LAB N° 0763 L

Test report n°: **21RP04680** dated **18/10/2021**

Dear
MatX Smart Materials
Rigtersbleek-Zandvoort 10-45
7521BE ENSCHEDE
Netherlands

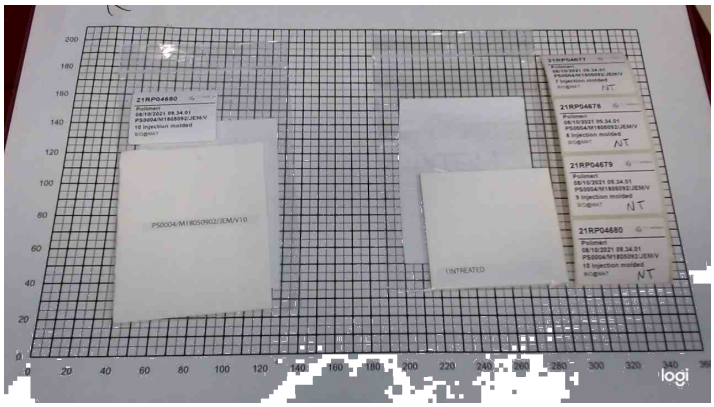
Acceptance Data

Subject of the test: **Polymers**

Transport: **Customer**

Date of arrival: **08/10/2021** Time of arrival: **09.34**

Acceptance date: **08/10/2021**



Sample data (C)

Description: **PS0004/M1805092/JEM/V10 3D PLA Printed**

Sampling data

Sampling by: **Customer**

Place: **Customer location**

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Parameter - Specification *Method - Notes*	M.U.	Results Notes	LoQ	LoD	Test start Test end
Determination of antibacterial activity (R) - R=(Ut-Uo)-(At-Uo) ISO 22196:2011		**> 6.2**	0,3		11/10/21 14/10/21
Determination of antibacterial activity (R) ISO 22196:2011	%	**> 99.999**	50		
Size of test specimens (H x L)	mm	**30x30**			
Thickness of test specimens	mm	**2,0**			
Type of polymer used for the cover film		**Polypropylene**			
Size of the cover film (H x L)	mm	**20x20**			
Thickness of the cover film	mm	**0,10**			
Strain		**Escherichia coli ATCC 8739**			
Method of conditioning		**UV-C radiation (30 min per side)**			
Reference used		**Untreated sample**			
Volume of test inoculum	ml	**0,2**			
Number of viable bacteria in the test inoculum	n°	**50000**			
Time of contact	Hours	**24**			
Uo - N° of viable bacteria recovered from the untreated test specimens after inoculation	log	**4,0**			
Ut - N° of viable bacteria recovered from the untreated test specimens after 24 h	log	**6,2**			
At - N° of viable bacteria recovered from the treated test specimens 24 hours post inoculation	log	**NQ**			

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Parameter - Specification *Method - Notes*	M.U.	Results Notes	LoQ	LoD	Test start Test end
Determination of antibacterial activity (R) - R=(Ut-Uo)-(At-Uo) ISO 22196:2011		**> 5.7**	0,3		14/10/21 17/10/21
Determination of antibacterial activity (R) ISO 22196:2011	%	**> 99.999**	50		
Size of test specimens (H x L)	mm	**30x30**			
Thickness of test specimens	mm	**2,0**			
Type of polymer used for the cover film		**Polypropylene**			
Size of the cover film (H x L)	mm	**20x20**			
Thickness of the cover film	mm	**0,10**			
Strain		**Staphylococcus aureus - ATCC 6538**			
Method of conditioning		**UV-C radiation (30 min per side)**			
Reference used		**Untreated sample**			
Volume of test inoculum	ml	**0,2**			
Number of viable bacteria in the test inoculum	n°	**80000**			
Time of contact	Hours	**24**			
Uo - N° of viable bacteria recovered from the untreated test specimens after inoculation	log	**4,2**			
Ut - N° of viable bacteria recovered from the untreated test specimens after 24 h	log	**5,7**			
At - N° of viable bacteria recovered from the treated test specimens 24 hours post inoculation	log	**NQ**			

If the sampling is not the responsibility of Chimicambiente S.r.l., the latter declines all responsibility for the information relating to sampling as provided by the Customer; the results of the tests refer exclusively to the sample as received. When these data include measurements that impact on the unit of measurement, the results expressed are obtained by processing them. The acceptance data are the responsibility of the Laboratory while the data relating to the sample are marked with a "C" if it is the responsibility of the Customer.
If the sample is unsuitable but the Customer chooses to continue anyway, the laboratory declines all responsibility for the results that could be influenced by the deviation.

LEGEND: **U.M.** = unit of measurement; **(sup)** = upper limit; **(inf)** = Lower Limit; **LoQ** = limit of quantification, is the lower concentration limit above which it is possible to obtain a quantitative measurement instrumentally; in microbiology the LoQ is theoretical in nature; **LoD** = limit of detection, it is the lower concentration limit below which the sample cannot be detected; in qualitative analyzes it represents the minimum concentration at which it is possible to determine or not the presence of an analyte; **NQ** = not quantifiable, indicates a value lower than LoQ; **NR** = not detectable, indicates a value lower than LoD; "**< x**" or "**> x**" respectively indicate a value lower or higher than the measurement range of the test, where x is the result; **N.A.** = not applicable to the test; **M.I.** = internal method.
(m): Indicates a change from the previous version of the test report.
(e): Indicates that the test/activity was performed under subcontract.

The analytical results refer exclusively to the sample under test.
Partial reproduction of this test report is not permitted without the written authorization of the laboratory.
The samples are kept in the laboratory for 2 weeks from the end of the test, unless otherwise indicated.
The records of the tests carried out are kept by the laboratory for 5 years from the issue of the test report.

IF NOT DIFFERENTLY SPECIFIED: the results of this test report are not correct for the recovery factors (R) as the recovery values fall within the tolerance indicated in the test method; the summations are calculated using the lower bound criterion (L.B.); the values (if present on the test report) reported in the "uncertainty" column refer to the expanded uncertainty with coverage factor K approximated to 2, probability level = 95%; the sampling report is identified and filed with the same sample acceptance code or with the relative order number.

(*): Test/activity not accredited by ACCREDIA

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The uncertainty is expressed in units of measurement of the parameter to which they relate. The coverage factor is equal to k=2 with a probability range of 95%.

Technical Director

Dr. Giovanni Mitaritonna
Chemist
Ordine Interprov. Chimici del Veneto - Padova n° 910 SEZ. A

---------- End of Test Report ----------