,3	66,6	50,8	36,0	19,87	19,76	17,99	19,21	19,97	18,32	18,25	19,75	0,42	0,48	1,63	0,87	0,41	1,45	1,51	0,50	0,39	0,40	0,55	0,50	0,42	0,55	0,56	0,42
100	75,1	65,2	53,2	44,3	75,1	66,3	50,2	35,6	19,90	19,77	18,02	19,26	19,95	18,42	18,36	19,80	0,42	0,48	1,61	0,83	0,41	1,42	1,42	0,49	0,40	0,41	0,55	0,49	0,41	0,56	0,55	0,43

Continuation of Table A6: Run 4a

101	75,1	65,0	53,0	43,9	75,1	66,5	52,9	35,5	19,90	19,70	18,09	19,29	19,95	18,40	18,03	19,82	0,42	0,50	1,60	0,83	0,40	1,38	1,64	0,50	0,40	0,40	0,56	0,50	0,40	0,54	0,56	0,44
102	75,0	65,5	52,8	43,5	75,3	66,5	51,9	35,1	19,92	19,76	18,12	19,36	19,96	18,36	17,95	19,82	0,40	0,50	1,53	0,80	0,41	1,42	1,71	0,49	0,39	0,42	0,54	0,50	0,41	0,55	0,57	0,43
103	75,2	64,9	52,7	43,3	74,9	66,6	51,2	35,1	19,95	19,75	18,16	19,40	19,95	18,35	18,20	19,85	0,41	0,49	1,51	0,76	0,40	1,46	1,54	0,47	0,41	0,41	0,54	0,49	0,40	0,56	0,56	0,43
104	75,0	65,2	52,5	42,9	75,0	66,8	50,4	34,9	19,96	19,82	18,17	19,43	20,01	18,35	18,42	19,91	0,42	0,47	1,50	0,73	0,39	1,46	1,42	0,46	0,42	0,42	0,54	0,48	0,42	0,56	0,56	0,44
105	75,2	65,4	52,3	42,6	75,0	66,9	52,9	34,4	19,92	19,80	18,23	19,54	19,95	18,34	18,05	19,92	0,40	0,48	1,47	0,71	0,42	1,46	1,62	0,44	0,39	0,42	0,54	0,50	0,42	0,56	0,56	0,43
106	75,1	65,5	52,3	42,3	75,2	66,2	51,9	34,6	19,93	19,77	18,25	19,55	20,09	18,30	18,24	19,95	0,42	0,50	1,49	0,69	0,36	1,48	1,54	0,44	0,41	0,42	0,55	0,49	0,42	0,56	0,57	0,44
107	75,1	64,9	52,0	41,8	75,2	66,4	50,7	34,0	19,84	19,80	18,34	19,58	19,90	18,28	18,47	19,99	0,42	0,48	1,38	0,66	0,43	1,47	1,39	0,43	0,38	0,42	0,53	0,48	0,41	0,55	0,56	0,45
108	75,2	65,4	51,8	41,2	75,2	66,3	51,4	33,5	19,92	19,82	18,32	19,63	19,97	18,30	18,39	20,02	0,41	0,47	1,42	0,63	0,41	1,46	1,41	0,42	0,40	0,42	0,54	0,48	0,42	0,55	0,55	0,45
109	75,1	64,9	51,6	41,0	75,1	66,3	50,7	33,7	19,97	19,81	18,34	19,68	19,98	18,26	18,59	20,02	0,41	0,48	1,41	0,60	0,41	1,45	1,30	0,41	0,42	0,42	0,54	0,47	0,42	0,54	0,55	0,44
110	74,9	65,4	51,4	40,4	75,2	66,0	52,1	33,1	19,91	19,78	18,36	19,70	19,97	18,22	18,32	19,96	0,42	0,49	1,35	0,58	0,41	1,53	1,47	0,43	0,40	0,42	0,52	0,46	0,42	0,56	0,56	0,43
111	75,2	65,3	50,9	39,8	75,1	66,4	50,8	33,1	19,92	19,75	18,37	19,72	19,97	18,16	18,49	20,03	0,42	0,48	1,34	0,59	0,40	1,56	1,33	0,40	0,41	0,40	0,52	0,48	0,41	0,56	0,54	0,43
112	74,9	65,2	50,8	39,1	75,1	67,1	51,4	32,8	19,89	19,74	18,42	19,77	19,97	18,20	18,38	20,04	0,41	0,50	1,34	0,57	0,42	1,54	1,36	0,39	0,39	0,41	0,53	0,48	0,43	0,56	0,53	0,43
113	75,0	65,3	50,7	38,8	75,1	66,7	50,3	32,5	19,92	19,80	18,38	19,78	19,97	18,16	18,59	20,09	0,40	0,48	1,31	0,57	0,41	1,53	1,23	0,38	0,39	0,42	0,51	0,49	0,42	0,55	0,52	0,44
114	75,0	64,9	50,7	38,5	75,4	66,7	53,0	32,4	19,92	19,73	18,44	19,80	19,93	18,15	18,25	20,09	0,40	0,50	1,31	0,55	0,42	1,57	1,43	0,37	0,39	0,41	0,52	0,48	0,41	0,56	0,53	0,43
115	75,1	65,3	50,7	38,1	75,3	66,8	51,7	32,2	19,92	19,80	18,44	19,82	19,95	18,15	18,30	20,10	0,40	0,47	1,26	0,54	0,43	1,57	1,43	0,37	0,39	0,41	0,50	0,48	0,43	0,56	0,54	0,44
116	75,1	65,3	50,6	37,9	75,3	66,6	50,4	32,1	19,92	19,77	18,48	19,90	19,92	18,10	18,62	20,07	0,40	0,50	1,28	0,50	0,42	1,57	1,23	0,36	0,39	0,42	0,52	0,48	0,41	0,55	0,53	0,41
117	75,1	64,9	50,7	37,8	75,0	66,0	53,1	31,9	19,95	19,82	18,49	19,18	19,79	18,09	18,32	19,90	0,39	0,45	1,25	0,83	0,50	1,57	1,42	0,44	0,39	0,40	0,51	0,47	0,43	0,55	0,54	0,42
118	75,2	65,2	50,6	37,6	75,0	66,8	51,5	31,6	19,92	19,82	18,52	19,18	19,35	18,05	18,61	19,92	0,40	0,45	1,22	0,85	0,72	1,62	1,24	0,43	0,39	0,40	0,50	0,48	0,45	0,56	0,53	0,42
119	75,0	65,2	50,7	37,4	74,9	67,0	50,1	32,0	19,95	19,84	18,54	19,21	19,26	18,22	18,88	19,92	0,39	0,46	1,21	0,82	0,78	1,50	1,14	0,42	0,39	0,41	0,50	0,47	0,46	0,55	0,55	0,41
120	75,1	65,0	50,6	37,1	75,0	67,0	53,1	32,0	19,92	19,82	18,57	19,23	19,21	18,17	18,44	19,96	0,40	0,46	1,19	0,84	0,78	1,53	1,38	0,43	0,39	0,41	0,50	0,49	0,45	0,55	0,55	0,43
121	75,2	65,1	50,3	36,8	75,2	66,5	51,3	31,6	19,97	19,82	18,63	19,28	19,24	18,17	18,70	19,97	0,39	0,46	1,18	0,78	0,79	1,50	1,17	0,42	0,40	0,41	0,51	0,47	0,46	0,54	0,52	0,43
122	75,1	65,5	50,2	36,4	75,2	66,7	50,8	31,7	19,94	19,82	18,62	19,31	19,21	18,17	18,89	19,96	0,39	0,46	1,19	0,77	0,80	1,53	1,05	0,42	0,39	0,41	0,51	0,47	0,46	0,55	0,51	0,42
123	75,1	65,0	51,3	36,0	75,2	67,1	52,1	31,4	19,96	19,82	18,69	19,36	19,18	18,17	18,72	19,98	0,40	0,45	1,15	0,76	0,78	1,50	1,16	0,42	0,40	0,40	0,51	0,48	0,44	0,54	0,52	0,43
124	75,0	65,1	53,0	35,7	75,0	66,6	50,4	31,1	19,92	19,84	18,50	19,40	19,20	18,14	18,91	20,02	0,39	0,44	1,30	0,74	0,79	1,55	1,06	0,41	0,38	0,40	0,53	0,48	0,45	0,55	0,52	0,44
125	75,0	64,9	53,0	35,3	75,1	66,9	52,8	31,3	19,92	19,82	18,18	19,45	19,16	18,12	18,52	20,02	0,40	0,44	1,50	0,72	0,79	1,53	1,29	0,40	0,39	0,39	0,54	0,48	0,44	0,54	0,53	0,43
126	75,0	64,9	52,8	35,0	75,0	66,7	50,9	31,9	19,92	19,82	18,00	19,45	19,16	18,10	18,81	19,95	0,39	0,45	1,62	0,74	0,81	1,54	1,11	0,44	0,38	0,40	0,55	0,49	0,45	0,54	0,52	0,44
127	75,1	65,3	52,5	34,8	75,1	66,8	52,1	31,9	19,95	19,87	18,14	19,50	19,16	18,10	18,67	19,97	0,40	0,44	1,55	0,71	0,81	1,57	1,19	0,41	0,40	0,41	0,55	0,49	0,45	0,55	0,52	0,42
128	75,1	65,4	52,2	34,5	75,3	66,7	50,3	31,7	19,94	19,84	18,33	19,53	19,15	18,07	18,93	19,95	0,40	0,46	1,39	0,71	0,83	1,58	1,03	0,41	0,40	0,41	0,53	0,50	0,46	0,55	0,51	0,41
129	74,9	65,3	51,6	34,2	75,3	66,7	53,0	31,2	19,92	19,83	18,51	19,55	19,12	18,05	18,56	19,95	0,40	0,45	1,29	0,67	0,86	1,60	1,22	0,40	0,39	0,40	0,53	0,48	0,47	0,55	0,51	0,40
130	75,2	65,3	51,2	33,9	74,9	66,5	51,1	31,3	19,92	19,87	18,64	19,60	19,09	18,03	18,81	19,97	0,40	0,43	1,22	0,66	0,86	1,58	1,09	0,41	0,39	0,40	0,53	0,49	0,46	0,54	0,51	0,42
131	75,0	65,1	50,7	33,8	75,2	66,4	52,4	31,0	19,92	19,82	18,76	19,62	19,08	18,05	18,74	19,99	0,39	0,46	1,14	0,66	0,86	1,57	1,15	0,40	0,38	0,41	0,52	0,50	0,46	0,54	0,52	0,42
132	75,1	65,2	50,1	33,4	75,1	66,8	50,3	31,3	19,92	19,87	18,86	19,63	19,06	18,02	18,93	19,95	0,40	0,43	1,13	0,67	0,89	1,58	1,01	0,42	0,39	0,40	0,54	0,51	0,47	0,54	0,50	0,42
133	75,1	65,4	51,6	33,2	75,1	66,6	53,2	31,2	19,87	19,87	18,92	19,63	19,01	18,04	18,56	19,94	0,43	0,44	1,10	0,66	0,89	1,60	1,20	0,41	0,40	0,41	0,54	0,50	0,46	0,55	0,50	0,41
134	75,0	65,1	52,6	32,9	75,1	66,5	51,1	31,2	19,90	19,82	18,52	19,63	18,98	17,98	18,82	19,96	0,41	0,45	1,29	0,65	0,89	1,60	1,07	0,41	0,39	0,40	0,53	0,49	0,45	0,54	0,50	0,41
135	75,1	64,9	52,3	32,7	75,2	66,7	52,5	33,1	19,92	19,82	18,47	19,65	18,97	17,95	18,74	19,80	0,40	0,46	1,29	0,64	0,91	1,65	1,08	0,48	0,39	0,41	0,52	0,49	0,46	0,55	0,49	0,42

Table A7: Run 5 - OT35

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	37,7	34,6	34,7	33,8	33,4	33,7	40,7	45,7	18,23	13,75	11,19	13,91	15,78	15,84	8,59	6,33	1,87	5,24	8,05	6,20	4,61	3,33	10,47	15,65	0,69	0,73	0,83	0,88	0,89	0,65	0,85	1,07
2	38,3	35,0	35,5	34,3	33,4	33,7	41,1	43,6	17,02	14,20	13,93	13,96	14,55	14,18	11,25	7,35	2,74	5,34	6,02	6,19	5,61	5,48	8,20	14,61	0,70	0,79	0,86	0,89	0,88	0,81	0,85	1,07
3	39,0	35,7	36,3	35,1	34,4	35,0	40,5	42,5	14,57	11,98	11,74	12,65	13,54	10,85	10,32	7,61	5,52	8,25	8,78	7,93	7,01	10,24	10,84	15,73	0,86	0,92	0,95	0,96	0,95	1,01	1,02	1,18
4	39,4	36,2	36,7	35,5	34,6	35,2	39,3	40,6	15,15	12,49	12,36	12,65	13,29	11,92	10,92	8,21	6,01	9,18	9,29	8,02	7,66	9,31	10,96	15,51	1,04	1,08	1,08	0,97	1,00	1,03	1,09	1,22
5	39,6	36,6	37,0	35,9	34,8	35,6	38,3	39,4	15,60	12,91	12,71	12,83	13,33	12,11	10,27	8,30	5,30	8,56	8,38	7,99	7,65	9,18	11,61	15,39	0,99	1,06	1,02	0,98	1,00	1,04	1,09	1,22
6	39,6	37,1	37,3	36,3	35,0	36,0	37,3	38,3	15,76	12,96	12,82	12,87	13,31	12,12	10,39	8,35	5,01	8,27	8,29	7,98	7,63	8,93	11,60	15,46	0,97	1,04	1,02	0,99	1,00	1,01	1,10	1,23
7	39,4	37,4	37,4	36,7	35,6	36,3	36,5	37,5	15,82	13,00	12,87	12,89	13,27	12,20	10,56	8,46	4,91	8,12	8,34	8,09	7,57	8,69	11,77	15,08	0,96	1,02	1,03	1,00	0,99	0,99	1,13	1,21
8	39,1	37,8	37,6	37,0	36,1	36,7	35,7	36,7	15,84	13,07	12,91	12,92	13,29	12,43	10,67	8,57	4,88	7,97	8,15	8,02	7,54	8,45	11,58	14,84	0,95	1,01	1,01	1,00	0,98	0,99	1,13	1,20
9	38,7	38,1	37,8	37,2	36,5	37,0	35,0	36,0	15,77	13,14	12,98	12,96	13,29	12,67	10,81	8,52	5,01	7,77	8,08	7,74	7,49	8,19	11,43	14,80	0,97	1,00	1,01	0,97	0,98	0,99	1,13	1,19
10	38,2	38,3	38,0	37,4	36,8	37,0	34,3	35,4	15,89	13,20	12,96	12,96	13,27	12,72	10,87	8,68	4,81	7,77	7,93	7,65	7,38	8,06	11,44	14,41	0,95	1,00	0,99	0,96	0,96	0,98	1,13	1,17
11	37,9	38,6	38,1	37,6	37,0	37,1	33,7	34,9	15,99	13,29	13,03	13,03	13,29	12,85	10,99	8,81	4,74	7,49	7,96	7,69	7,25	7,91	11,25	14,18	0,95	0,98	1,01	0,97	0,95	0,98	1,13	1,17
12	37,6	38,8	38,2	37,7	37,2	37,2	35,5	34,5	16,04	13,34	13,14	13,09	13,33	12,94	10,81	8,77	4,58	7,45	7,69	7,63	7,23	7,59	11,61	13,98	0,93	0,98	0,98	0,97	0,95	0,95	1,15	1,15
13	37,3	39,0	38,3	37,8	37,5	37,2	36,7	34,1	16,36	13,36	13,18	13,16	13,36	13,00	10,94	8,70	4,17	7,28	7,71	7,33	7,14	7,66	11,54	13,97	0,91	0,96	0,99	0,94	0,94	0,96	1,15	1,14
14	36,9	39,1	38,2	37,8	37,6	37,2	36,4	33,7	16,02	13,64	13,34	13,31	13,45	13,14	11,19	9,06	4,56	6,98	7,32	7,14	6,90	7,24	11,18	13,38	0,93	0,95	0,96	0,93	0,92	0,93	1,15	1,13
15	36,7	39,2	38,3	37,8	37,8	37,2	35,8	33,3	16,04	13,60	13,40	13,34	13,49	13,22	11,16	8,92	4,48	7,04	7,20	7,12	6,83	7,25	11,33	13,36	0,91	0,96	0,95	0,94	0,92	0,94	1,16	1,11
16	36,4	39,2	38,1	37,7	37,8	37,0	35,0	33,1	16,15	13,74	13,53	13,45	13,56	13,33	11,39	9,17	4,21	6,70	7,01	6,88	6,68	6,99	10,86	12,82	0,88	0,93	0,94	0,92	0,90	0,92	1,14	1,09
17	36,0	39,0	37,8	37,5	37,6	36,7	34,1	33,3	16,24	13,69	13,53	13,51	13,58	13,36	11,47	9,23	4,14	6,75	6,96	6,82	6,71	6,94	10,57	12,65	0,88	0,93	0,94	0,92	0,91	0,91	1,11	1,08
18	35,3	38,4	37,3	37,1	37,4	36,3	33,2	33,7	16,29	13,82	13,71	13,58	13,67	13,67	11,34	7,06	4,05	6,44	6,70	6,71	6,57	6,53	10,44	14,90	0,87	0,90	0,93	0,91	0,90	0,90	1,09	1,07
19	34,9	38,1	36,8	36,7	37,1	35,9	36,9	33,2	16,91	13,98	14,44	14,13	13,39	13,82	11,52	9,45	3,43	6,17	5,75	6,10	6,78	6,33	10,10	12,15	0,85	0,89	0,88	0,90	0,90	0,89	1,07	1,06
20	34,8	38,0	36,7	36,6	37,1	35,7	38,6	36,0	16,15	13,78	14,18	14,04	13,07	13,78	11,67	9,70	4,04	6,39	6,05	6,24	6,98	6,14	10,02	11,66	0,84	0,89	0,89	0,90	0,89	0,86	1,08	1,04
21	34,7	37,9	36,4	36,4	36,9	35,4	38,1	36,2	16,28	13,91	13,93	13,67	12,62	13,67	11,44	9,66	3,92	6,35	6,17	6,46	7,40	6,00	10,25	12,19	0,84	0,90	0,88	0,89	0,89	0,82	1,08	1,08
22	34,5	37,5	36,0	36,1	36,6	35,0	37,1	35,1	16,24	13,82	14,50	13,58	12,51	13,78	11,43	9,88	3,96	6,55	5,73	6,57	7,68	6,05	10,32	11,89	0,84	0,92	0,89	0,89	0,91	0,84	1,08	1,07
23	34,5	37,5	35,9	36,0	36,6	34,8	36,2	34,9	16,26	13,89	14,00	13,84	12,78	13,77	11,32	8,53	3,93	6,35	6,20	6,27	7,33	6,12	10,26	13,76	0,84	0,90	0,89	0,88	0,90	0,85	1,07	1,11
24	34,7	37,5	35,8	35,9	36,4	34,5	35,3	35,2	17,02	14,75	14,69	14,33	13,14	14,04	11,78	10,27	3,28	5,57	5,52	5,82	6,83	5,82	9,58	11,66	0,83	0,90	0,88	0,88	0,88	0,84	1,04	1,09
25	34,9	37,6	35,9	35,9	36,3	34,5	38,9	35,5	16,37	14,09	14,71	13,91	13,03	14,00	11,36	10,23	3,82	6,08	5,51	6,12	7,04	5,91	10,00	11,54	0,83	0,89	0,88	0,87	0,89	0,85	1,04	1,08
26	35,2	37,7	36,0	36,0	36,5	34,5	40,7	35,2	16,31	14,05	14,04	13,94	13,05	14,04	11,56	10,36	3,88	6,15	5,95	6,11	6,97	5,88	9,87	11,39	0,84	0,89	0,86	0,87	0,88	0,85	1,05	1,08
27	35,4	37,8	36,0	36,0	36,4	34,3	40,1	35,5	16,39	14,15	14,22	14,05	13,16	14,11	11,72	10,50	3,80	6,06	5,87	6,01	7,00	5,84	9,88	11,21	0,83	0,89	0,87	0,87	0,90	0,85	1,07	1,07
28	35,2	37,5	35,7	35,7	36,1	35,4	38,8	35,3	16,37	14,22	14,31	14,13	13,27	14,24	11,87	10,65	3,85	6,02	5,86	5,94	6,83	5,80	9,56	11,05	0,84	0,89	0,88	0,87	0,89	0,86	1,05	1,07
29	35,2	37,5	35,6	35,5	35,9	34,9	37,7	35,0	16,39	14,35	14,36	14,22	13,34	14,09	11,89	10,70	3,87	5,83	5,68	5,86	6,72	5,93	9,61	10,91	0,85	0,88	0,86	0,87	0,88	0,86	1,06	1,07
30	35,2	37,2	35,4	35,4	35,8	34,6	36,7	35,5	16,46	14,35	14,40	14,27	13,47	14,20	12,00	10,74	3,74	5,90	5,65	5,74	6,53	5,79	9,33	10,92	0,83	0,89	0,86	0,86	0,87	0,86	1,04	1,07
31	35,2	37,2	35,3	35,3	35,6	34,8	35,7	35,7	16,57	14,38	14,49	14,33	13,54	14,44	12,10	10,92	3,61	5,79	5,58	5,72	6,47	5,36	8,99	10,60	0,82	0,88	0,86	0,86	0,87	0,82	1,02	1,06
32	35,1	37,1	35,1	35,2	35,4	34,5	38,3	35,2	16,48	14,49	14,55	14,42	13,69	14,42	11,78	10,85	3,69	5,59	5,44	5,54	6,31	5,37	9,48	10,65	0,83	0,86	0,85	0,85	0,87	0,82	1,03	1,05
33	35,1	37,0	35,1	35,0	35,3	35,5	39,8	35,3	16,46	14,47	14,58	14,44	13,71	14,33	11,97	10,97	3,66	5,60	5,32	5,45	6,27	5,47	9,06	10,46	0,82	0,87	0,83	0,84	0,87	0,83	1,01	1,05
34	35,0	36,8	34,9	34,9	35,0	35,0	39,2	35,1	16,51	14,56	15,17	14,93	13,85	14,58	11,63	10,83	3,62	5,51	4,70	4,84	5,87	5,17	9,19	10,57	0,82	0,86	0,81	0,80	0,83	0,81	0,99	1,04
35	34,9	36,6	34,7	34,7	34,8	34,5	38,1	35,2	17,40	14,60	15,35	15,00	14,24	14,78	12,41	11,27	2,89	5,48	4,60	4,76	5,56	4,92	8,29	9,97	0,81	0,86	0,82	0,80	0,83	0,80	0,97	1,03
36	34,7	36,4	34,4	34,5	34,6	35,0	37,1	35,0	16,53	14,71	14,80	14,64	14,04	14,51	12,36	11,25	3,55	5,31	5,16	5,24	5,83	5,27	8,45	9,99	0,80	0,85	0,84	0,83	0,84	0,82	0,98	1,03
37	34,8	36,3	34,4	34,5	34,4	34,5	36,1	35,6	16,59	14,75	14,86	14,75	14,20	14,73	12,49	11,30	3,48	5,25	5,09	5,15	5,69	5,08	8,19	9,82	0,80	0,85	0,83	0,83	0,84	0,82	0,97	1,02
38	34,8	36,3	34,3	34,4	34,7	35,3	35,3	35,0	16,60	14,80	14,93	14,80	14,29	14,53	12,52	11,41	3,47	5,19	5,02	5,03	5,61	5,26	8,19	9,79	0,80	0,84	0,83	0,82	0,84	0,82	0,97	1,03
39	34,8	36,2	34,3	34,3	34,7	34,7	39,2	35,4	16,62	14,86	14,98	14,89	14,36	14,91	12,16	11,32	3,44	5,09	4,96	4,98	5,46	4,93	8,71	9,72	0,80	0,84	0,83	0,82	0,83	0,82	0,99	1,01
40	34,7	36,0	34,1	34,2	34,6	34,3	40,9	35,4	16,57	14,86	15,02	14,93	14,42	14,96	12,47	11,45	3,51	5,10	4,89	4,93	5,47	4,89	8,26	9,78	0,80	0,84	0,82	0,82	0,84	0,82	0,97	1,03
41	34,6	36,0	34,0	34,1	34,6	35,5	40,2	35,3	16,64	15,02	15,13	15,02	14,53	15,17	12,08	11,14	3,50	5,05	4,79	4,90	5,39	4,73	8,72	10,08	0,81	0,85	0,82	0,83	0,84	0,82	0,98	1,03
42	34,9	35,4	34,5	34,3	34,2	34,7	38,9	35,7	17,22	15,08	15,12	15,07	14,87	15,15	12,85	11,70	3,00	4,99	4,87	4,94	5,01	4,74	7,95	9,48	0,81	0,85	0,84	0,84	0,82	0,82	0,98	1,03
43	34,9	35,2	34,4	34,1	34,5	35,2	37,6	35,2	16,77	15,11	15,09	14,95	14,60	15,17	12,82	11,69	3,37	5,02	5,02	5,08	5,34	4,77	8,08	9,63	0,81	0,86	0,86	0,85	0,84	0,82	0,99	1,04
44	35,1	35,4	34,6	34,5	34,4	34,8	36,7	35,3	16,84	15,12	15,08	15,11	14,66	15,18	12,89	11,76	3,33	4,95	5,01	4,94	5,33	4,66	8,02	9,50	0,81	0,85	0,85	0,85	0,85	0,81	0,99	1,03
45	34,9	35,2	34,5	34,3	34,4	34,4	35,8	35,5	16,90	15,18	15,17	15,04	14,71	15,20	12,94	11,85	3,27	4,94	4,90	4,95	5,26	4,78	7,90	9,32	0,81	0,86	0,85	0,84	0,84	0,83	0,99	1,02
46	34,6	34,9	34,2	34,1	34,2	35,4	38,1	35,6	16,82	15,27	15,33	15,17	14,76	15,24	12,40	11,70	3,39	4,80	4,66	4,84	5,30	4,77	8,35	9,62	0,82	0,85	0,83	0,84	0,86	0,83	0,98	1,04
47	34,4	34,8	34,1	34,0	34,2	34,8	40,1	35,4	16,84	15,17	15,24	15,15	14,82	15,15	12,74	11,83	3,31	4,97	4,83	4,90	5,30	4,88	8,09	9,41	0,81	0,86	0,84	0,84	0,86	0,84	0,99	1,03
48	34,4	34,7	34,2	34,7	34,7	34,4	39,6	35,4	16,84	15,29	15,33	15,24	14,98	15,47	13,02	12,00	3,37	4,79	4,75	4,86	5,08	4,49	7,64	9,10	0,82	0,85	0,84	0,85	0,85	0,82	0,96	1,02
49	34,4	34,7	34,1	34,6	34,4	35,5	38,6	35,3	16,97	15,44	15,38	15,18	14,90	15,35	12,98	12,05	3,24	4,70	4,60	4,93	5,11	4,63	7,64	8,96	0,82	0,85	0,83	0,86	0,84	0,83	0,96	1,01
50	34,4	34,7	34,1	34,6	34,4	34,9	37,6	35,5	16,82	15,57	15,48	15,29	15,00	15,51	12,76	12,68	3,39	4,54	4,51	4,73	5,02	4,49	7,96	8,43	0,82	0,84	0,82	0,84	0,84	0,83	0,97	1,02
51	34,3	34,6	34,1	34,5	34,5	34,6	36,7	35,8	16,90	15,44	16,09	15,73	15,22	15,90	12,74	12,84	3,31	4,64	3,94	4,17	4,69	4,13	7,83	8,30	0,82	0,84	0,81	0,80	0,82	0,82	0,95	1,02
52	34,2	34,5	34,3	34,3	34,4	35,3	35,8	35,4	16,72	15,71	16,28	15,88	15,42	15,46	13,33	12,43	3,51	4,34	3,83	4,09	4,52	4,49	7,16	8,62	0,83	0,83	0,82	0,81	0,82	0,82	0,94	1,01
53	34,2	34,3	34,1	34,0	34,3	34,4	38,6	35,7	16,68	15,86	15,71	15,55	15,24	15,68	12,89	12,25	3,55	4,23	4,35	4,44	4,79	4,38	7,77	8,77	0,83	0,83	0,83	0,82	0,84	0,83	0,96	1,01
54	34,2	34,2	34,1	34,1	34,2	35,5	40,2	35,3	16,53	15,84	15,75	15,62	15,33	15,62	13,14	12,32	3,71	4,33	4,29	4,43	4,75	4,37	7,29	8,74	0,84	0,85	0,82	0,83	0,84	0,82	0,93	1,01
55	34,1	34,1	34,1	34,1	34,3	34,8	39,6	35,5	16,80	16,00	16,20	16,00	15,49	15,73	12,74	12,92	3,42	4,44	4,05	3,90	4,39	4,16	7,64	8,34	0,83	0,84	0,81	0,82	0,81	0,80	0,93	1,04
56	34,5	34,4	34,2	34,1	34,2	34,6	38,6	35,8	16,84	15,93	16,50	16,11	15,69	16,06	13,58	12,58	3,31	4,18	3,56	3,98	4,23	3,92	6,95	8,14	0,81	0,83	0,80	0,82	0,81	0,80	0,94	0,97
57	34,4	34,3	34,1	34,3	34,3	35,1	37,5	35,1	16,91	16,04	15,89	15,77	15,44	15,58	13,40	12,45	3,24	4,08	4,04	4,18	4,51	4,37	7,06	8,26	0,80	0,83	0,80	0,81	0,82	0,81	0,93	0,97
58	34,2	34,1	34,6	34,1	34,3	34,5	36,5	35,6	16,60	16,04	15,89	15,77	15,49	15,95	13,53	12,49	3,59	4,03	4,09	4,20	4,41	4,06	6,96	8,28	0,83	0,82	0,81	0,81	0,81	0,81	0,94	0,98
59	34,0	34,1	34,6	34,1	34,4	35,4	35,6	35,3	17,02	16,06	15,84	15,82	15,51	15,71	13,51	12,16	3,10	3,95	4,14	4,18	4,42	4,28	6,87	8,67	0,79	0,81	0,81	0,81	0,81	0,82	0,92	0,99
60	34,2	34,4	34,5	34,2	34,3	34,7	38,8	35,4	16,60	16,08	15,86	15,82	15,57	15,84	13,14	12,25	3,52	3,92	4,11	4,10	4,36	4,12	7,23	8,31	0,81	0,80	0,81	0,80	0,81	0,81	0,93	0,96
61	34,1	34,3	34,4	34,1	34,4	34,8	40,3	35,6	16,48	16,13	16,35	16,22	15,78	16,26	13,05	12,58	3,56	3,83	3,66	3,81	4,10	3,76	7,27	8,01	0,80	0,79	0,80	0,81	0,79	0,80	0,92	0,96
62	34,1	34,1	34,2	34,2	34,5	34,3	39,8	35,9	16,35	16,70	16,37	16,22	15,86	16,22	13,80	12,80	3,63	3,38	3,68	3,74	4,08	3,74	6,54	7,84	0,79	0,79	0,80	0,79	0,80	0,79	0,92	0,96
63	34,0	34,0	34,1	34,0	34,4	35,6	38,8	35,0	16,73	16,31	16,13	15,99	15,77	16,04	13,73	12,82	3,39	3,60	3,81	3,95	4,20	3,88	6,61	7,82	0,80	0,78	0,79	0,80	0,81	0,79	0,91	0,96
64	34,2	34,1	34,3	34,6	34,3	34,8	37,6	35,0	16,79	16,37	16,19	16,19	15,84	16,08	13,80	12,91	3,29	3,58	3,75	3,82	4,11	3,85	6,58	7,62	0,79	0,78	0,79	0,80	0,81	0,79	0,92	0,95
65	34,2	34,4	34,3	34,5	34,3	35,3	35,9	35,6	16,92	16,14	16,53	16,10	16,04	16,88	13,47	11,03	3,22	3,84	3,62	3,87	3,91	3,21	6,93	9,54	0,80	0,80	0,82	0,80	0,80	0,79	0,93	0,96
66	34,2	34,5	34,5	34,7	34,5	35,2	38,3	36,2	16,11	15,40	15,40	15,48	16,08	15,97	13,27	11,50	3,98	4,66	4,58	4,39	3,89	4,01	7,16	9,27	0,82	0,84	0,83	0,80	0,80	0,80	0,93	0,98
67	34,9	34,3	35,1	34,7	34,2	34,6	40,0	35,5	16,17	15,60	15,46	15,44	15,64	15,62	13,18	11,34	3,95	4,30	4,51	4,52	4,21	4,27	7,24	9,39	0,83	0,80	0,82	0,82	0,79	0,80	0,93	0,98
68	34,4	34,4	34,9	34,2	34,3	35,0	39,3	35,4	16,26	15,51	15,07	15,02	15,24	15,62	13,05	11,18	3,86	4,39	4,86	4,85	4,62	4,33	7,54	9,28	0,82	0,81	0,83	0,82	0,81	0,81	0,96	0,95
69	34,0	34,3	34,6	34,0	34,5	34,5	38,3	35,2	16,20	15,46	15,20	15,06	15,31	15,58	12,91	11,14	3,85	4,46	4,77	4,79	4,51	4,36	7,73	9,34	0,81	0,81	0,83	0,81	0,80	0,81	0,96	0,95
70	34,4	34,4	34,1	34,3	34,3	35,2	37,0	35,7	16,06	15,37	15,33	15,51	15,04	15,41	11,27	10,26	3,88	4,42	4,58	4,43	4,74	4,52	9,40	10,07	0,79	0,79	0,81	0,81	0,80	0,82	0,97	0,94
71	34,2	34,4	34,4	34,1	34,6	34,7	36,3	35,6	15,71	15,02	14,40	15,22	15,58	15,93	11,60	10,17	4,18	4,73	5,45	4,63	4,32	4,19	9,24	9,84	0,80	0,80	0,83	0,81	0,80	0,83	0,99	0,91
72	35,0	34,3	34,4	35,2	34,2	34,2	35,5	35,5	16,48	14,82	14,84	15,37	15,76	15,74	8,66	10,08	3,55	5,03	4,86	4,54	4,15	4,25	12,46	9,83	0,79	0,82	0,80	0,81	0,80	0,83	1,01	0,90

