MERIEUX NutriSciences

CHELAB S.R.L.

TEST REPORT N. 18/000223584

date of issue 31/05/2018

Customer ID 0078747

Messrs
BARTOLI SPA
VIA T. PAREZZANA, 12, 14, 16 - FRAZ. CARRAIA
55012 CAPANNORI (LU)
IT

Sample information

Acceptance number	17.603558.0002
Delivered by	GLS General Logistics Systems on 15/09/2017
Receiving Date	15/09/2017
Place of origin	BARTOLI SPA VIA T. PAREZZANA, 12, 14, 16 - FRAZ. CARRAIA 55012 CAPANNORI (LU) IT
Sample Description	PIATTO PIANO BIANCO NATURANDA 23cm - CODICE ARTICOLO: N2350 - LOTTO: A2719300

Sampling information

Sampled by	Customer

CHELAB S.r.l. Socio Unico, Company subject to the direction and coordination of Mérieux NutriSciences Corporation
Head office: Via Fratta 25 31023 Resana, Italy Phone. + 39 0423.7177 / Fax + 39 0423.715058 www.merieuxnutrisciences.it
VAT nr. 01500900269, R.E.A Treviso n. 156079 Fully paid up € 103.480,00.

CHELAB S.R.L.

follow test report n. 18/000223584

ANALYTICAL RESULTS

	Value/Uncertain	Unit of measure	LoQ	LoD	Start/end date of analysis	Op. units	Row
ON SAMPLE AS IT IS							1
THICKNESS FOR PIECE Met.: MP 1433 rev 2 2013	572±11	µm			17/01/2018--19/05/2018	02	2
TOTAL ORGANIC CARBON (TOC) Met.: UNI EN 13137:2002	460 000±110 000	mg/kg (as C)	1 000		17/01/2018--31/05/2018	02	3
DISINTEGRATION Met.: ISO 16929:2013					17/01/2018--11/05/2018	02	4
Disintegration	view attached report						5
Duration of the test	84	days					6
Fraction disintegrated	>98,0	% weight/weight (w/w) dry matter	2,0				7
Fraction not disintegrated	< LoQ	% weight/weight (w/w) dry matter	2,0				8
ORGANIC MATTER Met.: UNI EN 13432:2002					17/01/2018--08/02/2018	02	9
Solid residue	95,30±0,78	g/100 g	0,10				10
Ashes at 550 °C	0,51±0,18	g/100 g	0,10				11
Volatile solids	94,79±0,80	g/100 g	0,10				12
ON ASHES							13
TOTAL ORGANIC CARBON (TOC) Met.: UNI EN 13137:2002	12 300±2 900	mg/kg (as C)	1 000		23/10/2017--31/05/2018	02	14

Operative units

Unit 02 : Via Castellana Resana (TV)

Chemical responsible	Chemical responsible	Laboratory manager
Dott. Federico Perin Chimico Ordine dei chimici - Provincia di treviso Iscrizione n. A338	Dott. Enrico Nieddu Chimico Ordine dei chimici - Provincia di treviso Iscrizione n. A339	Dott. Sébastien Moulard
Num. certificato 18131919 emesso dall'ente certificatore ArubaPEC S.p.A. NG CA 3, ArubaPEC S.p.A., IT	Num. certificato 18131992 emesso dall'ente certificatore ArubaPEC S.p.A. NG CA 3, ArubaPEC S.p.A., IT	Num. certificato 18132017 emesso dall'ente certificatore ArubaPEC S.p.A. NG CA 3, ArubaPEC S.p.A., IT

- If not otherwise specified, the uncertainty is extended and has been calculated with a coverage factor k=2 corresponding to a probability interval of about 95%. - LoD is the detection limit and identifies a confidence interval of zero with a probabilty interval of about 99%. - LoQ is the limit of quantification."n.d" is not detected and indicates a value inferior to the LoD. "traces (X)" means a value between LoD and LoQ, this value is indicative. "<x" or ">x" indicate inferior or superior to the measurement field of the test. - If not differently specified, the sums are calculated by lower bound criteria (L.B.). - Registration with the number 7 of the Regional List of the laboratories of the Regione Veneto which perform analyses as regards the procedures for the food safety in food industries, as reported in Annex A of DDR n°73 of 16th January 2008

