

Prüfbericht - Nr.: Q00322875-1
Test Report No.:

Auftraggeber: DONGGUAN GLOBAL ECO THCH CO.,LTD
Client: Room 203 and 204, 2nd floor, Building B, Changping Science Park,
Banshicun New South Road, Changping Town, Dongguan City

Gegenstand der Prüfung: CCBM
Test Item:

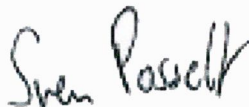
Bezeichnung: N/A
Identification:

Anlieferungszustand: Good
Delivery condition: **Eingangsdatum:** 2017-06-03
Date of Receipt:

Prüfört: Tested at TÜV Rheinland Shanghai
Testing location:

Prüfgrundlage: Testing according to customers specification for the following parameter:
Test specification: Test on aerobic disintegration (ISO 16929) in accordance with specifications shown in DIN EN 13432
IR spectrometry (DIN EN 13432)

Prüfergebnis: The sample fulfills the requirements.
Test result:



2017-09-26	Sven Posselt	Technical Manager
Datum	Name/Stellung	Unterschrift
<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>

Sonstiges / Other Aspects:

Test period:
2017-06-10 to 2017-09-02

Abkürzungen:	<i>ok / P = entspricht Prüfgrundlage</i>	Abbreviations:	<i>ok / P = passed</i>
	<i>fail / F = entspricht nicht Prüfgrundlage</i>		<i>fail / F = failed</i>
	<i>n.a. / N = nicht anwendbar</i>		<i>n.a. / N = not applicable</i>

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.

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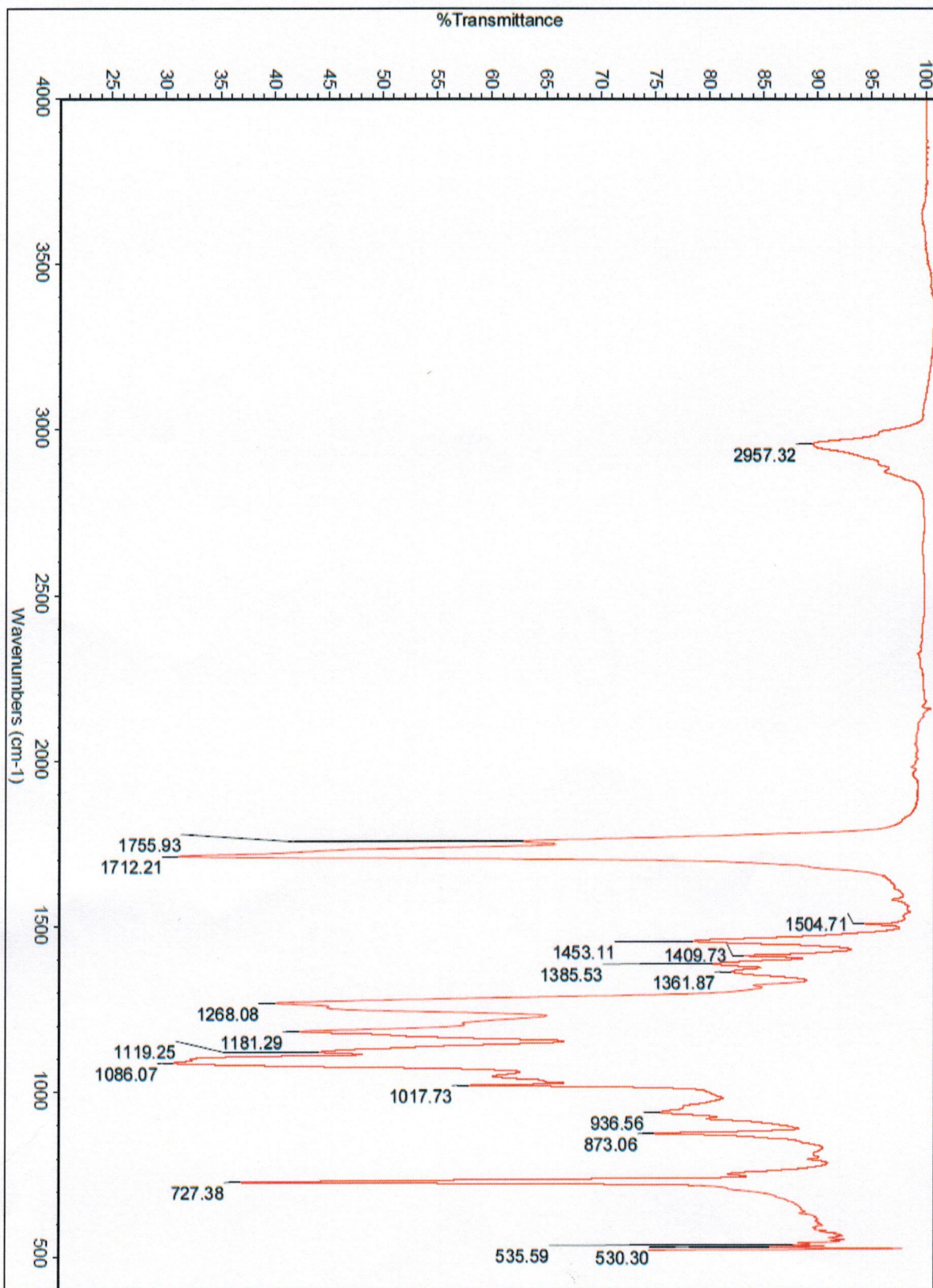
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Picture and detailed description of the test sample