Table A8: Run 6 - OT50

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
2	50,8	50,8	47,2	48,5			52,2	47,0	15,48	14,11	13,47	15,42			11,47	7,88	3,44	6,55	5,19	3,62			7,74	11,52	0,63	0,76	0,69	0,65			0,82	0,88
4	50,7	51,5	47,1	47,1			48,5	47,5	13,91	12,32	12,83	14,98			9,85	6,68	5,01	6,55	6,08	4,58			10,35	14,46	0,71	0,76	0,75	0,77			0,93	1,01
6	49,7	51,5	47,4	47,4			52,5	47,2	13,64	12,07	12,80	14,55			8,88	6,02	5,67	6,77	6,30	5,15			12,39	17,13	0,77	0,76	0,77	0,80			1,03	1,15
8	48,5	50,8	47,2	47,0			48,7	47,8	14,05	12,47	12,69	15,06			9,18	6,08	5,55	6,55	6,35	4,83			12,76	17,75	0,81	0,77	0,77	0,82			1,08	1,19
10	47,3	50,0	47,3	47,4			52,6	47,5	14,38	13,02	13,16	15,26			9,08	6,08	5,33	6,05	6,03	4,62			13,41	18,52	0,81	0,76	0,77	0,81			1,13	1,25
12	47,5	49,0	47,1	47,6			48,9	47,8	14,73	13,45	13,40	15,11			9,68	6,29	5,14	5,73	5,68	4,68			12,73	18,35	0,83	0,76	0,75	0,80			1,13	1,25
14	47,3	47,9	47,1	47,4			51,7	47,2	14,64	13,96	13,54	15,38			9,56	6,35	5,21	5,27	5,54	4,37			12,53	18,23	0,83	0,75	0,75	0,79			1,10	1,25
16	52,1	50,4	49,2	51,2			52,0	49,7	14,75	14,22	13,53	15,53			10,07	6,79	5,11	5,02	5,57	4,31			12,24	17,82	0,82	0,75	0,75	0,79			1,12	1,26
18	49,8	53,2	50,2	51,6			49,2	50,6	14,24	14,27	15,68	16,42			10,90	7,48	5,64	5,24	4,16	3,81			11,03	17,14	0,84	0,78	0,79	0,84			1,10	1,27
20	49,7	51,7	50,2	50,0			51,5	50,3	15,11	13,85	15,53	16,39			11,03	7,51	4,93	5,48	4,63	3,97			10,91	17,81	0,84	0,77	0,85	0,87			1,10	1,33
22	49,7	50,5	50,1	50,0			52,7	50,4	15,18	14,51	16,26	16,59			11,21	7,77	4,85	4,90	3,98	3,61			10,66	17,32	0,84	0,76	0,85	0,83			1,09	1,31
24	49,1	51,0	50,2	50,1			48,7	51,0	15,55	14,82	16,44	16,55			11,87	8,10	4,46	4,55	3,73	3,54			9,49	16,65	0,83	0,74	0,83	0,80			1,05	1,30
26	49,3	50,9	50,1	50,0			50,7	50,4	15,84	15,18	16,57	16,82			11,85	8,35	4,26	4,17	3,53	3,20			9,47	15,63	0,83	0,72	0,81	0,77			1,04	1,24
28	49,1	51,5	50,2	50,0			53,7	50,5	15,80	15,29	16,62	16,81			11,81	8,44	4,26	4,03	3,41	3,21			9,64	15,45	0,83	0,71	0,79	0,77			1,06	1,24
30	49,5	51,2	50,1	50,2			49,2	50,3	16,02	15,39	16,99	16,79			12,21	7,84	4,01	3,99	3,07	3,16			8,83	16,11	0,81	0,72	0,77	0,76			1,01	1,23
32	49,1	50,9	50,1	50,5			51,2	50,1	17,44	16,39	16,88	16,35			12,41	8,94	2,78	3,23	3,08	3,47			8,37	13,82	0,79	0,71	0,76	0,75			0,98	1,15
34	49,8	51,1	50,1	50,5			53,3	50,9	16,15	15,78	16,60	17,10			12,43	9,50	3,69	3,62	3,31	2,86			8,17	12,57	0,77	0,70	0,76	0,74			0,96	1,10
36	49,0	50,9	50,1	50,2			49,1	50,7	16,20	15,88	16,84	17,17			13,09	9,48	3,64	3,58	3,05	2,62			7,30	12,48	0,77	0,70	0,74	0,69			0,93	1,09
38	49,1	50,0	50,2	50,7			51,1	50,3	16,42	16,02	16,93	17,13			12,63	9,17	3,46	3,38	2,91	2,63			7,68	12,89	0,76	0,69	0,72	0,69			0,92	1,09
40	49,9	50,6	51,0	50,0			53,0	50,7	17,93	16,86	12,65	12,69			12,63	9,43	2,25	2,79	5,83	5,68			7,46	11,26	0,75	0,68	0,70	0,69			0,90	0,98
42	49,8	50,5	51,0	50,1			48,7	50,6	16,26	16,06	9,59	11,61			13,20	9,54	3,49	3,25	7,93	6,37			6,72	11,15	0,74	0,67	0,70	0,68			0,87	0,98
44	49,1	50,4	50,2	50,6			50,4	50,1	16,22	16,13	9,85	11,03			13,02	9,61	3,43	3,18	7,76	6,79			6,79	10,93	0,72	0,66	0,70	0,68			0,86	0,96
46	51,0	50,5	50,0	50,6			54,2	50,5	16,44	16,22	9,92	10,99			12,87	9,83	3,22	3,05	7,76	6,84			6,89	10,52	0,71	0,64	0,70	0,69			0,85	0,95
48	50,6	50,4	50,3	50,8			49,6	50,5	16,33	16,33	10,05	11,12			13,47	10,27	3,30	3,01	7,71	6,75			6,28	10,09	0,72	0,65	0,71	0,69			0,84	0,94
50	50,2	50,7	50,5	50,3			54,5	50,6	16,62	16,49	10,59	11,25			13,20	10,32	2,91	2,84	7,32	6,65			6,44	9,77	0,67	0,64	0,71	0,69			0,83	0,92
52	50,2	50,0	50,1	50,0			49,5	50,0	16,71	16,60	11,29	11,63			13,85	10,48	2,94	2,78	6,81	6,46			5,65	9,68	0,69	0,64	0,70	0,69			0,80	0,92
54	50,7	51,4	50,2	50,6			50,9	50,1	16,79	16,68	11,87	11,83			13,79	10,50	2,83	2,67	6,39	6,32			5,68	9,41	0,68	0,62	0,70	0,69			0,79	0,90
56	50,4	50,4	50,3	50,4			53,4	50,3	16,77	16,80	12,31	11,98			13,56	10,65	2,81	2,56	6,00	6,14			5,78	9,12	0,67	0,62	0,69	0,68			0,78	0,89
58	50,1	51,3	50,1	50,5			49,0	50,5	16,79	17,08	12,62	12,36			14,16	10,87	2,77	2,34	5,69	5,81			5,28	8,89	0,67	0,60	0,68	0,68			0,78	0,88
60	50,6	50,4	50,1	50,2			50,5	50,6	16,95	17,06	12,83	12,28			14,15	10,94	2,60	2,34	5,61	5,82			5,15	8,40	0,65	0,60	0,69	0,67			0,76	0,84
62	50,2	50,1	50,2	50,4			53,7	50,0	17,11	17,24	13,22	12,42			14,13	11,07	2,43	2,19	5,26	5,67			5,17	8,36	0,63	0,59	0,68	0,66			0,76	0,85
64	50,7	50,0	50,3	50,5			51,7	50,3	17,02	17,08	12,94	12,56			11,01	8,46	2,50	2,30	5,63	5,68			7,63	10,32	0,64	0,59	0,70	0,68			0,77	0,83
66	50,1	51,4	50,2	51,2			50,0	50,2	16,24	15,58	12,47	13,85			11,03	7,26	3,02	3,19	6,00	4,92			7,82	11,27	0,64	0,59	0,71	0,69			0,79	0,82
68	50,1	50,8	50,2	50,9			54,3	50,0	15,88	15,93	12,20	15,77			8,30	5,55	3,27	2,95	6,00	3,58			9,96	12,30	0,65	0,59	0,69	0,69			0,79	0,80
70	50,2	50,4	50,2	50,3			50,4	50,2	17,59	16,59	13,40	15,00			7,95	5,63	2,16	2,57	5,14	4,08			10,10	12,27	0,64	0,59	0,68	0,69			0,78	0,80
72	50,2	50,4	50,1	50,2			54,2	50,4	18,01	16,77	13,67	15,07			9,92	6,33	1,83	2,43	4,79	4,00			8,10	11,27	0,62	0,58	0,66	0,68			0,73	0,77
74	50,3	51,2	50,0	50,1			50,6	50,2	16,06	16,02	13,40	14,98			10,12	6,35	2,98	2,85	5,10	4,02			7,91	11,47	0,61	0,58	0,68	0,67			0,73	0,79
76	50,6	51,0	50,1	50,2			53,2	50,7	16,06	15,78	13,60	15,04			9,92	6,59	3,02	2,98	4,78	3,86			8,16	11,40	0,62	0,58	0,65	0,65			0,74	0,79
78	50,0	50,3	50,2	50,4			49,6	50,1	16,02	16,02	13,27	16,02			10,28	6,73	3,06	2,87	5,07	3,16			7,85	11,22	0,62	0,58	0,66	0,64			0,74	0,79
80	50,1	51,5	50,0	50,5			54,7	50,1	16,15	16,31	14,00	15,27			10,14	6,71	2,98	2,71	4,51	3,65			7,98	10,99	0,62	0,59	0,65	0,64			0,74	0,77
82	50,6	50,3	50,2	50,5			50,5	50,2	16,02	16,13	14,04	15,24			10,32	6,84	3,05	2,87	4,51	3,64			8,00	10,80	0,62	0,59	0,65	0,64			0,75	0,77
84	50,7	51,0	50,1	50,3			53,7	50,4	16,06	16,48	14,42	15,29			10,37	5,08	2,95	2,68	4,11	3,52			7,82	12,34	0,60	0,60	0,63	0,62			0,74	0,78
86	50,8	50,3	50,1	50,1			49,5	51,4	16,29	16,42	14,58	15,40			10,78	7,44	2,80	2,74	4,16	3,53			7,58	10,21	0,60	0,61	0,65	0,64			0,74	0,76
88	50,1	49,9	50,2	50,4			54,0	50,2	19,05	17,28	14,15	16,08			10,18	7,03	1,18	2,26	4,58	3,13			7,96	10,67	0,62	0,62	0,67	0,64			0,74	0,77
90	50,4	50,9	50,1	50,4			49,3	50,1	16,08	16,19	14,44	15,24			10,96	7,53	3,10	3,01	4,38	3,63			7,32	10,48	0,64	0,63	0,67	0,64			0,73	0,78

Table A9: Run 7 - OT65

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	51,4	51,8	52,2	51,1	51,5	52,2	51,9	51,2	11,98	14,33	10,63	6,57	5,68	4,15	3,27	4,91	8,70	5,63	9,29	14,38	15,88	18,31	19,80	18,61	0,97	0,85	0,90	1,00	1,04	1,09	1,12	1,16
2	51,5	51,8	52,1	51,7	51,3	51,1	53,3	51,4	14,56	13,16	9,05	6,02	5,13	3,62	2,92	4,66	6,01	6,93	11,54	14,93	16,77	18,54	20,01	19,06	0,94	0,89	0,97	1,00	1,06	1,07	1,11	1,17
3	54,3	56,1	55,5	57,1	54,4	54,3	58,8	55,9	14,44	13,09	9,23	6,17	4,82	3,43	2,74	4,76	6,05	7,00	11,37	15,81	17,26	19,27	20,03	19,10	0,93	0,89	0,97	1,07	1,07	1,10	1,10	1,18
4	54,9	54,4	54,6	55,8	54,2	54,0	57,0	54,1	14,69	14,40	9,34	6,06	5,18	3,67	2,78	4,87	5,82	5,83	11,38	16,23	17,03	19,18	20,17	18,17	0,93	0,89	0,98	1,09	1,08	1,11	1,11	1,13
5	57,6	58,7	58,8	59,5	57,1	58,7	54,9	58,0	14,91	13,80	9,28	6,26	5,02	3,42	2,67	3,89	5,44	6,36	11,55	15,87	16,89	19,46	20,29	19,62	0,90	0,89	0,99	1,08	1,06	1,11	1,11	1,15
6	57,6	57,7	57,6	58,6	57,0	57,4	65,0	57,4	15,09	14,35	10,43	6,66	5,40	3,84	3,16	4,09	5,27	5,87	10,41	15,43	16,48	19,16	20,10	19,89	0,90	0,89	0,99	1,08	1,06	1,12	1,13	1,18
7	57,9	57,4	57,1	57,2	57,4	57,4	62,2	57,3	15,26	14,91	10,87	7,30	5,71	4,11	4,18	5,68	5,12	5,07	8,97	13,38	15,24	18,02	17,94	15,88	0,90	0,84	0,89	0,98	1,00	1,07	1,07	1,04
8	57,3	57,1	57,2	57,5	57,4	57,3	58,8	57,1	15,00	14,60	10,56	7,06	5,58	4,02	4,78	5,60	5,18	5,21	8,94	13,06	14,91	17,44	16,49	15,50	0,87	0,82	0,86	0,94	0,97	1,03	1,02	1,01
9	57,1	57,2	57,1	57,2	57,4	57,3	59,5	57,2	15,09	14,51	10,79	7,06	5,68	4,11	4,22	5,82	4,92	5,15	8,64	12,92	14,20	16,84	16,56	14,83	0,84	0,80	0,85	0,93	0,93	1,00	0,99	0,98
10	57,1	57,2	57,0	57,1	57,2	57,1	61,6	57,4	15,22	14,58	11,14	7,06	5,73	4,20	4,36	5,33	4,70	5,03	8,24	12,64	14,00	16,58	16,09	15,31	0,82	0,79	0,84	0,91	0,92	0,99	0,97	0,98
11	57,5	57,0	57,1	57,5	57,5	57,3	59,1	57,2	15,24	14,55	11,23	7,24	5,68	4,13	3,98	5,27	4,63	5,06	7,97	12,34	13,59	16,65	15,78	15,21	0,81	0,79	0,82	0,90	0,89	0,99	0,93	0,97
12	57,3	57,3	57,0	57,7	57,6	57,1	56,9	57,2	15,13	14,51	11,23	7,10	5,55	4,09	3,74	5,17	4,60	5,02	7,87	12,19	13,86	16,52	16,01	15,31	0,79	0,78	0,81	0,88	0,90	0,98	0,93	0,97
13	57,0	57,1	57,3	57,7	57,2	57,4	61,5	57,0	15,17	14,99	11,81	7,24	5,69	4,25	3,62	5,44	4,57	4,53	7,31	11,79	13,58	16,20	16,12	14,89	0,79	0,76	0,80	0,86	0,89	0,97	0,93	0,96
14	58,9	61,6	62,1	62,9	60,9	62,4	59,3	61,2	14,95	14,75	11,83	7,44	5,80	4,09	3,31	5,40	4,86	4,71	7,39	11,62	13,33	16,52	16,41	15,55	0,81	0,76	0,81	0,86	0,88	0,98	0,93	1,00
15	60,8	61,5	60,9	61,5	61,2	61,4	66,6	61,1	16,26	14,99	11,38	7,52	6,24	4,58	4,15	6,24	3,80	4,53	8,42	11,82	14,12	16,37	16,97	14,71	0,81	0,76	0,88	0,88	0,96	1,00	1,01	1,00
16	61,2	61,1	61,0	61,9	61,0	61,1	63,3	61,1	16,40	14,13	11,32	7,22	6,94	4,78	4,24	6,59	3,78	5,18	8,57	12,22	13,73	16,33	16,38	13,64	0,83	0,76	0,89	0,89	0,98	1,01	0,98	0,95
17	61,0	61,2	61,3	61,4	61,0	61,4	63,6	61,2	16,06	14,23	11,25	9,25	6,22	5,29	4,15	8,53	4,01	4,97	8,44	10,41	13,11	14,72	15,79	11,92	0,82	0,74	0,87	0,89	0,89	0,94	0,94	0,96
18	61,4	61,6	61,3	61,0	61,0	61,5	64,2	61,4	16,66	14,44	11,38	9,45	6,50	4,86	4,80	9,52	3,39	4,69	8,13	10,12	12,72	15,12	14,70	10,97	0,79	0,72	0,85	0,88	0,88	0,94	0,91	0,96
19	64,9	64,9	65,7	66,1	64,4	65,3	61,4	64,9	15,48	14,51	11,24	9,33	6,22	4,38	4,02	9,24	4,27	4,89	8,06	10,23	12,67	15,41	15,41	11,48	0,78	0,76	0,83	0,88	0,86	0,93	0,91	0,98
20	64,1	64,0	64,3	64,9	64,3	64,2	69,5	64,5	15,53	14,95	11,27	10,72	7,19	5,17	5,37	9,48	4,28	4,68	8,03	8,90	11,70	14,83	14,18	11,13	0,79	0,78	0,83	0,87	0,85	0,94	0,91	0,97
21	64,0	64,2	64,5	64,2	64,0	64,1	65,3	64,1	15,44	15,33	12,40	11,49	8,04	5,53	5,84	9,32	4,41	4,38	6,93	8,14	10,97	14,49	13,75	10,70	0,80	0,78	0,81	0,86	0,85	0,94	0,91	0,92
22	64,0	64,1	64,1	64,8	64,1	63,9	68,4	63,9	15,57	15,27	12,25	11,56	8,57	5,77	5,66	10,08	4,30	4,32	6,87	7,98	10,40	13,81	13,61	9,89	0,80	0,76	0,79	0,85	0,84	0,91	0,89	0,91
23	64,1	64,5	64,1	64,1	64,2	64,2	67,2	64,0	15,79	15,28	12,11	11,78	8,69	5,69	5,15	10,05	3,97	4,20	6,81	7,79	10,30	13,73	14,06	9,81	0,77	0,74	0,77	0,85	0,84	0,90	0,89	0,90
24	65,3	65,4	65,2	65,7	65,2	65,3	63,3	65,1	15,80	15,17	12,09	11,29	8,77	5,29	5,06	9,12	3,91	4,28	6,91	8,21	10,11	14,09	13,98	8,41	0,76	0,74	0,78	0,85	0,83	0,90	0,88	0,91
25	65,2	65,0	65,2	65,2	65,1	65,0	68,0	64,9	16,64	15,86	12,72	11,63	9,34	6,09	5,26	8,99	3,19	3,61	6,42	7,83	9,52	13,23	13,81	8,31	0,74	0,71	0,78	0,84	0,82	0,89	0,88	0,90
26	65,2	65,3	65,0	65,8	65,0	65,2	64,2	65,2	16,09	15,66	12,47	11,67	9,48	6,26	6,62	9,94	3,60	3,70	6,44	7,80	9,29	12,93	12,32	9,91	0,74	0,70	0,76	0,84	0,81	0,88	0,86	0,90
27	65,1	65,1	65,0	65,5	65,3	65,1	69,5	65,6	15,80	15,44	12,25	11,34	9,45	6,08	6,68	10,34	3,86	3,91	6,61	8,07	9,20	13,09	12,27	9,34	0,75	0,71	0,76	0,84	0,80	0,88	0,86	0,88
28	64,9	65,4	65,1	65,5	65,2	65,1	66,6	65,5	15,84	15,60	12,56	11,60	9,39	6,04	6,46	9,21	3,83	3,80	6,38	7,76	9,36	12,97	12,46	10,21	0,75	0,71	0,76	0,83	0,81	0,87	0,86	0,87
29	65,2	65,1	65,0	65,7	65,1	65,0	65,3	65,4	15,64	15,33	12,54	11,72	9,28	6,13	6,46	9,39	3,98	4,05	6,48	7,57	9,45	12,89	12,46	10,06	0,75	0,72	0,77	0,82	0,81	0,87	0,86	0,87
30	65,1	65,3	65,1	65,5	65,0	64,9	67,2	65,1	15,84	15,58	12,56	11,49	9,15	5,99	6,42	9,39	3,78	3,87	6,46	7,66	9,32	12,87	12,50	10,17	0,74	0,72	0,77	0,81	0,79	0,86	0,86	0,88
31	65,1	65,3	65,0	65,8	65,0	65,0	63,4	65,0	15,84	15,58	12,71	11,81	9,34	6,15	6,40	10,03	3,78	3,81	6,34	7,40	9,17	12,73	12,22	9,50	0,74	0,71	0,77	0,81	0,79	0,86	0,84	0,87
32	65,0	65,4	65,4	65,6	65,3	65,1	68,3	65,1	15,84	15,91	12,83	11,65	9,17	6,00	6,51	10,08	3,73	3,48	6,25	7,44	9,42	12,71	12,13	9,46	0,73	0,69	0,77	0,80	0,80	0,85	0,84	0,87
33	65,1	65,3	65,2	65,3	65,2	65,2	64,5	65,3	15,95	15,79	12,89	11,23	9,59	6,80	6,40	9,37	3,60	3,56	6,13	7,78	9,09	12,03	12,22	10,07	0,72	0,69	0,76	0,80	0,80	0,85	0,84	0,87
34	65,1	65,0	65,1	66,0	65,3	65,1	69,3	65,3	15,99	15,57	12,71	11,78	9,36	6,97	6,99	9,26	3,57	3,66	6,18	7,34	9,16	11,74	11,59	10,05	0,72	0,68	0,75	0,80	0,79	0,84	0,83	0,86
35	65,0	65,1	65,1	64,9	65,2	65,0	67,1	65,3	16,10	15,93	13,16	11,39	9,39	6,19	6,35	8,43	3,44	3,31	5,76	7,84	9,13	12,55	12,26	10,89	0,71	0,66	0,74	0,82	0,79	0,85	0,84	0,87
36	65,1	65,3	65,0	66,2	64,9	65,0	63,7	65,9	15,91	15,82	13,16	11,71	9,48	6,26	6,13	8,77	3,58	3,49	5,76	7,67	9,06	12,49	12,30	10,60	0,71	0,68	0,74	0,83	0,79	0,85	0,83	0,87
37	65,1	65,2	65,1	65,5	65,1	65,0	67,5	65,3	15,91	15,53	13,09	11,40	9,56	6,33	6,40	10,45	3,58	3,74	5,82	7,93	9,11	12,57	12,22	8,93	0,71	0,69	0,74	0,83	0,80	0,86	0,84	0,85
38	65,1	65,4	65,1	65,7	65,0	65,1	63,1	65,3	16,37	15,93	13,38	11,87	9,94	6,66	6,53	10,41	3,30	3,46	5,60	7,63	8,70	12,29	12,26	9,06	0,72	0,69	0,74	0,84	0,79	0,86	0,85	0,86
39	65,1	65,4	65,4	65,6	65,2	65,3	68,6	65,0	16,37	15,90	13,38	12,69	9,25	6,88	6,70	9,10	3,30	3,43	5,60	6,86	9,13	12,10	12,40	10,19	0,72	0,68	0,74	0,83	0,78	0,86	0,87	0,86
40	65,4	65,4	65,1	65,4	64,9	65,3	64,8	65,5	16,08	15,09	12,60	12,58	9,26	6,48	6,24	9,48	3,51	4,10	6,18	6,78	9,24	12,44	12,65	9,75	0,72	0,70	0,74	0,81	0,79	0,86	0,86	0,85
41	65,0	65,1	65,2	66,0	65,1	65,3	68,7	65,2	15,97	14,84	12,63	12,62	8,99	6,26	6,04	9,28	3,59	4,28	6,16	6,58	9,45	12,49	12,52	9,57	0,72	0,70	0,74	0,79	0,79	0,85	0,84	0,82
42	65,0	65,3	65,2	64,8	65,1	65,3	67,1	65,2	15,81	14,94	12,51	11,89	9,92	5,82	5,55	9,26	3,65	4,15	6,16	7,16	8,60	13,01	13,09	9,59	0,71	0,69	0,73	0,79	0,78	0,86	0,85	0,82
43	65,2	65,3	65,2	66,0	65,2	65,4	63,5	65,0	15,73	14,80	12,76	11,05	8,63	5,82	5,26	8,98	3,71	4,24	5,98	7,72	9,73	12,86	13,34	9,70	0,71	0,69	0,73	0,78	0,79	0,85	0,85	0,81
44	65,2	65,2	65,1	64,9	65,0	65,3	67,9	65,1	15,97	14,93	12,87	11,47	8,46	5,82	5,31	8,33	3,44	4,03	5,82	7,30	9,87	12,86	13,29	10,35	0,69	0,67	0,72	0,77	0,79	0,85	0,85	0,82
45	65,1	64,8	65,0	66,1	65,2	65,2	63,8	64,9	15,93	15,66	12,98	11,99	8,82	6,03	5,13	8,61	3,46	3,54	5,58	6,99	9,70	12,68	13,29	10,12	0,69	0,67	0,70	0,78	0,80	0,85	0,84	0,82
46	64,9	64,9	65,2	65,0	65,4	65,1	69,6	64,8	15,89	15,61	12,85	12,27	9,45	6,62	5,99	9,46	3,39	3,58	5,59	6,34	8,86	12,04	12,27	9,08	0,67	0,67	0,69	0,73	0,77	0,84	0,82	0,79
47	65,1	65,2	65,1	66,1	65,1	65,3	66,0	65,5	16,20	15,31	12,80	12,18	9,74	6,11	5,64	9,19	3,18	3,78	5,71	6,23	8,63	12,32	12,71	9,29	0,67	0,67	0,70	0,71	0,77	0,83	0,83	0,79
48	65,0	65,3	65,7	64,9	65,3	65,3	67,4	65,1	16,09	15,09	12,85	11,50	8,92	5,93	5,40	9,03	3,26	3,93	5,67	6,71	9,26	12,62	12,75	9,30	0,67	0,67	0,70	0,71	0,77	0,84	0,82	0,78
49	65,0	65,3	65,2	66,1	65,0	65,4	66,8	65,1	15,99	15,24	12,83	12,27	9,23	6,29	5,58	9,15	3,32	3,77	5,68	6,08	9,02	12,17	12,76	9,20	0,67	0,66	0,70	0,70	0,77	0,83	0,83	0,78
50	64,7	65,3	65,1	65,5	65,1	65,1	64,6	65,1	16,02	15,11	13,05	12,11	9,34	6,28	5,38	9,23	3,25	3,80	5,45	6,28	8,94	12,03	12,61	9,02	0,66	0,65	0,69	0,71	0,77	0,82	0,81	0,77
51	64,7	65,0	65,1	65,8	65,1	65,6	67,1	65,2	16,09	15,24	13,00	12,63	9,51	6,52	5,76	9,48	3,21	3,71	5,49	5,82	8,69	11,98	12,30	8,83	0,66	0,65	0,69	0,70	0,76	0,83	0,81	0,77
52	64,8	65,1	65,2	65,7	65,0	65,5	63,2	65,2	16,10	15,73	13,22	13,13	9,28	6,91	6,24	9,61	3,15	3,34	5,33	5,40	8,64	11,65	11,92	8,62	0,65	0,64	0,69	0,69	0,74	0,83	0,81	0,76
53	65,5	65,1	65,1	65,3	65,2	65,0	68,2	65,2	16,26	15,40	13,24	13,71	9,66	6,66	5,89	9,08	3,05	3,50	5,24	5,00	8,35	11,72	12,20	9,14	0,65	0,63	0,68	0,69	0,74	0,82	0,81	0,77
54	65,3	65,2	65,0	65,8	65,3	65,0	64,7	65,0	15,91	15,41	13,29	13,55	9,76	6,59	5,84	9,74	3,28	3,55	5,13	5,03	8,28	11,78	12,24	8,52	0,65	0,64	0,67	0,68	0,74	0,82	0,81	0,76
55	65,1	65,0	65,2	65,0	65,3	65,2	69,0	65,1	16,16	15,31	13,25	13,40	10,41	6,77	6,09	9,63	3,07	3,61	5,24	5,21	7,69	11,49	12,04	8,60	0,64	0,64	0,68	0,69	0,73	0,81	0,81	0,76
56	65,2	65,3	65,1	65,7	65,2	65,2	67,3	65,4	16,20	15,62	13,60	13,80	9,77	7,01	5,86	9,96	3,04	3,36	5,00	4,79	8,27	11,15	12,07	8,46	0,64	0,63	0,68	0,67	0,74	0,80	0,80	0,77
57	65,7	65,0	64,9	65,0	65,0	65,6	63,3	65,0	16,31	15,57	13,42	13,56	10,21	6,68	5,86	9,94	2,97	3,34	5,12	5,10	7,84	11,56	12,07	8,37	0,64	0,62	0,68	0,69	0,73	0,81	0,80	0,76
58	64,9	65,2	65,1	65,9	65,0	65,0	68,2	65,2	16,31	15,57	13,45	13,93	10,43	6,93	6,19	9,41	2,92	3,39	4,95	4,63	7,57	11,22	11,81	8,66	0,63	0,63	0,66	0,66	0,72	0,80	0,80	0,75
59	64,9	65,0	65,0	65,1	65,1	65,3	64,4	65,1	16,31	15,60	13,60	13,56	9,96	7,06	6,33	10,14	2,92	3,32	4,85	4,95	8,02	11,11	11,84	8,11	0,63	0,62	0,66	0,67	0,73	0,80	0,81	0,75
60	65,1	65,0	65,2	65,9	65,2	65,0	69,1	65,0	16,24	15,51	13,51	14,04	9,99	7,16	6,03	10,54	2,97	3,43	4,98	4,49	8,00	11,03	12,38	7,81	0,63	0,63	0,67	0,65	0,73	0,80	0,83	0,75
61	64,5	65,4	65,1	65,2	65,2	65,2	66,7	65,2	16,08	15,46	13,29	13,93	10,28	6,85	6,23	10,37	3,02	3,18	4,90	4,70	7,58	11,28	12,36	7,94	0,62	0,58	0,64	0,67	0,71	0,80	0,84	0,75
62	64,6	65,3	65,3	65,3	65,0	65,0	66,0	65,2	16,27	15,71	13,75	14,28	10,48	7,67	5,99	10,39	2,85	3,09	4,54	4,40	7,43	10,36	11,97	7,92	0,61	0,59	0,63	0,66	0,71	0,78	0,80	0,75
63	64,8	65,5	65,2	65,9	65,2	65,4	66,6	65,4	16,37	15,66	13,35	14,26	10,28	6,71	5,97	10,26	2,79	3,23	5,09	4,35	7,79	11,53	11,98	8,02	0,61	0,61	0,67	0,65	0,73	0,81	0,80	0,75
64	65,2	65,5	65,1	64,8	65,2	65,5	63,5	65,2	16,20	15,62	13,54	14,05	10,12	6,57	5,48	10,43	2,95	3,30	4,96	4,35	7,91	11,65	12,38	7,78	0,62	0,62	0,67	0,63	0,73	0,81	0,80	0,74
65	65,4	65,1	65,0	65,6	65,2	65,1	67,5	64,9	16,19	15,50	13,65	14,58	10,34	7,33	6,09	10,50	2,90	3,22	4,67	3,95	7,43	10,62	11,89	7,73	0,61	0,59	0,64	0,62	0,70	0,78	0,80	0,74
66	65,1	65,4	64,9	65,8	65,0	65,0	63,2	65,0	16,04	15,55	13,62	14,31	10,48	7,62	6,26	10,81	3,04	3,29	4,76	4,32	7,43	10,40	11,46	7,40	0,62	0,61	0,65	0,65	0,71	0,78	0,78	0,73
67	64,8	65,3	65,2	65,3	65,2	65,1	68,8	65,3	16,06	15,53	13,67	14,15	10,50	7,37	6,42	10,86	2,98	3,25	4,66	4,15	7,32	10,59	11,33	7,47	0,61	0,60	0,64	0,61	0,70	0,78	0,78	0,74
68	64,7	65,0	65,5	66,1	65,3	65,2	64,8	65,4	16,31	15,60	13,67	13,65	11,60	7,44	6,68	10,83	2,78	3,10	4,66	4,53	6,45	10,67	11,27	7,29	0,60	0,58	0,64	0,62	0,69	0,79	0,79	0,72
69	64,7	65,1	64,9	64,8	65,1	65,1	68,4	65,0	16,33	15,85	13,02	13,40	11,12	7,52	6,40	10,90	2,77	3,01	5,08	4,68	6,88	10,48	11,64	7,24	0,60	0,59	0,64	0,62	0,70	0,78	0,80	0,72
70	64,6	64,9	65,1	65,9	65,1	65,5	66,9	64,4	16,24	15,60	13,31	14,16	11,42	7,73	6,51	10,90	2,78	3,16	4,89	4,28	6,77	10,31	11,84	7,24	0,59	0,59	0,64	0,63	0,71	0,78	0,82	0,72
71	64,8	65,0	65,0	65,0	65,4	65,3	64,4	65,1	16,26	15,21	13,22	13,33	11,67	8,09	6,42	10,94	2,77	3,33	4,87	4,80	6,12	9,90	11,33	7,01	0,59	0,58	0,63	0,63	0,66	0,77	0,78	0,70
72	64,6	65,2	65,2	65,4	65,0	65,5	67,0	65,1	16,28	15,80	13,13	14,46	10,87	8,06	6,37	10,92	2,76	2,94	4,85	4,22	6,96	9,80	11,37	7,22	0,59	0,57	0,62	0,65	0,69	0,76	0,78	0,72
73	64,6	65,2	64,9	66,0	64,9	64,9	63,2	65,1	16,35	15,62	13,82	14,71	10,81	7,46	6,35	10,41	2,62	3,09	4,42	3,68	7,00	10,39	11,24	7,38	0,57	0,58	0,62	0,59	0,69	0,77	0,77	0,70
74	65,1	65,5	65,0	64,8	65,0	65,3	67,8	65,1	16,19	15,75	14,04	14,42	10,99	7,75	6,80	11,29	2,71	2,91	4,22	3,98	6,57	10,03	10,90	6,76	0,57	0,56	0,61	0,61	0,66	0,76	0,77	0,70