Chelab code – Acceptance number: **17.603558.0002**

Test material description:

Product Name :	PIATTO PIANO BIANCO NATURANDA 23cm - CODICE ARTICOLO: N2350 - LOTTO: A2719300
Product family :	Paper Dish
Manufacturing :	----
Type :	----
Characteristics :	White
Grammage:	385±10 g/m^2
Shape :	Dish
Composition :	----
Picture :	

Customer

Name:	BARTOLI SPA
Address:	VIA T. PAREZZANA, 12, 14, 16 - FRAZ. CARRAIA
Postcode – City:	55012 CAPANNORI (LU)
Nation :	ITALY
Referent name :	----

Date test

Sample supplying :	12/12/2017
Starting analysis :	25/01/2018
Finishing analysis:	03/05/2018

INDEX

1. TEST RESULT RISULTATI DEL TEST

	w/w % (dry weight) Disintegration of test material (< 2 mm)	**Test Duration *weeks***	**Observations**
Test material	> 98,0	12	---
EN 13432 pass level	> 90,0	12	---

Validity criteria	
a) The temperature during composting is below 75°C for the first week and below 65 °C after	Passed
b) For all control bins or nets in bins with biowaste only	
1) The temperature is above 60°C for at least 1 week	Passed
2) The temperature is above 40°C for at least 4 consecutive weeks	Passed
3) The pH should increase to above 7.0 at the end of the test	Passed

DISINTEGRATION

$$\%\text{Disintegration} = \frac{m_1 - m_2}{m_1} \times 100$$

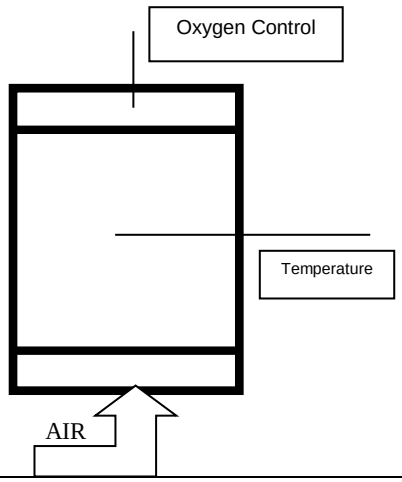
m1:dry weight of test substance input (g);

m2:dry weight of retrievable test substance > 2 mm (g);

Weeks 12 Net	**dry weight of Test material (g) > 2 mm**	**w/w %(dry weight) Disintegration**
A	< 6,0	> 98,0
B	< 6,0	> 98,0

2. PRINCIPLE

The disintegration test under defined composting conditions on a pilot-scale level is a standardized composting process. The test material (reduced in size 10 cm × 10 cm to for films and 5 cm× 5 cm for other products) is mixed in a precise concentration with fresh biowaste and introduced in a defined composting environment after which the biological composting process spontaneously starts. A natural ubiquitous microbial population will start the composting process and temperature increase will happen spontaneously. The composting mass is regularly turned over and mixed. The temperature, pH, moisture content and gas composition within the composting material are regularly monitored and have to fulfill certain requirements in order to ensure sufficient and appropriate microbial activity. The composting process is continued till fully stabilized compost is obtained (after 12weeks). At the end of the composting process, the compost / test material mixture is sieved over 2 and 10 mm. If possible a mass balance is calculated on the basis of wet and dry weight. The compost obtained at the end of the composting process can be used for further measurements such as chemical analyses and ecotoxicity tests.



3. BIOWASTE CHARACTERIZATION

Source	**Screened 50 mm**	**Structural Material added**	**pH** mixture 1: 5 inoculum :water	**C/N**	**Moisture content (% w/w)** (EN 13432) 105 °C	**Volatile solids (%w/w) d.s.** (EN 13432)
	Yes	Wood Chips	7,80	24,2	55,3	74,4
ISO 16929 Parameters	-	-	>5	20÷30	>50%	>50% d.s.

