



ANALYSIS REPORT N° CHL-R15-0190

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Test starting date: 12/03/2015

Test ending date: 10/04/2015

1 Tests requested:

- Determination of materials resistance to fungi according to NF EN ISO 846 "Plastics-Evaluation of the action of microorganisms" part B, by visual determination. Material is examined to determine whether it remains inert or if it is a nutritive substance for microorganisms' growth.
- Determination of the mass variation (Method B)

2 Sample descriptions:

Laboratory reference	Sample description
15-CHL-0190	Rouleau PVC – FATRAFOL 818V-UV

3 Experimental conditions ISO 846 part B :

Part B:

Fungi strains names = *Aspergillus niger* DSM 1957
Chaetomium globosum DSM 1962
Paecilomyces variotii DSM 1961
Penicillium funiculosum DSM 1944
Gliocladium virens DSM 1963

Inoculum volume= 0.1 ml at 10^6 CFU/ml to obtain a final concentration at 10^5 CFU/ml

Used media= Salt Mineral Agar with glucose

Volume= 200 ml

Disinfection: none

After 28 days: visual examination for growth and rating according to table 1.

A negative control **NC** is run with sample in presence of ethanol

A sample control **SC** is run with sample alone in media.

The viability of each strain used is controlled by seeding one drop of inoculum at the surface of two media.

Incubate during 3 to 4 days. The culture is viable if the growth is abundant.

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4 Results:

15-CHL-0190	Fungi (method B) Day 28
Test 1	5
Test 2	5
Test 3	5
Test 4	5
Test 5	5
Test 6	5
Mean	5
Negative Control 1	0
Negative Control 2	0
Negative Control 3	0
Negative Control 4	0
Negative Control 5	0
Negative Control 6	0
Mean	0
Sample Control 1	3*
Sample Control 2	0
Sample Control 3	0
Sample Control 4	3*
Sample Control 5	0
Sample Control 6	3*
Mean	2
Control viability	viable

*: The samples are passed from light gray to purple

5 Table 1: Evaluation of microbiological growth:

Rating	Observed growth
0	No growth.
1	Invisible growth at eye observation but visible in microscopic observation.
2	Visible growth at eye observation covering 25% of the sample surface.
3	Visible growth at eye observation covering 50% of the sample surface.
4	Visible growth at eye observation covering more than 50% of the sample surface.
5	High growth covering all the surface sample.

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6 Interpretation:

Table 2: Method B

Rating	Interpretation for material
0	High fungistatic activity of the material.
0 + inhibition zone around the sample.	High fungistatic activity, spreading around the material.
1	Material is not completely fungistatic.
2-5	Decrease fungistatic activity until total absence of fungistatic activity.

Fungistatic = Having an inhibiting effect upon the growth and reproduction of fungi without destroying them.

7 Determination of the weight loss

15-CHL-0190 Rouleau PVC - Fatrafol 818V-UV	m : mass before analysis	m' : mass after analysis	mass variation: $\Delta m = m' - m$	average mass variation	percentage mass variation
Negative control 1	3,8933 g	3,8975 g	- 0,0042 g	0,0036 g	-0.029%
Negative control 2	4,0443 g	4,0544 g	- 0,0101 g		
Negative control 3	4,0871 g	4,0920 g	0,0049 g		
Negative control 4	4,1047 g	4,1104 g	0,0057 g		
Negative control 5	3,9996 g	3,9841 g	-0,0155 g		
Negative control 6	4,1844 g	4,1965 g	0,0121 g		
Sample control 1	4,2518 g	4,2495 g	-0,0023 g	0,3365 g	
Sample control 2	3,9114 g	4,9202 g	1,0088 g		
Sample control 3	4,3184 g	4,3230 g	0,0046 g		
Sample control 4	4,1822 g	4,1760 g	-0,0062 g		
Sample control 5	3,8520 g	4,8563 g	1,0043 g		
Sample control 6	3,9362 g	3,9459 g	0,0097 g		
Testing 1	4,1783 g	4,1801 g	0,0018 g	0,0024 g	
Testing 2	4,1551 g	4,1597 g	0,0046 g		
Testing 3	4,2165 g	4,2152 g	-0,0013 g		
Testing 4	3,9582 g	3,9600 g	0,0018 g		
Testing 5	3,9994 g	4,0040 g	0,0046 g		
Testing 6	4,1761 g	4,1790 g	0,0029 g		

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To determine whether there was a difference in mass after the inoculation of fungi on sample 5-CHL-0190-01 a student t-test was conducted, where the independent variable was the samples negative control and testing and the dependent variable was the mass variation ($\Delta m = m' - m$). Difference was considered statistically significant at $p < 0.01$.

Results:

	Negative control	Testing
Mean	0,0036 g	0,0024 g
Variance (SD)	0,0000972	0,0000049
Observations	6	6
Hypothesized Mean Difference	0	
degrees of freedom	5	
p	0,78	
T critical 99%	4,032	

$p = 0,78$ is lower than T critical (4,032)

8 Conclusion:

According to reading and interpretation (table 2) of the NF EN ISO 846, sample 15-CHL-0190-01 shows no fungistatic activity.

The result of student t-test is $p = 0,78$. There was no significant difference in the Δm between negative control (Mean = 0,0036, SD < 0,001) and testing (Mean = 0,0024, SD < 0,001).

END OF REPORT

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