Table A10: Run 8 - OT75

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	47,1	49,9	49,5	48,0		45,6	49,6		15,95	12,47	11,29	6,31		8,54	2,23		2,60	5,34	6,67	11,86		9,18	16,85		0,52	0,63	0,69	0,81		0,74	0,90	
2	47,0	51,3	51,1	50,0		46,0	48,5		15,29	8,52	5,95	3,25		4,13	2,09		3,45	9,57	10,95	14,51		14,13	17,54		0,61	0,77	0,73	0,82		0,84	0,93	
3	51,2	52,5	51,8	51,0		50,0	55,8		15,29	6,78	5,03	2,67		2,23	1,03		3,57	11,19	12,58	15,72		18,53	20,12		0,63	0,79	0,79	0,86		0,99	1,01	
4	50,5	53,6	52,2	51,5		49,3	54,7		14,84	5,89	5,33	2,85		3,11	1,96		4,09	12,50	12,81	15,75		17,30	20,13		0,67	0,83	0,82	0,87		0,97	1,06	
5	49,8	54,2	52,3	51,9		50,0	52,6		14,89	5,93	6,00	3,03		2,43	1,78		4,18	12,47	12,41	15,59		17,78	18,98		0,69	0,83	0,83	0,87		0,96	0,99	
6	49,1	54,5	52,3	51,8		49,8	50,5		15,79	6,26	6,84	3,45		2,78	1,73		3,56	12,19	11,85	15,23		17,44	18,84		0,69	0,83	0,84	0,87		0,96	0,98	
7	49,2	54,4	51,9	51,6		49,9	52,5		14,98	6,75	7,97	3,93		2,58	1,83		4,18	11,64	10,90	14,98		16,90	18,55		0,70	0,82	0,84	0,88		0,92	0,97	
8	49,6	54,5	51,6	51,5		49,7	53,0		15,99	7,41	8,97	4,31		2,98	1,69		3,27	10,97	10,18	14,64		16,17	18,68		0,66	0,81	0,85	0,88		0,90	0,97	
9	52,1	54,3	51,2	51,7		55,2	51,1		16,19	8,35	9,92	4,66		2,49	1,87		3,09	9,83	9,60	14,34		16,43	18,32		0,65	0,78	0,87	0,88		0,89	0,96	
10	54,6	55,1	60,5	60,3		54,8	60,0		16,31	8,28	10,52	6,22		2,92	2,07		3,02	9,76	9,07	13,11		16,05	18,12		0,65	0,77	0,87	0,89		0,89	0,96	
11	54,1	54,8	58,5	59,0		54,0	57,5		16,13	8,94	10,65	6,89		2,58	1,74		3,13	9,25	8,86	11,95		16,53	18,25		0,65	0,77	0,86	0,85		0,90	0,95	
12	54,6	54,2	57,5	58,0		54,8	54,9		16,48	9,81	10,45	7,30		2,49	1,96		2,91	8,36	8,40	11,19		16,61	18,04		0,65	0,75	0,80	0,82		0,90	0,95	
13	54,6	54,0	56,9	57,3		54,3	59,1		16,20	10,54	10,71	3,93		2,52	1,93		3,04	7,81	8,09	13,62		16,59	17,88		0,64	0,75	0,79	0,80		0,90	0,94	
14	54,0	54,7	55,6	56,3		54,6	57,9		16,39	11,07	10,57	3,87		2,69	2,01		2,83	7,31	7,99	13,66		16,07	17,80		0,62	0,74	0,77	0,80		0,88	0,94	
15	54,3	54,1	54,0	55,2		54,2	55,2		16,81	11,08	10,94	4,84		2,90	1,91		2,53	7,30	7,71	12,73		15,70	16,95		0,61	0,74	0,77	0,79		0,87	0,89	
16	54,6	55,4	58,3	54,0		54,3	58,2		16,47	11,43	11,83	6,04		2,59	1,65		2,73	6,95	6,84	11,78		15,97	16,98		0,61	0,73	0,75	0,79		0,87	0,88	
17	54,8	54,5	56,8	55,8		54,0	57,3		16,88	11,64	11,98	5,86		2,83	2,07		2,40	6,80	6,64	12,07		15,58	16,61		0,59	0,73	0,74	0,80		0,86	0,88	
18	54,3	55,2	54,5	55,1		54,6	54,9		16,79	11,76	11,63	6,79		3,02	1,81		2,45	6,62	6,43	11,33		15,24	16,84		0,59	0,72	0,69	0,80		0,85	0,88	
19	54,2	54,1	58,6	54,2		54,3	58,7		16,77	11,34	13,16	8,13		2,85	1,92		2,47	6,92	5,38	10,13		15,57	16,75		0,59	0,72	0,69	0,79		0,86	0,88	
20	55,1	55,9	57,1	55,4		54,7	56,8		16,51	11,40	12,36	7,01		2,46	2,09		2,66	6,88	5,76	11,01		15,90	16,60		0,60	0,72	0,67	0,79		0,86	0,88	
21	58,0	60,5	62,8	62,0		58,2	63,2		16,42	11,99	12,53	8,44		2,62	2,60		2,72	6,36	5,56	10,01		15,58	15,96		0,60	0,71	0,66	0,80		0,85	0,87	
22	61,4	62,3	60,8	61,9		61,4	61,3		16,99	12,89	14,75	11,92		2,98	2,69		2,38	5,56	4,09	7,04		15,27	15,89		0,60	0,69	0,66	0,78		0,85	0,87	
23	65,4	66,7	68,8	68,7		65,2	69,7		17,28	13,56	14,88	13,46		4,44	3,09		2,20	4,80	4,01	5,77		14,20	15,18		0,60	0,65	0,66	0,77		0,86	0,85	
24	65,3	65,4	66,1	65,6		65,0	65,1		18,34	15,24	16,42	14,95		8,04	4,97		1,44	3,54	3,04	4,50		10,97	13,42		0,55	0,62	0,67	0,75		0,85	0,84	
25	70,3	71,1	72,5	73,2		70,6	73,3		18,68	15,64	16,30	15,93		9,10	8,10		1,09	3,19	3,12	3,71		9,95	10,41		0,48	0,60	0,67	0,74		0,84	0,81	
26	70,0	70,4	70,2	69,9		70,4	72,3		18,85	15,91	16,19	13,76		8,51	10,28		1,01	2,92	3,09	5,25		10,33	8,54		0,48	0,58	0,65	0,73		0,83	0,80	
27	73,9	75,6	75,7	76,5		75,1	77,2		18,79	16,61	16,81	14,11		9,99	10,96		1,04	2,39	2,57	4,99		9,10	7,99		0,48	0,55	0,62	0,73		0,83	0,80	
28	75,3	75,6	75,1	75,7		75,6	76,7		19,01	16,55	16,99	14,57		8,88	10,81		0,85	2,38	2,42	4,47		9,78	8,01		0,44	0,54	0,61	0,70		0,81	0,79	
29	75,0	75,0	75,9	74,8		75,5	76,6		18,97	17,50	17,77	14,77		10,19	10,72		0,87	1,79	1,56	4,02		8,39	7,77		0,44	0,52	0,49	0,65		0,78	0,76	
30	75,2	75,0	74,7	76,0		75,4	76,5		18,86	17,97	17,97	15,84		10,32	10,99		0,84	1,37	1,37	2,81		7,65	7,17		0,40	0,46	0,46	0,55		0,72	0,72	
31	75,1	75,0	76,2	75,3		75,3	76,2		19,38	17,94	17,90	15,75		10,99	11,17		0,52	1,29	1,34	2,76		6,87	6,75		0,33	0,43	0,44	0,53		0,69	0,69	
32	75,1	74,8	74,9	74,8		75,5	76,3		19,52	18,24	18,14	16,10		11,23	11,38		0,46	1,11	1,21	2,47		6,42	6,32		0,32	0,41	0,43	0,51		0,66	0,66	
33	75,2	74,9	75,6	76,1		75,3	76,3		18,97	18,19	18,30	15,84		10,56	11,45		0,63	1,13	1,06	2,61		6,75	6,08		0,32	0,41	0,40	0,51		0,65	0,64	
34	75,1	74,9	74,9	75,5		75,3	76,4		19,47	18,23	18,23	15,69		11,29	11,54		0,46	1,09	1,09	2,68		5,99	5,93		0,31	0,40	0,40	0,51		0,62	0,63	
35	75,0	75,2	75,6	74,8		75,2	76,5		19,39	18,21	18,30	15,80		11,32	11,65		0,50	1,10	1,03	2,63		5,87	5,77		0,32	0,40	0,39	0,51		0,61	0,62	
36	75,0	75,1	75,3	74,9		75,1	76,4		19,58	18,26	18,14	16,11		11,03	11,25		0,44	1,05	1,12	2,32		6,05	5,92		0,32	0,39	0,40	0,48		0,61	0,61	
37	75,0	75,3	75,7	76,1		75,0	76,3		19,68	18,17	18,48	16,24		11,58	12,07		0,42	1,11	0,91	2,26		5,62	5,24		0,33	0,40	0,37	0,48		0,60	0,59	
38	75,1	75,1	74,9	75,5		75,6	76,1		19,48	18,12	18,15	16,42		11,27	12,27		0,49	1,13	1,04	2,17		5,81	5,12		0,33	0,40	0,37	0,48		0,60	0,59	
39	75,1	75,1	75,9	74,5		74,9	76,1		19,67	18,19	18,45	16,35		11,89	12,47		0,42	1,10	0,93	2,21		5,35	4,92		0,33	0,40	0,37	0,48		0,59	0,58	
40	75,1	74,9	74,8	75,8		75,3	76,0		19,67	18,41	18,50	16,59		11,83	12,56		0,42	0,99	0,91	1,96		5,29	4,78		0,33	0,39	0,37	0,45		0,58	0,57	
41	75,1	75,0	76,1	75,5		75,0	75,9		19,59	18,48	18,50	16,60		12,02	12,62		0,44	0,94	0,91	1,96		5,18	4,75		0,32	0,38	0,37	0,45		0,58	0,57	
42	74,9	75,0	75,2	74,8		75,2	75,8		19,52	16,95	17,10	16,75		11,98	12,43		0,46	1,68	1,58	1,85		5,20	4,77		0,32	0,42	0,41	0,44		0,58	0,56	
43	75,0	75,2	74,9	74,5		75,2	76,0		19,50	17,02	17,24	17,21		11,30	12,03		0,46	1,73	1,56	1,61		5,69	5,00		0,32	0,44	0,42	0,43		0,59	0,56	
44	75,1	75,3	74,9	75,9		75,0	75,8		19,41	17,06	17,28	17,48		11,54	11,80		0,46	1,71	1,61	1,49		5,55	5,31		0,30	0,44	0,44	0,43		0,59	0,58	
45	75,1	75,2	74,9	75,6		74,9	75,9		19,54	17,04	17,30	17,03		11,61	11,71		0,42	1,80	1,61	1,80		5,51	5,36		0,30	0,46	0,44	0,46		0,59	0,58	
46	75,2	75,2	74,5	74,4		75,6	75,2		19,35	18,25	18,14	18,94		12,25	12,42		0,72	1,62	1,69	1,15		6,87	6,91		0,45	0,60	0,60	0,57		0,79	0,81	
47	75,2	75,2	75,6	75,5		75,3	74,0		19,76	18,50	18,97	19,01		12,51	12,09		0,62	1,49	1,19	1,13		6,75	7,00		0,52	0,61	0,60	0,58		0,80	0,79	
48	75,0	75,1	74,7	75,9		74,9	76,3		19,10	18,26	18,30	19,19		12,98	12,47		1,00	1,69	1,59	1,04		6,38	6,70		0,54	0,63	0,60	0,59		0,80	0,79	
49	74,9	75,4	75,7	75,0		75,4	75,7		19,98	18,41	19,17	19,61		13,22	12,51		0,52	1,60	1,07	0,78		6,18	6,75		0,54	0,63	0,60	0,58		0,80	0,80	
50	75,2	75,3	75,7	75,2		75,4	75,7		19,82	18,54	19,08	19,16		13,27	12,83		0,61	1,49	1,12	1,02		6,07	6,41		0,54	0,62	0,60	0,57		0,79	0,79	
51	75,1	75,4	75,0	76,1		75,2	75,8		19,74	18,55	18,54	19,21		13,45	13,11		0,65	1,49	1,49	0,99		5,85	6,04		0,54	0,62	0,62	0,57		0,78	0,77	
52	75,2	75,4	75,9	75,7		75,3	75,7		19,98	18,72	19,19	18,48		13,62	13,89		0,50	1,36	1,11	1,38		5,72	5,37		0,52	0,61	0,63	0,56		0,78	0,76	
53	75,1	75,1	74,6	75,3		74,9	75,4		19,92	18,61	18,65	18,92		13,82	14,15		0,51	1,43	1,40	1,14		5,56	5,17		0,50	0,61	0,61	0,56		0,78	0,76	
54	75,2	75,4	76,4	74,5		75,6	75,7		19,69	18,80	19,39	19,21		13,96	14,40		0,60	1,33	0,95	1,01		5,45	4,98		0,48	0,62	0,61	0,58		0,78	0,76	
55	74,9	75,5	75,8	75,5		75,2	75,4		19,61	18,63	19,21	19,25		14,07	14,66		0,66	1,44	1,08	0,99		5,37	4,78		0,49	0,62	0,62	0,58		0,78	0,76	
56	75,1	75,2	74,7	75,9		74,9	74,3		19,52	18,70	18,61	19,21		14,29	14,15		0,72	1,40	1,43	1,04		5,13	5,30		0,50	0,62	0,61	0,60		0,77	0,78	
57	75,1	75,1	75,8	75,3		75,2	76,4		19,85	18,63	19,28	18,88		14,36	14,80		0,56	1,46	1,00	1,24		5,14	4,80		0,51	0,63	0,60	0,60		0,78	0,78	
58	75,2	74,9	74,7	74,7		75,1	76,0		19,78	18,75	18,59	19,27		14,51	14,62		0,60	1,39	1,46	0,99		5,02	4,87		0,51	0,63	0,62	0,59		0,78	0,77	
59	75,2	75,0	76,2	76,0		74,9	75,8		19,98	19,06	19,28	19,32		14,44	14,07		0,50	1,19	1,02	0,96		5,01	5,30		0,52	0,63	0,61	0,59		0,77	0,77	
60	75,0	75,2	75,0	75,6		75,1	75,6		19,99	19,17	19,34	18,32		14,15	14,60		0,50	1,10	1,00	1,60		5,24	4,76		0,52	0,62	0,62	0,61		0,77	0,75	
61	75,0	75,5	75,2	74,5		74,9	75,1		19,92	18,70	19,39	19,05		14,75	14,95		0,55	1,37	0,92	1,18		4,77	4,50		0,53	0,61	0,59	0,62		0,77	0,75	
62	75,3	75,2	75,6	75,7		75,0	73,8		19,87	19,10	19,27	19,37		15,06	14,93		0,57	1,11	1,02	0,93		4,48	4,52		0,53	0,60	0,61	0,59		0,76	0,75	
63	75,0	75,1	74,7	75,5		75,5	76,0		19,81	18,70	18,65	18,55		14,86	15,04		0,60	1,35	1,43	1,42		4,69	4,37		0,53	0,60	0,62	0,59		0,77	0,74	
64	75,0	75,4	75,5	74,5		75,5	75,7		19,72	18,79	19,32	18,99		14,71	15,49		0,64	1,30	0,96	1,20		4,80	4,04		0,52	0,60	0,59	0,61		0,77	0,74	
65	75,0	75,0	75,4	75,6		75,4	75,5		19,87	18,81	18,76	19,37		15,17	15,09		0,56	1,31	1,36	0,96		4,39	4,40		0,52	0,61	0,62	0,61		0,76	0,75	
66	75,1	75,2	74,7	75,5		75,4	75,0		19,85	18,88	19,28	19,14		17,17	15,11		0,58	1,26	1,00	1,10		2,87	4,38		0,53	0,61	0,60	0,61		0,76	0,75	
67	75,2	75,1	75,6	74,5		74,9	75,3		19,83	19,56	19,32	18,94		14,86	14,38		0,62	0,86	0,96	1,25		4,75	4,93		0,55	0,62	0,59	0,62		0,78	0,75	
68	75,1	75,3	74,8	75,8		75,0	75,4		19,79	18,86	18,70	19,36		15,17	15,71		0,66	1,30	1,40	1,00		4,45	3,88		0,57	0,62	0,62	0,63		0,77	0,74	
69	75,2	75,0	75,6	75,1		75,0	75,1		19,87	19,01	19,28	18,25		15,33	15,59		0,62	1,20	1,00	1,73		4,33	3,97		0,57	0,62	0,60	0,64		0,77	0,74	
70	75,1	75,0	75,1	75,2		75,1	74,0		19,69	19,25	18,66	19,27		15,24	15,29		0,71	1,04	1,42	1,08		4,34	4,25		0,56	0,61	0,62	0,64		0,76	0,75	
71	75,2	75,3	75,4	76,2		75,0	75,9		19,71	19,16	19,32	19,30		15,93	15,42		0,66	1,07	0,98	1,07		3,87	4,04		0,53	0,60	0,60	0,65		0,77	0,73	
72	75,3	75,3	75,7	75,0		75,2	75,3		19,76	18,81	18,85	18,03		14,86	15,75		0,63	1,28	1,28	1,90		4,75	3,80		0,53	0,60	0,61	0,65		0,78	0,73	
73	75,1	75,2	74,8	75,4		75,0	75,4		19,72	18,85	18,83	19,25		15,40	15,69		0,65	1,28	1,25	1,02		4,33	3,84		0,53	0,61	0,59	0,60		0,78	0,73	

Table A11: Run 9 - OM40

time	temperatures of the reactor [°C]							oxygen content [%]							carbon dioxide content [%]							Respiratory Quotient						
hours	R1	R2	R3	R5	R6	R7	R8	R1	R2	R3	R5	R6	R7	R8	R1	R2	R3	R5	R6	R7	R8	R1	R2	R3	R5	R6	R7	R8
1	51,4	58,4	57,3	62,1	60,1	60,0	55,9	17,56	14,34	10,03	8,43	3,63	0,24	0,29	2,14	4,97	8,97	10,72	15,41	20,11	20,11	0,63	0,75	0,82	0,86	0,89	0,97	0,97
2	51,5	58,2	57,5	62,1	60,8	56,0	56,6	17,58	14,55	10,58	6,81	3,85	0,19	0,23	1,97	4,54	8,29	12,57	15,39	20,11	20,11	0,58	0,71	0,80	0,89	0,90	0,97	0,97
3	51,7	58,2	57,8	62,7	61,7	59,1	57,8	17,70	14,87	10,83	7,30	4,98	0,26	0,33	1,95	4,17	8,15	11,46	14,38	20,11	20,11	0,60	0,69	0,81	0,84	0,90	0,97	0,98
4	51,3	57,8	57,4	62,8	61,8	60,4	58,2	17,80	15,02	11,22	7,55	5,66	0,30	0,29	1,83	4,03	7,64	11,20	13,58	20,11	20,11	0,58	0,68	0,79	0,84	0,89	0,97	0,97
5	51,1	57,5	57,2	62,7	61,7	61,1	58,4	17,90	15,13	11,31	7,80	6,16	0,19	0,32	1,72	4,01	7,32	10,91	12,87	20,11	20,11	0,56	0,69	0,76	0,83	0,87	0,97	0,97
6	50,8	57,0	56,7	62,6	61,4	61,4	58,4	17,94	15,36	11,69	8,04	6,54	0,22	0,26	1,70	3,74	7,04	10,76	12,39	20,11	20,11	0,56	0,67	0,76	0,83	0,86	0,97	0,97
7	50,5	57,2	57,0	62,6	61,4	61,7	59,1	18,12	15,36	11,91	7,30	3,63	0,32	0,28	1,58	3,86	7,03	11,29	15,07	20,11	20,11	0,56	0,69	0,78	0,83	0,87	0,97	0,97
8	50,3	57,5	57,1	62,3	61,1	61,5	59,9	18,25	13,65	9,17	3,27	2,29	0,27	0,23	1,50	5,25	9,42	15,72	16,27	20,11	20,00	0,56	0,72	0,80	0,89	0,87	0,97	0,97
9	50,2	57,6	57,0	62,4	61,0	61,6	60,5	18,30	13,63	9,15	3,31	2,17	0,25	0,35	1,45	5,18	9,55	15,93	16,75	20,08	20,10	0,55	0,71	0,81	0,90	0,89	0,97	0,98
10	50,4	57,7	57,0	62,1	60,7	61,3	61,0	18,40	13,66	9,20	3,38	2,19	0,31	0,33	1,38	5,04	9,06	15,40	17,02	20,11	20,03	0,54	0,69	0,77	0,88	0,91	0,97	0,97
11	50,3	57,6	56,8	61,9	60,5	61,2	61,4	18,47	13,78	9,42	3,55	2,24	0,21	0,29	1,32	4,93	8,93	14,97	16,03	19,94	20,10	0,53	0,69	0,77	0,86	0,86	0,96	0,97
12	50,1	57,3	56,4	61,7	60,2	61,0	61,5	18,52	13,96	9,67	3,77	2,33	0,29	0,35	1,27	4,89	8,58	14,86	15,93	19,80	19,78	0,52	0,70	0,76	0,86	0,86	0,96	0,96
13	50,2	56,9	56,1	61,5	60,1	60,8	61,6	18,52	14,15	9,89	4,11	2,59	0,25	0,30	1,27	4,79	8,30	14,48	16,02	19,32	19,88	0,52	0,70	0,75	0,86	0,87	0,93	0,96
14	50,2	56,5	55,7	61,0	59,6	60,4	61,7	18,58	14,38	10,01	4,46	2,88	0,30	0,34	1,28	4,26	8,32	14,02	15,51	19,85	19,61	0,54	0,65	0,76	0,85	0,86	0,96	0,95
15	50,1	56,1	55,3	60,6	59,3	60,2	61,7	18,61	14,63	10,60	4,91	3,18	0,24	0,25	1,29	4,27	7,79	13,73	15,46	19,02	19,59	0,55	0,68	0,75	0,86	0,87	0,92	0,95
16	50,0	55,5	54,8	60,2	58,8	59,7	61,3	18,62	14,88	10,92	5,35	3,48	0,23	0,38	1,23	4,06	7,56	12,95	15,42	18,44	19,69	0,53	0,67	0,75	0,83	0,88	0,89	0,96
17	50,5	55,2	54,5	59,8	58,3	55,4	57,6	18,59	14,90	10,70	3,97	3,52	0,35	0,66	1,28	4,10	7,47	14,14	15,34	17,92	19,07	0,54	0,68	0,73	0,83	0,88	0,87	0,94
18	51,6	54,2	53,7	59,1	57,5	56,5	58,0	17,69	15,37	11,49	4,71	2,24	0,98	0,93	1,66	3,61	6,77	13,39	16,28	16,77	18,42	0,51	0,65	0,72	0,82	0,87	0,84	0,92
19	51,2	54,2	54,0	58,4	56,8	56,7	58,0	18,35	15,07	10,02	2,02	2,96	0,99	0,72	1,46	3,79	8,09	15,34	15,60	17,17	18,21	0,56	0,64	0,74	0,81	0,87	0,86	0,90
20	50,3	53,6	53,4	57,7	56,0	56,6	57,4	18,54	14,94	10,17	1,89	3,80	1,06	0,52	1,29	4,02	8,21	16,88	14,26	16,83	18,12	0,54	0,67	0,76	0,89	0,83	0,85	0,89
21	50,4	53,2	53,1	56,8	55,0	56,3	57,0	18,75	15,21	10,58	2,07	4,41	0,60	0,49	1,14	3,82	7,67	16,27	13,36	17,68	18,89	0,52	0,67	0,74	0,86	0,81	0,87	0,92
22	50,2	52,7	52,5	56,1	54,3	56,1	56,9	18,74	15,47	11,00	2,74	5,28	0,77	0,59	1,13	3,77	7,41	15,63	12,72	17,35	18,34	0,51	0,69	0,74	0,86	0,81	0,86	0,90
23	51,0	52,0	52,0	55,4	53,5	55,8	56,8	18,86	15,71	11,44	3,77	6,09	1,11	0,54	1,15	3,51	6,85	14,63	11,89	16,94	17,66	0,55	0,67	0,72	0,85	0,80	0,85	0,87
24	50,3	51,5	51,6	54,4	52,4	55,4	56,7	18,76	15,98	11,87	4,51	6,81	1,46	0,62	1,15	3,23	6,33	13,81	11,17	16,55	17,59	0,53	0,65	0,70	0,84	0,79	0,85	0,87
25	51,4	51,1	51,2	53,9	51,9	55,2	56,5	18,94	15,46	10,60	5,28	7,52	1,80	0,49	1,02	3,57	7,35	13,03	10,82	16,53	18,07	0,51	0,65	0,71	0,83	0,81	0,86	0,88
26	50,5	50,6	50,7	53,1	51,2	54,9	56,6	18,83	15,93	11,07	5,90	7,97	2,02	0,51	1,12	3,31	7,01	12,65	10,38	16,67	18,19	0,53	0,66	0,71	0,84	0,80	0,88	0,89
27	50,4	50,0	50,0	52,2	50,3	54,4	56,7	18,91	16,20	11,57	6,64	8,51	2,39	0,57	1,06	3,03	6,83	12,00	10,11	16,43	18,25	0,52	0,64	0,73	0,84	0,81	0,89	0,90
28	51,4	51,5	51,2	51,4	52,5	53,9	56,4	19,06	15,93	11,20	7,37	8,73	2,81	0,62	0,96	3,38	7,57	11,54	10,04	16,05	18,09	0,51	0,67	0,78	0,85	0,82	0,88	0,89
29	50,3	51,0	50,7	50,7	51,6	53,6	56,4	18,91	15,71	11,07	8,04	7,50	3,28	0,74	1,02	3,58	7,77	10,84	11,16	14,96	18,26	0,50	0,68	0,79	0,84	0,83	0,85	0,90
30	51,4	50,3	50,0	51,2	50,3	52,9	56,1	19,16	16,05	11,47	8,73	7,92	3,83	0,97	0,91	3,34	7,37	10,26	10,55	14,79	18,15	0,51	0,68	0,78	0,84	0,81	0,86	0,91
31	50,0	52,4	50,5	52,5	52,3	52,3	55,9	19,03	16,35	11,35	6,95	7,97	4,24	1,09	0,98	3,02	7,38	11,75	10,67	14,12	17,98	0,51	0,66	0,77	0,84	0,82	0,85	0,91
32	50,5	51,7	51,6	52,0	51,6	51,8	55,5	19,06	15,49	11,41	6,66	6,78	4,54	1,11	0,93	3,69	7,64	12,15	12,25	14,26	17,44	0,49	0,68	0,80	0,85	0,86	0,87	0,88
33	51,7	50,9	51,2	51,3	50,9	51,2	55,1	19,21	15,76	10,33	6,99	6,90	5,01	1,33	0,89	3,42	8,37	11,87	12,12	13,79	17,00	0,51	0,66	0,79	0,85	0,86	0,87	0,87
34	50,0	50,1	50,6	50,5	50,8	50,6	55,0	19,06	15,88	10,60	7,40	7,25	5,43	1,55	0,97	3,39	8,05	11,52	11,90	13,24	16,80	0,51	0,67	0,78	0,85	0,87	0,85	0,87
35	50,9	51,2	50,1	52,4	50,3	55,4	54,7	19,30	16,23	10,92	7,87	6,87	4,54	1,97	0,84	3,19	8,03	11,23	12,39	14,28	16,74	0,51	0,68	0,80	0,86	0,88	0,87	0,88
36	51,9	50,2	51,5	53,9	52,5	57,8	54,0	19,21	15,78	11,05	5,01	6,88	3,89	2,19	0,88	3,66	7,68	14,34	12,40	14,84	16,71	0,51	0,71	0,78	0,90	0,88	0,87	0,89
37	50,3	52,1	51,0	53,4	52,3	57,4	53,5	19,11	16,13	9,91	4,32	4,69	3,29	2,37	0,95	3,33	8,91	14,80	14,28	15,54	16,26	0,52	0,69	0,81	0,89	0,88	0,88	0,88
38	51,2	51,3	50,3	52,8	51,9	56,8	53,1	19,35	15,48	10,16	4,54	4,37	3,66	2,71	0,81	3,86	8,77	15,09	14,41	15,04	15,57	0,51	0,71	0,81	0,92	0,87	0,87	0,85
39	51,3	50,2	51,1	52,2	51,4	55,8	52,5	19,26	15,54	10,58	5,08	4,54	3,23	3,16	0,83	3,66	8,38	14,08	14,36	15,77	15,17	0,49	0,68	0,81	0,89	0,88	0,89	0,85
40	50,9	51,9	51,3	51,3	50,7	54,6	51,8	19,23	16,01	9,52	5,35	4,69	3,37	3,65	0,89	3,42	9,42	13,29	14,26	16,09	14,76	0,52	0,69	0,82	0,85	0,88	0,92	0,85
41	50,4	51,1	50,7	50,9	50,4	53,7	51,2	19,21	15,51	9,59	5,92	5,03	3,67	4,29	0,91	3,75	9,21	12,69	14,17	15,28	14,27	0,52	0,69	0,81	0,84	0,89	0,88	0,86
42	51,2	50,2	50,1	50,5	52,1	52,6	50,7	19,39	15,85	10,16	6,36	5,33	4,59	4,74	0,77	3,40	8,57	12,25	13,90	14,56	13,67	0,49	0,67	0,79	0,84	0,89	0,89	0,84
43	51,6	51,6	51,0	51,5	51,9	51,5	50,3	19,38	15,55	10,77	5,65	3,83	4,60	5,23	0,81	3,62	8,03	13,01	15,65	14,22	12,71	0,52	0,67	0,79	0,85	0,91	0,87	0,81
44	50,1	50,7	50,3	51,2	51,5	50,4	50,8	19,33	15,73	10,14	5,62	3,72	4,51	4,96	0,82	3,55	8,75	13,21	15,48	14,47	12,84	0,51	0,68	0,81	0,86	0,90	0,88	0,80
45	51,0	50,9	51,6	50,5	51,0	56,5	51,0	19,46	16,15	10,70	5,89	4,02	4,55	4,88	0,66	3,16	8,19	13,13	14,79	14,20	13,14	0,44	0,66	0,80	0,87	0,87	0,87	0,82
46	51,4	50,1	51,2	50,3	50,7	58,4	50,5	19,43	16,08	9,82	7,79	4,43	4,36	3,50	0,70	3,09	8,74	10,72	14,56	14,77	14,31	0,46	0,63	0,79	0,81	0,88	0,89	0,82
47	50,2	51,8	50,5	50,8	50,5	57,6	50,8	19,29	15,49	9,74	11,25	5,06	4,69	1,92	0,78	3,48	8,81	7,66	13,53	14,47	15,89	0,47	0,64	0,79	0,79	0,85	0,89	0,83
48	50,6	50,8	50,8	51,0	50,0	56,1	51,2	19,29	15,22	11,62	10,73	5,45	4,59	0,99	0,81	3,73	7,18	8,03	13,38	14,56	17,72	0,49	0,65	0,77	0,79	0,86	0,89	0,89
49	50,8	51,7	50,2	50,7	51,0	54,5	50,4	19,45	15,66	11,67	11,10	5,20	4,23	0,84	0,74	3,60	7,16	7,62	13,86	14,55	17,98	0,49	0,68	0,77	0,77	0,88	0,87	0,89
50	51,3	50,9	50,3	51,4	50,2	52,7	52,0	19,45	15,36	11,43	11,57	5,23	4,86	0,77	0,75	3,73	7,32	7,15	13,99	14,00	17,79	0,50	0,67	0,77	0,76	0,89	0,87	0,88
51	50,8	51,5	51,5	53,3	53,3	51,1	52,7	19,42	15,76	11,37	9,32	5,55	4,64	0,65	0,81	3,46	7,57	9,01	13,71	14,35	18,61	0,53	0,67	0,79	0,77	0,89	0,88	0,92
52	51,4	51,0	50,8	53,2	53,2	54,1	52,1	19,55	15,53	11,42	9,82	3,48	4,92	0,52	0,68	3,54	7,53	8,30	15,98	14,27	19,00	0,49	0,65	0,79	0,75	0,91	0,89	0,93
53	50,0	49,9	50,0	52,7	52,6	56,5	51,4	19,43	15,94	11,28	10,52	3,23	4,30	0,54	0,72	3,27	7,54	8,12	15,92	14,32	18,77	0,47	0,65	0,78	0,78	0,90	0,86	0,92
54	50,9	50,9	50,2	51,8	51,8	55,2	50,4	19,63	16,03	12,35	11,20	3,82	4,29	1,11	0,60	3,12	6,71	7,58	15,63	14,49	18,05	0,45	0,63	0,78	0,78	0,91	0,87	0,91
55	51,2	51,2	51,5	51,0	50,9	53,5	51,8	19,58	16,11	11,84	11,84	4,71	4,59	1,33	0,63	3,12	6,98	6,87	14,13	14,56	18,15	0,46	0,64	0,77	0,75	0,87	0,89	0,93
56	51,3	51,5	50,6	50,1	50,1	51,7	51,9	19,58	15,16	12,60	12,43	5,55	5,01	1,08	0,64	3,59	6,51	6,49	13,43	14,19	18,52	0,47	0,62	0,78	0,76	0,87	0,89	0,93
57	52,1	50,0	51,0	51,2	52,7	50,0	50,8	19,58	16,13	12,80	13,04	6,17	5,22	1,55	0,64	3,03	6,17	5,93	12,59	14,00	17,09	0,47	0,63	0,76	0,75	0,85	0,89	0,88
58	49,9	51,0	50,0	50,7	51,9	58,6	50,9	19,51	16,52	11,80	12,35	4,96	5,03	1,27	0,71	2,84	7,18	6,46	13,91	14,45	17,28	0,49	0,64	0,78	0,75	0,87	0,91	0,88
59	50,4	51,6	50,8	52,1	51,0	59,0	54,6	19,65	16,20	12,46	12,90	5,25	4,90	0,99	0,55	3,04	6,54	6,28	13,51	14,12	19,54	0,42	0,64	0,77	0,78	0,86	0,88	0,98
60	51,2	51,1	51,2	53,4	52,0	57,3	53,8	19,72	16,05	12,95	10,85	5,87	5,16	1,21	0,52	3,21	6,03	8,21	12,97	14,05	19,31	0,42	0,66	0,75	0,81	0,86	0,89	0,98
61	51,4	51,0	50,7	52,6	51,2	55,1	52,7	19,67	16,42	12,70	11,47	5,47	5,19	1,54	0,56	2,86	6,12	7,34	13,26	14,03	19,22	0,44	0,63	0,74	0,77	0,86	0,89	0,99
62	51,6	50,5	51,2	51,5	50,0	52,8	51,4	19,68	16,40	13,10	12,28	5,82	5,37	1,18	0,55	2,94	5,77	6,75	13,16	13,87	18,41	0,43	0,65	0,74	0,78	0,87	0,89	0,93
63	51,0	52,0	50,2	50,5	52,8	50,7	50,1	19,68	16,79	13,09	13,00	6,39	6,59	2,47	0,53	2,58	5,84	5,85	12,74	12,49	16,73	0,42	0,62	0,74	0,74	0,88	0,87	0,91
64	51,3	50,2	51,1	52,8	51,7	56,2	54,9	19,70	16,13	13,19	13,71	5,20	6,52	1,75	0,51	2,98	5,66	5,50	14,03	12,55	17,20	0,41	0,62	0,73	0,76	0,89	0,87	0,90
65	50,5	50,3	50,6	53,2	50,6	58,0	54,5	19,70	16,92	13,17	11,30	5,45	5,67	1,04	0,51	2,61	5,52	7,41	13,72	13,60	18,12	0,41	0,65	0,71	0,77	0,89	0,89	0,91
66	51,2	52,0	50,4	52,4	52,7	56,0	53,0	19,72	16,89	13,19	12,03	6,19	5,63	0,89	0,51	2,53	5,48	6,59	12,99	13,63	18,49	0,41	0,62	0,71	0,74	0,88	0,89	0,92
67	50,1	50,6	50,5	51,1	51,7	53,6	51,7	19,72	16,44	13,32	12,90	5,20	5,05	1,53	0,54	2,80	5,47	5,88	13,86	13,82	17,33	0,44	0,62	0,72	0,73	0,88	0,87	0,89
68	49,9	52,3	50,2	50,7	50,5	51,2	50,2	19,80	15,29	13,42	8,82	5,47	5,89	2,81	0,49	3,55	5,33	8,96	13,74	13,40	16,49	0,43	0,63	0,71	0,74	0,89	0,89	0,91
69	50,8	50,8	51,0	52,0	52,8	55,3	53,5	19,82	14,67	13,74	7,10	6,07	5,97	2,56	0,47	4,27	5,19	10,87	13,03	12,88	16,96	0,42	0,68	0,72	0,78	0,88	0,86	0,92
70	51,2	52,2	51,2	51,0	52,0	56,6	52,9	19,85	15,37	13,56	6,58	4,78	5,13	1,95	0,48	3,69	5,34	12,23	13,84	13,33	17,48	0,44	0,66	0,72	0,85	0,86	0,84	0,92
71	51,5	50,6	50,4	51,4	50,8	54,6	51,4	19,85	14,90	13,47	7,47	5,01	5,40	2,49	0,48	4,19	5,47	11,35	13,41	13,05	17,17	0,44	0,69	0,73	0,84	0,84	0,84	0,93
72	51,3	52,3	51,7	52,1	51,2	52,2	49,9	19,82	15,58	13,41	6,78	5,72	6,68	3,53	0,48	3,66	5,43	11,90	12,95	12,13	16,03	0,42	0,68	0,72	0,84	0,85	0,85	0,92
73	51,6	50,5	50,2	51,0	50,2	49,9	52,0	19,86	14,99	13,46	7,05	5,82	6,31	3,18	0,48	4,06	5,50	11,83	12,54	12,59	16,35	0,44	0,68	0,73	0,85	0,83	0,86	0,92
74	50,6	51,5	51,1	51,5	50,5	57,0	51,4	19,85	15,71	13,43	7,85	6,16	6,84	3,18	0,49	3,51	5,54	11,05	12,42	12,13	16,35	0,45	0,67	0,74	0,84	0,84	0,86	0,92