4. TEST MATERIAL MATERIALE TEST

Sample Test material	**Thickness [µm]**	**Grammage [g/m²]**	**Shape**	**Color**	**Total dry solids content (% w/w)** (EN 13432)	**Moisture content (% w/w)** (EN 13432)
Test Material	572±11	385±10	Dish	White	95,3	4,7

5. PREPARATION OF THE MIXTURE IN THE PILOT SCALE BIN

PREPARAZIONE DELLA MISCELA NEL REATTORE IN SCALA PILOTA

Pilot Scale Composting Unit	**Wet weight biowaste in Bin (Kg)**	**Weight Test material (g) (net)**	**Weight Test material (g) Ecotox (net)**
Biowaste control A	30	-----	------
Biowaste control B	30	-----	------
Test Material A	30	*302*	------
Test Material B	30	*302*	------

6. DESCRIPTION OF THE SET UP FOR COMPOSTING

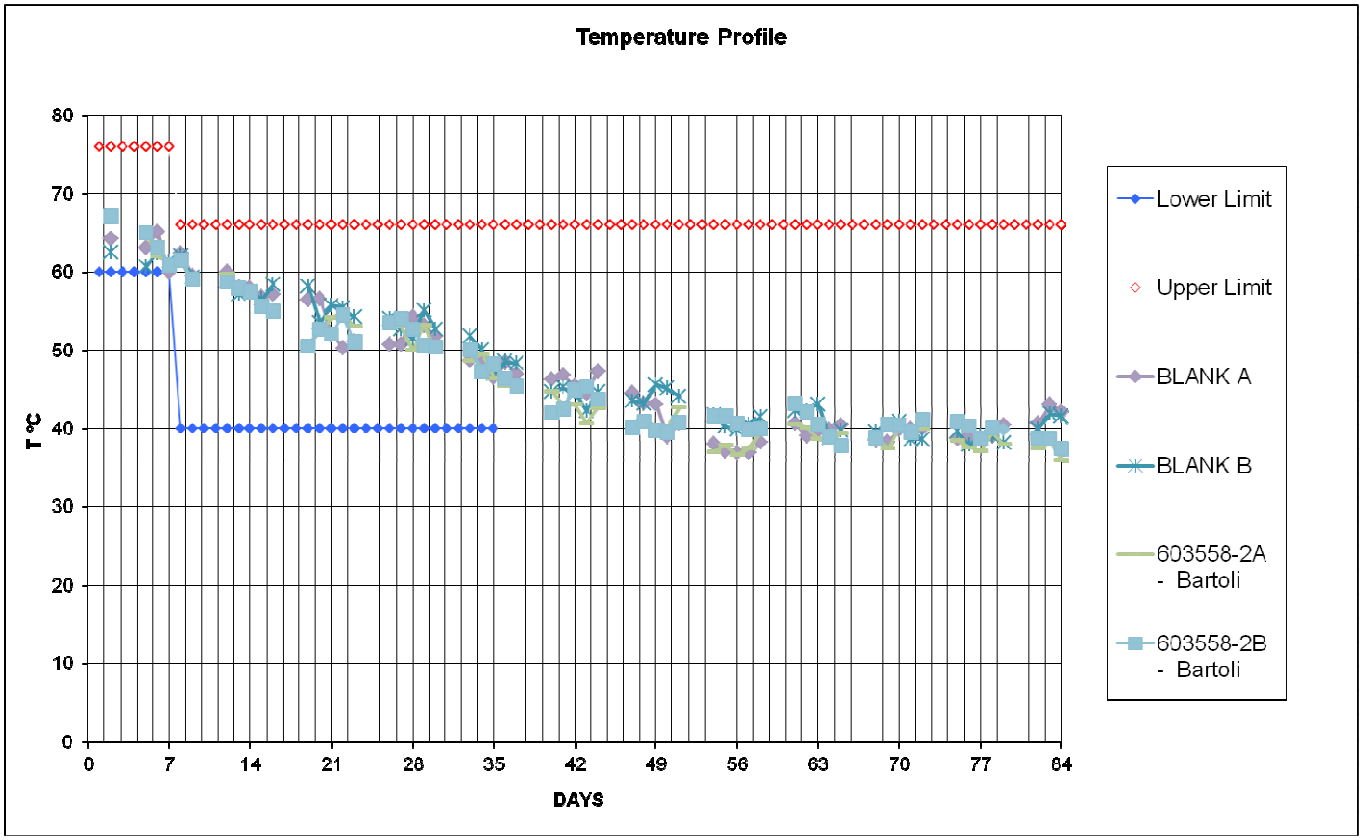
Characteristics of equipment:	Control device of:	Volume of the bin system	
• Bin Insulated • Room Insulated • Aeration Bin System • Regulation of Inlet Air Humidity • Regulation of Inlet Air Flow • Regulation of Inlet Air Temperature	• Temperature into the compost °C • Oxygen concentration in exhaust air • % Relative Humidity in exhaust air (for inlet air regulation)	Total	Available for the compost
		120 L	60 L