The form of sample used for tests is film.
Thickness of film: 0.07mm.

1.

Picture of IR spectrometry



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2. Disintegration

2.1 General test information

Ovens: The ovens used for this test contain of a heating system and an flow-rate adjustable air providing system. The temperature of the compost can be determined at any time

O₂-determination: An instrument (CY-C12) is used for determining the concentration of oxygen in the exhaust gas directly

2.2 Compost

2.2.1 Composition of compost

The bio-waste contains of a mixture of 20kg soil (peilei), 5kg onions, 5kg carrots, 5kg pepper, 1kg sawdust, 12.5kg rice and 12.5kg soybeans.

Mass for rice and soybeans is wet mass after soaking the rice and the soybeans in water for 12 hours.

2.2.2 Results of the analysis of compost in beginning of test

Parameter	Reference value	Result	Pass / Fail
Water content	>50%	53%	Pass
Volatile solids of total dry mass	>50%	88%	Pass
C-N-ratio	20-30	21	Pass
pH-Value	>5	7.4	Pass

The requirements on the bio waste have been fulfilled.

2.3 Set up of the testing

The whole mixture is composted in the oven. No nets are used during this test.

Wet mass of the compost: 61 kg

Amount of test material added: 0.6 kg small pieces (10*10cm) and 5.4 kg as powder

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2.4 Flow chart of experiment