Table A12: Run 10 - OM50

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	45,8	48,3	45,4	48,0	46,0	46,8	48,9	45,1	19,70	18,54	14,54	11,90	18,40	15,09	6,49	9,15	0,84	1,49	5,19	7,78	1,40	4,16	12,58	9,20	0,67	0,62	0,81	0,86	0,55	0,71	0,87	0,78
2	46,0	47,2	52,9	49,7	46,4	49,4	48,4	50,7	18,84	14,94	12,09	7,42	14,43	10,40	4,42	5,38	1,39	4,75	7,44	11,77	3,98	8,97	15,04	13,55	0,66	0,79	0,84	0,87	0,61	0,85	0,91	0,87
3	46,0	47,6	56,3	50,7	46,5	49,4	48,1	49,8	18,47	12,48	5,92	5,01	8,93	6,46	2,99	4,02	1,51	6,78	14,88	14,51	9,50	13,04	16,70	15,58	0,61	0,80	0,99	0,91	0,79	0,90	0,93	0,92
4	46,5	48,5	57,6	51,5	46,6	49,8	48,0	49,1	18,42	11,38	5,42	4,43	5,40	5,30	1,91	2,67	1,49	7,85	14,75	15,36	13,84	14,09	17,90	17,91	0,59	0,82	0,95	0,93	0,89	0,90	0,94	0,98
5	47,1	49,1	57,8	52,0	46,2	50,3	47,7	48,3	18,39	11,17	5,48	4,42	3,77	4,79	1,19	1,60	1,46	8,12	14,39	15,54	15,81	14,87	18,77	19,16	0,57	0,83	0,93	0,94	0,92	0,92	0,95	0,99
6	49,9	49,5	57,3	52,3	48,2	50,7	49,9	48,2	18,31	10,97	5,87	4,11	2,81	4,32	0,77	0,84	1,50	7,98	14,02	15,83	17,78	15,47	19,78	20,11	0,57	0,80	0,93	0,94	0,98	0,93	0,98	1,00
7	49,2	49,7	56,5	52,2	48,2	51,1	54,5	52,6	18,69	13,81	11,61	4,64	1,88	3,97	0,42	0,52	1,27	5,64	7,85	15,82	19,26	16,13	20,12	20,02	0,56	0,79	0,84	0,97	1,01	0,95	0,98	0,98
8	49,4	49,9	55,8	52,1	48,4	51,4	54,0	51,4	18,86	13,96	12,38	5,16	1,33	3,92	0,47	0,57	1,17	5,31	7,11	14,84	19,82	16,18	19,87	19,77	0,56	0,76	0,83	0,94	1,01	0,95	0,97	0,97
9	48,2	49,8	54,8	51,9	48,4	51,6	52,9	50,3	18,80	14,28	13,16	5,54	1,09	4,07	0,45	0,65	1,23	5,07	6,47	14,49	19,86	16,04	19,68	19,69	0,57	0,76	0,83	0,94	1,00	0,95	0,96	0,97
10	49,2	49,6	53,8	51,6	48,3	51,6	51,8	48,9	19,25	14,62	13,29	6,11	1,14	4,32	0,43	0,52	0,95	4,75	6,05	13,95	19,81	15,63	19,70	19,82	0,56	0,75	0,79	0,94	1,00	0,94	0,96	0,97
11	49,5	49,3	52,7	51,2	48,2	51,5	50,8	48,4	19,23	15,02	14,36	6,76	1,31	4,64	0,42	0,61	0,96	4,39	4,88	13,34	19,84	15,33	19,71	19,53	0,56	0,74	0,74	0,94	1,01	0,94	0,96	0,96
12	47,9	48,8	51,5	50,7	48,6	51,4	49,8	52,4	19,06	15,04	15,14	7,30	1,65	4,98	0,56	0,63	1,02	4,26	4,30	12,42	19,11	14,85	19,57	19,51	0,54	0,72	0,74	0,91	0,99	0,93	0,96	0,96
13	48,5	48,3	50,4	50,2	48,3	51,0	48,5	51,1	19,43	15,36	15,71	8,16	2,54	5,70	0,64	0,59	0,82	3,97	3,83	11,26	17,86	14,03	19,50	19,55	0,54	0,71	0,73	0,88	0,97	0,92	0,96	0,96
14	49,3	49,3	49,2	49,7	48,4	50,5	53,7	49,6	19,48	16,01	16,18	8,39	2,52	5,72	0,37	0,72	0,78	3,51	3,43	11,05	17,69	13,71	20,17	19,42	0,53	0,71	0,72	0,88	0,96	0,90	0,98	0,96
15	49,1	48,8	48,0	49,1	48,1	49,8	54,5	48,2	19,42	15,62	16,64	8,72	2,96	6,22	0,42	0,69	0,81	3,78	3,10	10,76	17,09	13,40	19,91	19,65	0,53	0,71	0,72	0,88	0,95	0,91	0,97	0,97
16	48,0	48,1	53,6	48,5	48,1	49,1	53,5	52,5	19,40	16,07	16,59	8,28	3,45	6,74	0,55	0,53	0,81	3,42	3,14	11,15	16,28	12,79	19,79	19,81	0,52	0,70	0,72	0,88	0,93	0,90	0,97	0,97
17	48,9	49,0	54,5	48,0	48,4	48,3	52,1	51,6	19,62	16,39	16,06	7,94	3,82	7,35	0,52	0,42	0,68	3,24	3,57	11,32	15,93	12,10	19,82	19,91	0,51	0,71	0,73	0,87	0,93	0,89	0,97	0,97
18	48,8	48,4	53,6	51,6	48,2	51,6	50,6	50,2	19,58	16,10	15,77	7,47	4,05	7,02	0,54	0,57	0,71	3,40	3,78	11,86	15,72	12,26	19,80	19,97	0,52	0,70	0,73	0,88	0,93	0,88	0,97	0,98
19	49,3	50,6	52,2	52,1	48,4	50,5	49,1	48,6	19,53	16,35	15,51	7,36	4,34	7,22	0,57	0,59	0,74	3,22	4,03	11,96	15,61	12,22	19,97	20,16	0,52	0,70	0,74	0,88	0,94	0,89	0,98	0,99
20	49,4	50,0	50,9	51,6	49,3	49,4	52,6	50,9	19,55	15,39	16,05	8,46	5,03	7,00	1,16	1,04	0,74	3,84	3,58	10,87	14,81	12,42	19,39	19,71	0,53	0,69	0,73	0,87	0,93	0,89	0,98	0,99
21	49,6	49,2	49,4	50,6	49,4	52,5	54,1	51,3	19,52	16,10	16,60	11,96	4,54	7,35	1,06	0,85	0,76	3,35	3,13	7,82	15,43	12,10	20,09	19,90	0,53	0,69	0,72	0,87	0,94	0,89	1,01	0,99
22	50,2	48,9	53,6	49,7	49,3	51,1	53,2	49,7	19,56	16,20	16,09	12,55	4,41	7,72	2,07	0,92	0,74	3,33	3,40	7,14	15,22	11,91	17,94	19,83	0,53	0,70	0,70	0,85	0,92	0,90	0,95	0,99
23	50,0	50,6	55,1	49,0	49,1	49,9	52,0	51,1	19,59	16,22	15,13	13,09	4,91	7,63	3,73	0,81	0,72	3,31	4,13	6,68	14,44	11,99	16,36	20,14	0,53	0,70	0,71	0,85	0,90	0,90	0,95	1,00
24	49,9	49,5	54,0	54,5	49,1	52,5	50,6	52,0	19,60	15,34	15,07	10,51	4,56	7,29	3,86	0,97	0,69	3,87	4,17	8,87	14,75	12,02	16,06	19,78	0,51	0,69	0,71	0,85	0,90	0,88	0,94	0,99
25	49,9	51,1	52,5	54,9	49,2	51,4	49,3	50,4	19,65	16,45	15,86	10,99	4,76	7,07	3,39	0,89	0,65	3,06	3,66	8,27	14,41	12,21	16,51	19,86	0,50	0,68	0,72	0,83	0,89	0,88	0,94	0,99
26	49,1	50,8	51,0	54,1	49,2	49,9	55,8	49,1	19,67	15,91	16,46	11,48	5,57	7,09	3,41	1,44	0,64	3,48	3,19	7,77	13,69	12,20	16,31	19,31	0,50	0,69	0,71	0,82	0,89	0,88	0,93	0,99
27	48,9	49,5	49,3	52,6	49,5	52,3	57,0	53,2	19,77	16,30	16,88	12,40	5,21	7,69	2,37	0,94	0,55	3,26	2,89	6,93	14,17	11,67	17,28	20,01	0,47	0,70	0,71	0,81	0,90	0,88	0,93	1,00
28	48,9	50,9	53,2	51,4	49,0	51,1	55,4	51,8	19,79	16,69	16,56	13,24	5,43	7,51	2,64	0,91	0,52	2,94	3,12	6,01	13,97	11,96	17,03	20,04	0,45	0,69	0,71	0,78	0,90	0,89	0,93	1,00
29	49,1	49,9	53,9	50,1	49,0	49,5	53,7	50,1	19,73	16,42	15,58	13,96	5,67	7,20	3,78	0,91	0,52	3,13	3,76	5,31	13,60	12,10	15,80	20,04	0,43	0,69	0,70	0,76	0,89	0,88	0,92	1,00
30	49,2	50,9	52,4	48,8	49,2	52,8	51,9	50,5	19,85	16,74	15,57	12,62	5,92	8,23	5,28	0,84	0,49	2,86	3,71	6,08	13,38	11,19	14,42	20,11	0,45	0,68	0,69	0,73	0,89	0,88	0,92	1,00
31	48,9	51,0	50,8	55,1	49,3	51,3	50,4	53,8	19,84	15,98	16,85	11,84	6,71	7,93	5,15	1,51	0,50	3,43	2,87	6,74	12,67	11,59	14,38	19,83	0,45	0,69	0,70	0,74	0,89	0,89	0,91	1,02
32	49,3	49,6	49,0	55,2	49,4	49,6	52,2	51,8	19,85	16,62	16,42	11,62	6,41	7,38	5,40	1,31	0,48	2,99	3,13	6,90	12,94	11,94	14,15	19,84	0,44	0,69	0,69	0,74	0,89	0,88	0,91	1,01
33	49,8	51,5	55,0	53,7	49,1	53,1	54,0	49,9	19,85	17,01	16,58	12,83	6,63	7,61	5,38	1,43	0,49	2,72	2,97	6,01	12,60	11,74	14,01	19,32	0,45	0,69	0,68	0,74	0,88	0,88	0,90	0,99
34	49,2	50,1	55,1	52,1	49,2	51,3	52,6	52,3	19,82	16,67	16,35	13,86	6,88	6,93	5,67	1,38	0,51	2,91	3,17	5,18	12,38	12,34	13,75	19,57	0,45	0,68	0,69	0,73	0,88	0,88	0,90	1,00
35	48,9	49,1	53,4	50,5	49,2	49,6	50,9	51,5	19,87	17,01	16,30	14,69	7,05	7,74	6,73	1,48	0,48	2,64	3,21	4,57	12,09	11,49	12,66	19,47	0,44	0,67	0,69	0,73	0,87	0,87	0,89	1,00
36	48,8	50,3	51,4	48,9	49,0	52,5	49,1	49,6	19,93	17,07	16,96	13,37	7,35	7,88	7,02	1,65	0,46	2,56	2,63	5,61	11,70	11,24	12,40	19,11	0,45	0,66	0,66	0,74	0,86	0,86	0,89	0,99
37	49,0	49,4	49,4	54,6	49,1	50,7	56,6	52,9	19,96	17,16	17,65	13,51	7,55	7,66	7,36	1,71	0,46	2,50	2,21	5,51	11,52	11,56	12,37	19,05	0,46	0,66	0,67	0,74	0,86	0,87	0,91	0,99
38	49,2	51,0	53,6	55,1	49,1	50,4	57,3	52,2	19,97	17,01	17,13	13,61	7,82	8,50	7,58	1,73	0,45	2,60	2,64	5,36	11,42	10,71	12,30	19,03	0,46	0,66	0,69	0,73	0,87	0,86	0,92	0,99
39	49,6	49,4	53,9	53,5	49,4	49,7	55,3	50,2	19,95	17,08	16,30	13,76	7,97	8,63	7,85	1,65	0,45	2,55	3,26	5,25	11,16	10,60	12,18	19,11	0,45	0,66	0,70	0,73	0,86	0,86	0,93	0,99
40	49,8	51,8	52,2	51,8	49,2	52,6	53,2	49,5	18,47	17,46	16,99	13,70	8,19	9,35	7,16	1,43	1,12	2,34	2,89	5,29	10,97	9,98	12,55	19,52	0,45	0,67	0,73	0,73	0,86	0,86	0,91	1,00
41	49,9	50,2	50,3	50,0	49,3	50,8	51,3	53,3	19,93	17,02	17,58	13,51	8,94	8,48	7,30	2,17	0,46	2,63	2,46	5,36	10,21	10,72	12,29	18,78	0,45	0,67	0,73	0,72	0,85	0,86	0,90	1,00
42	49,5	50,6	49,7	49,8	49,1	50,2	49,2	51,3	19,95	17,42	17,17	13,13	8,63	8,80	8,39	1,90	0,45	2,33	2,53	5,71	10,47	10,45	11,30	18,86	0,45	0,66	0,67	0,73	0,85	0,86	0,90	0,99
43	49,4	50,1	54,7	54,8	49,1	49,6	56,9	49,4	19,99	17,24	16,42	13,02	8,92	9,05	8,04	2,15	0,43	2,45	2,94	5,79	10,23	10,12	11,75	18,61	0,45	0,66	0,65	0,73	0,85	0,85	0,91	0,99
44	49,3	50,5	53,2	53,8	49,3	52,4	57,1	54,2	19,97	17,19	16,87	13,93	9,07	9,64	8,55	1,98	0,43	2,44	2,65	5,19	9,98	9,61	11,53	18,78	0,44	0,65	0,65	0,74	0,84	0,85	0,93	0,99
45	49,7	49,2	51,0	51,9	49,5	50,4	54,9	52,7	19,97	17,38	17,53	14,94	9,62	9,83	8,40	2,42	0,44	2,28	2,22	4,39	9,63	9,56	11,67	18,90	0,45	0,64	0,65	0,73	0,85	0,86	0,93	1,02
46	49,5	51,5	48,9	49,9	49,7	51,6	52,6	50,5	20,00	16,72	17,47	15,74	9,75	9,59	7,84	2,52	0,44	2,75	2,23	3,70	9,52	9,77	11,93	18,43	0,46	0,65	0,64	0,71	0,85	0,86	0,91	1,00
47	49,5	49,7	54,2	50,0	49,4	49,8	50,3	48,8	20,02	16,97	17,15	15,35	9,40	9,97	8,06	1,90	0,42	2,59	2,39	3,86	9,70	9,33	11,34	18,86	0,45	0,65	0,63	0,69	0,84	0,85	0,88	0,99
48	49,7	50,8	53,7	55,3	49,4	52,5	54,1	53,2	20,02	17,73	16,20	14,09	9,57	9,74	8,54	2,17	0,42	2,09	2,90	4,80	9,45	9,53	10,92	18,59	0,45	0,65	0,61	0,70	0,83	0,85	0,88	0,99
49	49,2	49,2	51,7	54,4	49,4	50,5	55,1	51,5	20,02	17,48	17,56	14,18	9,99	9,98	7,08	2,74	0,42	2,26	2,10	4,81	9,21	9,32	12,07	17,85	0,45	0,65	0,62	0,71	0,84	0,85	0,87	0,98
50	49,3	51,7	49,4	52,4	49,2	51,8	53,4	49,2	20,07	17,88	17,10	15,09	9,80	9,50	7,11	2,25	0,40	1,96	2,54	4,16	9,14	9,50	12,04	18,14	0,45	0,64	0,66	0,71	0,82	0,83	0,87	0,97
51	49,2	50,0	52,7	50,4	49,3	49,7	50,8	53,5	20,04	17,16	17,68	15,98	10,41	9,51	7,16	2,76	0,42	2,39	2,19	3,48	8,64	9,50	11,86	17,64	0,46	0,63	0,67	0,70	0,82	0,83	0,86	0,97
52	49,3	51,0	54,5	48,7	49,1	52,5	49,1	52,1	20,08	17,14	16,39	14,62	10,41	10,29	6,73	3,03	0,39	2,44	3,15	4,49	8,64	8,95	12,23	17,38	0,45	0,64	0,69	0,71	0,82	0,84	0,86	0,97
53	49,6	49,7	52,7	55,3	49,1	50,3	54,9	50,1	20,10	17,36	16,16	14,26	10,35	10,15	5,43	2,86	0,40	2,30	3,35	4,88	8,69	9,07	13,35	17,37	0,47	0,64	0,70	0,73	0,82	0,84	0,86	0,96
54	49,0	51,4	50,4	54,6	49,6	52,3	53,3	52,4	20,09	17,75	16,92	14,41	10,68	10,21	4,39	3,14	0,40	2,08	2,78	4,71	8,32	8,91	14,74	16,92	0,46	0,65	0,69	0,72	0,81	0,83	0,89	0,95
55	49,1	49,6	48,7	52,8	49,3	50,2	50,9	52,4	20,12	17,41	17,63	15,44	11,17	9,84	4,83	3,58	0,37	2,30	2,26	3,97	7,92	9,22	14,35	16,68	0,45	0,65	0,68	0,72	0,81	0,83	0,89	0,96
56	49,8	51,6	55,1	50,6	49,1	52,2	49,9	50,4	20,14	17,78	16,32	15,21	11,07	10,35	5,16	3,16	0,37	2,06	3,19	4,08	8,10	8,69	14,05	17,08	0,46	0,65	0,69	0,71	0,82	0,82	0,89	0,96
57	49,5	49,7	54,0	48,7	49,1	50,1	54,2	49,1	20,14	17,70	16,95	15,89	11,12	9,84	5,07	3,13	0,38	2,11	2,80	3,59	8,06	9,11	14,61	16,93	0,47	0,65	0,70	0,71	0,82	0,82	0,92	0,95
58	49,7	51,9	51,7	54,8	49,4	52,5	52,4	53,1	20,14	17,90	16,77	15,06	11,20	10,56	4,57	3,38	0,39	1,95	2,88	4,18	7,90	8,62	15,07	16,69	0,48	0,64	0,69	0,71	0,81	0,83	0,92	0,95
59	49,4	50,0	49,5	54,3	49,1	50,4	50,1	51,1	20,15	17,48	17,48	14,98	11,25	9,79	4,96	3,48	0,38	2,26	2,39	4,30	8,05	9,26	14,71	16,60	0,47	0,65	0,69	0,72	0,83	0,83	0,92	0,95
60	49,3	51,4	53,9	52,3	49,5	52,5	55,6	49,1	20,17	17,91	18,07	15,93	11,55	10,61	5,07	3,70	0,36	1,95	1,99	3,51	7,71	8,48	14,61	16,22	0,46	0,64	0,69	0,70	0,82	0,82	0,92	0,94
61	49,7	49,6	54,7	50,1	49,4	50,3	56,7	53,9	20,16	17,61	16,83	15,66	11,44	9,86	4,14	3,48	0,36	2,14	2,93	3,65	7,70	9,20	15,97	16,60	0,45	0,64	0,71	0,69	0,81	0,83	0,95	0,95
62	49,6	50,4	52,6	50,6	49,3	52,3	54,1	51,9	20,17	17,68	16,65	15,26	11,44	10,55	4,55	3,26	0,35	2,06	2,88	3,93	7,80	8,63	15,58	16,45	0,45	0,63	0,67	0,69	0,82	0,83	0,95	0,93
63	49,4	50,6	50,1	55,5	49,2	50,1	51,5	49,6	20,19	17,89	17,38	15,31	11,62	10,04	4,29	3,65	0,34	1,90	2,32	4,00	7,56	8,95	15,49	16,09	0,45	0,62	0,65	0,71	0,81	0,82	0,93	0,93
64	49,6	49,2	51,8	54,1	49,5	52,8	49,0	53,7	20,17	17,74	17,98	15,21	11,45	10,65	4,84	3,21	0,34	1,96	1,90	4,08	7,79	8,45	14,82	16,32	0,44	0,61	0,64	0,71	0,82	0,82	0,92	0,92
65	49,4	51,2	53,5	51,7	49,4	50,5	57,5	52,1	20,17	18,10	16,46	14,17	11,62	9,96	4,65	3,55	0,34	1,74	2,87	4,68	7,46	9,01	15,00	16,01	0,44	0,61	0,64	0,69	0,80	0,82	0,92	0,92
66	49,4	49,0	51,4	49,3	49,1	51,9	56,9	49,8	20,17	17,29	17,04	14,92	11,71	10,56	4,15	3,58	0,34	2,23	2,50	4,16	7,30	8,62	15,29	15,81	0,44	0,61	0,64	0,69	0,79	0,83	0,91	0,91
67	50,5	51,0	50,1	54,5	50,2	50,4	54,7	53,1	20,19	18,15	17,66	13,46	11,60	10,07	3,78	3,48	0,34	1,76	2,04	5,17	7,39	8,92	15,45	16,25	0,45	0,63	0,62	0,69	0,79	0,82	0,90	0,93
68	50,7	52,4	53,3	55,0	50,3	51,4	51,3	51,4	20,07	17,86	16,97	13,45	11,58	10,21	4,39	3,88	0,39	1,98	2,47	5,48	7,59	8,91	14,90	15,88	0,44	0,64	0,62	0,73	0,81	0,83	0,90	0,93
69	50,3	50,0	51,6	52,9	50,0	52,9	54,9	52,7	20,14	17,58	17,06	13,81	11,93	10,70	5,89	4,22	0,36	2,16	2,45	5,43	7,22	8,51	13,70	15,73	0,45	0,64	0,63	0,76	0,80	0,83	0,91	0,94
70	50,0	51,2	49,9	50,7	50,1	50,5	56,3	53,8	20,14	18,03	17,72	14,57	11,42	10,07	4,14	4,09	0,36	1,84	2,00	4,85	7,53	9,03	15,30	15,68	0,44	0,63	0,62	0,76	0,79	0,83	0,91	0,93
71	50,1	52,4	55,2	53,7	50,3	52,6	53,6	51,3	20,16	17,85	16,57	14,36	11,54	10,90	4,49	4,54	0,35	1,92	2,67	4,81	7,43	8,24	14,98	15,26	0,44	0,62	0,61	0,73	0,79	0,82	0,91	0,93
72	50,1	50,6	53,5	55,6	50,2	50,1	50,9	53,3	20,14	17,63	16,52	14,18	11,52	10,38	4,98	4,17	0,36	2,03	2,70	5,08	7,54	8,56	14,69	15,77	0,45	0,61	0,61	0,75	0,80	0,81	0,92	0,94
73	50,1	52,1	51,3	53,7	50,2	50,5	56,2	53,4	20,17	18,02	17,31	14,59	11,79	11,06	4,41	4,86	0,35	1,76	2,22	4,77	7,42	8,11	15,22	15,12	0,45	0,60	0,61	0,75	0,81	0,82	0,92	0,94
74	50,8	50,4	52,0	51,2	50,4	52,6	56,6	50,7	20,15	17,74	17,93	14,87	12,16	11,57	5,50	5,30	0,36	1,96	1,87	4,62	7,03	7,60	14,37	14,71	0,45	0,61	0,62	0,76	0,80	0,81	0,93	0,94

Table A13: Run 11 - OM55

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	46,7	48,1	47,5	47,0	48,0	48,3	45,6	49,4	19,26	17,23	15,04	11,89	15,24	9,49	4,51	5,48	1,00	2,49	4,26	7,07	4,45	8,37	13,97	12,99	0,59	0,67	0,72	0,78	0,78	0,73	0,85	0,84
2	47,9	48,5	47,7	48,4	50,6	48,3	54,1	48,8	18,84	16,45	12,86	11,34	13,68	6,95	3,60	3,80	1,27	3,33	7,44	7,88	6,40	12,88	16,14	15,44	0,60	0,74	0,92	0,82	0,88	0,92	0,93	0,90
3	47,6	47,0	47,5	49,2	49,8	48,1	55,6	48,0	18,59	16,35	13,27	10,58	13,96	6,25	2,42	2,84	1,42	3,45	6,84	9,02	5,59	13,52	19,83	17,20	0,60	0,75	0,89	0,87	0,80	0,92	1,07	0,95
4	47,1	47,6	47,0	48,9	49,1	47,6	54,9	46,8	18,52	16,42	13,37	10,83	14,08	5,80	1,78	2,37	1,46	3,31	6,52	8,70	5,50	14,54	19,17	18,02	0,60	0,73	0,86	0,86	0,80	0,96	1,00	0,97
5	50,2	50,6	53,1	52,0	50,2	54,3	53,6	54,7	18,63	16,33	14,97	11,30	12,63	6,27	2,39	2,29	1,39	3,42	5,02	8,30	6,82	14,83	18,19	18,10	0,60	0,74	0,84	0,86	0,82	1,01	0,98	0,97
6	49,6	49,1	52,7	53,8	49,6	54,1	52,2	53,6	18,29	16,35	13,93	10,53	12,68	5,01	1,60	1,36	1,62	3,45	5,83	8,75	7,03	15,78	18,96	19,20	0,61	0,75	0,83	0,84	0,85	0,99	0,98	0,98
7	51,4	52,3	51,8	53,5	53,4	53,4	50,9	52,6	18,55	16,64	14,37	10,37	12,93	6,02	1,41	1,31	1,44	3,19	5,33	8,78	7,06	14,33	19,15	19,44	0,60	0,74	0,81	0,83	0,88	0,96	0,98	0,99
8	50,0	50,4	50,7	52,4	54,2	52,3	54,0	52,1	18,27	16,45	15,11	12,15	11,20	7,13	1,68	1,41	1,63	3,38	4,50	7,22	8,78	13,27	19,08	19,74	0,61	0,75	0,77	0,82	0,90	0,96	0,99	1,01
9	50,1	50,6	50,6	51,4	53,1	51,5	54,3	51,4	18,74	16,82	15,17	12,63	11,66	7,23	1,00	1,90	1,30	2,97	4,57	6,66	8,08	13,03	19,55	19,05	0,59	0,72	0,79	0,80	0,87	0,95	0,98	1,00
10	50,4	50,8	51,7	50,5	52,1	50,6	53,0	50,6	18,79	16,72	15,09	13,21	12,35	7,97	1,41	3,04	1,27	2,92	4,45	6,11	7,14	12,33	19,15	17,55	0,59	0,69	0,76	0,79	0,83	0,95	0,98	0,98
11	50,0	50,7	50,6	50,8	51,0	52,7	51,5	51,3	18,84	16,18	14,80	13,54	13,02	8,98	1,83	3,36	1,31	3,20	4,74	5,93	6,58	11,25	19,12	17,06	0,62	0,67	0,77	0,80	0,83	0,94	1,00	0,97
12	50,0	50,3	50,7	56,3	51,3	53,1	50,0	51,1	18,86	16,25	15,77	10,49	13,36	6,51	2,15	3,60	1,21	3,24	3,99	8,47	6,22	13,72	18,80	16,83	0,58	0,69	0,77	0,81	0,82	0,95	1,00	0,97
13	50,3	51,1	52,3	56,4	51,2	52,2	54,2	50,3	18,81	16,92	14,50	10,18	12,65	6,46	1,33	4,00	1,24	2,82	4,84	8,72	6,89	13,77	19,23	16,61	0,58	0,70	0,75	0,81	0,83	0,95	0,98	0,98
14	50,0	50,8	51,5	55,1	50,4	51,3	53,6	52,4	18,82	16,74	14,87	11,86	13,12	7,56	1,29	4,37	1,26	2,99	4,62	7,27	6,50	12,32	19,27	16,08	0,59	0,71	0,76	0,80	0,83	0,92	0,98	0,97
15	50,1	50,4	50,5	53,8	53,1	50,3	52,1	51,9	18,94	16,65	15,39	12,63	13,17	7,42	1,63	3,68	1,17	3,05	4,17	6,66	6,30	12,45	19,90	16,75	0,58	0,71	0,75	0,80	0,81	0,92	1,03	0,97
16	50,5	50,8	51,4	52,4	52,9	53,4	50,6	50,9	18,91	16,69	15,56	13,27	11,60	7,99	1,70	3,70	1,20	2,94	4,10	6,07	7,67	11,92	19,25	16,56	0,59	0,69	0,76	0,79	0,82	0,92	1,00	0,96
17	50,4	51,1	51,0	51,1	51,9	53,9	55,1	49,9	18,79	16,69	15,22	13,81	12,13	5,03	1,83	4,48	1,25	2,98	4,30	5,50	7,23	14,81	19,12	15,81	0,58	0,70	0,75	0,77	0,82	0,93	1,00	0,96
18	50,1	50,1	50,0	49,9	50,9	52,9	55,4	53,0	18,89	16,62	15,52	14,30	12,60	5,45	1,95	3,36	1,19	2,94	4,13	5,12	6,60	14,57	18,81	17,24	0,58	0,68	0,76	0,77	0,79	0,94	0,99	0,98
19	50,9	50,1	51,0	55,3	50,5	51,9	54,0	52,1	18,89	16,63	14,99	11,58	12,87	5,65	1,48	3,03	1,24	2,98	4,29	7,31	6,46	14,08	19,28	17,74	0,60	0,69	0,72	0,78	0,80	0,92	0,99	0,99
20	50,3	50,1	50,1	56,1	51,5	50,9	52,3	51,0	18,81	16,82	15,51	11,12	12,30	6,31	1,65	3,38	1,26	2,85	3,97	7,77	7,09	13,18	18,91	17,22	0,59	0,69	0,73	0,79	0,82	0,90	0,98	0,98
21	50,5	50,4	50,7	54,9	50,5	51,0	50,6	50,0	18,94	16,85	15,35	11,06	12,77	7,04	1,92	4,12	1,19	2,75	4,03	7,81	6,54	12,52	18,84	16,49	0,59	0,67	0,72	0,79	0,80	0,90	0,99	0,98
22	50,1	50,7	50,5	53,5	52,0	51,4	55,3	52,1	18,87	16,82	15,39	11,69	13,23	6,44	1,85	3,43	1,19	2,77	4,00	7,41	6,02	12,91	18,91	16,99	0,57	0,67	0,72	0,80	0,78	0,89	0,99	0,97
23	50,5	49,9	51,0	52,1	51,4	50,4	55,6	51,3	18,98	16,60	14,93	12,50	12,51	6,61	1,73	3,48	1,12	2,87	4,33	6,59	6,58	12,76	19,03	17,12	0,57	0,66	0,72	0,78	0,78	0,89	0,99	0,98
24	50,1	50,3	50,0	50,6	50,4	53,6	54,1	50,2	18,94	16,77	15,34	13,24	13,05	7,61	1,97	4,03	1,13	2,80	4,10	6,01	6,16	12,14	18,98	16,58	0,56	0,67	0,73	0,78	0,78	0,91	1,00	0,98
25	50,7	50,1	51,4	50,9	53,1	53,2	51,7	52,4	19,06	16,95	15,19	13,78	13,54	4,29	1,68	2,77	1,06	2,64	4,26	5,52	5,78	14,99	18,69	17,82	0,56	0,66	0,74	0,77	0,78	0,90	0,97	0,98
26	50,2	50,2	50,3	57,6	52,3	51,9	50,1	51,5	18,86	16,58	14,92	10,26	11,80	4,79	1,50	2,57	1,19	2,80	4,46	8,45	7,05	14,71	18,87	17,83	0,57	0,64	0,74	0,79	0,77	0,91	0,97	0,97
27	50,4	50,2	51,5	57,5	51,3	50,9	52,6	50,6	19,00	16,96	15,39	10,85	12,61	5,95	1,83	3,23	1,07	2,63	3,95	8,08	6,34	13,50	18,74	16,83	0,55	0,66	0,71	0,80	0,76	0,90	0,98	0,95
28	50,4	50,7	51,1	56,5	50,6	50,3	51,9	50,1	19,03	16,92	15,00	10,59	13,07	6,39	1,62	3,40	1,04	2,66	4,28	8,39	5,99	13,25	18,75	16,32	0,54	0,66	0,72	0,81	0,76	0,91	0,97	0,93
29	50,5	50,5	50,0	54,6	53,4	53,5	50,6	51,9	19,13	17,02	15,46	11,94	13,71	7,55	2,07	3,13	0,95	2,52	3,84	7,30	5,36	12,19	18,31	16,57	0,52	0,64	0,70	0,81	0,74	0,91	0,97	0,93
30	50,1	50,7	50,4	52,7	53,2	53,7	55,0	51,2	18,96	16,74	15,53	13,27	12,33	5,01	1,98	3,48	1,05	2,69	3,74	6,22	6,47	14,82	18,40	16,25	0,53	0,64	0,69	0,81	0,75	0,93	0,97	0,93
31	50,2	50,5	51,5	51,1	52,2	52,7	55,3	50,2	19,28	17,19	15,83	14,23	13,05	5,18	1,75	3,40	0,90	2,41	3,48	5,24	5,93	14,51	19,01	16,50	0,54	0,64	0,68	0,78	0,75	0,92	0,99	0,94
32	50,7	50,4	50,5	50,4	50,6	51,2	53,7	52,4	19,27	17,19	15,51	15,05	13,61	5,94	1,70	3,33	0,94	2,44	3,70	4,60	5,43	13,36	18,87	16,39	0,56	0,65	0,68	0,78	0,74	0,89	0,98	0,93
33	50,4	50,5	52,0	56,3	51,9	50,1	52,1	51,8	19,23	17,04	15,66	11,56	14,20	6,90	1,95	3,11	0,93	2,54	3,49	7,23	4,93	12,08	18,43	16,77	0,54	0,65	0,66	0,77	0,73	0,86	0,97	0,94
34	50,1	50,6	51,2	55,5	51,4	50,2	50,5	50,7	19,29	17,36	15,39	12,26	13,52	7,25	2,05	3,41	0,93	2,37	3,89	6,60	5,50	11,92	18,33	16,31	0,56	0,66	0,70	0,76	0,74	0,87	0,97	0,93
35	50,0	50,0	50,0	53,6	51,2	54,4	55,8	51,9	19,34	17,36	15,87	13,59	14,16	7,93	2,17	3,54	0,89	2,30	3,51	5,74	4,96	11,33	18,03	16,02	0,55	0,64	0,69	0,78	0,73	0,87	0,96	0,92
36	50,1	51,3	51,2	51,6	51,0	54,0	55,9	52,4	19,38	17,31	15,63	14,50	13,81	7,88	1,80	2,96	0,86	2,33	3,62	4,97	5,28	11,37	18,58	16,73	0,55	0,64	0,68	0,77	0,74	0,87	0,97	0,93
37	50,6	50,1	50,1	49,8	51,5	52,6	54,4	51,4	19,38	17,40	15,97	15,30	14,37	7,55	2,10	3,60	0,83	2,34	3,49	4,29	4,74	11,79	18,47	15,96	0,53	0,66	0,70	0,76	0,72	0,88	0,98	0,92
38	50,3	50,0	52,2	56,1	52,6	51,1	52,5	50,2	19,36	17,65	15,61	13,81	13,34	6,50	2,05	4,36	0,84	2,15	3,68	5,14	5,56	12,72	18,33	15,10	0,53	0,65	0,69	0,72	0,73	0,88	0,97	0,91
39	50,1	49,9	51,1	56,4	51,1	51,5	50,8	51,5	19,42	17,51	15,73	12,23	13,98	7,42	2,02	4,19	0,83	2,24	3,60	6,54	5,09	11,64	18,17	15,59	0,54	0,65	0,69	0,75	0,73	0,86	0,96	0,93
40	50,1	50,7	50,3	54,5	52,6	52,3	54,9	50,5	19,38	16,99	16,31	13,56	14,65	6,78	2,07	4,51	0,86	2,34	3,11	5,54	4,66	12,19	18,12	14,96	0,55	0,59	0,67	0,75	0,74	0,86	0,96	0,91
41	50,4	50,5	51,5	52,4	52,2	50,8	54,7	51,2	19,48	17,26	15,80	14,65	13,76	7,15	2,12	4,79	0,78	2,40	3,61	4,60	5,46	11,73	18,27	14,54	0,53	0,65	0,70	0,73	0,76	0,85	0,97	0,90
42	50,5	49,9	50,0	50,2	50,6	52,0	52,8	50,3	19,46	17,61	16,24	15,46	14,39	7,97	2,05	4,59	0,77	2,10	3,20	3,90	4,79	10,90	18,33	14,72	0,52	0,63	0,68	0,71	0,73	0,84	0,97	0,90
43	50,4	51,4	51,0	54,2	53,1	51,7	51,0	53,0	19,45	17,65	16,40	15,95	15,02	7,05	2,32	4,11	0,80	2,05	2,96	3,65	4,39	11,82	18,26	15,16	0,53	0,62	0,65	0,73	0,74	0,85	0,98	0,90
44	50,5	51,1	50,2	55,9	52,2	50,3	54,2	52,3	19,50	17,65	16,42	12,47	13,66	7,68	3,14	3,65	0,74	1,98	2,99	6,19	5,39	11,28	17,45	15,40	0,51	0,60	0,66	0,73	0,74	0,85	0,98	0,89
45	50,5	51,0	51,0	54,0	50,7	53,3	53,8	50,9	19,51	17,73	16,08	13,54	14,35	8,11	3,40	4,19	0,73	1,93	3,21	5,34	4,82	10,91	17,20	14,75	0,51	0,60	0,66	0,72	0,73	0,85	0,98	0,88
46	50,0	50,7	49,9	52,0	51,1	52,3	52,0	51,4	19,50	16,84	15,12	13,86	12,28	6,58	3,18	4,98	0,73	2,42	3,85	4,96	6,42	12,21	17,24	14,05	0,50	0,59	0,66	0,70	0,74	0,85	0,97	0,88
47	49,9	50,3	51,3	49,8	51,8	50,6	50,0	52,3	19,58	17,61	14,72	14,33	10,97	7,11	2,80	3,85	0,66	2,07	4,17	4,57	7,29	11,90	17,61	15,39	0,48	0,62	0,67	0,69	0,73	0,86	0,97	0,90
48	49,9	51,4	50,1	55,7	51,9	53,5	55,8	50,9	19,59	17,68	15,07	13,95	9,91	8,14	2,32	4,08	0,65	2,09	4,12	4,97	8,61	11,02	18,07	15,01	0,48	0,64	0,70	0,71	0,78	0,86	0,97	0,89
49	50,2	51,7	51,8	56,2	50,6	52,6	54,5	52,0	19,55	17,48	14,49	10,89	10,17	6,29	2,10	4,79	0,67	2,26	4,46	7,24	8,41	12,75	18,66	14,38	0,48	0,65	0,69	0,72	0,78	0,87	0,99	0,89
50	50,2	51,0	50,3	54,1	50,2	50,9	52,7	52,5	19,60	17,52	14,95	12,33	10,53	6,93	2,32	3,87	0,65	2,23	4,20	6,12	8,34	11,92	18,07	15,37	0,48	0,65	0,70	0,71	0,80	0,85	0,97	0,90
51	50,5	50,7	51,2	51,8	50,6	52,8	50,7	51,0	19,61	17,58	15,58	13,57	10,85	8,11	2,29	4,27	0,71	2,22	3,65	5,46	7,98	10,79	18,10	15,01	0,53	0,66	0,68	0,74	0,79	0,84	0,97	0,90
52	50,0	50,4	50,0	49,9	53,2	52,6	55,1	51,4	19,58	17,64	15,34	14,53	10,92	6,63	1,92	4,91	0,66	2,15	3,87	4,75	7,92	12,17	18,65	14,28	0,48	0,65	0,69	0,74	0,79	0,85	0,98	0,89
53	50,1	50,0	51,3	55,7	51,6	50,8	54,4	51,6	19,70	17,85	15,63	14,33	9,74	7,05	1,97	4,41	0,59	1,95	3,56	4,97	8,74	11,68	18,60	14,39	0,47	0,63	0,67	0,75	0,78	0,84	0,98	0,87
54	50,0	50,6	49,9	56,3	50,1	53,1	52,8	50,2	19,70	17,79	15,56	11,37	10,34	8,08	2,13	4,98	0,60	1,96	3,72	7,09	8,28	10,94	17,88	14,21	0,48	0,62	0,69	0,74	0,78	0,85	0,95	0,89
55	50,1	51,4	51,3	54,2	53,1	52,7	50,7	53,5	19,75	17,87	15,49	12,97	10,97	6,88	2,52	5,06	0,58	1,91	3,71	5,61	7,88	12,10	17,51	14,14	0,48	0,62	0,68	0,74	0,79	0,86	0,95	0,89
56	50,0	50,7	49,9	52,0	52,2	50,9	55,3	52,5	19,72	17,87	15,71	14,02	11,02	7,14	2,17	4,12	0,57	1,88	3,56	5,20	7,75	11,88	17,84	15,15	0,46	0,61	0,68	0,75	0,78	0,86	0,95	0,90
57	50,3	50,7	51,8	49,8	51,6	53,1	55,0	50,9	19,73	17,96	15,39	14,89	10,48	8,11	2,27	4,69	0,55	1,79	3,73	4,36	8,17	11,04	17,93	14,31	0,45	0,60	0,67	0,72	0,78	0,86	0,96	0,88
58	50,4	50,2	50,1	56,0	51,2	53,1	53,1	52,3	19,72	17,21	15,73	14,72	11,27	7,00	2,66	5,75	0,57	2,21	3,50	4,67	7,74	12,14	17,38	13,38	0,46	0,59	0,67	0,75	0,80	0,87	0,95	0,88
59	50,3	50,8	51,8	56,4	50,1	51,2	50,9	51,6	19,72	18,15	16,20	12,03	11,32	7,25	2,74	5,08	0,57	1,71	3,28	6,60	7,61	11,65	17,30	14,12	0,46	0,61	0,69	0,74	0,79	0,85	0,95	0,89
60	50,2	50,1	50,3	54,1	51,0	52,1	54,5	50,0	19,75	17,97	15,76	13,19	11,57	8,08	2,44	5,45	0,54	1,79	3,58	5,74	7,32	10,81	17,77	13,80	0,45	0,60	0,69	0,74	0,78	0,84	0,96	0,89
61	50,5	51,3	52,2	51,8	52,5	52,7	54,0	52,3	19,80	18,03	16,36	14,43	11,66	7,50	2,91	5,57	0,51	1,72	3,12	4,69	7,43	11,30	17,32	13,69	0,44	0,59	0,68	0,72	0,80	0,84	0,96	0,89
62	50,3	51,1	50,6	49,7	51,3	50,8	52,1	50,7	19,75	18,00	15,76	15,31	10,83	7,60	2,69	5,48	0,52	1,80	3,48	4,00	7,99	11,35	17,53	13,61	0,43	0,61	0,67	0,71	0,79	0,85	0,96	0,88
63	50,6	50,4	52,0	56,1	52,6	53,5	50,0	52,7	19,80	17,43	16,37	14,57	11,37	8,60	2,81	6,04	0,51	2,08	3,11	4,72	7,47	10,37	17,23	13,12	0,44	0,59	0,68	0,74	0,78	0,84	0,95	0,88
64	50,5	50,5	50,3	55,9	51,8	52,8	56,6	51,9	19,82	18,22	15,95	12,65	11,02	7,38	3,02	5,60	0,50	1,64	3,40	6,23	7,65	11,40	16,85	13,35	0,44	0,60	0,68	0,75	0,77	0,84	0,94	0,87
65	50,0	50,3	52,1	53,8	50,1	50,8	55,3	50,2	19,82	18,10	16,53	13,86	11,49	7,69	2,91	5,92	0,51	1,74	2,92	5,32	7,38	11,01	17,14	12,78	0,45	0,61	0,66	0,75	0,78	0,83	0,95	0,85
66	50,1	51,8	50,3	51,2	51,8	53,8	53,1	53,1	19,82	18,30	16,05	14,82	12,03	8,87	3,16	5,95	0,50	1,56	3,28	4,29	7,05	10,03	16,90	12,75	0,44	0,59	0,67	0,70	0,79	0,83	0,95	0,85
67	50,2	51,2	51,6	50,2	50,4	53,1	50,9	51,7	19,87	18,10	16,62	15,71	11,74	7,25	3,28	5,65	0,48	1,65	2,86	3,62	7,09	11,51	16,61	13,16	0,44	0,58	0,66	0,69	0,77	0,84	0,94	0,86
68	50,3	50,0	50,0	56,3	51,9	51,0	55,2	49,8	19,85	17,48	16,25	13,10	11,86	7,55	2,81	6,07	0,49	2,05	3,06	5,57	7,18	11,26	17,05	12,65	0,45	0,59	0,65	0,71	0,79	0,84	0,94	0,85
69	50,2	50,3	51,0	54,8	50,8	52,7	54,6	52,5	19,87	18,35	16,43	13,27	11,51	8,79	3,09	5,97	0,48	1,61	2,98	5,61	7,55	10,09	16,97	12,73	0,44	0,62	0,66	0,73	0,80	0,83	0,95	0,85
70	50,1	49,9	52,1	52,3	52,1	51,9	52,4	50,6	19,87	18,01	15,74	14,52	12,28	8,05	3,50	5,20	0,48	1,79	3,33	4,69	6,76	10,84	16,23	13,23	0,44	0,61	0,64	0,73	0,78	0,84	0,93	0,84
71	50,0	51,5	50,6	50,0	50,6	50,0	50,2	52,6	19,87	17,88	15,23	15,48	11,74	8,58	3,60	4,91	0,48	1,81	3,83	3,88	7,28	10,27	16,48	13,47	0,44	0,59	0,67	0,71	0,79	0,83	0,95	0,84
72	50,1	50,7	50,6	55,4	52,6	50,9	56,3	51,2	19,90	17,94	15,91	15,96	12,60	8,93	3,43	4,51	0,47	1,84	3,33	3,59	6,35	10,10	16,64	13,81	0,45	0,61	0,66	0,72	0,76	0,84	0,95	0,84
73	50,3	51,6	52,1	56,2	50,6	53,3	55,3	51,9	19,90	17,93	15,96	12,75	11,77	9,32	3,38	4,54	0,47	1,81	3,29	5,99	6,98	9,77	16,52	14,11	0,45	0,60	0,66	0,73	0,76	0,84	0,94	0,86
74	50,0	50,9	50,6	53,8	51,2	53,3	53,1	52,4	19,89	17,83	15,46	14,02	12,30	7,56	3,21	4,02	0,47	1,84	3,68	4,99	6,49	11,38	16,50	14,39	0,44	0,59	0,67	0,72	0,75	0,85	0,93	0,85