*Types of bins and useful volume

Bins total volume L	**Useful volume L**
50	40
100	60
120	75
280	200

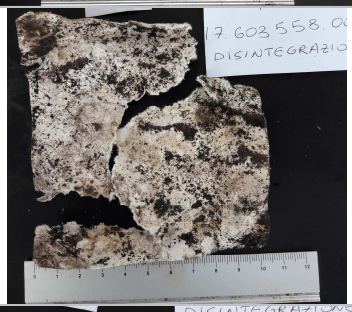
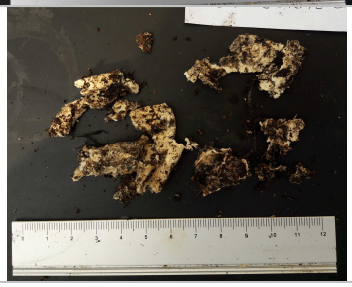
7. CONTROLS

Controls and Operations	**Repeat**
Temperature °C	Once per day
Oxygen Concentration In exhaust air (%)	Every day during the 30 days and once a week afterwards
Visual observation (optional - picture)	After every Turning
pH	After every Turning
Moisture (% w/w)	After every Turning (< 40% w/w)
Turning of biowaste mixture	Weekly for the first 4 weeks and every 2nd week until the end of the test



8. PARAMETERS AND VISUAL OBSERVATION

PARAMETRI E OSSERVAZIONI VISIVE

Week Settimana	**pH**	**Moisture % (w/w)** Umidità % p/p	**Observation Color Erosion Consistency** Osservazioni e Variazione colore	**Picture** Foto
1	8,5	58,3	The disintegration process is started.	
2	8,5	56,7	All the specimens are broken	
3	8,4	56,9	Different pieces are distinguishable.	
4	8,2	55,3	The specimens are decreasing in size.	
6	7,5	57.1	No pieces are distinguishable from the compost.	----

8	7,6	57,7	No pieces are distinguishable from the compost.	-----
10	7,6	56,6	No pieces are distinguishable from the compost.	-----
12	7,5 (validity criteria)	55,4	No pieces are distinguishable from the compost even after the sieving procedures.	-----

9. BIBLIOGRAPHY BIBLIOGRAFIA

ISO 16929:2013 Plastics — Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot scale test.

EN 13432:2000 Packaging - Requirements for packaging recoverable through composting and biodegradation Test scheme and evaluation criteria for the final acceptance of packaging.

ASTM D6400:2012 Standard specification for labeling of plastic designed to be aerobically composted in municipal or industrial facilities.

ASTM D6868:2017 Standard specification for labeling of end items that incorporate plastics and polymers ad coatings or additives with paper and other substances designed to be aerobically composted in municipal or industrial facilities.