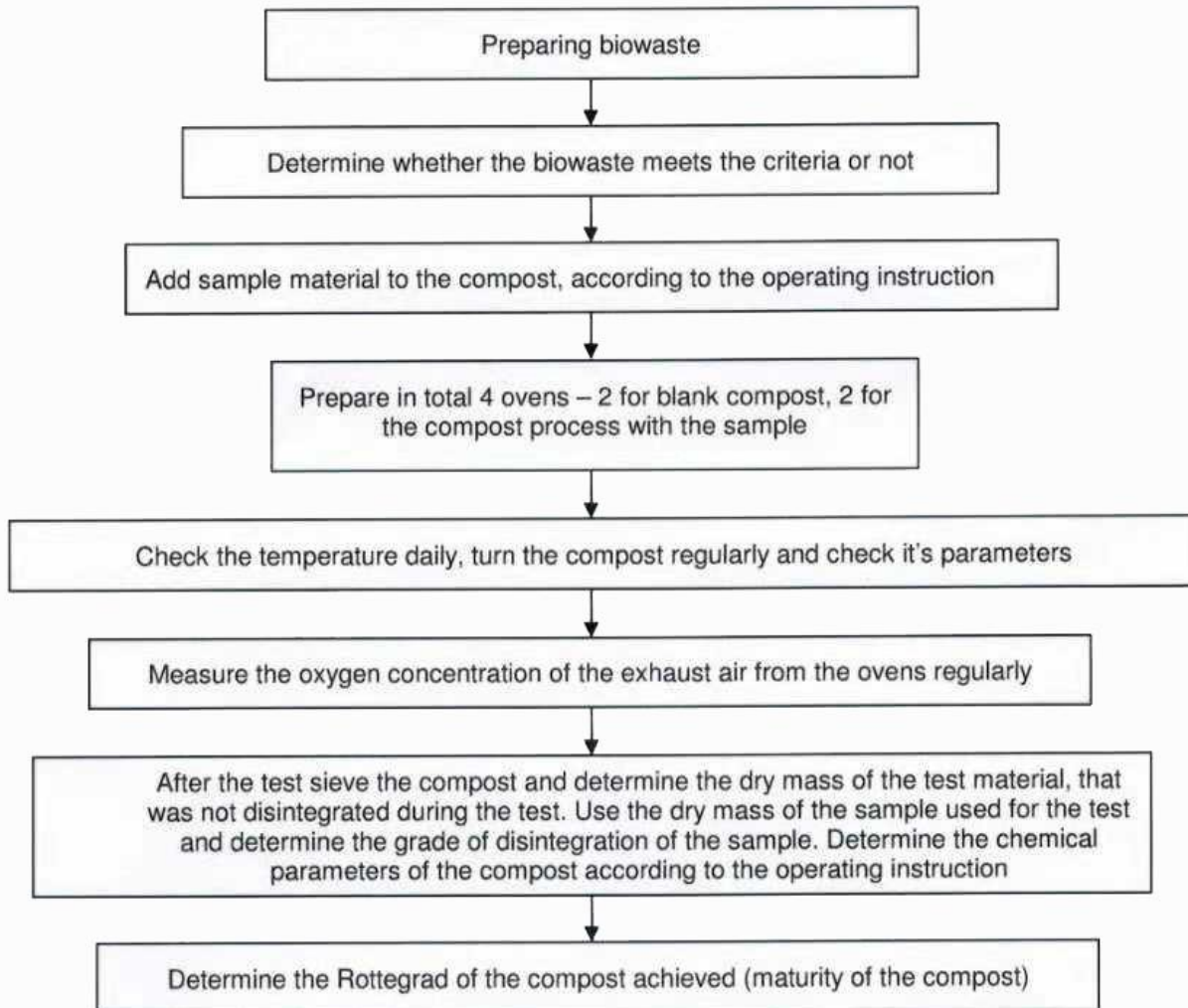


Fig 2 : Flow chart of experiment

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2.5 RESULTS

2.5.1 Amount of test material after the process of disintegration

Sample 1

Parameter	Unit	Result
Total dry mass of the sample used for the test	kg	0.6
Total dry mass of sample (>2mm-fraction) after the test:	kg	0
Degree of disintegration	%	100

Sample 2

Parameter	Unit	Result
Total dry mass of the sample used for the test	kg	0.6
Total dry mass of sample (>2mm-fraction) after the test:	kg	0
Degree of disintegration	%	100

The amount of sample found after sieving the final compost through a 2mm sieve, washing and drying the material, is less than 10% of the sample amount placed in the bio-waste at the beginning of the test. The physical breakdown during the composting process was successful.

2.5.2 Test results of the compost after disintegration

Determination of the wet mass of the compost achieved after the process of disintegration

Wet mass of the compost (blank 1)	kg	28
Wet mass of the compost (blank 2)	kg	29
Wet mass of the compost (sample 1)	kg	32
Wet mass of the compost (sample 2)	kg	33

Determination of chemical parameters of the compost achieved after the process of disintegration

Parameter	Unit	Blank 1	Blank 2	Sample 1	Sample 2
Total dry solids	%	48	43	50	51
Volatile solids	%	42	47	44	46
pH		7.9	8.1	8.2	8.5
ammonium nitrogen	mg/kg	33	90	65	<20
nitrite	mg/kg	0.51	0.51	0.51	0.24
nitrate nitrogen	mg/kg	106	70.2	118	57.3
total nitrogen	mg/kg	21400	21700	23100	20600
Volumetric density	Kg/L	0.94	0.91	0.89	0.90

There is no obvious deviation on the tested parameters between the composts obtained after the test on disintegration.

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Determination of the Rottegrad of the compost achieved after the process of disintegration

The Rottegrad is a parameter for determining the maturity of the compost obtained after the test on disintegration. After 84 days the final compost is placed in Dewar vessels for 72 hours. The highest temperature during these 72 hours is used for comparing with the limits for the different Rottegrads (see table below).

As mature compost does not undergo a significant self-heating process anymore, the temperature shall be below 30 °C.