Table A14: Run 12 - OM60

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	48,8	45,0	51,6	51,9			44,6	43,3	12,29	11,98	4,98	2,94			6,70	11,91	5,37	6,55	13,89	16,21			12,68	6,42	0,62	0,73	0,87	0,90			0,89	0,71
2	47,8	46,3	53,4	53,3			47,4	44,2	14,77	12,74	4,44	2,94			6,19	12,05	4,02	5,99	15,02	17,11			14,17	7,30	0,65	0,73	0,91	0,95			0,96	0,82
3	47,5	47,8	54,7	53,8			46,5	44,3	14,47	12,54	4,27	3,23			5,20	12,04	4,54	6,22	15,35	17,90			15,75	7,93	0,70	0,74	0,92	1,01			1,00	0,89
4	47,3	49,4	55,5	54,3			46,5	48,8	15,29	12,85	4,45	3,65			5,69	15,05	3,96	6,16	16,01	17,30			15,87	5,72	0,70	0,76	0,97	1,00			1,04	0,97
5	48,0	50,5	56,1	54,4			51,3	47,1	15,37	12,56	4,56	3,76			5,49	14,66	3,74	6,46	16,06	17,19			17,01	6,23	0,67	0,77	0,98	1,00			1,10	0,99
6	47,6	51,3	56,3	54,5			49,7	47,0	15,90	13,00	6,83	4,02			5,46	15,18	3,33	6,28	13,98	16,76			17,50	6,06	0,66	0,79	0,99	0,99			1,13	1,05
7	47,4	52,3	56,9	54,8			48,0	47,1	15,88	12,45	6,12	4,24			5,84	9,36	3,30	6,72	15,27	16,54			17,07	12,75	0,65	0,79	1,03	0,99			1,13	1,10
8	50,3	52,7	57,2	54,8			52,1	51,9	15,46	13,31	5,51	4,38			5,52	10,25	3,51	6,11	14,82	16,07			17,13	12,52	0,64	0,80	0,96	0,97			1,11	1,17
9	52,0	52,6	57,1	54,8			52,4	50,2	15,57	13,55	6,00	4,55			5,40	11,23	3,44	5,70	13,75	15,58			17,42	11,57	0,64	0,77	0,92	0,95			1,12	1,19
10	51,2	53,1	57,4	55,0			50,4	50,0	16,06	14,13	6,55	4,82			5,44	11,20	3,08	5,12	12,96	15,16			17,37	10,63	0,63	0,75	0,90	0,94			1,12	1,09
11	50,0	53,0	57,0	55,0			55,2	50,0	16,11	14,40	7,13	5,17			5,37	11,16	3,05	4,72	12,44	14,83			18,23	10,38	0,63	0,72	0,90	0,94			1,17	1,06
12	50,6	52,8	56,5	54,7			53,5	50,1	16,48	14,56	7,77	5,68			5,40	11,58	2,73	4,66	11,47	14,20			18,04	9,56	0,61	0,73	0,87	0,93			1,16	1,02
13	51,7	52,6	56,1	54,6			50,9	50,1	16,48	14,69	8,39	6,17			5,27	11,58	2,55	4,19	10,80	13,60			17,88	9,46	0,57	0,67	0,86	0,92			1,14	1,01
14	50,5	52,5	55,8	54,4			54,3	50,2	16,97	14,88	9,03	6,77			5,22	10,70	2,27	3,95	10,01	13,05			17,77	10,25	0,57	0,65	0,84	0,92			1,13	1,00
15	51,5	52,2	55,2	54,0			52,9	50,4	16,79	14,42	9,61	8,01			5,67	14,26	2,29	4,18	9,53	11,52			17,11	6,69	0,55	0,64	0,84	0,89			1,12	1,00
16	50,2	51,8	54,6	53,6			50,3	50,1	16,33	15,04	10,21	7,99			5,60	11,67	2,59	3,78	8,91	11,66			16,89	8,82	0,56	0,64	0,83	0,90			1,10	0,95
17	50,8	51,4	53,9	53,2			54,7	50,1	16,93	15,11	10,76	8,61			5,69	11,34	2,17	3,74	8,36	10,49			16,33	8,84	0,54	0,64	0,82	0,85			1,07	0,92
18	51,7	50,6	52,9	52,3			52,6	50,3	17,19	15,77	10,30	9,96			5,89	11,25	1,99	3,11	8,20	9,34			15,96	8,92	0,53	0,60	0,77	0,85			1,06	0,92
19	50,2	50,1	52,1	51,7			50,0	50,2	17,21	15,68	10,45	9,14			6,26	11,71	1,94	3,16	7,88	9,80			14,98	8,59	0,52	0,60	0,75	0,83			1,02	0,93
20	51,2	50,7	51,4	51,3			52,0	50,0	17,08	13,95	9,72	9,12			6,89	11,85	2,01	4,27	8,31	9,82			14,06	8,19	0,52	0,61	0,74	0,83			1,00	0,90
21	51,2	50,4	50,5	50,3			50,9	50,1	16,64	14,29	10,23	9,65			6,33	11,89	2,24	4,26	7,83	9,49			14,77	7,97	0,52	0,64	0,73	0,84			1,01	0,88
22	50,2	51,4	51,4	51,5			51,5	50,0	17,33	14,00	9,88	9,57			6,35	15,04	1,85	4,59	7,86	9,45			14,89	5,20	0,51	0,66	0,71	0,83			1,02	0,88
23	50,2	51,1	54,5	56,1			53,4	50,1	17,37	13,96	9,66	9,68			6,59	11,63	1,79	4,61	7,90	9,35			14,50	8,20	0,50	0,66	0,70	0,83			1,01	0,88
24	50,7	50,3	54,4	56,1			52,3	50,2	17,15	14,95	9,97	9,73			6,50	11,65	1,90	4,02	7,80	9,42			14,31	8,09	0,50	0,67	0,71	0,84			0,99	0,87
25	51,5	51,7	53,6	55,4			49,9	50,2	17,35	14,89	9,52	9,67			6,71	11,98	1,80	3,88	8,34	9,48			14,10	7,71	0,50	0,64	0,73	0,84			0,99	0,86
26	49,9	51,1	52,7	54,5			52,2	50,2	16,99	14,78	10,34	9,30			6,90	11,67	1,94	3,95	7,75	9,79			13,91	7,89	0,49	0,64	0,73	0,84			0,99	0,85
27	50,8	50,5	51,7	53,3			50,0	50,1	17,59	14,42	10,14	9,32			7,01	11,92	1,58	4,18	7,78	9,65			13,94	7,77	0,47	0,64	0,72	0,83			1,00	0,86
28	51,1	51,1	50,9	52,4			53,0	50,1	17,79	14,35	10,92	10,21			7,79	14,66	1,45	4,22	7,32	8,70			13,03	5,22	0,46	0,64	0,73	0,81			0,99	0,83
29	50,8	51,0	50,0	51,6			51,5	50,3	17,68	14,15	10,28	10,04			7,76	12,36	1,41	4,35	7,90	8,51			13,06	6,87	0,43	0,64	0,74	0,78			0,99	0,80
30	50,8	50,0	53,7	50,4			52,4	50,4	16,97	14,24	9,32	10,42			9,45	12,67	1,67	4,36	8,61	8,00			11,39	6,04	0,42	0,65	0,74	0,76			0,99	0,73
31	51,2	50,2	54,1	54,0			53,1	50,2	17,01	14,06	9,76	10,18			9,28	12,62	1,62	4,41	9,06	9,69			11,67	6,33	0,41	0,64	0,81	0,90			1,00	0,76
32	51,0	51,3	53,3	57,1			50,7	50,1	17,04	13,93	9,05	10,10			6,28	12,18	1,56	4,42	10,95	11,07			14,52	6,67	0,40	0,63	0,92	1,02			0,99	0,76
33	50,3	50,0	51,7	56,3			54,1	50,3	16,93	14,42	9,40	10,63			6,30	12,98	1,57	4,05	10,51	10,22			14,21	6,06	0,39	0,62	0,91	0,99			0,97	0,76
34	50,4	50,2	50,7	55,1			53,0	50,2	16,80	14,42	9,61	10,49			6,46	12,34	1,66	3,92	9,75	9,94			14,06	6,54	0,40	0,60	0,86	0,95			0,97	0,76
35	51,5	52,4	52,9	53,3			50,4	50,1	17,03	13,76	9,66	10,42			6,46	11,80	1,57	4,31	9,60	9,79			14,06	7,05	0,40	0,60	0,85	0,93			0,97	0,77
36	50,7	51,5	55,5	51,7			54,3	50,1	16,73	14,69	9,59	10,78			6,50	10,94	1,73	3,76	9,43	9,15			14,02	7,81	0,41	0,60	0,83	0,90			0,97	0,78
37	50,9	50,5	55,0	50,2			53,1	50,4	16,77	14,51	9,44	10,80			6,75	11,47	1,76	3,80	9,44	9,03			13,49	7,49	0,42	0,59	0,82	0,89			0,95	0,79
38	50,8	50,9	53,6	54,4			50,6	50,3	16,46	14,44	9,36	10,16			6,39	10,79	1,89	3,78	9,39	9,71			13,83	7,82	0,42	0,58	0,81	0,90			0,95	0,77
39	51,2	50,0	52,1	56,9			54,3	50,3	16,72	14,81	9,64	10,21			6,57	12,63	1,78	3,50	9,05	9,77			13,66	6,32	0,42	0,57	0,80	0,91			0,95	0,76
40	50,9	51,6	50,6	55,8			52,9	50,3	16,93	14,37	9,88	10,40			6,62	12,38	1,69	3,68	8,86	9,50			13,18	6,00	0,42	0,56	0,80	0,90			0,92	0,70
41	50,0	50,2	52,7	54,0			50,4	50,1	16,99	14,75	9,44	10,66			6,51	12,58	1,50	3,47	9,21	9,36			13,14	5,78	0,38	0,56	0,80	0,91			0,91	0,69
42	50,1	52,2	55,4	52,0			54,5	50,2	16,86	15,11	9,34	10,33			6,71	12,51	1,55	3,15	9,40	9,35			12,82	5,82	0,38	0,54	0,81	0,88			0,90	0,69
43	50,2	50,9	54,6	50,3			52,9	50,3	16,79	14,97	9,52	10,79			6,71	12,38	1,58	3,23	9,14	8,84			12,96	5,91	0,38	0,54	0,80	0,87			0,91	0,69
44	50,8	51,9	53,0	54,2			50,4	50,2	16,79	14,42	9,73	10,94			6,97	11,36	1,62	3,40	9,09	8,71			12,58	6,62	0,39	0,52	0,81	0,87			0,90	0,69
45	50,9	50,9	51,2	56,4			53,5	50,0	16,44	14,73	9,28	10,40			6,81	11,03	1,76	3,23	9,45	9,28			12,73	6,84	0,39	0,52	0,81	0,88			0,90	0,69
46	51,0	50,8	49,6	55,1			51,5	50,2	16,74	14,73	9,57	10,97			6,68	11,32	1,60	3,23	9,45	8,98			12,70	6,64	0,38	0,52	0,83	0,90			0,89	0,69
47	51,2	51,7	55,2	53,2			53,0	50,1	16,79	14,49	9,69	10,91			6,66	11,65	1,58	3,36	9,57	8,94			12,86	6,51	0,38	0,52	0,85	0,89			0,90	0,70
48	50,8	50,9	55,1	51,4			51,6	50,2	16,82	14,78	9,42	10,35			6,60	11,12	1,61	3,21	9,92	9,33			12,92	6,88	0,39	0,52	0,86	0,88			0,90	0,70
49	51,0	50,9	53,3	50,1			53,2	50,3	16,75	15,13	9,71	10,28			6,82	11,83	1,60	3,03	9,55	9,39			12,86	6,38	0,38	0,52	0,85	0,88			0,91	0,70
50	51,5	50,7	51,7	56,6			51,9	50,0	16,59	14,88	9,22	10,85			6,82	11,27	1,66	3,04	9,74	9,09			12,72	6,68	0,38	0,50	0,83	0,90			0,90	0,69
51	51,2	50,1	50,0	56,1			50,7	50,3	16,31	15,49	9,62	10,35			7,13	11,09	1,76	2,68	9,06	9,01			12,44	6,70	0,38	0,49	0,80	0,85			0,90	0,68
52	50,3	50,0	54,7	54,3			51,4	50,3	16,66	15,09	9,44	10,11			6,82	11,43	1,54	2,81	9,21	9,00			12,72	6,47	0,36	0,48	0,80	0,83			0,90	0,68
53	50,3	51,9	55,0	52,3			52,8	50,2	16,55	14,95	9,60	10,41			6,77	11,82	1,54	2,82	9,19	8,64			12,76	6,12	0,35	0,47	0,81	0,82			0,90	0,67
54	50,6	50,6	53,6	50,4			51,3	50,8	16,44	15,02	9,70	10,66			6,42	9,79	1,62	2,79	8,89	8,54			12,79	7,37	0,36	0,47	0,79	0,83			0,88	0,66
55	50,9	50,6	52,1	51,1			51,5	50,3	16,48	15,11	9,14	10,55			6,70	10,85	1,61	2,74	8,86	8,63			12,68	6,67	0,36	0,47	0,75	0,83			0,89	0,66
56	51,2	51,6	50,1	56,7			50,7	50,2	16,52	14,97	10,49	10,54			6,81	9,77	1,59	2,81	7,74	8,85			13,15	7,60	0,36	0,47	0,74	0,85			0,93	0,68
57	50,9	50,1	54,4	55,8			54,1	50,3	16,41	15,02	9,22	10,52			6,46	10,94	1,63	2,85	8,68	8,87			13,77	7,01	0,36	0,48	0,74	0,85			0,95	0,70
58	51,1	51,4	54,8	54,0			52,5	50,2	16,41	15,00	9,85	10,33			6,66	10,18	1,63	2,86	8,10	8,92			13,86	7,54	0,36	0,48	0,73	0,84			0,97	0,70
59	51,0	49,9	53,3	51,9			50,0	50,2	16,30	15,22	9,63	10,68			6,53	10,43	1,67	2,75	8,26	8,73			13,84	7,47	0,36	0,48	0,73	0,85			0,96	0,71
60	51,2	51,0	51,4	49,8			52,4	50,3	16,44	15,15	9,97	10,69			6,71	11,36	1,58	2,67	8,02	8,62			13,39	6,90	0,35	0,46	0,73	0,84			0,94	0,72
61	50,9	51,4	49,8	56,0			50,3	49,9	16,44	15,06	10,16	10,47			6,22	11,41	1,53	2,59	7,88	8,91			13,99	6,87	0,34	0,44	0,73	0,85			0,95	0,72
62	51,2	49,9	55,3	56,6			54,6	50,2	16,41	15,64	9,75	10,80			6,42	10,65	1,54	2,34	8,18	8,63			13,80	7,42	0,34	0,44	0,73	0,85			0,95	0,72
63	51,1	51,3	54,5	54,8			52,8	50,3	16,33	15,35	10,06	10,42			6,44	10,78	1,57	2,41	7,84	8,63			13,64	7,32	0,34	0,43	0,72	0,82			0,94	0,72
64	50,7	51,4	52,7	52,5			50,2	50,1	16,33	15,09	9,47	10,05			7,32	10,83	1,57	2,46	8,15	8,61			12,68	7,19	0,34	0,42	0,71	0,79			0,93	0,71
65	50,3	50,2	50,7	50,5			53,9	50,3	16,35	15,35	10,76	10,18			7,06	10,49	1,56	2,35	7,13	8,29			12,64	7,43	0,34	0,42	0,70	0,77			0,91	0,71
66	50,9	51,2	53,6	54,0			51,7	50,1	16,28	15,18	9,92	10,25			7,50	11,34	1,59	2,31	7,83	8,24			12,11	6,73	0,34	0,40	0,71	0,77			0,90	0,70
67	51,1	50,6	55,6	57,3			52,4	50,1	16,31	15,35	9,68	10,79			7,67	11,03	1,53	2,24	8,11	7,62			11,95	6,94	0,33	0,40	0,72	0,75			0,90	0,70
68	50,2	50,4	54,1	55,6			51,0	50,0	16,40	15,35	9,21	11,90			7,90	9,92	1,55	2,24	8,22	6,70			11,61	7,83	0,34	0,40	0,70	0,74			0,89	0,71
69	49,9	50,5	52,0	53,4			53,6	50,3	16,41	15,55	10,39	11,95			7,55	15,04	1,50	2,11	7,18	6,66			11,93	4,20	0,33	0,39	0,68	0,74			0,89	0,71
70	50,0	51,9	50,0	51,2			52,0	50,1	16,61	15,26	10,72	11,58			7,17	13,87	1,43	2,22	6,55	6,56			12,26	5,03	0,33	0,39	0,64	0,70			0,89	0,71
71	50,8	50,2	55,1	51,3			51,8	50,3	16,44	15,29	10,17	11,30			7,08	13,38	1,31	2,15	6,68	7,14			12,48	5,30	0,29	0,38	0,62	0,74			0,90	0,70
72	50,6	49,9	55,4	56,5			51,0	50,3	16,37	15,57	10,68	11,55			7,28	13,38	1,33	2,04	6,26	6,96			12,30	5,30	0,29	0,38	0,61	0,74			0,90	0,70
73	50,8	50,9	53,5	55,2			53,5	50,3	16,44	15,24	10,05	11,10			7,61	10,85	1,31	2,17	6,76	7,58			11,87	7,17	0,29	0,38	0,62	0,77			0,89	0,71
74	50,3	51,6	51,5	53,1			51,8	50,1	16,35	15,17	10,45	11,57			7,17	10,83	1,29	2,20	6,41	6,66			12,26	7,29	0,28	0,38	0,61	0,71			0,89	0,72
75	50,0	50,2	49,8	50,9			52,1	50,2	16,06	15,28	10,25	11,59			7,08	10,58	1,42	2,10	6,53	6,46			12,34	7,47	0,29	0,37	0,61	0,69			0,89	0,72
76	49,9	50,3	55,2	51,3			50,6	50,4	15,93	15,46	10,26	11,88			6,88	10,69	1,46	1,98	6,95	6,26			12,66	7,39	0,29	0,36	0,65	0,69			0,90	0,72
77	51,1	51,3	54,3	56,7			53,9	50,0	15,84	15,11	10,13	11,59			7,05	10,70	1,53	2,10	7,03	6,18			12,65	7,18	0,30	0,36	0,65	0,66			0,91	0,70
78	50,8	51,3	52,1	55,3			52,3	50,0	15,99	15,40	10,87	11,25			7,22	9,99	1,49	2,05	6,65	6,40			12,36	7,56	0,30	0,37	0,66	0,66			0,90	0,69
79	50,6	50,0	50,1	53,2			50,0	50,2	15,82	15,20	10,39	11,88			7,33	9,87	1,54	2,07	6,97	5,99			12,26	7,65	0,30	0,36	0,66	0,66			0,90	0,69
80	50,4	51,1	54,9	50,8			51,3	50,3	15,69	15,37	10,98	11,12			7,21	9,92	1,58	2,01	6,48	6,49			12,64	7,61	0,30	0,36	0,65	0,66			0,92	0,69

Table A15: Run 13 - OM70

time	temperatures of the reactor [°C]								oxygen content [%]								carbon dioxide content [%]								Respiratory Quotient							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	49,4	51,3	48,5	50,3	48,0	51,7	50,1	51,0	16,30	14,78	13,49	3,36	8,99	6,08	1,87	5,77	2,84	4,01	5,60	18,12	9,93	14,87	20,03	18,06	0,61	0,65	0,75	1,03	0,83	1,00	1,05	1,19
2	49,1	50,6	48,1	50,8	48,1	52,1	49,4	50,3	16,97	13,60	12,69	3,24	7,86	4,22	1,34	5,06	2,27	5,66	6,94	18,42	12,44	17,40	20,20	19,70	0,57	0,77	0,84	1,04	0,95	1,04	1,03	1,24
3	49,0	50,5	48,5	50,9	48,1	52,4	48,5	49,5	16,75	13,35	12,56	3,36	7,19	3,54	1,05	4,62	2,48	5,78	7,05	18,12	13,90	18,11	20,10	20,09	0,59	0,76	0,84	1,03	1,01	1,04	1,01	1,23
4	48,9	50,6	49,0	50,7	48,2	52,3	51,0	49,1	16,73	13,29	12,27	3,71	6,70	4,20	1,58	4,66	2,49	5,82	7,12	17,76	14,39	17,42	19,56	20,04	0,59	0,76	0,82	1,03	1,01	1,04	1,01	1,23
5	48,5	50,4	49,1	50,3	48,1	52,2	53,6	49,2	16,84	13,60	12,29	3,98	5,84	4,04	0,85	4,36	2,42	5,59	6,93	17,65	15,56	17,76	20,10	20,07	0,59	0,76	0,80	1,04	1,03	1,05	1,00	1,21
6	48,1	50,2	49,0	49,9	48,3	52,1	52,9	48,8	16,90	14,00	12,47	4,44	5,77	4,38	0,68	4,38	2,39	5,21	6,70	16,84	16,09	17,23	20,07	19,88	0,59	0,75	0,79	1,02	1,06	1,04	0,99	1,20
7	48,2	49,8	48,7	49,4	48,4	51,7	51,6	47,8	17,04	14,35	12,87	7,91	5,69	4,73	0,61	4,32	2,23	4,75	6,38	12,91	16,02	16,71	20,14	19,96	0,57	0,72	0,79	0,99	1,05	1,03	0,99	1,20
8	48,3	49,4	48,3	48,9	48,7	51,4	50,2	50,7	17,08	14,64	13,16	5,40	5,73	5,07	0,58	4,31	2,17	4,48	6,00	15,39	16,13	16,36	20,17	20,13	0,56	0,71	0,77	0,99	1,06	1,03	0,99	1,21
9	48,1	49,0	48,4	48,5	48,2	51,1	48,8	50,0	17,12	14,88	13,40	5,97	6,35	5,44	0,59	4,46	2,11	4,13	5,66	14,83	15,04	15,67	20,16	19,46	0,55	0,68	0,75	0,99	1,03	1,01	0,99	1,18
10	48,1	48,5	48,4	48,1	48,6	50,7	50,9	48,8	17,03	15,08	13,42	6,31	6,64	5,77	0,87	4,62	2,16	3,87	5,65	14,35	14,60	15,33	20,08	18,94	0,55	0,66	0,75	0,98	1,02	1,01	1,00	1,16
11	48,1	48,1	48,1	49,5	48,1	50,3	53,5	48,8	17,12	15,24	13,67	6,28	6,04	6,11	0,69	3,96	2,03	3,71	5,39	14,52	15,21	14,54	20,06	19,54	0,53	0,65	0,74	0,99	1,02	0,98	0,99	1,15
12	48,0	48,2	48,3	50,2	48,1	49,9	52,6	49,3	16,57	15,51	13,71	6,17	6,22	6,53	0,63	4,51	2,32	3,32	5,36	15,08	14,88	13,99	19,91	18,74	0,53	0,61	0,74	1,02	1,01	0,97	0,98	1,14
13	48,5	48,4	48,4	49,8	48,6	49,2	51,1	48,0	17,08	15,59	13,78	6,30	6,51	6,97	0,63	4,56	2,09	3,22	5,16	14,65	14,44	13,14	19,91	18,68	0,54	0,60	0,72	1,00	1,00	0,94	0,98	1,14
14	48,1	48,8	48,2	49,2	48,2	48,6	49,8	50,1	17,19	15,37	13,93	6,44	6,55	7,52	0,67	4,51	1,99	3,35	5,05	14,07	14,54	12,89	19,87	18,58	0,53	0,60	0,72	0,97	1,01	0,96	0,98	1,13
15	48,3	48,1	48,5	48,6	48,3	48,2	48,5	49,0	16,77	14,88	14,04	6,90	6,71	10,69	6,48	7,88	2,22	3,22	4,91	13,21	13,96	9,85	14,33	14,77	0,53	0,60	0,71	0,94	0,98	0,96	0,99	1,13
16	50,4	51,0	50,3	49,6	50,1	51,9	51,5	51,6	16,99	15,95	13,62	7,66	7,02	8,55	1,01	3,62	2,10	2,95	5,20	12,23	13,65	12,28	19,74	20,10	0,53	0,59	0,71	0,92	0,98	0,99	0,99	1,16
17	50,1	51,3	50,3	55,9	51,0	53,5	56,4	52,2	16,99	15,04	13,49	5,60	5,26	5,33	0,78	4,42	2,18	3,43	5,30	19,80	16,47	16,56	19,97	20,00	0,55	0,58	0,71	1,29	1,05	1,06	0,99	1,21
18	50,1	50,5	50,2	56,5	51,1	52,6	55,1	50,9	16,91	14,93	13,33	4,04	5,37	5,20	0,68	4,44	2,30	3,49	5,41	18,77	16,98	15,75	20,07	20,14	0,57	0,58	0,71	1,11	1,09	1,00	0,99	1,22
19	50,3	50,0	50,0	56,4	50,2	51,9	53,4	50,6	16,73	15,13	13,47	2,73	5,57	7,95	1,07	4,24	2,41	3,43	5,54	18,77	16,46	12,87	20,08	20,05	0,57	0,59	0,74	1,03	1,07	0,99	1,01	1,20
20	50,0	50,7	50,2	55,6	50,1	51,0	51,6	50,9	14,40	15,35	13,64	3,33	5,29	6,30	0,61	4,62	3,73	3,30	5,12	18,15	16,60	13,92	20,14	19,27	0,57	0,59	0,70	1,03	1,06	0,95	0,99	1,18
21	50,1	50,5	50,1	54,5	50,2	50,2	50,1	50,1	14,77	15,33	13,91	4,26	5,42	7,04	0,65	3,73	3,46	3,37	4,93	16,36	16,31	13,21	20,10	19,80	0,56	0,60	0,70	0,98	1,05	0,95	0,99	1,15
22	50,2	50,2	50,4	53,2	50,2	52,7	54,4	51,7	15,60	15,29	14,15	5,22	5,42	7,74	0,92	4,66	2,89	3,45	4,69	15,26	16,00	12,42	20,03	18,73	0,54	0,61	0,69	0,97	1,03	0,94	1,00	1,15
23	51,2	52,1	51,0	53,5	51,0	54,1	57,6	52,4	16,86	15,59	14,22	5,86	5,46	6,50	0,76	4,67	2,21	3,27	4,64	14,64	15,64	13,58	19,99	18,56	0,54	0,61	0,69	0,97	1,01	0,94	0,99	1,14
24	50,3	49,9	50,3	51,6	50,9	51,6	54,7	50,8	15,84	15,48	14,35	6,88	5,48	10,03	1,89	1,03	2,91	3,28	4,62	13,51	15,47	9,94	19,44	21,51	0,57	0,60	0,70	0,96	1,00	0,91	1,02	1,08
25	50,2	51,3	50,0	50,4	50,8	50,5	52,8	51,9	14,64	15,62	14,17	7,84	5,60	7,55	0,78	1,18	3,53	3,14	4,54	11,67	15,04	12,06	20,37	20,76	0,56	0,59	0,67	0,89	0,98	0,90	1,01	1,05
26	50,2	50,2	50,1	50,7	50,7	52,0	51,1	50,6	15,04	15,59	14,46	8,81	5,64	10,52	0,85	1,47	3,43	3,11	4,22	10,80	15,00	9,39	20,30	19,67	0,58	0,58	0,65	0,89	0,98	0,90	1,01	1,01
27	50,1	51,1	50,2	50,5	50,2	51,8	51,4	51,9	14,80	15,84	14,35	8,43	5,68	7,24	1,23	1,16	3,38	2,86	4,29	11,14	14,96	12,48	20,11	20,19	0,55	0,56	0,65	0,89	0,98	0,91	1,02	1,02
28	50,0	50,2	50,4	51,2	50,4	50,7	54,3	51,1	17,04	15,71	14,44	9,23	5,75	8,08	0,87	1,40	2,15	2,93	4,17	10,55	14,59	11,58	20,08	19,94	0,55	0,56	0,64	0,90	0,96	0,90	1,00	1,02
29	50,2	50,6	50,3	52,5	50,2	51,5	53,0	50,5	16,97	15,40	14,42	7,01	5,64	8,50	0,83	1,25	2,19	3,05	4,18	12,69	14,54	11,08	20,12	20,09	0,55	0,55	0,64	0,91	0,95	0,89	1,00	1,02
30	50,0	50,6	50,4	52,0	50,0	51,3	51,6	50,2	15,66	15,77	14,43	7,79	5,51	7,72	0,83	1,61	2,96	2,80	4,17	12,77	14,67	11,64	20,12	20,11	0,56	0,54	0,64	0,97	0,95	0,88	1,00	1,04
31	50,0	51,3	50,5	50,9	50,3	50,1	50,0	51,0	15,08	15,88	14,48	8,52	5,26	8,14	0,89	7,17	3,29	2,74	4,14	12,06	14,59	11,40	20,06	14,19	0,56	0,54	0,64	0,97	0,93	0,89	1,00	1,03
36	50,0	51,2	50,0	50,3	50,1	50,7	50,5	50,5	0,00	0,00	0,00	10,65	0,00	0,00	0,00	0,00	11,10	11,31	13,41	10,20	19,48	18,65	20,95	20,95	0,53	0,54	0,64	0,99	0,93	0,89	1,00	1,00
37	71,7	53,3	72,8	54,3	50,0	54,3	49,7	53,6	18,25	15,88	16,41	9,12	4,78	10,71	6,19	5,28	1,43	2,74	2,91	12,07	15,20	9,01	14,61	15,83	0,53	0,54	0,64	1,02	0,94	0,88	0,99	1,01
38	65,2	51,4	66,0	57,7	50,8	53,1	55,5	52,8	18,12	15,60	16,11	5,46	4,78	6,35	0,99	0,85	1,50	2,89	2,95	15,34	15,36	12,85	19,96	19,90	0,53	0,54	0,61	0,99	0,95	0,88	1,00	0,99
39	60,7	50,1	61,4	57,7	50,4	51,9	54,4	51,9	18,06	15,88	15,68	3,69	4,69	6,22	0,87	1,01	1,53	2,59	3,16	15,71	15,61	12,96	19,88	19,94	0,53	0,51	0,60	0,91	0,96	0,88	0,99	1,00
40	57,9	50,7	58,2	56,7	50,0	50,8	52,7	50,4	17,51	15,97	14,78	5,02	4,73	7,19	0,85	1,40	1,75	2,54	3,64	14,18	15,41	11,97	19,90	19,94	0,51	0,51	0,59	0,89	0,95	0,87	0,99	1,02
41	56,3	51,2	56,4	54,9	50,3	52,1	50,6	51,9	16,59	16,02	12,91	6,66	4,97	8,10	0,90	5,59	2,18	2,47	4,90	12,58	15,18	11,18	20,05	15,67	0,50	0,50	0,61	0,88	0,95	0,87	1,00	1,02
42	54,6	50,7	55,4	53,4	50,0	50,8	49,1	50,8	15,70	16,15	11,54	8,26	4,98	7,68	0,90	1,43	2,63	2,35	5,93	11,17	15,01	11,68	19,85	20,11	0,50	0,49	0,63	0,88	0,94	0,88	0,99	1,03
43	52,6	50,5	54,3	51,8	50,3	52,1	55,5	50,8	16,64	16,26	11,91	9,61	5,13	8,26	1,19	1,56	2,07	2,25	5,70	10,09	14,55	10,91	19,96	19,78	0,48	0,48	0,63	0,89	0,92	0,86	1,01	1,02
44	51,2	51,7	53,7	50,8	50,1	51,3	55,1	50,4	16,84	14,88	11,34	10,61	5,48	7,90	0,94	6,62	1,97	3,10	6,25	9,20	14,23	11,22	19,81	14,19	0,48	0,51	0,65	0,89	0,92	0,86	0,99	0,99
45	50,2	50,8	51,8	52,1	50,2	51,4	52,8	51,7	13,16	15,68	12,64	9,79	5,13	8,57	0,96	1,36	3,43	2,74	5,40	9,93	14,55	10,77	19,79	19,39	0,44	0,52	0,65	0,89	0,92	0,87	0,99	0,99
46	50,0	50,6	50,1	53,6	50,4	50,0	50,9	50,5	17,13	15,64	13,93	9,06	5,38	8,45	0,92	2,18	1,64	2,87	4,49	9,99	14,32	11,00	20,03	18,77	0,43	0,54	0,64	0,84	0,92	0,88	1,00	1,00
47	50,3	51,7	50,0	52,7	50,1	52,4	49,2	51,7	13,53	15,51	14,40	9,96	5,51	9,01	1,09	6,40	2,89	2,88	4,06	8,57	13,74	10,27	19,66	14,11	0,39	0,53	0,62	0,78	0,89	0,86	0,99	0,97
48	50,1	50,2	50,0	51,5	50,4	51,1	54,9	51,0	13,80	15,69	14,75	10,79	5,73	7,81	1,29	6,35	2,65	2,79	3,72	8,03	13,55	11,43	20,05	14,16	0,37	0,53	0,60	0,79	0,89	0,87	1,02	0,97
49	50,3	51,2	50,3	49,9	50,2	50,3	54,0	51,0	17,63	15,62	14,66	11,61	5,97	9,79	5,93	5,53	1,23	2,82	3,71	7,38	13,18	9,82	14,87	15,27	0,37	0,53	0,59	0,79	0,88	0,88	0,99	0,99
50	50,1	50,8	50,7	53,0	50,3	51,4	52,3	51,1	17,57	15,77	14,80	9,67	5,64	8,41	0,99	1,91	1,28	2,69	3,69	8,91	13,47	11,04	20,16	19,04	0,38	0,52	0,60	0,79	0,88	0,88	1,01	1,00
51	50,2	51,2	50,1	53,2	50,2	50,2	50,9	49,9	17,30	15,62	15,08	10,14	5,73	8,50	4,82	4,67	1,46	2,67	3,23	8,43	13,39	10,83	15,97	15,79	0,40	0,50	0,55	0,78	0,88	0,87	0,99	0,97
52	50,5	51,1	50,2	51,9	51,0	52,9	49,2	50,7	17,39	15,90	15,02	10,90	5,89	8,90	0,99	1,85	1,42	2,47	3,20	7,84	13,10	10,48	19,56	18,53	0,40	0,49	0,54	0,78	0,87	0,87	0,98	0,97
53	50,1	50,4	50,5	50,4	50,0	51,2	55,1	51,2	17,55	15,71	15,08	11,67	6,10	7,52	1,34	5,46	1,29	2,62	3,23	7,05	12,92	11,68	19,61	15,34	0,38	0,50	0,55	0,76	0,87	0,87	1,00	0,99
54	50,3	51,4	50,7	52,0	50,3	50,0	54,4	50,8	13,58	15,71	15,48	10,69	6,75	8,23	1,10	2,07	2,80	2,67	2,84	7,80	12,21	11,07	20,05	18,69	0,38	0,51	0,52	0,76	0,86	0,87	1,01	0,99
55	50,0	50,2	50,4	52,9	50,4	52,9	52,7	50,9	17,46	15,95	15,59	10,39	6,39	8,90	1,16	2,34	1,36	2,40	2,73	8,13	12,52	10,36	20,19	18,42	0,39	0,48	0,51	0,77	0,86	0,86	1,02	0,99
56	50,3	50,0	50,1	52,0	50,6	51,5	51,0	51,3	17,37	16,10	15,42	11,09	6,44	7,42	1,01	1,63	1,40	2,33	2,88	7,69	12,48	11,77	19,74	19,13	0,39	0,48	0,52	0,78	0,86	0,87	0,99	0,99
57	50,0	51,3	50,2	50,5	50,0	50,0	49,3	50,0	17,74	15,88	14,86	11,79	6,57	9,63	5,95	5,42	1,25	2,43	3,17	7,14	12,22	9,85	14,85	15,37	0,39	0,48	0,52	0,78	0,85	0,87	0,99	0,99
58	50,2	50,6	50,0	52,1	50,2	53,1	55,1	51,7	17,52	16,17	15,08	11,00	6,77	8,66	2,47	1,29	1,27	2,25	3,05	7,86	12,05	10,69	18,11	19,27	0,37	0,47	0,52	0,79	0,85	0,87	0,98	0,98
59	50,0	50,0	50,2	53,7	50,6	51,7	54,4	50,5	17,66	15,88	15,15	10,14	6,84	7,44	1,09	2,14	1,22	2,38	2,96	8,54	11,85	11,48	20,06	18,25	0,37	0,47	0,51	0,79	0,84	0,85	1,01	0,97
60	50,1	50,1	50,3	52,8	50,3	50,1	52,6	51,7	17,55	16,06	12,43	10,84	7,02	8,70	4,93	4,86	1,29	2,30	4,35	7,78	11,70	9,92	15,86	15,93	0,38	0,47	0,51	0,77	0,84	0,81	0,99	0,99
61	50,2	50,8	50,3	51,1	50,6	52,3	50,7	50,9	17,39	16,06	12,38	10,70	7,08	8,90	5,09	4,55	1,35	2,35	4,29	7,69	11,65	9,64	15,70	15,91	0,38	0,48	0,50	0,75	0,84	0,80	0,99	0,97
62	50,0	51,7	50,5	50,1	50,6	50,6	49,0	51,3	17,44	15,88	15,37	12,42	7,99	9,03	5,77	5,49	1,33	2,43	2,85	6,40	10,63	9,66	14,72	15,15	0,38	0,48	0,51	0,75	0,82	0,81	0,97	0,98
63	50,1	49,9	50,2	53,1	50,4	52,2	55,1	51,1	17,66	16,19	15,55	10,27	7,94	8,86	2,27	2,36	1,28	2,28	2,75	8,01	10,54	9,55	17,93	18,22	0,39	0,48	0,51	0,75	0,81	0,79	0,96	0,98
64	50,0	50,9	50,4	52,3	50,5	50,5	54,0	50,5	17,28	15,73	15,77	11,20	8,04	8,35	2,01	2,94	1,43	2,56	2,59	7,22	10,59	10,08	18,18	17,47	0,39	0,49	0,50	0,74	0,82	0,80	0,96	0,97
65	50,2	51,6	50,3	50,6	50,5	51,8	52,0	51,3	17,59	15,64	15,35	10,72	8,39	10,12	6,39	5,55	1,11	2,55	2,86	7,88	10,17	8,66	14,12	14,94	0,33	0,48	0,51	0,77	0,81	0,80	0,97	0,97
66	50,1	50,1	50,0	51,8	50,8	50,3	50,2	50,3	17,59	15,42	13,00	10,52	6,91	8,43	1,09	2,54	1,14	2,71	3,98	7,93	11,37	10,14	19,26	17,49	0,34	0,49	0,50	0,76	0,81	0,81	0,97	0,95
67	50,2	51,1	50,6	53,4	50,2	51,8	50,9	51,9	15,29	15,51	15,66	9,47	7,52	9,70	2,49	3,56	2,15	2,67	2,59	8,95	10,88	8,89	18,28	16,17	0,38	0,49	0,49	0,78	0,81	0,79	0,99	0,93
68	50,3	51,6	50,4	52,3	50,2	50,4	55,1	51,1	17,70	16,06	15,79	10,14	7,04	9,01	2,12	3,53	1,27	2,40	2,53	8,54	11,41	9,55	18,83	16,20	0,39	0,49	0,49	0,79	0,82	0,80	1,00	0,93
69	50,0	50,1	50,6	50,8	50,0	52,1	53,5	50,4	14,89	16,02	15,77	10,69	6,92	9,59	2,09	3,89	2,85	2,42	2,43	8,11	11,50	9,09	19,05	15,35	0,47	0,49	0,47	0,79	0,82	0,80	1,01	0,90
70	50,0	51,2	50,2	50,8	50,4	50,5	51,6	50,0	15,04	15,68	15,88	11,18	6,24	8,44	1,18	2,96	3,13	2,53	2,28	7,82	12,06	10,13	19,77	16,37	0,53	0,48	0,45	0,80	0,82	0,81	1,00	0,91
71	50,1	50,8	50,6	53,4	50,7	52,6	50,4	51,7	15,42	16,21	15,91	9,48	7,30	9,90	2,52	3,05	2,99	2,13	2,22	9,18	11,33	8,73	18,25	16,29	0,54	0,45	0,44	0,80	0,83	0,79	0,99	0,91
72	50,2	51,3	50,5	52,7	50,0	50,6	51,6	50,6	15,62	16,03	15,55	9,96	7,10	8,74	2,32	3,84	2,72	2,16	2,38	8,68	11,50	9,65	18,44	15,57	0,51	0,44	0,44	0,79	0,83	0,79	0,99	0,91
73	50,0	50,1	50,5	51,0	50,5	52,0	52,9	51,1	16,01	16,02	16,11	10,98	6,84	8,86	1,41	3,03	2,37	2,22	2,08	7,78	11,71	9,55	18,95	16,13	0,48	0,45	0,43	0,78	0,83	0,79	0,97	0,90
74	50,4	50,6	50,3	50,0	50,3	50,5	51,5	50,1	16,02	16,11	16,15	11,01	7,28	8,74	2,36	3,80	2,42	2,13	2,06	7,75	11,21	9,89	17,85	15,44	0,49	0,44	0,43	0,78	0,82	0,81	0,96	0,90
75	50,1	51,0	50,5	53,4	50,0	52,2	49,8	51,5	16,64	16,11	16,13	9,52	6,62	8,99	1,32	2,23	2,11	2,13	2,07	8,80	11,89	9,45	18,84	16,85	0,49	0,44	0,43	0,77	0,83	0,79	0,96	0,90
76	50,0	51,6	50,5	52,9	50,2	50,6	54,2	50,4	15,86	16,31	16,15	10,21	7,57	8,83	2,89	4,24	2,55	2,00	2,06	8,16	11,11	9,57	17,34	14,70	0,50	0,43	0,43	0,76	0,83	0,79	0,96	0,88
77	50,0	49,9	50,2	51,3	50,7	51,7	53,3	51,9	16,44	16,24	16,26	10,94	7,13	9,34	2,16	3,75	2,21	2,03	1,97	7,61	11,61	9,17	18,23	15,14	0,49	0,43	0,42	0,76	0,84	0,79	0,97	0,88
78	50,0	50,5	50,3	49,8	50,4	50,2	51,5	51,1	16,17	16,17	16,26	11,25	7,43	8,86	2,23	3,07	2,29	2,10	2,02	7,47	11,36	9,55	17,97	16,09	0,48	0,44	0,43	0,77	0,84	0,79	0,96	0,90
79	50,3	51,5	50,5	53,2	50,8	53,0	49,8	50,3	16,44	16,11	16,28	9,65	6,82	9,73	1,34	3,07	2,21	2,08	2,01	8,70	11,87	8,86	18,83	16,09	0,49	0,43	0,43	0,77	0,84	0,79	0,96	0,90
80	50,0	50,6	50,4	52,9	50,6	51,3	53,7	50,7	15,02	16,24	16,19	10,30	6,82	7,81	1,69	8,24	2,97	2,07	2,09	7,99	11,87	10,51	18,49	11,31	0,50	0,44	0,44	0,75	0,84	0,80	0,96	0,89
81	50,1	50,7	50,1	51,5	50,0	50,0	52,8	50,8	17,75	16,08	16,26	11,07	7,57	8,99	2,40	4,07	1,60	2,09	2,06	7,11	10,97	9,45	17,62	15,02	0,50	0,43	0,44	0,72	0,82	0,79	0,95	0,89
82	50,3	51,4	50,3	49,9	50,1	51,5	51,2	49,9	17,65	16,28	16,32	11,78	7,63	9,36	2,34	4,02	1,68	1,96	2,04	6,60	10,92	9,16	17,68	15,07	0,51	0,42	0,44	0,72	0,82	0,79	0,95	0,89
83	50,4	50,8	50,1	52,8	50,5	49,7	49,4	51,5	15,09	15,48	15,73	12,76	7,77	9,21	2,25	2,83	2,70	2,30	2,24	5,98	10,81	9,16	18,14	16,31	0,46	0,42	0,43	0,73	0,82	0,78	0,97	0,90
84	50,1	51,0	50,4	52,4	51,0	52,9	55,0	50,3	17,75	16,15	16,28	10,72	7,70	9,90	2,60	3,73	1,41	2,11	2,01	7,47	11,00	8,51	17,80	15,50	0,44	0,44	0,43	0,73	0,83	0,77	0,97	0,90
85	50,3	51,7	50,7	51,1	50,5	51,2	54,1	51,6	17,34	16,53	16,39	11,23	7,81	8,44	2,27	3,27	1,48	1,86	1,92	7,29	10,77	9,88	18,68	16,27	0,41	0,42	0,42	0,75	0,82	0,79	1,00	0,92
86	50,0	50,0	50,3	50,3	50,5	50,4	52,2	50,5	17,54	16,44	16,37	11,78	7,28	8,66	1,38	2,51	1,40	1,94	1,88	6,88	11,35	9,59	19,18	16,96	0,41	0,43	0,41	0,75	0,83	0,78	0,98	0,92
87	50,2	50,5	50,4	53,1	50,0	49,8	50,3	51,6	17,21	16,13	15,68	10,01	8,10	9,50	2,47	3,80	1,61	2,07	2,16	8,42	10,67	8,93	18,11	15,61	0,43	0,43	0,41	0,77	0,83	0,78	0,98	0,91
88	50,0	51,2	50,1	52,3	50,6	52,6	49,7	50,5	15,79	16,28	16,59	10,94	7,39	9,41	1,49	2,51	2,22	2,01	1,83	7,71	11,25	9,12	19,27	16,96	0,43	0,43	0,42	0,77	0,83	0,79	0,99	0,92
89	50,2	51,0	50,2	50,5	50,8	50,7	55,5	51,6	17,77	16,61	16,55	11,91	7,59	8,08	1,60	3,00	1,30	1,82	1,85	6,24	10,96	10,42	18,96	16,16	0,41	0,42	0,42	0,69	0,82	0,81	0,98	0,90
90	50,3	51,5	50,5	52,4	50,2	52,0	53,8	50,2	17,63	16,62	16,42	11,10	8,37	9,61	2,74	8,83	1,39	1,86	1,86	7,68	10,32	9,07	18,03	11,03	0,42	0,43	0,41	0,78	0,82	0,80	0,99	0,91

Appendix B

Oxygen Consumption (OCR) and Carbon Dioxide Evolution Rates (CER)

Table B1: Run 5 - OT35

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	1.33	2.83	2.84	2.49	2.17	1.23	0.94	0.92	1.26	2.85	3.25	3.04	2.68	1.11	1.10	1.36
2	1.92	2.66	2.04	2.47	2.69	1.63	0.74	0.85	1,85	2,91	2,43	3.03	3,26	1,83	0.86	1,27
3	3.11	3.53	2.68	2.94	3.11	2.43	0.81	0.84	3,73	4,49	3,54	3,88	4,08	3,41	1,14	1,36
4	5.66	3.33	2.50	2.94	3.22	2.17	0.68	0.47	8,12	5,00	3,74	3,93	4,45	3,10	1,02	0,78
5	5.22	3.16	2.40	2.87	3.20	2.13	0.72	0.46	7,16	4,66	3,38	3,91	4,45	3,06	1,09	0,78
6	5.06	3.14	2.37	2.86	3.21	2.12	0.71	0.46	6,77	4,50	3,34	3,91	4,44	2,97	1.08	0,78
7	5.01	3.13	2.35	2.85	3.23	2.11	0.70	0.46	6,63	4,42	3,36	3,96	4,40	2,89	1,10	0,76
8	4.99	3.10	2.34	2.84	3.22	2.05	0.69	0.45	6,59	4,34	3,29	3,93	4,38	2,81	1,08	0,75
9	5.05	3.07	2.32	2.83	3.22	1.99	0.68	0.45	6,77	4,23	3,26	3,79	4,36	2,73	1,07	0,75
10	4.94	3.05	2.33	2.83	3.23	1.98	0.68	0.45	6.50	4,23	3,20	3,75	4,29	2,68	1.07	0.73
11	4.84	3.01	2.31	2.80	3.22	1.95	0.67	0.44	6,40	4,08	3,21	3,77	4,22	2,63	1,05	0,72
12	4.79	2.99	2.27	2.78	3.20	1.93	0.68	0.45	6,19	4,06	3,10	3,74	4,20	2,53	1,09	0,71
13	4.48	2.99	2.26	2.76	3.19	1.91	0.68	0.45	5,63	3,96	3,11	3,59	4,15	2,55	1,08	0,71
14	4.81	2.88	2.22	2.70	3.15	1.88	0.66	0.43	6,16	3,80	2,95	3,50	4,01	2,41	1,05	0,68
15	4.79	2.89	2.20	2.69	3.13	1.86	0.66	0.44	6,05	3,83	2,90	3,49	3,97	2,41	1,06	0,68
16	4.68	2.84	2.16	2.65	3.10	1.83	0.65	0.43	5,69	3,65	2,83	3,37	3,88	2,33	1,02	0,65
17	4.60	2.86	2.16	2.63	3.10	1.83	0.64	0.43	5,59	3,68	2,81	3,34	3,90	2,31	0,99	0,64
18	4.55	2.81	2.11	2.61	3.06	1.75	0.65	0.51	5,47	3,51	2,70	3,29	3,82	2,17	0,98	0,75
19	1.97	2.74	1.90	2.41	3.18	1.72	0.64	0.42	4.63	3,36	2,32	2,99	3,94	2,11	0.94	0.61
20	2.34	2.82	1.18	1.63	1.66	0.86	0.63	0.21	2,73	3,48	1,46	2,04	2,03	1,02	0,94	0,29
21	2.28	2.77	1.23	1.72	1.75	0.88	0.64	0.21	2,65	3,46	1,49	2,11	2,15	1,00	0,96	0,31
22	2.30	2.81	1.13	1.74	1.77	0.86	0.64	0.20	2,67	3,57	1,39	2,15	2,23	1,01	0,96	0,30
23	2.29	2.78	1.21	1.68	1.72	0.86	0.65	0.23	2,65	3,46	1,50	2,05	2,13	1,02	0.96	0.35
24	1.92	2.44	1.09	1.56	1.64	0.83	0.62	0.20	2,22	3,03	1,34	1,90	1,99	0,97	0,90	0,29
25	2.23	2.70	1.09	1.66	1.66	0.84	0.65	0.20	2,58	3,31	1,33	2,00	2,05	0,98	0,93	0,29
26	2.26	2.71	1.21	1.65	1.66	0.83	0.63	0.19	2,62	3,35	1,44	2,00	2,03	0,98	0,92	0,29
27	2.22	2.68	1.18	1.63	1.64	0.82	0.62	0.19	2,57	3,30	1,42	1,96	2,04	0,97	0,92	0,28
28	2.23	2.65	1.16	1.61	1.61	0.81	0.61	0.19	2,60	3,28	1,42	1,94	1,99	0,97	0,89	0,28
29	2.22	2.60	1.15	1.59	1.60	0.83	0.61	0.19	2,61	3,18	1,37	1,91	1,95	0,99	0,90	0,28
30	2.19	2.60	1.14	1.58	1.57	0.81	0.60	0.19	2,53	3,21	1,37	1,87	1,90	0,96	0,87	0,28
31	2.14	2.58	1.13	1.56	1.56	0.78	0.60	0.18	2,44	3,15	1,35	1,87	1,88	0,89	0,84	0,27
32	2.18	2.54	1.12	1.54	1.52	0.79	0.62	0.18	2,49	3,04	1,32	1,81	1,83	0,89	0,89	0,27
33	2.19	2.55	1.11	1.54	1.52	0.80	0.61	0.18	2,47	3,05	1,29	1,78	1,82	0,91	0,85	0,26
34	2.17	2.51	1.01	1.42	1.49	0.77	0.63	0.18	2,45	3,00	1,14	1,58	1,71	0,86	0,86	0,27
35	1.73	2.50	0.98	1.40	1.41	0.74	0.58	0.18	1,95	2,98	1,11	1,55	1,62	0,82	0,77	0,25
36	2.16	2.46	1.07	1.49	1.45	0.77	0.58	0.18	2,40	2,89	1,25	1,71	1,70	0,88	0,79	0,25
37	2.13	2.44	1.06	1.46	1.42	0.75	0.57	0.18	2,35	2,86	1,23	1,68	1,65	0,85	0,77	0,25
38	2.12	2.42	1.05	1.45	1.40	0.77	0.57	0.17	2,34	2,83	1,21	1,64	1,63	0,88	0,77	0,25
39	2.11	2.40	1.04	1.43	1.38	0.73	0.59	0.18	2,32	2,77	1,20	1,63	1,59	0,82	0,81	0,25
40	2.14	2.40	1.04	1.42	1.37	0.72	0.57	0.17	2,37	2,78	1,18	1,61	1,59	0,81	0,77	0,25
41	2.10	2.33	1.02	1.40	1.35	0.70	0.60	0.18	2,36	2,75	1,16	1,60	1,57	0,79	0,82	0,26
42	1.82	2.31	1.02	1.39	1.28	0.70	0.55	0.17	2,03	2,72	1,18	1,61	1,46	0,79	0,74	0,24
43	2.04	2.30	1.02	1.42	1.33	0.70	0.55	0.17	2,28	2,73	1,21	1,66	1,55	0,79	0,76	0,24
44	2.01	2.29	1.03	1.38	1.32	0.69	0.54	0.17	2,25	2,70	1,21	1,61	1,55	0,78	0,75	0,24
45	1.98	2.27	1.01	1.39	1.31	0.69	0.54	0.17	2,21	2,69	1,19	1,62	1,53	0,80	0,74	0,24
46	2.02	2.23	0.98	1.36	1.30	0.69	0.58	0.17	2,29	2,61	1,13	1,58	1,54	0,79	0,78	0,24
47	2.01	2.27	1.00	1.37	1.29	0.70	0.55	0.17	2,24	2,71	1,17	1,60	1,54	0,81	0,76	0,24
48	2.01	2.23	0.98	1.35	1.25	0.66	0.54	0.16	2,28	2,61	1,15	1,59	1,48	0,75	0,71	0,23
49	1.94	2.17	0.97	1.36	1.27	0.67	0.54	0.16	2,19	2,56	1,11	1,61	1,49	0,77	0,71	0,23
50	2.02	2.12	0.96	1.34	1.25	0.65	0.55	0.15	2,29	2,47	1,09	1,54	1,46	0,75	0,74	0,21
51	1.98	2.17	0.85	1.23	1.20	0.61	0.55	0.15	2,24	2,53	0,95	1,36	1,36	0,69	0,73	0,21
52	2.06	2.06	0.82	1.20	1.16	0.66	0.51	0.16	2,37	2,36	0,93	1,34	1,31	0,75	0,67	0,22
53	2.08	2.00	0.92	1.27	1.20	0.63	0.54	0.16	2,40	2,30	1,05	1,45	1,39	0,73	0,73	0,22
54	2.16	2.01	0.91	1.26	1.18	0.64	0.53	0.16	2,51	2,36	1,04	1,45	1,38	0,73	0,68	0,22
55	2.02	1.95	0.83	1.17	1.15	0.63	0.55	0.15	2,31	2,42	0,98	1,27	1,28	0,69	0,71	0,21
56	2.01	1.98	0.78	1.14	1.10	0.59	0.50	0.15	2,24	2,28	0,86	1,30	1,23	0,65	0,65	0,21
57	1.97	1.93	0.88	1.22	1.16	0.65	0.51	0.16	2,19	2,22	0,98	1,36	1,31	0,73	0,66	0,21
58	2.12	1.93	0.88	1.22	1.15	0.60	0.50	0.15	2,42	2,19	0,99	1,37	1,28	0,68	0,65	0,21
59	1.92	1.92	0.89	1.21	1.14	0.63	0.50	0.16	2,09	2,15	1,00	1,36	1,29	0,71	0,64	0,22
60	2.12	1.92	0.89	1.21	1.13	0.61	0.53	0.16	2,38	2,13	0,99	1,34	1,27	0.69	0.68	0,21
61	2.18	1.90	0.80	1.12	1.09	0.56	0.53	0.15	2,40	2,09	0,89	1,24	1,19	0,63	0,68	0,20
62	2.24	1.67	0.80	1.12	1.07	0.57	0.48	0.15	2,45	1,84	0,89	1,22	1,19	0,62	0,61	0,20
63	2.06	1.83	0.84	1.17	1.09	0.59	0.49	0.15	2,29	1,96	0,92	1,29	1,22	0,65	0,62	0,20
64	2.03	1.80	0.83	1.12	1.07	0.59	0.48	0.15	2,22	1.95	0.91	1,25	1,20	0.64	0,62	0.19
65	1.97	1.89	0.77	1.14	1.03	0.49	0.51	0.18	2,17	2,09	0,88	1,26	1,14	0,53	0,65	0,24
66	2.36	2.18	0.97	1.29	1.28	1.20	0.52	0.67	2,69	2,18	1,11	1,43	1,41	0,67	0,67	0,90
67	2.33	1.80	0.96	1.30	1.39	1.28	0.52	0.68	2,67	2,01	1,09	1,48	1,53	0,71	0,68	0,92
68	2.29	1.83	1.03	1.40	1.50	1.28	0.53	0.69	2.61	2.05	1.18	1.58	1.68	0.72	0.70	0.91
69	2.32	1.85	1.00	1.39	1.48	1.29	0.54	0.69	2,60	2,08	1,15	1,56	1,64	0,73	0,72	0,91
70	2.39	1.88	0.98	1.28	1.55	1.33	0.65	0.75	2,62	2,06	1,11	1,45	1,72	0,75	0,88	0,98
71	2.56	2.00	1.14	1.35	1.41	1.21	0.63	0.76	2,82	2,21	1,32	1,51	1,57	0,70	0,86	0,96
72	2.18	2.07	1.07	1.32	1.36	1.25	0.83	0.77	2,40	2,35	1,18	1,48	1,51	0,71	1,16	0,96

Table B2: Run 6 - OT50

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
2	6.55	4.31	0.97	0.50			0.73	0.51	5.70	5.71	0.93	0.46			0.83	0.62
4	8.43	5.44	1.05	0.54			0.86	0.55	8.31	5.71	1.09	0.58			1.11	0.78
6	8.76	5.60	1.05	0.58			0.93	0.58	9.40	5.90	1.13	0.65			1.32	0.92
8	8.26	5.34	1.07	0.53			0.91	0.58	9.20	5.71	1.14	0.61			1.36	0.95
10	7.87	5.00	1.01	0.52			0.92	0.58	8.84	5.28	1.08	0.58			1.43	0.99
12	7.45	4.73	0.98	0.53			0.87	0.57	8.52	5.00	1.02	0.59			1.36	0.98
14	7.56	4.40	0.96	0.51			0.88	0.57	8.64	4.60	0.99	0.55			1.34	0.98
16	7.43	5.51	0.48	0.33			0.42	0.27	8.47	5.69	0.50	0.36			0.65	0.48
18	8.04	5.47	0.34	0.27			0.39	0.26	9.35	5.94	0.37	0.32			0.59	0.46
20	7.00	5.82	0.35	0.28			0.38	0.26	8.17	6.21	0.41	0.33			0.58	0.48
22	6.91	5.27	0.30	0.26			0.38	0.26	8.04	5.56	0.36	0.30			0.57	0.46
24	6.47	5.02	0.29	0.27			0.35	0.25	7.39	5.16	0.33	0.30			0.51	0.45
26	6.12	4.73	0.28	0.25			0.35	0.24	7.06	4.73	0.32	0.27			0.51	0.42
28	6.17	4.64	0.28	0.25			0.35	0.24	7.06	4.57	0.31	0.27			0.52	0.41
30	5.91	4.55	0.26	0.25			0.34	0.25	6.65	4.52	0.27	0.26			0.47	0.43
32	4.20	3.74	0.26	0.28			0.33	0.23	4.61	3.66	0.28	0.29			0.45	0.37
34	5.75	4.23	0.28	0.23			0.33	0.22	6.12	4.10	0.30	0.24			0.44	0.34
36	5.69	4.15	0.27	0.23			0.30	0.22	6.04	4.06	0.27	0.22			0.39	0.33
38	5.43	4.04	0.26	0.23			0.32	0.23	5.74	3.83	0.26	0.22			0.41	0.35
40	3.62	3.35	0.54	0.50			0.32	0.22	3.73	3.16	0.52	0.48			0.40	0.30
42	5.62	3.70	3.67	1.70			0.15	0.22	5.79	3.40	3.55	1.60			0.18	0.30
44	5.67	3.64	3.59	1.80			0.15	0.22	5.69	3.33	3.47	1.71			0.18	0.29
46	5.40	3.58	3.57	1.81			0.16	0.22	5.34	3.19	3.47	1.72			0.18	0.28
48	5.53	3.49	3.53	1.79			0.14	0.21	5.47	3.15	3.45	1.70			0.17	0.27
50	5.19	3.37	3.35	1.76			0.15	0.21	4.82	2.97	3.28	1.67			0.17	0.26
52	5.08	3.29	3.12	1.69			0.14	0.20	4.87	2.91	3.05	1.62			0.15	0.26
54	4.98	3.23	2.94	1.66			0.14	0.20	4.69	2.79	2.86	1.59			0.15	0.25
56	5.01	3.14	2.79	1.63			0.14	0.20	4.66	2.68	2.69	1.54			0.15	0.24
58	4.98	2.93	2.69	1.56			0.13	0.20	4.59	2.45	2.55	1.46			0.14	0.24
60	4.79	2.94	2.63	1.57			0.13	0.19	4.31	2.45	2.51	1.46			0.14	0.23
62	4.60	2.80	2.50	1.55			0.13	0.19	4.03	2.29	2.36	1.43			0.14	0.22
64	4.71	1.95	1.55	0.76			0.19	0.73	4.15	1.60	1.51	0.71			0.82	0.83
66	5.64	2.71	1.65	0.64			0.19	0.80	5.01	2.23	1.61	0.62			0.84	0.91
68	6.07	2.53	1.70	0.47			0.24	0.89	5.42	2.06	1.61	0.45			1.06	0.99
70	4.02	2.20	1.47	0.54			0.25	0.89	3.58	1.79	1.38	0.51			1.08	0.99
72	3.52	2.11	1.41	0.53			0.21	0.85	3.03	1.70	1.29	0.50			0.87	0.91
74	5.86	2.48	1.47	0.54			0.84	0.85	4.94	1.99	1.37	0.51			0.85	0.92
76	5.86	2.61	1.43	0.54			0.85	0.83	5.01	2.08	1.28	0.49			0.87	0.92
78	5.91	2.48	1.49	0.45			0.82	0.83	5.07	2.00	1.36	0.40			0.84	0.90
80	5.75	2.34	1.35	0.52			0.83	0.83	4.94	1.89	1.21	0.46			0.85	0.88
82	5.91	2.43	1.34	0.52			0.82	0.82	5.06	2.00	1.21	0.46			0.85	0.87
84	5.86	2.25	1.27	0.51			0.82	0.92	4.89	1.87	1.10	0.44			0.84	0.99
86	5.58	2.28	1.24	0.50			0.79	0.79	4.64	1.91	1.12	0.44			0.81	0.82
88	2.28	1.85	1.32	0.44			0.83	0.81	1.96	1.58	1.23	0.39			0.85	0.86
90	5.83	2.40	1.26	0.52			0.77	0.78	5.14	2.10	1.18	0.46			0.78	0.84