Parameter	Amount of compost [kg]	Temperature after 72 h	Rottegrad
Blank 1	0.86	26.7	V
Blank 2	0.79	26	V
Sample 1	0.75	26.4	V
Sample 2	0.81	28.9	V

Reference

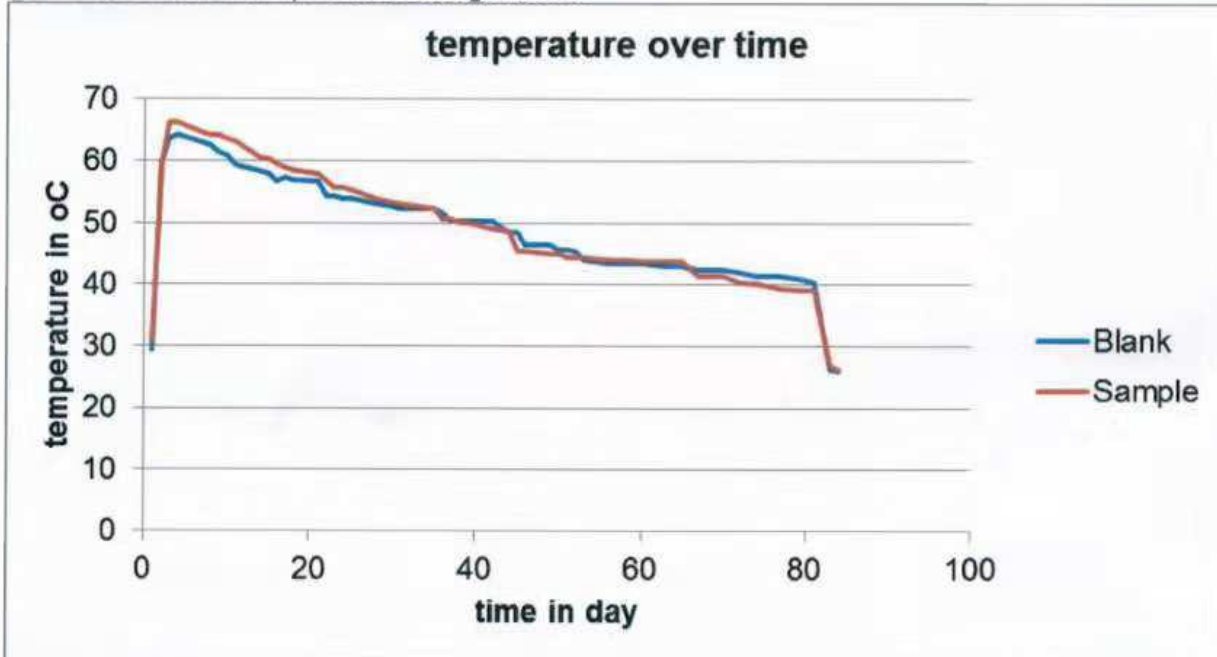
Maximum Temperature	> 60 °C	50.1 °C to 60 °C	40.1 °C to 50 °C	30.1 °C to 40 °C	30 °C
Rottegrad	I	II	III	IV	V

Validity parameter: The compost shall have a Rottegrad of 4 or 5. This validity parameter has been fulfilled.

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2.6 Diagrams

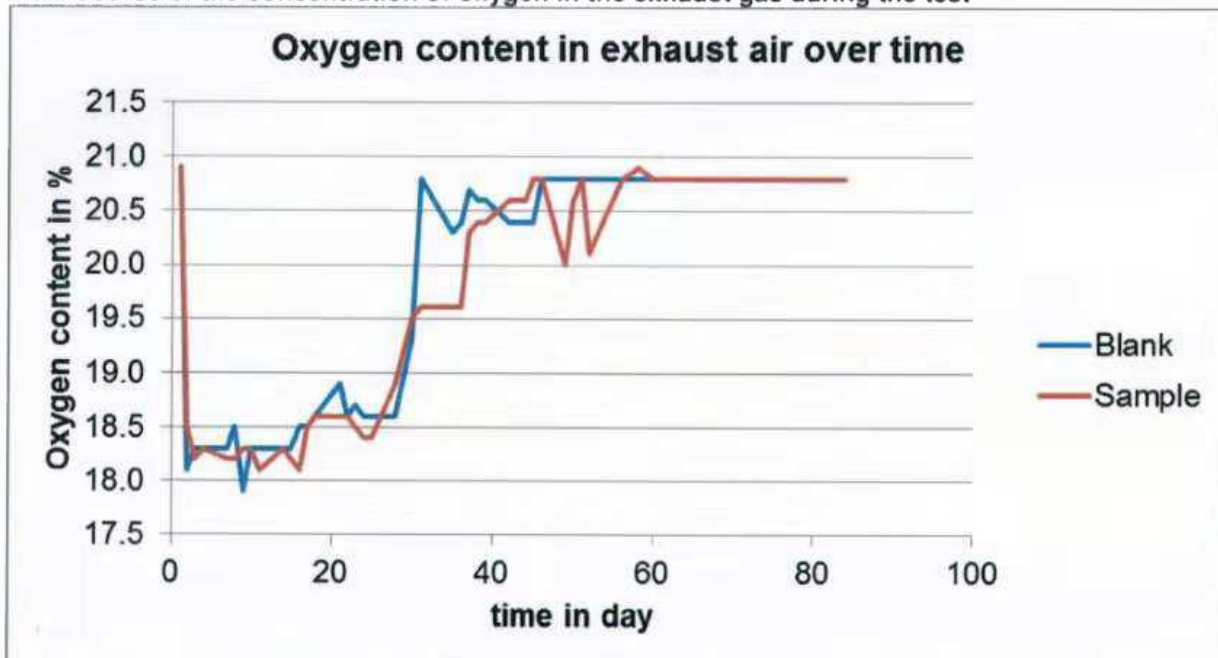
2.6.1 Course of the temperature during the test



Temperature over time

Validity parameter: The temperature in the ovens is higher than 60°C, but below 75°C for the first week and higher than 40°C but below 65°C for 4 consecutive weeks. This requirement has been fulfilled. For single values please see on page 11.

2.6.2 Course of the concentration of oxygen in the exhaust gas during the test

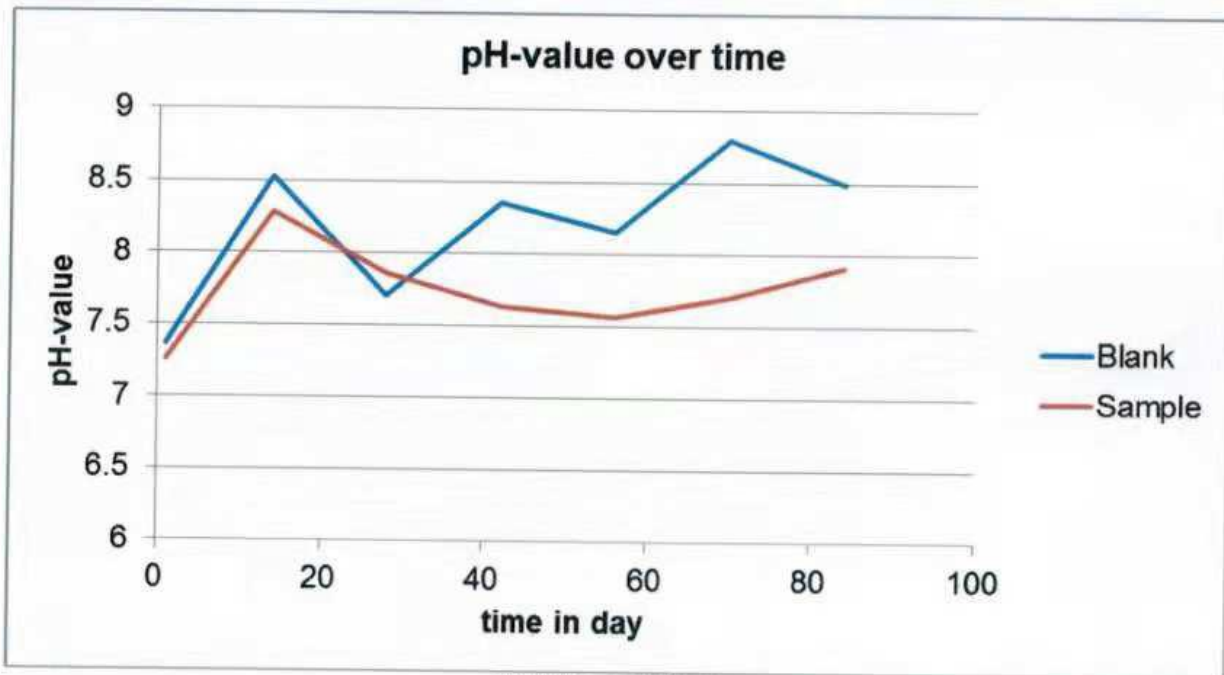


Concentration of oxygen over time

Validity parameter: For ensuring aerobic conditions, the concentration of oxygen in the exhaust gas never falls below 10%. This requirement has been fulfilled. For single values please see page 13

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2.6.3 Graph of development of pH value of the compost during composting process



pH Value over time

Validity parameter: The pH-value never falls below pH=5 and raises to a value above pH=7 during the test. This requirement has been fulfilled.