Table B3: Run 7 - OT65

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	20.33	6.56	4.31	1.84	2.63	2.22	3.24	1.36	27.29	7.72	5.36	2.55	3.78	3.35	5.02	2.18
2	14.48	7.72	4.96	1.91	2.72	2.29	3.30	1.38	18.85	9.51	6.66	2.65	3.99	3.39	5.07	2.23
3	18.44	8.76	4.89	3.79	3.70	3.48	3.33	2.08	23.72	10.80	6.57	5.61	5.48	5.29	5.07	3.39
4	17.73	7.30	4.84	3.82	3.62	3.43	3.33	2.06	22.82	9.00	6.57	5.76	5.41	5.27	5.11	3.23
5	17.11	7.97	4.87	3.77	3.66	3.48	3.35	2.19	21.33	9.81	6.67	5.63	5.36	5.34	5.14	3.49
6	23.24	8.18	4.39	3.66	3.57	3.39	3.26	3.22	24.80	10.07	6.01	5.48	5.23	5.26	5.09	5.26
7	22.56	7.48	4.21	3.50	3.50	3.34	3.07	2.92	24.09	8.69	5.18	4.75	4.84	4.95	4.54	4.20
8	23.60	7.87	4.33	3.56	3.53	3.36	2.96	2.93	28.44	8.93	5.16	4.64	4.74	4.79	4.18	4.10
9	23.24	7.98	4.24	3.56	3.50	3.34	3.06	2.89	27.01	8.83	4.99	4.59	4.51	4.63	4.20	3.92
10	22.72	7.89	4.09	3.56	3.49	3.32	3.04	2.98	25.80	8.62	4.76	4.49	4.45	4.55	4.08	4.05
11	22.64	7.93	4.05	3.52	3.50	3.34	3.11	2.99	25.42	8.68	4.60	4.38	4.32	4.57	4.00	4.02
12	23.08	7.98	4.05	3.55	3.53	3.35	3.15	3.01	25.25	8.61	4.54	4.33	4.40	4.54	4.06	4.05
13	22.92	7.38	3.81	3.52	3.50	3.31	3.17	2.96	25.09	7.77	4.22	4.18	4.31	4.45	4.08	3.94
14	20.39	7.68	2.54	3.46	3.48	3.35	2.56	2.00	22.87	8.08	2.85	4.12	4.23	4.54	3.30	2.76
15	15.94	7.38	2.66	3.44	3.38	3.25	2.44	1.89	17.88	7.77	3.24	4.20	4.48	4.50	3.41	2.61
16	15.47	8.45	2.68	3.52	3.21	3.21	2.43	1.84	17.79	8.88	3.30	4.34	4.36	4.49	3.30	2.42
17	16.62	5.83	2.70	3.00	3.38	3.11	1.22	0.54	18.87	5.97	3.25	3.70	4.16	4.04	1.59	0.72
18	14.58	5.64	2.66	2.95	3.32	3.19	1.17	0.50	15.95	5.63	3.13	3.59	4.04	4.15	1.48	0.67
19	18.59	5.58	2.70	2.98	3.38	3.29	1.23	0.51	20.09	5.87	3.10	3.63	4.02	4.23	1.55	0.70
20	18.42	5.20	2.69	2.62	3.16	3.13	1.13	0.50	20.14	5.62	3.09	3.16	3.72	4.07	1.43	0.68
21	18.73	4.87	2.38	2.43	2.96	3.06	1.10	0.51	20.75	5.26	2.67	2.89	3.48	3.98	1.38	0.65
22	18.29	4.92	2.42	2.41	2.84	3.01	1.11	0.48	20.23	5.19	2.64	2.83	3.30	3.79	1.37	0.60
23	17.54	4.92	2.46	2.35	2.81	3.03	1.15	0.48	18.68	5.04	2.62	2.77	3.27	3.77	1.41	0.60
24	17.51	5.01	2.46	2.48	2.79	3.11	1.15	0.52	18.40	5.14	2.66	2.91	3.21	3.87	1.41	0.51
25	14.65	4.41	2.29	2.39	2.66	2.95	1.14	0.52	15.01	4.33	2.47	2.78	3.02	3.63	1.39	0.50
26	16.52	4.59	2.36	2.38	2.63	2.91	1.04	0.48	16.94	4.44	2.48	2.77	2.95	3.55	1.24	0.60
27	17.51	4.78	2.42	2.46	2.64	2.95	1.04	0.47	18.16	4.69	2.54	2.86	2.92	3.60	1.23	0.57
28	17.37	4.64	2.33	2.40	2.65	2.96	1.05	0.51	18.02	4.56	2.46	2.75	2.97	3.56	1.25	0.62
29	18.05	4.87	2.34	2.37	2.68	2.94	1.05	0.51	18.73	4.86	2.49	2.69	3.00	3.54	1.25	0.61
30	17.37	4.66	2.33	2.43	2.71	2.97	1.06	0.51	17.79	4.65	2.49	2.72	2.96	3.53	1.26	0.62
31	17.37	4.66	2.29	2.34	2.66	2.94	1.06	0.48	17.79	4.57	2.44	2.63	2.91	3.50	1.23	0.58
32	17.37	4.37	2.26	2.38	2.70	2.97	1.05	0.48	17.55	4.18	2.41	2.64	2.99	3.49	1.22	0.57
33	17.00	4.47	2.24	2.49	2.61	2.81	1.06	0.51	16.94	4.27	2.36	2.76	2.89	3.30	1.23	0.61
34	16.86	4.66	2.29	2.35	2.66	2.77	1.01	0.51	16.80	4.39	2.38	2.61	2.91	3.22	1.17	0.61
35	16.49	4.35	2.17	2.45	2.65	2.93	1.06	0.55	16.19	3.97	2.22	2.78	2.90	3.45	1.23	0.66
36	17.13	4.45	2.17	2.37	2.63	2.91	1.08	0.53	16.85	4.19	2.22	2.72	2.88	3.43	1.24	0.64
37	17.13	4.70	2.19	2.45	2.61	2.90	1.06	0.46	16.85	4.49	2.24	2.81	2.89	3.45	1.23	0.54
38	15.57	2.49	1.58	1.16	1.89	1.89	1.05	0.89	15.53	2.37	1.62	1.35	2.07	2.25	1.23	1.06
39	15.57	2.50	1.58	1.06	2.01	1.86	1.04	1.00	15.53	2.35	1.62	1.22	2.17	2.22	1.25	1.19
40	16.55	2.90	1.74	1.07	2.01	1.91	1.07	0.97	16.52	2.81	1.78	1.20	2.20	2.28	1.27	1.14
41	16.93	3.03	1.74	1.07	2.06	1.94	1.08	0.99	16.89	2.94	1.78	1.17	2.25	2.29	1.26	1.12
42	17.47	2.98	1.76	1.16	1.90	2.00	1.12	0.99	17.17	2.85	1.78	1.27	2.05	2.38	1.32	1.12
43	17.74	3.05	1.71	1.27	2.12	2.00	1.14	1.01	17.46	2.91	1.73	1.37	2.32	2.35	1.34	1.14
44	16.93	2.98	1.69	1.22	2.15	2.00	1.14	1.07	16.19	2.76	1.68	1.30	2.35	2.35	1.34	1.21
45	17.06	2.62	1.66	1.15	2.09	1.97	1.15	1.04	16.28	2.43	1.61	1.24	2.31	2.32	1.34	1.18
46	17.20	2.65	1.69	1.11	1.98	1.90	1.09	0.97	15.95	2.46	1.61	1.13	2.11	2.20	1.23	1.06
47	16.15	2.79	1.70	1.12	1.93	1.96	1.11	0.99	14.96	2.59	1.65	1.11	2.06	2.26	1.28	1.09
48	16.52	2.90	1.69	1.21	2.07	1.99	1.13	1.01	15.34	2.70	1.64	1.19	2.21	2.31	1.28	1.09
49	16.86	2.83	1.69	1.11	2.02	1.94	1.12	1.00	15.62	2.59	1.64	1.08	2.15	2.23	1.28	1.08
50	16.76	2.89	1.65	1.13	2.00	1.94	1.13	0.99	15.29	2.61	1.57	1.11	2.13	2.20	1.27	1.06
51	16.52	2.83	1.66	1.07	1.97	1.91	1.10	0.97	15.10	2.54	1.59	1.03	2.07	2.19	1.24	1.03
52	16.49	2.59	1.61	1.00	2.01	1.86	1.07	0.96	14.82	2.29	1.54	0.96	2.06	2.13	1.20	1.01
53	15.94	2.75	1.61	0.93	1.94	1.89	1.09	1.00	14.35	2.40	1.51	0.89	1.99	2.15	1.23	1.07
54	17.13	2.74	1.60	0.95	1.93	1.90	1.10	0.95	15.43	2.43	1.48	0.89	1.97	2.16	1.23	1.00
55	16.28	2.79	1.61	0.97	1.81	1.88	1.08	0.96	14.45	2.48	1.51	0.92	1.83	2.10	1.21	1.01
56	16.15	2.64	1.53	0.92	1.92	1.84	1.10	0.93	14.30	2.30	1.44	0.85	1.97	2.04	1.21	0.99
57	15.77	2.67	1.57	0.95	1.85	1.89	1.10	0.93	13.97	2.29	1.48	0.91	1.87	2.12	1.21	0.98
58	15.77	2.67	1.56	0.90	1.81	1.85	1.07	0.98	13.74	2.33	1.43	0.82	1.80	2.05	1.19	1.01
59	15.77	2.65	1.53	0.95	1.89	1.84	1.06	0.91	13.74	2.28	1.40	0.88	1.91	2.03	1.19	0.95
60	16.01	2.70	1.55	0.89	1.89	1.82	1.08	0.88	13.97	2.35	1.44	0.80	1.91	2.02	1.25	0.91
61	16.55	2.72	1.60	0.90	1.84	1.87	1.07	0.89	14.21	2.18	1.41	0.83	1.81	2.07	1.24	0.93
62	15.91	2.60	1.50	0.86	1.80	1.76	1.09	0.89	13.41	2.12	1.31	0.78	1.77	1.90	1.20	0.93
63	15.57	2.62	1.59	0.86	1.84	1.88	1.09	0.90	13.13	2.22	1.47	0.77	1.86	2.11	1.21	0.94
64	16.15	2.64	1.55	0.88	1.86	1.90	1.12	0.89	13.88	2.26	1.43	0.77	1.88	2.13	1.25	0.91
65	16.18	2.70	1.52	0.82	1.83	1.80	1.08	0.88	13.65	2.21	1.35	0.70	1.77	1.94	1.20	0.90
66	16.69	2.68	1.53	0.85	1.80	1.76	1.07	0.86	14.30	2.26	1.37	0.77	1.77	1.90	1.15	0.87
67	16.62	2.69	1.52	0.87	1.80	1.80	1.06	0.85	14.02	2.23	1.35	0.74	1.74	1.94	1.14	0.87
68	15.77	2.65	1.52	0.94	1.61	1.79	1.04	0.86	13.08	2.13	1.35	0.80	1.54	1.95	1.13	0.85
69	15.70	2.53	1.65	0.97	1.69	1.78	1.06	0.85	13.03	2.06	1.47	0.83	1.64	1.92	1.17	0.85
70	16.01	2.65	1.59	0.87	1.64	1.75	1.05	0.85	13.08	2.17	1.41	0.76	1.61	1.89	1.19	0.85
71	15.94	2.84	1.61	0.98	1.60	1.70	1.06	0.85	13.03	2.28	1.41	0.85	1.46	1.81	1.14	0.82
72	15.87	2.55	1.63	0.83	1.73	1.71	1.06	0.85	12.99	2.02	1.40	0.75	1.66	1.79	1.14	0.84
73	15.64	2.64	1.49	0.80	1.74	1.78	1.06	0.89	12.33	2.12	1.28	0.65	1.67	1.90	1.13	0.86
74	16.18	2.58	1.44	0.84	1.71	1.75	1.03	0.82	12.75	2.00	1.22	0.71	1.57	1.84	1.10	0.79

Table B4: Run 8 - OT75

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	1.20	3.63	3.20	3.97		2.11	3.24		0.87	3.17	3.06	4.45		2.16	4.04	
2	1.36	5.32	4.97	4.80		2.86	3.27		1.15	5.67	5.02	5.44		3.33	4.21	
3	1.36	6.07	5.27	4.95		3.19	3.45		1.19	6.63	5.77	5.90		4.37	4.82	
4	1.47	6.45	5.17	4.91		3.04	3.29		1.36	7.41	5.87	5.91		4.08	4.83	
5	1.46	6.43	4.95	4.86		3.15	3.32		1.39	7.39	5.69	5.85		4.19	4.55	
6	1.24	6.29	4.67	4.74		3.09	3.33		1.19	7.23	5.43	5.71		4.11	4.52	
7	1.44	6.08	4.30	4.61		3.13	3.31		1.39	6.90	5.00	5.62		3.98	4.45	
8	1.20	5.80	3.97	4.51		3.06	3.34		1.09	6.50	4.67	5.49		3.81	4.48	
9	1.15	5.40	3.65	4.42		3.14	3.30		1.03	5.83	4.40	5.38		3.87	4.39	
10	1.12	5.43	3.45	3.99		3.07	3.27		1.01	5.79	4.16	4.92		3.78	4.34	
11	1.16	5.14	3.41	3.81		3.13	3.33		1.04	5.48	4.06	4.48		3.90	4.38	
12	1.08	4.77	3.48	3.70		3.14	3.29		0.97	4.96	3.85	4.20		3.91	4.33	
13	1.14	4.46	3.39	4.61		3.14	3.29		1.01	4.63	3.71	5.11		3.91	4.29	
14	1.10	4.23	3.44	4.63		3.11	3.28		0.94	4.33	3.66	5.13		3.79	4.27	
15	1.00	4.23	3.31	4.37		3.07	3.30		0.84	4.33	3.53	4.78		3.70	4.06	
16	1.08	4.08	3.02	4.04		3.13	3.34		0.91	4.12	3.13	4.42		3.76	4.07	
17	0.98	3.99	2.97	4.09		3.08	3.27		0.80	4.03	3.04	4.53		3.67	3.98	
18	1.00	3.94	3.09	3.84		3.05	3.32		0.82	3.92	2.95	4.25		3.59	4.04	
19	1.01	4.11	2.58	3.47		3.08	3.30		0.82	4.10	2.47	3.80		3.67	4.02	
20	1.07	4.09	2.84	3.78		3.15	3.27		0.89	4.08	2.64	4.13		3.75	3.98	
21	1.09	3.84	2.79	3.39		3.12	3.18		0.91	3.77	2.55	3.76		3.67	3.83	
22	0.95	3.45	2.05	2.45		3.06	3.16		0.79	3.30	1.87	2.64		3.60	3.81	
23	0.88	3.16	2.01	2.03		2.81	3.09		0.73	2.85	1.84	2.16		3.35	3.64	
24	0.63	2.44	1.50	0.98		1.47	2.13		0.48	2.10	1.39	1.01		1.72	2.48	
25	0.55	2.27	1.54	0.82		1.34	1.71		0.36	1.89	1.43	0.84		1.56	1.92	
26	0.51	2.16	1.58	1.17		1.41	1.42		0.34	1.73	1.42	1.18		1.62	1.58	
27	0.52	1.86	1.37	1.11		1.24	1.33		0.35	1.42	1.18	1.12		1.43	1.48	
28	0.47	1.88	1.31	1.04		1.37	1.35		0.28	1.41	1.11	1.01		1.54	1.48	
29	0.48	1.48	1.05	1.01		1.22	1.37		0.29	1.06	0.71	0.90		1.32	1.44	
30	0.50	1.28	0.99	0.83		1.21	1.33		0.28	0.81	0.63	0.63		1.20	1.32	
31	0.38	1.29	1.01	0.85		1.13	1.31		0.17	0.76	0.61	0.62		1.08	1.25	
32	0.34	1.16	0.93	0.79		1.10	1.28		0.15	0.66	0.55	0.56		1.01	1.17	
33	0.48	1.18	0.88	0.83		1.18	1.27		0.21	0.67	0.49	0.59		1.06	1.12	
34	0.36	1.16	0.90	0.86		1.10	1.26		0.15	0.65	0.50	0.60		0.94	1.10	
35	0.38	1.17	0.88	0.84		1.09	1.24		0.17	0.65	0.47	0.59		0.92	1.07	
36	0.33	1.15	0.93	0.79		1.13	1.29		0.15	0.62	0.51	0.52		0.95	1.09	
37	0.31	1.19	0.82	0.77		1.06	1.19		0.14	0.66	0.42	0.51		0.88	0.97	
38	0.35	1.21	0.93	0.74		1.10	1.16		0.16	0.67	0.48	0.49		0.91	0.95	
39	0.31	1.18	0.83	0.75		1.03	1.13		0.14	0.65	0.43	0.50		0.84	0.91	
40	0.31	0.54	0.41	0.47		0.52	0.64		0.14	0.29	0.21	0.29		0.42	0.51	
41	0.33	0.53	0.41	0.47		0.51	0.64		0.15	0.28	0.21	0.29		0.41	0.50	
42	0.34	0.86	0.64	0.46		0.51	0.65		0.15	0.50	0.36	0.28		0.41	0.51	
43	0.35	0.84	0.61	0.41		0.55	0.68		0.15	0.51	0.36	0.24		0.45	0.53	
44	0.37	0.83	0.61	0.38		0.53	0.70		0.15	0.51	0.37	0.22		0.44	0.56	
45	0.34	0.84	0.60	0.42		0.53	0.71		0.14	0.53	0.37	0.27		0.43	0.57	
46	0.39	0.58	0.47	0.22		0.49	0.65		0.24	0.48	0.39	0.17		0.54	0.73	
47	0.29	0.52	0.33	0.21		0.48	0.68		0.21	0.44	0.27	0.17		0.53	0.74	
48	0.45	0.58	0.44	0.19		0.45	0.65		0.33	0.50	0.36	0.16		0.50	0.71	
49	0.23	0.54	0.29	0.15		0.44	0.65		0.17	0.47	0.25	0.12		0.49	0.72	
50	0.27	0.52	0.31	0.19		0.44	0.62		0.20	0.44	0.26	0.15		0.48	0.68	
51	0.29	0.51	0.40	0.19		0.43	0.60		0.22	0.44	0.34	0.15		0.46	0.64	
52	0.23	0.48	0.29	0.27		0.42	0.54		0.17	0.40	0.25	0.21		0.45	0.57	
53	0.25	0.50	0.38	0.22		0.40	0.52		0.17	0.42	0.32	0.17		0.44	0.55	
54	0.30	0.46	0.26	0.19		0.40	0.50		0.20	0.39	0.22	0.15		0.43	0.53	
55	0.32	0.50	0.29	0.18		0.39	0.48		0.22	0.43	0.25	0.15		0.42	0.51	
56	0.34	0.48	0.39	0.19		0.38	0.52		0.24	0.41	0.33	0.16		0.40	0.56	
57	0.27	0.50	0.28	0.22		0.37	0.47		0.19	0.43	0.23	0.19		0.40	0.51	
58	0.28	0.47	0.39	0.18		0.37	0.49		0.20	0.41	0.33	0.15		0.39	0.52	
59	0.23	0.40	0.28	0.18		0.37	0.53		0.17	0.35	0.23	0.14		0.39	0.56	
60	0.23	0.38	0.27	0.29		0.39	0.49		0.17	0.33	0.23	0.24		0.41	0.51	
61	0.25	0.48	0.26	0.21		0.35	0.46		0.18	0.41	0.21	0.18		0.37	0.48	
62	0.26	0.40	0.28	0.17		0.33	0.46		0.19	0.33	0.23	0.14		0.35	0.48	
63	0.27	0.48	0.38	0.26		0.35	0.45		0.20	0.40	0.33	0.21		0.37	0.46	
64	0.30	0.46	0.27	0.21		0.35	0.42		0.21	0.39	0.22	0.18		0.38	0.43	
65	0.26	0.46	0.36	0.17		0.33	0.45		0.19	0.39	0.31	0.14		0.34	0.47	
66	0.27	0.44	0.28	0.20		0.21	0.45		0.19	0.37	0.23	0.17		0.23	0.46	
67	0.27	0.30	0.27	0.22		0.35	0.50		0.21	0.25	0.22	0.19		0.37	0.52	
68	0.28	0.45	0.37	0.17		0.33	0.40		0.22	0.39	0.32	0.15		0.35	0.41	
69	0.26	0.42	0.28	0.29		0.32	0.41		0.21	0.36	0.23	0.26		0.34	0.42	
70	0.30	0.36	0.38	0.18		0.32	0.43		0.24	0.31	0.33	0.16		0.34	0.45	
71	0.30	0.38	0.27	0.18		0.28	0.42		0.22	0.32	0.22	0.16		0.30	0.43	
72	0.29	0.46	0.35	0.32		0.35	0.40		0.21	0.38	0.29	0.29		0.37	0.40	
73	0.30	0.45	0.35	0.18		0.31	0.40		0.22	0.38	0.29	0.15		0.34	0.41	

Table B5: Run 9 - OM40

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	3,08	6,90	9,07		8,02	10,82	7,39	6,97	2,69	7,18	10,31		9,50	13,33	9,94	7,51
2	3,07	6,68	8,61		9,06	10,68	7,41	6,99	2,48	6,56	9,53		11,14	13,31	9,94	7,51
3	2,96	6,35	8,41		8,74	9,98	7,39	6,95	2,46	6,03	9,37		10,16	12,44	9,94	7,51
4	2,87	6,19	8,08		8,58	9,55	7,37	6,97	2,30	5,83	8,79		9,93	11,74	9,94	7,51
5	2,77	6,08	8,01		8,42	9,24	7,41	6,96	2,17	5,80	8,42		9,67	11,13	9,94	7,51
6	2,74	5,25	5,77		4,13	4,87	7,40	6,98	2,14	4,87	6,07		4,77	5,80	9,94	7,51
7	2,57	5,25	5,63		4,37	5,85	7,37	6,97	1,99	5,02	6,06		5,00	7,05	9,94	7,51
8	2,46	6,86	7,34		5,66	6,31	7,38	6,99	1,89	6,83	8,12		6,97	7,61	9,94	7,47
9	2,41	6,88	7,35		5,65	6,35	7,39	6,95	1,83	6,74	8,24		7,06	7,84	9,92	7,51
10	2,32	6,85	7,32		5,63	6,34	7,37	6,95	1,74	6,56	7,81		6,83	7,96	9,94	7,48
11	2,26	6,74	7,18		5,57	6,32	7,41	6,97	1,66	6,41	7,70		6,64	7,50	9,86	7,51
12	2,21	6,57	7,03		5,50	6,29	7,38	6,95	1,60	6,36	7,40		6,59	7,45	9,79	7,39
13	2,21	6,39	6,89		5,39	6,21	7,39	6,97	1,60	6,23	7,16		6,42	7,49	9,55	7,43
14	2,16	6,17	6,82		5,28	6,11	7,37	6,95	1,61	5,54	7,18		6,21	7,26	9,81	7,32
15	2,13	5,94	5,37		4,28	4,00	7,39	6,31	1,62	5,56	5,60		5,07	4,82	9,40	8,27
16	2,12	5,70	5,21		4,16	3,94	7,40	6,27	1,55	5,28	5,43		4,78	4,81	9,11	8,31
17	2,15	5,69	5,32		4,53	3,93	7,36	6,18	1,61	5,33	5,37		5,22	4,78	8,86	8,05
18	2,97	4,66	4,42		3,47	4,22	7,13	6,10	2,09	4,17	4,38		3,96	5,08	8,29	7,77
19	2,37	4,91	5,11		4,04	4,05	7,13	6,17	1,84	4,38	5,23		4,53	4,87	8,49	7,68
20	2,19	5,02	5,04		4,07	3,86	7,10	6,23	1,62	4,65	5,31		4,99	4,45	8,32	7,65
21	2,00	4,80	4,85		4,03	3,73	7,27	6,24	1,44	4,42	4,96		4,81	4,17	8,74	7,97
22	2,01	4,58	4,65		3,89	3,53	7,21	6,21	1,42	4,36	4,79		4,62	3,97	8,58	7,74
23	1,90	3,83	3,46		3,67	3,35	7,08	6,22	1,45	3,55	3,45		4,32	3,71	8,37	7,45
24	1,99	3,63	3,30		3,51	3,19	6,96	6,20	1,45	3,27	3,18		4,08	3,48	8,18	7,42
25	1,83	4,01	3,76		3,35	3,03	6,84	6,24	1,28	3,61	3,70		3,85	3,37	8,17	7,62
26	1,93	3,67	3,59		3,21	2,92	6,76	6,23	1,41	3,35	3,53		3,74	3,24	8,24	7,68
27	1,86	3,47	3,41		3,05	2,80	6,63	6,21	1,33	3,07	3,44		3,55	3,15	8,12	7,70
28	1,72	3,67	3,54		2,90	2,75	6,48	6,20	1,21	3,42	3,81		3,41	3,13	7,93	7,63
29	1,86	3,83	3,59		2,76	3,03	6,31	6,16	1,28	3,62	3,91		3,20	3,48	7,39	7,70
30	1,63	3,58	3,45		2,61	2,94	6,11	6,09	1,15	3,38	3,71		3,03	3,29	7,31	7,66
31	1,75	3,36	3,49		2,99	2,92	5,97	6,05	1,23	3,06	3,71		3,47	3,33	6,98	7,59
32	1,72	3,99	3,47		3,05	3,19	5,86	6,05	1,17	3,73	3,84		3,59	3,82	7,05	7,36
33	1,58	3,79	3,86		2,98	3,17	5,69	5,98	1,12	3,46	4,21		3,51	3,78	6,82	7,17
34	1,72	3,71	3,76		2,89	3,09	5,54	5,91	1,22	3,43	4,05		3,40	3,71	6,54	7,09
35	1,50	3,45	3,65		2,79	3,17	5,86	5,79	1,06	3,23	4,04		3,32	3,86	7,06	7,06
36	1,58	3,78	3,60		3,40	3,17	6,09	5,72	1,11	3,70	3,86		4,24	3,87	7,33	7,05
37	1,67	3,52	4,01		3,55	3,66	6,31	5,66	1,20	3,37	4,48		4,37	4,45	7,68	6,86
38	1,46	4,00	3,92		3,50	3,74	6,17	5,56	1,02	3,91	4,41		4,46	4,49	7,43	6,57
39	1,54	3,95	3,77		3,39	3,70	6,33	5,42	1,05	3,70	4,22		4,16	4,48	7,79	6,40
40	1,56	3,61	4,15		3,33	3,66	6,28	5,27	1,12	3,46	4,74		3,93	4,45	7,95	6,23
41	1,58	3,98	4,13		3,21	3,59	6,17	5,08	1,15	3,79	4,63		3,75	4,42	7,55	6,02
42	1,42	3,73	3,92		3,11	3,52	5,84	4,94	0,97	3,44	4,31		3,62	4,34	7,20	5,77
43	1,43	3,95	3,70		3,27	3,86	5,84	4,79	1,02	3,66	4,04		3,84	4,88	7,03	5,36
44	1,47	3,82	3,93		3,27	3,88	5,87	4,87	1,03	3,59	4,40		3,90	4,83	7,15	5,42
45	1,36	3,01	3,19		4,82	3,81	4,68	3,25	0,83	2,74	3,53		5,82	4,61	5,61	3,68
46	1,38	3,05	3,47		4,21	3,72	4,74	3,53	0,88	2,68	3,77		4,75	4,54	5,84	4,01
47	1,51	3,42	3,49		3,11	3,58	4,64	3,85	0,98	3,02	3,80		3,40	4,22	5,72	4,45
48	1,51	3,59	2,91		3,27	3,49	4,67	4,04	1,02	3,24	3,10		3,56	4,17	5,76	4,96
49	1,36	3,31	2,89		3,15	3,55	4,78	4,07	0,93	3,12	3,09		3,38	4,32	5,75	5,04
50	1,36	3,50	2,97		3,00	3,54	4,60	4,08	0,94	3,24	3,16		3,17	4,36	5,54	4,98
51	1,39	3,25	2,98		3,72	3,47	4,66	4,11	1,02	3,00	3,26		3,99	4,28	5,67	5,21
52	1,27	3,40	2,97		3,56	3,94	4,58	4,13	0,86	3,07	3,25		3,68	4,98	5,64	5,32
53	1,38	3,14	3,01		3,34	3,99	4,76	4,13	0,91	2,84	3,25		3,60	4,97	5,66	5,26
54	1,20	3,08	2,68		3,12	3,86	4,76	4,02	0,76	2,71	2,89		3,36	4,88	5,73	5,06
55	1,25	3,03	2,84		2,92	3,66	4,67	3,97	0,79	2,71	3,01		3,05	4,41	5,76	5,08
56	1,25	3,63	2,60		2,73	3,47	4,55	4,02	0,81	3,11	2,81		2,88	4,19	5,61	5,19
57	1,25	3,02	2,54		2,53	3,33	4,49	3,93	0,81	2,63	2,66		2,63	3,93	5,54	4,79
58	1,31	2,78	2,85		2,75	3,60	4,55	3,98	0,89	2,46	3,10		2,86	4,34	5,71	4,84
59	1,18	2,98	2,64		2,58	3,54	4,58	4,04	0,69	2,64	2,82		2,78	4,21	5,58	5,47
60	1,12	3,07	2,49		3,23	3,40	4,51	3,99	0,65	2,78	2,60		3,64	4,05	5,56	5,41
61	1,16	2,84	2,57		3,04	3,49	4,50	3,93	0,71	2,48	2,64		3,25	4,14	5,55	5,38
62	1,16	2,85	2,45		2,78	3,41	4,45	4,00	0,69	2,55	2,49		2,99	4,10	5,48	5,16
63	1,16	2,61	2,45		2,55	3,28	4,10	3,74	0,67	2,24	2,52		2,59	3,97	4,94	4,69
64	1,14	3,02	2,42		2,32	3,55	4,12	3,89	0,64	2,58	2,44		2,44	4,38	4,96	4,82
65	1,14	2,52	2,42		3,09	3,49	4,36	4,03	0,64	2,26	2,38		3,28	4,28	5,38	5,08
66	1,12	1,70	2,42		1,90	3,33	4,38	4,06	0,64	1,46	2,36		1,95	4,05	5,39	5,18
67	1,12	1,88	2,38		1,72	3,55	4,54	3,93	0,68	1,62	2,36		1,74	4,32	5,46	4,85
68	1,05	2,36	2,35		2,59	3,49	4,30	3,67	0,62	2,05	2,30		2,65	4,29	5,30	4,62
69	1,03	2,62	2,25		2,96	3,35	4,28	3,72	0,59	2,47	2,24		3,21	4,06	5,09	4,75
70	1,00	2,33	2,30		3,07	3,64	4,52	3,85	0,60	2,13	2,30		3,61	4,32	5,27	4,90
71	1,00	2,53	2,33		2,88	3,59	4,44	3,74	0,60	2,42	2,36		3,35	4,18	5,16	4,81
72	1,03	2,24	2,35		3,02	3,43	4,08	3,53	0,60	2,12	2,34		3,52	4,04	4,80	4,49
73	0,99	2,49	2,33		2,97	3,41	4,18	3,60	0,60	2,35	2,37		3,50	3,91	4,98	4,58
74	1,00	2,19	2,34		2,80	3,33	4,03	3,60	0,62	2,03	2,39		3,27	3,87	4,80	4,58

Table B6: Run 10 - OM50

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	0,70	1,32	2,72	2,67	0,59	2,17	2,87	1,74	0,65	1,13	3,05	3,18	0,45	2,13	3,46	1,88
2	1,18	3,28	3,76	3,99	1,51	3,91	3,28	2,29	1,07	3,59	4,37	4,81	1,28	4,60	4,14	2,76
3	1,38	4,63	6,37	4,70	2,79	5,37	3,57	2,49	1,17	5,13	8,73	5,93	3,05	6,69	4,59	3,18
4	1,41	5,23	6,58	4,87	3,61	5,80	3,78	2,69	1,15	5,94	8,65	6,27	4,44	7,23	4,92	3,65
5	2,82	8,31	11,24	3,90	3,98	5,99	3,92	2,85	1,63	9,56	14,47	5,08	5,08	7,63	5,16	3,91
6	2,91	8,48	10,96	3,98	4,21	6,16	4,01	2,96	1,68	9,39	14,10	5,17	5,71	7,93	5,44	4,10
7	2,49	6,07	6,79	3,85	4,42	6,29	4,08	3,01	1,42	6,64	7,90	5,17	6,18	8,27	5,53	4,08
8	2,30	5,94	6,23	3,73	4,55	6,31	4,07	3,00	1,31	6,25	7,15	4,85	6,36	8,30	5,46	4,03
9	2,37	5,67	5,66	3,64	4,61	6,25	4,07	2,99	1,37	5,97	6,51	4,74	6,38	8,23	5,41	4,02
10	1,87	5,38	5,57	3,50	4,59	6,16	4,08	3,01	1,06	5,59	6,09	4,56	6,36	8,02	5,42	4,04
11	1,89	5,04	4,79	3,35	4,55	6,04	4,08	3,00	1,07	5,17	4,91	4,36	6,37	7,86	5,42	3,98
12	2,08	5,02	4,22	3,22	4,48	5,92	4,05	2,99	1,14	5,01	4,33	4,06	6,13	7,62	5,38	3,98
13	1,67	4,75	3,81	3,02	4,27	5,65	4,03	3,00	0,92	4,67	3,85	3,68	5,73	7,20	5,36	3,99
14	1,62	4,20	3,47	2,97	4,27	5,64	4,09	2,98	0,87	4,13	3,45	3,61	5,68	7,03	5,55	3,96
15	1,68	4,53	3,13	2,89	4,17	5,46	4,08	2,98	0,91	4,45	3,12	3,52	5,49	6,87	5,47	4,01
16	1,71	4,15	3,17	2,99	4,06	5,26	4,05	3,01	0,91	4,02	3,16	3,64	5,23	6,56	5,44	4,04
17	1,46	3,88	3,55	3,07	3,97	5,04	4,06	3,02	0,76	3,81	3,59	3,70	5,11	6,21	5,45	4,06
18	1,51	4,12	3,76	3,18	3,92	5,16	4,05	3,00	0,79	4,00	3,80	3,88	5,05	6,29	5,44	4,07
19	1,56	3,91	3,95	3,21	3,85	5,09	6,43	3,00	0,83	3,79	4,05	3,91	5,01	6,27	8,72	4,11
20	1,54	4,73	3,56	2,95	3,69	5,17	6,24	2,93	0,83	4,52	3,60	3,55	4,75	6,37	8,47	4,02
21	1,57	4,12	3,16	2,12	3,81	5,04	6,27	2,96	0,85	3,94	3,15	2,56	4,95	6,21	8,77	4,06
22	1,53	4,04	3,53	1,98	3,84	4,90	5,96	2,95	0,83	3,92	3,42	2,33	4,89	6,11	7,83	4,04
23	1,50	4,02	4,23	1,86	3,72	4,94	5,43	2,97	0,80	3,90	4,15	2,18	4,64	6,15	7,14	4,11
24	1,49	4,77	4,27	2,46	3,80	5,06	5,39	2,94	0,77	4,55	4,19	2,90	4,73	6,16	7,01	4,03
25	1,43	3,83	3,70	2,35	3,75	5,14	5,54	2,96	0,73	3,60	3,68	2,70	4,63	6,26	7,21	4,05
26	1,41	4,28	3,26	2,24	3,57	5,14	5,53	2,87	0,72	4,10	3,21	2,54	4,39	6,26	7,12	3,94
27	1,30	3,95	2,96	2,02	3,65	4,91	5,86	2,95	0,61	3,84	2,91	2,26	4,55	5,99	7,55	4,08
28	1,28	3,62	3,19	1,82	3,60	4,98	5,78	2,95	0,58	3,46	3,14	1,96	4,48	6,13	7,44	4,09
29	1,34	3,85	3,90	1,65	3,54	5,09	5,42	2,95	0,58	3,68	3,78	1,74	4,37	6,21	6,90	4,09
30	1,21	3,58	3,91	1,97	3,49	4,71	4,94	2,96	0,55	3,37	3,73	1,99	4,30	5,74	6,30	4,10
31	1,22	4,22	2,98	2,15	3,30	4,82	4,98	2,86	0,56	4,04	2,89	2,20	4,07	5,94	6,28	4,04
32	1,21	3,68	3,29	2,20	3,37	5,03	4,91	2,89	0,54	3,52	3,15	2,25	4,15	6,12	6,18	4,05
33	1,21	3,35	3,18	1,92	3,32	4,94	4,91	2,88	0,55	3,20	2,99	1,96	4,04	6,02	6,12	3,94
34	1,24	3,64	3,34	1,67	3,26	5,19	4,82	2,88	0,57	3,42	3,19	1,69	3,97	6,33	6,00	3,99
35	1,19	3,35	3,38	1,48	3,22	4,89	4,49	2,87	0,54	3,11	3,23	1,49	3,88	5,89	5,53	3,97
36	1,12	3,30	2,90	1,79	3,15	4,84	4,39	2,84	0,51	3,01	2,65	1,83	3,76	5,76	5,41	3,90
37	1,09	3,22	2,40	1,76	3,11	4,92	4,29	2,83	0,51	2,94	2,22	1,80	3,70	5,93	5,40	3,88
38	1,08	3,35	2,78	1,73	3,04	4,61	4,22	2,83	0,50	3,06	2,66	1,75	3,67	5,49	5,37	3,88
39	1,10	3,29	3,38	1,70	3,01	4,56	4,13	2,84	0,50	3,00	3,28	1,72	3,58	5,44	5,32	3,90
40	2,73	2,97	2,88	1,71	2,96	4,30	4,35	2,88	1,25	2,75	2,91	1,73	3,52	5,12	5,48	3,98
41	1,12	3,34	2,45	1,76	2,79	4,62	4,31	2,77	0,51	3,09	2,47	1,75	3,28	5,50	5,37	3,83
42	1,10	3,00	2,75	1,85	2,86	4,50	3,96	2,81	0,50	2,74	2,54	1,87	3,36	5,36	4,93	3,85
43	1,06	3,15	3,29	1,87	2,79	4,41	4,07	2,77	0,48	2,88	2,96	1,89	3,28	5,19	5,13	3,79
44	1,08	3,20	2,96	1,66	2,75	4,19	3,91	2,79	0,48	2,87	2,67	1,70	3,20	4,93	5,04	3,83
45	1,08	3,03	2,49	1,42	2,63	4,12	3,96	2,73	0,49	2,68	2,23	1,43	3,09	4,90	5,10	3,85
46	1,05	3,60	2,53	1,23	2,60	4,21	4,14	2,71	0,49	3,24	2,24	1,21	3,06	5,01	5,21	3,76
47	1,02	3,38	2,76	1,32	2,68	4,07	4,07	2,81	0,47	3,05	2,40	1,26	3,11	4,79	4,95	3,85
48	1,02	2,74	3,45	1,62	2,64	4,15	3,91	2,77	0,47	2,46	2,92	1,57	3,03	4,89	4,77	3,79
49	1,02	2,95	2,46	1,60	2,54	4,06	4,38	2,68	0,47	2,66	2,11	1,57	2,96	4,78	5,27	3,64
50	0,97	2,61	2,80	1,38	2,59	4,24	4,37	2,75	0,45	2,31	2,55	1,36	2,93	4,87	5,26	3,70
51	1,00	2,76	1,58	1,17	2,44	4,24	2,18	2,68	0,47	2,41	1,47	1,14	2,77	4,87	2,59	3,60
52	0,96	2,78	2,21	1,49	2,44	3,95	2,24	2,64	0,44	2,46	2,11	1,47	2,77	4,59	2,67	3,54
53	0,94	2,62	2,32	1,58	2,46	4,00	2,45	2,66	0,45	2,32	2,25	1,59	2,79	4,65	2,91	3,54
54	0,95	2,33	1,95	1,54	2,38	3,98	2,61	2,62	0,45	2,10	1,86	1,54	2,67	4,57	3,22	3,45
55	0,91	2,58	1,61	1,30	2,27	4,12	2,54	2,56	0,41	2,32	1,52	1,30	2,54	4,73	3,13	3,40
56	0,89	2,31	2,24	1,36	2,29	3,93	2,49	2,62	0,41	2,08	2,14	1,33	2,60	4,46	3,07	3,48
57	0,89	2,37	1,94	1,19	2,28	4,12	2,50	2,63	0,42	2,13	1,88	1,17	2,59	4,67	3,19	3,45
58	0,89	2,22	2,02	1,39	2,26	3,85	2,58	2,59	0,44	1,97	1,93	1,37	2,54	4,42	3,29	3,40
59	0,88	2,53	1,68	1,41	2,25	4,13	2,52	2,57	0,42	2,28	1,60	1,41	2,58	4,75	3,21	3,39
60	0,86	2,22	1,40	1,19	2,18	3,83	2,50	2,54	0,40	1,97	1,33	1,15	2,48	4,35	3,19	3,31
61	0,87	2,43	2,00	1,25	2,21	4,11	2,65	2,57	0,40	2,16	1,96	1,19	2,47	4,72	3,49	3,39
62	0,86	2,38	2,08	1,34	2,21	3,85	2,59	2,61	0,39	2,08	1,93	1,28	2,50	4,43	3,40	3,35
63	0,84	2,23	1,73	1,33	2,16	4,04	2,63	2,55	0,38	1,92	1,56	1,31	2,43	4,59	3,38	3,28
64	0,86	2,34	1,44	1,36	2,20	3,82	2,54	2,61	0,38	1,98	1,27	1,33	2,50	4,33	3,24	3,33
65	0,86	2,08	2,17	1,60	2,16	4,07	2,57	2,56	0,38	1,76	1,92	1,53	2,39	4,62	3,28	3,26
66	0,86	2,67	1,89	1,42	2,14	3,85	2,65	1,28	0,38	2,25	1,68	1,36	2,34	4,42	3,34	1,61
67	0,84	2,04	1,59	1,77	2,17	4,03	2,71	1,29	0,38	1,78	1,37	1,69	2,37	4,58	3,37	1,66
68	0,97	2,25	1,93	1,77	2,17	3,98	2,61	1,26	0,44	2,00	1,66	1,79	2,44	4,57	3,25	1,62
69	0,89	2,46	1,88	1,69	2,09	3,80	2,38	1,23	0,40	2,18	1,64	1,77	2,32	4,36	2,99	1,60
70	0,89	2,13	1,56	1,51	2,21	4,03	2,65	1,24	0,40	1,86	1,34	1,58	2,42	4,63	3,34	1,60
71	0,87	2,26	2,12	1,56	2,18	3,72	2,60	1,21	0,39	1,94	1,79	1,57	2,39	4,23	3,27	1,56
72	0,89	2,42	2,15	1,60	2,19	3,92	2,52	1,24	0,40	2,05	1,81	1,66	2,42	4,39	3,21	1,61
73	0,86	2,13	1,76	1,50	2,12	3,66	2,61	1,19	0,39	1,78	1,49	1,56	2,38	4,16	3,32	1,54
74	0,88	2,34	1,46	1,44	2,04	3,48	2,44	1,15	0,40	1,98	1,25	1,51	2,26	3,90	3,14	1,50

Table B7: Run 11 - OM55

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	0.89	3.27	2.90	3.14	3.43	2.64	3.16	2.32	0.73	3.03	2.89	3.39	3.71	2.66	3.72	2.70
2	1.11	3.96	3.97	3.33	4.37	3.22	3.34	2.58	0.92	4.05	5.05	3.78	5.32	4.10	4.30	4.40
3	1.24	4.33	4.71	3.59	3.36	4.23	3.28	3.73	1.03	4.50	5.80	4.33	3.72	5.38	4.85	3.58
4	1.28	4.27	4.65	3.51	3.30	4.35	3.39	3.82	1.06	4.31	5.53	4.18	3.66	5.79	4.69	3.75
5	1.22	4.35	3.67	3.35	4.00	4.22	3.28	3.84	1.01	4.46	4.26	3.98	4.54	5.90	4.45	3.76
6	1.40	4.62	5.17	4.82	3.98	4.58	3.42	5.17	1.18	4.80	5.94	5.60	4.68	6.28	4.64	7.02
7	1.26	4.33	4.84	4.89	3.86	4.29	3.46	5.19	1.05	4.44	5.43	5.62	4.70	5.70	4.69	7.11
8	1.41	4.52	4.30	4.07	4.69	3.97	3.41	5.16	1.19	4.69	4.58	4.62	5.84	5.28	4.67	7.22
9	1.16	4.15	4.25	3.85	4.47	3.94	3.53	5.03	0.95	4.14	4.65	4.26	5.38	5.19	4.79	6.97
10	1.14	4.25	4.31	3.58	4.14	3.73	3.46	4.73	0.93	4.06	4.54	3.91	4.75	4.91	4.69	6.42
11	1.11	4.79	4.53	3.42	3.81	3.44	3.38	4.65	0.95	4.44	4.82	3.79	4.38	4.48	4.68	6.24
12	1.10	4.72	3.81	4.83	3.65	4.15	3.32	4.58	0.88	4.51	4.06	5.42	4.14	5.46	4.60	6.15
13	1.13	4.05	4.75	4.98	3.99	4.16	3.47	4.48	0.90	3.92	4.93	5.58	4.59	5.48	4.71	6.07
14	1.12	4.23	4.47	4.20	3.77	3.85	3.48	4.38	0.92	4.16	4.71	4.65	4.33	4.90	4.72	5.88
15	1.06	4.32	4.09	3.85	3.74	3.89	3.42	4.56	0.85	4.25	4.25	4.26	4.20	4.95	4.87	6.13
16	1.07	4.28	3.97	3.55	4.50	3.72	3.40	4.56	0.88	4.09	4.17	3.88	5.11	4.74	4.71	6.06
17	1.14	4.28	4.22	3.30	4.24	4.58	3.38	4.35	0.91	4.15	4.38	3.52	4.82	5.89	4.68	5.78
18	1.08	4.35	4.00	3.07	4.02	4.46	3.36	4.65	0.87	4.09	4.20	3.28	4.39	5.80	4.60	6.30
19	1.08	4.34	4.39	4.33	3.89	4.40	3.44	4.73	0.90	4.15	4.37	4.68	4.30	5.60	4.72	6.49
20	1.13	4.15	3.70	3.41	4.16	4.21	3.41	4.64	0.92	3.96	3.74	3.73	4.72	5.24	4.63	6.30
21	1.06	4.12	3.81	3.43	3.93	4.00	3.36	4.45	0.86	3.82	3.80	3.75	4.36	4.98	4.61	6.03
22	1.09	4.15	3.78	3.21	3.71	4.17	3.38	4.63	0.86	3.85	3.77	3.55	4.01	5.14	4.63	6.21
23	1.04	4.37	4.09	2.93	4.06	4.12	3.40	4.61	0.82	3.99	4.08	3.16	4.38	5.08	4.66	6.26
24	1.06	4.20	3.82	2.67	3.80	3.83	3.36	4.47	0.82	3.89	3.86	2.89	4.10	4.83	4.65	6.06
25	0.99	4.02	3.92	2.49	3.56	4.79	3.41	4.80	0.77	3.67	4.01	2.65	3.85	5.97	4.58	6.51
26	1.10	4.39	4.10	3.71	4.40	4.64	3.44	4.86	0.87	3.89	4.20	4.05	4.69	5.85	4.62	6.52
27	1.03	4.01	3.78	3.50	4.01	4.31	3.38	4.68	0.78	3.66	3.72	3.88	4.22	5.37	4.59	6.16
28	1.01	4.05	4.05	3.59	3.79	4.18	3.42	4.64	0.76	3.70	4.03	4.03	3.99	5.27	4.59	5.97
29	0.96	3.95	3.73	3.12	3.48	3.85	3.34	4.71	0.69	3.50	3.62	3.50	3.57	4.85	4.48	6.06
30	1.05	4.23	3.69	2.66	4.15	4.58	3.35	4.61	0.77	3.75	3.52	2.99	4.30	5.90	4.50	5.94
31	0.88	3.78	3.48	2.33	3.80	4.53	3.39	4.64	0.66	3.35	3.28	2.52	3.95	5.77	4.65	6.03
32	0.88	3.78	3.70	2.05	3.53	4.31	3.40	4.65	0.69	3.40	3.48	2.21	3.62	5.32	4.62	5.99
33	0.90	3.93	3.60	3.26	3.25	4.04	3.36	4.71	0.68	3.53	3.29	3.47	3.28	4.81	4.51	6.13
34	0.87	3.61	3.78	3.01	3.57	3.94	3.34	4.63	0.68	3.30	3.66	3.17	3.66	4.74	4.49	5.96
35	0.85	3.61	3.46	2.55	3.27	3.74	3.32	4.60	0.64	3.20	3.30	2.75	3.30	4.51	4.41	5.86
36	0.83	3.66	3.62	2.24	3.43	3.76	3.39	4.75	0.63	3.24	3.41	2.38	3.52	4.52	4.55	6.12
37	0.83	3.57	3.39	1.96	3.17	3.85	3.33	4.58	0.61	3.26	3.28	2.06	3.15	4.69	4.52	5.84
38	0.84	3.32	3.63	2.48	3.66	4.15	3.34	4.38	0.61	2.98	3.47	2.47	3.70	5.06	4.49	5.52
39	0.80	3.46	3.55	3.02	3.35	3.89	3.35	4.43	0.60	3.11	3.39	3.14	3.39	4.63	4.45	5.70
40	0.83	3.98	3.16	2.56	3.03	4.07	3.34	4.34	0.63	3.25	2.93	2.66	3.10	4.85	4.44	5.47
41	0.77	3.71	3.50	2.18	3.46	3.97	3.33	4.27	0.57	3.34	3.39	2.21	3.64	4.67	4.47	5.32
42	0.78	3.36	3.20	1.90	3.16	3.73	3.34	4.32	0.56	2.93	3.02	1.87	3.19	4.34	4.49	5.38
43	0.79	3.32	3.09	1.73	2.85	4.00	3.29	4.45	0.58	2.85	2.78	1.75	2.92	4.70	4.47	5.54
44	0.76	2.90	2.22	1.96	1.75	3.05	1.90	3.90	0.54	2.41	2.03	1.98	1.80	3.59	2.58	4.80
45	0.76	2.83	2.39	1.71	1.59	2.95	1.87	3.77	0.53	2.35	2.18	1.71	1.60	3.47	2.54	4.60
46	0.76	3.61	2.86	1.64	2.09	3.30	1.89	3.60	0.53	2.95	2.61	1.59	2.14	3.89	2.54	4.38
47	0.72	2.94	3.06	1.53	2.40	3.18	1.94	3.85	0.48	2.52	2.83	1.46	2.43	3.79	2.60	4.80
48	0.72	2.87	2.88	1.62	2.66	2.95	1.99	3.80	0.48	2.55	2.80	1.59	2.87	3.51	2.67	4.68
49	0.74	3.05	3.17	2.32	2.59	3.37	2.01	3.64	0.49	2.74	3.03	2.32	2.80	4.06	2.75	4.48
50	0.71	3.02	2.94	1.99	2.51	3.22	1.99	3.85	0.47	2.71	2.85	1.96	2.78	3.79	2.67	4.79
51	0.70	2.96	2.63	1.71	2.43	2.95	1.99	3.76	0.52	2.71	2.48	1.75	2.66	3.43	2.67	4.68
52	0.72	2.91	2.75	1.48	2.41	3.29	2.03	3.61	0.48	2.62	2.63	1.52	2.64	3.87	2.75	4.45
53	0.66	2.73	2.61	1.53	2.70	3.20	2.02	3.73	0.43	2.38	2.42	1.59	2.91	3.72	2.75	4.49
54	0.66	2.78	2.64	2.21	2.55	2.96	2.01	3.60	0.44	2.38	2.53	2.27	2.76	3.48	2.64	4.43
55	0.63	2.71	2.68	1.84	2.40	3.24	1.96	3.58	0.42	2.32	2.52	1.89	2.62	3.85	2.58	4.41
56	0.65	2.71	2.57	1.60	2.39	3.18	2.00	3.79	0.41	2.29	2.42	1.66	2.58	3.78	2.63	4.72
57	0.64	2.63	2.73	1.40	2.52	2.95	1.99	3.66	0.40	2.18	2.53	1.40	2.72	3.51	2.65	4.46
58	0.65	3.29	2.56	1.44	2.33	3.21	1.95	3.42	0.41	2.69	2.38	1.49	2.58	3.86	2.56	4.17
59	0.65	2.46	2.33	2.06	2.32	3.15	1.94	3.57	0.41	2.08	2.23	2.11	2.53	3.71	2.55	4.40
60	0.63	2.62	2.55	1.79	2.26	2.96	1.97	3.49	0.39	2.18	2.43	1.84	2.44	3.44	2.62	4.30
61	0.61	2.57	2.25	1.51	2.23	3.09	1.92	3.46	0.37	2.10	2.12	1.50	2.47	3.60	2.56	4.27
62	0.63	2.59	2.55	1.30	2.43	3.07	1.95	3.48	0.38	2.19	2.36	1.28	2.66	3.61	2.59	4.24
63	0.61	3.09	2.25	1.47	2.30	2.84	1.93	3.36	0.37	2.53	2.12	1.51	2.49	3.30	2.54	4.09
64	0.59	2.40	2.45	1.92	2.39	3.12	1.91	3.46	0.36	1.99	2.31	1.99	2.55	3.63	2.49	4.16
65	0.59	2.51	2.17	1.64	2.28	3.05	1.92	3.39	0.37	2.12	1.98	1.70	2.46	3.50	2.53	3.98
66	0.59	2.33	2.40	1.42	2.15	2.78	1.90	3.38	0.36	1.90	2.23	1.37	2.35	3.19	2.49	3.98
67	0.57	2.51	2.12	1.21	2.22	3.15	1.88	3.45	0.35	2.01	1.94	1.16	2.36	3.66	2.45	4.10
68	0.58	2.61	1.73	1.81	2.19	3.08	1.93	2.23	0.36	2.14	1.56	1.78	2.39	3.58	2.52	2.63
69	0.57	1.96	1.66	1.77	2.27	2.80	1.90	2.25	0.35	1.68	1.52	1.79	2.51	3.21	2.50	2.65
70	0.57	2.22	1.92	1.49	2.09	2.97	1.86	2.36	0.35	1.87	1.70	1.50	2.25	3.45	2.40	2.75
71	0.57	2.31	2.10	1.26	2.22	2.84	1.85	2.41	0.35	1.89	1.95	1.24	2.42	3.27	2.43	2.80
72	0.55	2.27	1.85	1.15	2.01	2.76	1.87	2.47	0.34	1.92	1.69	1.15	2.11	3.21	2.46	2.87
73	0.55	2.28	1.84	1.90	2.21	2.67	1.87	2.46	0.34	1.89	1.68	1.91	2.32	3.11	2.44	2.93
74	0.56	2.35	2.02	1.60	2.08	3.08	1.89	2.54	0.34	1.92	1.87	1.60	2.16	3.62	2.43	2.99

Table B8: Run 12 - OM60

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	2.15	6.83	5.98	5.67			2.18	0.73	1.91	7.16	7.47	7.32			2.79	0.74
2	1.53	6.25	6.18	5.67			2.26	0.72	1.43	6.55	8.08	7.73			3.12	0.85
3	1.61	6.41	6.25	5.58			2.41	0.30	1.62	6.80	8.25	8.09			3.47	0.38
4	1.41	6.17	6.18	5.45			2.34	0.20	1.41	6.73	8.60	7.82			3.49	0.27
5	1.39	6.39	6.14	5.41			2.37	0.21	1.33	7.06	8.63	7.77			3.74	0.30
6	1.25	6.05	5.29	5.33			2.37	0.19	1.19	6.86	7.51	7.57			3.85	0.29
7	1.26	6.47	3.97	5.26			2.32	1.13	1.17	7.34	8.21	7.47			3.76	1.78
8	1.36	5.82	4.13	5.22			2.37	1.04	1.25	6.68	7.97	7.26			3.77	1.75
9	1.34	4.03	4.00	4.30			1.81	0.79	1.23	4.45	5.28	5.87			2.91	1.34
10	1.21	3.71	3.85	4.23			1.81	0.79	1.10	3.99	4.98	5.71			2.90	1.23
11	1.20	3.56	3.70	4.14			1.81	0.79	1.09	3.68	4.78	5.58			3.04	1.20
12	1.11	3.48	3.53	4.01			1.81	0.76	0.97	3.64	4.40	5.35			3.01	1.11
13	1.11	3.41	3.36	3.88			1.83	0.76	0.91	3.27	4.15	5.12			2.99	1.10
14	0.99	3.30	3.19	3.72			1.83	0.83	0.81	3.08	3.84	4.91			2.97	1.19
15	1.03	3.55	3.03	3.39			1.78	0.54	0.82	3.26	3.66	4.34			2.86	0.78
16	1.15	3.22	2.87	3.40			1.79	0.75	0.92	2.95	3.42	4.39			2.82	1.02
17	1.00	3.18	2.73	3.24			1.78	0.78	0.77	2.92	3.21	3.95			2.73	1.03
18	0.93	2.82	2.85	2.88			1.75	0.78	0.71	2.43	3.15	3.52			2.67	1.04
19	0.93	2.87	2.81	3.10			1.71	0.31	0.69	2.47	3.02	3.69			2.50	1.00
20	0.96	3.81	3.00	3.10			1.64	0.30	0.72	3.33	3.19	3.70			2.35	0.95
21	1.07	3.62	2.87	2.96			1.70	0.30	0.80	3.33	3.00	3.57			2.47	0.92
22	0.90	3.78	2.96	2.99			1.70	0.20	0.66	3.58	3.02	3.56			2.49	0.60
23	0.89	3.80	3.02	2.96			1.67	0.31	0.64	3.60	3.03	3.52			2.42	0.95
24	0.94	3.26	2.94	2.94			1.68	0.31	0.68	3.14	2.99	3.55			2.39	0.94
25	0.89	3.30	3.06	2.96			1.66	0.30	0.64	3.03	3.20	3.57			2.35	0.89
26	0.98	3.36	2.84	3.06			1.64	0.31	0.69	3.08	2.97	3.68			2.32	0.92
27	0.83	3.55	2.89	3.05			1.62	0.30	0.56	3.26	2.99	3.63			2.33	0.90
28	0.78	3.59	1.61	1.69			1.53	0.21	0.52	3.30	1.69	1.97			2.18	0.25
29	0.81	3.70	1.71	1.72			1.54	0.29	0.50	3.40	1.82	1.92			2.18	0.33
30	0.99	3.65	1.87	1.66			1.34	0.28	0.60	3.40	1.98	1.81			1.90	0.29
31	0.98	3.75	1.80	1.70			1.36	0.28	0.58	3.44	2.09	2.19			1.95	0.30
32	0.97	3.82	1.91	1.71			1.71	0.29	0.56	3.45	2.52	2.50			2.43	0.32
33	1.00	3.55	1.85	1.62			1.71	0.27	0.56	3.16	2.42	2.31			2.37	0.29
34	1.03	3.55	1.82	1.65			1.69	0.29	0.59	3.06	2.25	2.24			2.35	0.31
35	0.97	3.91	1.81	1.66			1.69	0.30	0.56	3.37	2.21	2.21			2.35	0.34
36	1.05	3.41	1.82	1.60			1.68	0.33	0.62	2.93	2.17	2.07			2.34	0.37
37	1.04	3.50	1.85	1.60			1.65	0.32	0.63	2.97	2.17	2.04			2.25	0.36
38	1.11	3.54	1.86	1.70			1.69	0.34	0.67	2.95	2.16	2.19			2.31	0.37
39	1.05	3.34	1.82	1.69			1.67	0.28	0.63	2.73	2.08	2.21			2.28	0.30
40	1.00	3.58	1.78	1.66			1.67	0.29	0.60	2.88	2.04	2.14			2.20	0.29
41	0.98	3.37	1.85	1.62			1.68	0.28	0.54	2.71	2.12	2.12			2.19	0.28
42	1.02	3.18	1.86	1.67			1.66	0.28	0.55	2.46	2.17	2.11			2.14	0.28
43	1.03	3.25	1.83	1.60			1.66	0.29	0.56	2.52	2.11	2.00			2.16	0.28
44	1.03	3.55	1.80	1.58			1.63	0.32	0.58	2.65	2.09	1.97			2.10	0.32
45	1.12	3.38	1.87	1.66			1.65	0.33	0.63	2.53	2.18	2.10			2.13	0.33
46	1.05	3.38	1.83	1.57			1.66	0.32	0.57	2.53	2.18	2.03			2.12	0.32
47	1.03	3.51	1.81	1.58			1.66	0.31	0.56	2.62	2.20	2.02			2.15	0.31
48	1.03	3.36	1.85	1.67			1.67	0.33	0.57	2.50	2.28	2.11			2.16	0.33
49	1.04	3.17	1.80	1.68			1.64	0.30	0.57	2.36	2.20	2.12			2.15	0.30
50	1.08	3.30	1.88	1.59			1.64	0.32	0.59	2.37	2.24	2.05			2.12	0.32
51	1.15	2.97	1.82	1.67			1.61	0.33	0.63	2.09	2.09	2.04			2.08	0.32
52	1.06	3.19	1.85	1.71			1.64	0.32	0.55	2.20	2.12	2.03			2.12	0.31
53	1.09	3.26	1.82	1.66			1.65	0.30	0.55	2.20	2.12	1.95			2.13	0.29
54	1.12	3.23	1.81	1.62			1.69	0.37	0.58	2.18	2.05	1.93			2.14	0.35
55	1.11	3.18	1.90	1.64			1.66	0.34	0.57	2.14	2.04	1.95			2.12	0.32
56	1.10	3.25	1.68	1.64			1.65	0.37	0.57	2.19	1.78	2.00			2.20	0.36
57	1.13	3.23	1.88	1.64			1.69	0.33	0.58	2.22	2.00	2.00			2.30	0.33
58	1.13	3.24	1.78	1.67			1.66	0.36	0.58	2.23	1.87	2.02			2.32	0.36
59	1.15	3.12	1.82	1.62			1.68	0.35	0.60	2.15	1.90	1.97			2.31	0.36
60	1.12	3.16	1.76	1.62			1.66	0.32	0.56	2.08	1.85	1.95			2.24	0.33
61	1.12	3.20	1.73	1.65			1.71	0.32	0.55	2.02	1.81	2.01			2.34	0.33
62	1.13	2.89	1.80	1.60			1.69	0.34	0.55	1.82	1.88	1.95			2.31	0.35
63	1.15	3.05	1.75	1.66			1.69	0.34	0.56	1.88	1.81	1.95			2.28	0.35
64	1.15	3.19	1.84	1.72			1.59	0.34	0.56	1.92	1.88	1.95			2.12	0.34
65	1.14	3.05	1.64	1.70			1.62	0.35	0.56	1.84	1.64	1.87			2.11	0.35
66	1.16	3.14	1.77	1.68			1.57	0.32	0.57	1.80	1.80	1.86			2.02	0.32
67	1.15	3.05	1.81	1.60			1.55	0.33	0.55	1.75	1.87	1.72			2.00	0.33
68	1.13	3.05	1.88	1.42			1.52	0.37	0.55	1.75	1.89	1.51			1.94	0.37
69	1.13	2.94	1.70	1.42			1.56	0.20	0.53	1.64	1.65	1.50			1.99	0.20
70	1.08	3.10	1.64	1.47			1.60	0.24	0.51	1.73	1.51	1.48			2.05	0.24
71	1.12	3.08	1.73	1.52			1.61	0.25	0.47	1.68	1.54	1.61			2.09	0.25
72	1.14	2.93	1.65	1.48			1.59	0.25	0.47	1.60	1.44	1.57			2.06	0.25
73	1.12	3.11	1.75	1.55			1.55	0.34	0.47	1.69	1.56	1.71			1.98	0.34
74	1.14	3.14	1.69	1.48			1.60	0.34	0.46	1.71	1.48	1.50			2.05	0.35
75	1.21	3.08	1.72	1.47			1.61	0.35	0.51	1.64	1.50	1.46			2.06	0.36
76	1.25	2.99	1.72	1.43			1.64	0.34	0.52	1.54	1.60	1.41			2.12	0.35
77	1.27	3.18	1.74	1.47			1.62	0.34	0.55	1.64	1.62	1.40			2.11	0.34
78	1.23	3.02	1.62	1.53			1.60	0.36	0.53	1.60	1.53	1.45			2.06	0.36
79	1.27	3.13	1.70	1.43			1.59	0.37	0.55	1.62	1.61	1.35			2.05	0.37
80	1.31	3.04	1.60	1.55			1.60	0.37	0.56	1.57	1.49	1.47			2.11	0.36

Table B9: Run 13 - OM70

time	OCR								CER							
hours	R1	R2	R3	R4	R5	R6	R7	R8	R1	R2	R3	R4	R5	R6	R7	R8
1	2,39	4,05	2,93	3,13	2,18	3,74	2,34	1,23	2,02	3,64	3,04	4,47	2,50	5,17	3,40	2,03
2	2,05	4,83	3,24	3,15	2,38	4,20	2,40	1,29	1,62	5,14	3,77	4,54	3,13	6,05	3,43	2,22
3	2,16	4,99	3,29	3,13	2,50	4,37	2,44	1,33	1,77	5,25	3,83	4,47	3,50	6,30	3,41	2,26
4	2,17	5,03	3,40	3,07	2,59	4,21	2,37	1,32	1,77	5,29	3,87	4,38	3,63	6,06	3,32	2,25
5	2,11	4,83	3,40	3,02	2,75	4,25	2,46	1,35	1,72	5,08	3,76	4,35	3,92	6,18	3,41	2,26
6	2,08	4,56	3,33	2,94	2,76	4,16	2,48	1,35	1,70	4,74	3,64	4,15	4,05	5,99	3,40	2,24
7	2,01	4,33	3,17	2,86	2,78	4,08	2,49	1,35	1,59	4,32	3,46	3,92	4,04	5,81	3,42	2,24
8	1,99	4,14	3,06	2,77	2,77	3,99	2,50	1,35	1,54	4,07	3,26	3,79	4,06	5,69	3,42	2,26
9	1,97	3,99	2,96	2,67	2,66	3,90	2,49	1,34	1,50	3,75	3,07	3,66	3,79	5,45	3,42	2,19
10	2,02	3,85	2,95	2,61	2,61	3,81	2,46	1,33	1,54	3,52	3,07	3,54	3,68	5,33	3,41	2,13
11	1,97	3,75	2,86	2,61	2,71	3,73	2,48	1,38	1,44	3,37	2,93	3,58	3,83	5,06	3,40	2,20
12	2,25	3,57	2,84	2,63	2,68	3,62	2,49	1,34	1,65	3,02	2,91	3,72	3,75	4,87	3,38	2,11
13	1,99	3,52	2,81	2,61	2,63	3,51	2,49	1,33	1,49	2,93	2,80	3,61	3,64	4,57	3,38	2,10
14	1,93	3,66	2,75	2,58	2,62	3,37	2,48	1,34	1,42	3,04	2,74	3,47	3,66	4,48	3,37	2,09
15	2,97	3,52	2,71	2,50	1,94	2,78	2,11	1,02	2,18	2,93	2,67	3,26	2,64	3,69	2,89	1,59
16	2,81	3,28	2,88	2,37	2,04	2,60	2,16	1,17	2,07	2,68	2,82	3,02	2,77	3,56	2,96	1,87
17	2,81	3,88	2,93	2,73	2,14	3,27	2,19	1,11	2,14	3,12	2,88	4,88	3,11	4,80	3,00	1,86
18	2,87	3,95	2,99	3,01	2,13	3,30	2,20	1,11	2,26	3,17	2,94	4,63	3,21	4,57	3,01	1,88
19	3,00	3,82	2,93	3,25	2,10	3,14	2,16	1,13	2,37	3,12	3,01	4,63	3,11	4,30	3,01	1,87
20	3,23	3,68	2,87	3,14	2,14	3,07	2,21	1,10	2,55	3,00	2,78	4,48	3,14	4,04	3,02	1,80
21	2,97	3,69	2,76	2,97	2,12	2,91	2,20	1,16	2,30	3,06	2,68	4,03	3,08	3,83	3,02	1,85
22	3,09	3,72	2,67	2,80	2,12	2,77	2,17	1,10	2,31	3,14	2,55	3,76	3,02	3,60	3,01	1,75
23	2,91	3,52	2,64	2,69	2,11	3,03	2,19	1,10	2,17	2,97	2,52	3,61	2,96	3,94	3,00	1,73
24	3,63	3,59	2,59	2,51	2,11	2,91	2,07	1,34	2,86	2,98	2,51	3,33	2,92	3,67	2,92	1,87
25	3,77	3,25	2,66	2,34	2,10	2,81	2,19	1,84	2,92	2,65	2,47	2,88	2,84	3,50	3,06	2,59
26	4,20	3,27	2,55	2,16	2,09	2,74	2,18	1,81	3,37	2,62	2,29	2,66	2,84	3,41	3,05	2,54
27	3,66	3,12	2,59	2,23	2,08	2,87	2,14	1,84	2,78	2,41	2,33	2,75	2,83	3,62	3,02	2,60
28	2,78	3,19	2,55	2,27	2,08	2,70	2,18	1,82	2,11	2,47	2,26	2,82	2,76	3,36	3,01	2,57
29	2,83	3,38	2,56	2,48	2,09	2,61	2,18	1,83	2,15	2,57	2,27	3,13	2,75	3,21	3,02	2,59
30	3,76	3,16	2,56	2,34	2,11	2,77	2,18	1,80	2,91	2,36	2,26	3,15	2,77	3,37	3,02	2,59
31	3,46	3,09	2,54	2,21	2,14	2,68	2,18	1,84	2,68	2,31	2,25	2,97	2,76	3,30	3,01	2,63
36	2,92	3,33	2,25	2,19	2,17	2,80	2,14	1,83	2,14	2,49	1,99	3,00	2,79	3,46	2,96	2,53
37	1,92	3,09	1,78	2,11	2,21	2,77	2,14	1,83	1,41	2,31	1,58	2,98	2,87	3,38	2,94	2,56
38	2,01	3,26	1,90	2,76	2,21	3,06	2,16	1,87	1,48	2,44	1,60	3,78	2,90	3,72	3,00	2,57
39	2,05	3,09	2,07	2,74	2,22	3,08	2,18	1,86	1,50	2,19	1,72	3,45	2,95	3,76	2,98	2,57
40	2,44	3,04	2,42	2,84	2,21	2,88	2,18	1,82	1,72	2,14	1,98	3,50	2,91	3,47	2,99	2,57
41	3,10	2,54	2,80	2,55	2,18	2,69	2,17	2,07	2,14	1,85	2,37	3,10	2,87	3,24	3,01	2,92
42	3,02	2,48	3,28	2,26	2,18	2,78	2,17	2,09	2,09	1,76	2,86	2,75	2,84	3,39	2,98	2,98
43	3,06	2,42	3,15	2,02	2,16	2,66	2,14	2,07	2,04	1,69	2,75	2,49	2,75	3,16	3,00	2,93
44	2,92	3,13	3,35	1,84	2,11	2,73	2,17	2,07	1,94	2,32	3,02	2,27	2,69	3,25	2,97	2,83
45	2,69	2,72	2,90	1,99	2,16	2,59	2,17	2,10	1,64	2,05	2,61	2,45	2,75	3,12	2,97	2,87
46	2,71	2,74	2,45	2,12	2,13	2,62	2,17	2,01	1,61	2,15	2,17	2,46	2,71	3,19	3,01	2,78
47	2,43	2,81	2,28	1,96	2,11	2,50	2,15	2,09	1,31	2,16	1,96	2,11	2,60	2,98	2,95	2,81
48	2,24	2,71	2,16	1,81	2,08	2,75	2,13	2,10	1,15	2,09	1,80	1,98	2,56	3,31	3,01	2,82
49	2,36	2,75	2,19	1,84	2,05	2,34	2,12	1,97	1,21	2,11	1,79	2,01	2,49	2,85	2,91	2,70
50	2,40	2,67	2,14	2,01	2,09	2,63	2,16	2,04	1,26	2,02	1,78	2,20	2,55	3,20	3,03	2,82
51	2,59	2,75	2,05	1,93	2,08	2,61	2,11	2,06	1,44	2,00	1,56	2,08	2,53	3,14	2,89	2,77
52	2,53	2,61	2,07	1,79	2,06	2,52	2,16	2,04	1,40	1,85	1,54	1,93	2,48	3,04	2,94	2,74
53	2,42	2,70	2,05	1,65	2,03	2,81	2,13	2,09	1,27	1,96	1,56	1,74	2,44	3,39	2,94	2,86
54	2,39	2,70	1,91	1,83	1,94	2,66	2,15	2,02	1,26	2,00	1,37	1,92	2,31	3,21	3,01	2,77
55	2,48	2,58	1,87	1,88	1,99	2,52	2,15	1,99	1,34	1,80	1,32	2,00	2,37	3,00	3,03	2,73
56	2,54	2,50	1,93	1,76	1,98	2,83	2,16	2,07	1,38	1,75	1,39	1,90	2,36	3,41	2,96	2,83
57	2,28	2,62	2,12	1,63	1,96	2,37	2,06	2,09	1,23	1,82	1,53	1,76	2,31	2,86	2,82	2,86
58	2,44	2,47	2,05	1,77	1,94	2,57	2,00	2,10	1,25	1,69	1,47	1,94	2,28	3,10	2,72	2,85
59	2,34	2,62	2,02	1,93	1,93	2,83	2,15	2,01	1,20	1,78	1,43	2,11	2,24	3,33	3,01	2,70
60	2,42	2,52	1,92	1,80	1,90	2,57	2,06	1,72	1,27	1,72	1,36	1,92	2,21	2,88	2,83	2,36
61	2,53	2,52	1,94	1,83	1,89	2,52	1,96	1,75	1,33	1,76	1,35	1,90	2,20	2,79	2,68	2,36
62	2,49	2,62	1,95	1,88	1,77	2,50	1,65	1,65	1,31	1,82	1,38	1,95	2,01	2,80	2,21	2,24
63	1,69	2,23	1,41	1,43	1,18	1,52	2,03	2,25	0,91	1,48	1,00	1,48	1,33	1,66	2,69	3,05
64	1,89	2,45	1,35	1,30	1,18	1,58	2,05	2,18	1,02	1,66	0,94	1,34	1,33	1,75	2,73	2,92
65	1,73	2,49	1,46	1,37	1,14	1,61	2,01	2,22	0,79	1,66	1,04	1,46	1,28	1,78	2,70	2,99
66	1,73	2,59	1,56	1,39	1,28	1,57	2,15	2,22	0,81	1,76	1,08	1,47	1,43	1,76	2,89	2,93
67	1,88	2,55	1,38	1,53	1,22	1,41	2,00	2,10	0,99	1,73	0,94	1,66	1,37	1,55	2,74	2,71
68	1,67	2,29	1,35	1,44	1,27	1,50	2,04	2,11	0,90	1,56	0,92	1,58	1,44	1,66	2,83	2,71
69	3,12	2,31	1,35	1,37	1,28	1,43	2,05	2,06	2,03	1,57	0,88	1,50	1,45	1,58	2,86	2,57
70	3,04	2,47	1,33	1,31	1,34	1,57	2,14	2,17	2,23	1,64	0,83	1,45	1,52	1,76	2,97	2,74
71	2,84	2,22	1,32	1,53	1,24	1,39	2,00	2,16	2,13	1,38	0,80	1,70	1,43	1,52	2,74	2,73
72	2,74	2,31	1,41	1,47	1,26	1,53	2,02	2,07	1,94	1,40	0,86	1,61	1,45	1,68	2,77	2,60
73	2,54	2,31	1,27	1,33	1,28	1,52	2,12	2,17	1,69	1,44	0,75	1,44	1,48	1,66	2,84	2,70
74	2,53	2,27	1,26	1,33	1,24	1,53	2,02	2,07	1,72	1,38	0,75	1,43	1,41	1,72	2,68	2,58
75	2,22	2,27	1,26	1,53	1,30	1,50	2,13	2,26	1,50	1,38	0,75	1,63	1,50	1,64	2,83	2,82

continuation of Table B10 - OM70

76	2.62	2.18	1.26	1.43	1.22	1.52	1.96	2.02	1.81	1.30	0.75	1.51	1.40	1.66	2.60	2.46
77	2.32	2.21	1.23	1.34	1.26	1.46	2.04	2.08	1.57	1.32	0.71	1.41	1.46	1.59	2.74	2.53
78	2.46	2.24	1.23	1.30	1.23	1.52	2.03	2.16	1.63	1.36	0.73	1.38	1.43	1.66	2.70	2.69
79	2.32	2.27	1.22	1.51	1.29	1.41	2.13	2.16	1.57	1.35	0.73	1.61	1.50	1.54	2.83	2.69
80	3.05	2.21	1.24	1.42	1.29	1.65	2.09	2.02	2.11	1.34	0.76	1.48	1.50	1.83	2.78	2.49
81	1.65	2.28	1.23	1.32	1.22	1.50	2.01	2.04	1.14	1.36	0.75	1.31	1.38	1.64	2.65	2.51
82	1.70	2.19	1.21	1.22	1.21	1.46	2.02	2.05	1.20	1.27	0.74	1.22	1.38	1.59	2.65	2.52
83	3.01	2.57	1.37	1.09	1.20	1.48	2.03	2.19	1.92	1.49	0.81	1.11	1.36	1.59	2.72	2.73
84	1.65	2.25	1.22	1.37	1.21	1.39	1.99	2.08	1.00	1.37	0.73	1.38	1.39	1.48	2.67	2.59
85	1.86	2.07	1.19	1.30	1.20	1.57	2.03	2.14	1.05	1.21	0.70	1.35	1.36	1.72	2.80	2.72
86	1.75	2.12	1.20	1.22	1.24	1.54	2.12	2.23	1.00	1.26	0.68	1.27	1.43	1.67	2.88	2.84
87	1.92	2.26	1.38	1.46	1.17	1.44	2.00	2.07	1.15	1.34	0.78	1.56	1.34	1.55	2.72	2.61
88	2.65	2.19	1.14	1.34	1.23	1.45	2.11	2.23	1.58	1.30	0.66	1.43	1.42	1.59	2.89	2.84
89	1.64	2.04	1.15	1.21	1.22	1.62	2.10	2.17	0.93	1.18	0.67	1.15	1.38	1.81	2.85	2.70
90	1.71	2.03	1.18	1.32	1.15	1.42	1.97	2.12	0.99	1.21	0.67	1.42	1.30	1.58	2.71	2.67