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Table 1 Temperature of the compost during the test

Day of test	Blank 1	Blank 2	Sample 1	Sample 2
1	29	29	28	31
2	60	65	61	60
3	64	66	65	66
4	64	66	66	66
7	63	65	65	65
8	63	64	64	64
9	61	64	64	64
10	61	63	64	64
11	59	63	63	63
14	58	61	62	61
15	58	60	62	60
16	57	60	58	60
17	57	59	57	59
18	57	59	57	59
21	57	58	55	58
22	54	58	55	57
23	54	57	53	56
24	54	56	53	56
25	54	55	53	55
28	53	54	53	54
30	53	54	52	53
31	52	54	52	53
35	52	54	52	52
36	52	53	52	51
37	50	52	52	51
38	50	52	51	50
39	50	51	50	50
42	50	51	49	49
44	48	49	49	49
45	48	49	48	45
46	46	46	47	45
49	46	46	45	45
50	46	46	44	45
51	46	45	44	44
52	45	45	44	44
53	44	44	43	44
56	43	42	42	44
58	43	42	42	44
60	43	42	42	44
63	43	42	41	44
65	43	42	41	44
67	42	41	41	41
70	42	41	41	41
72	42	40	41	40
74	41	40	41	40
77	41	39	41	39
79	41	39	40	39
81	40	39	39	39
83	26	25	27	27
84	26	25	26	26

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4 days before the test was finished the heating function of the ovens was switched off. This caused the decreasing temperature after 80 days. The reason for switching off the heating function is, that the final compost will be used for determining the Rottegrad. Here the self-heating process of the final compost is determined, so we need to allow the compost to cool down to its natural temperature.

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Table 2 Concentration of O₂ in the exhaust gas

Day of test	Blank 1	Blank 2	Sample 1	Sample 2
1	20.9	20.9	20.5	20.9
2	18.1	18.5	18.0	18.1
3	18.3	18.2	18.3	18.5
4	18.3	18.3	18.0	18.3
7	18.3	18.2	17.8	18.2
8	18.5	18.2	18.1	18.3
9	17.9	18.3	18.3	18.5
10	18.3	18.3	18.3	18.5
11	18.3	18.1	18.5	18.6
14	18.3	18.3	18.5	18.6
15	18.3	18.2	18.6	18.7
16	18.5	18.1	18.6	18.5
17	18.5	18.5	18.7	18.6
18	18.6	18.6	18.5	18.6
21	18.9	18.6	18.5	18.7
22	18.6	18.6	18.3	18.9
23	18.7	18.5	18.3	18.2
24	18.6	18.4	18.2	18.3
25	18.6	18.4	18.6	18.6
28	18.6	18.9	19.1	19.0
30	19.3	19.5	19.3	19.3
31	20.8	19.6	20.3	19.9
35	20.3	19.6	20.3	20.3
36	20.4	19.6	20.4	20.3
37	20.7	20.3	20.6	20.4
38	20.6	20.4	20.4	20.6
39	20.6	20.4	20.6	20.3
42	20.4	20.6	20.3	20.6
44	20.4	20.6	20.3	20.8
45	20.4	20.8	20.4	20.8
46	20.8	20.8	20.4	20.6
49	20.8	20.0	20.6	20.6
50	20.8	20.6	20.6	20.6
51	20.8	20.8	20.6	20.6
52	20.8	20.1	20.6	20.6
53	20.8	20.3	20.6	20.6
56	20.8	20.8	20.6	20.8
58	20.8	20.9	20.8	20.8
60	20.8	20.8	20.8	20.8
63	20.8	20.8	20.8	20.8
65	20.8	20.8	20.8	20.8
67	20.8	20.8	20.8	20.8
70	20.8	20.8	20.8	20.8
72	20.8	20.8	20.8	20.8
74	20.8	20.8	20.8	20.8
77	20.8	20.8	20.8	20.8
79	20.8	20.8	20.8	20.8
81	20.8	20.8	20.8	20.8
83	20.8	20.8	20.8	20.8
84	20.8	20.8	20.8	20.8

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3.7 Additional information (*observations, reasons for rejection of test results and others*)

n/a