

Do coated surfaces pass the coffee test?

Don't worry!

Sara Moruzzi

The surface resistance to cold liquids is a test “daily” performed at CATAS. This test is carried out to assess the resistance of a surface to common substances verifying the possible occurrence of defects like stains, discolorations, swellings, cracking, or other alterations of the surfaces.

The technical procedure, the type of liquids and the test periods are described in the European Standard EN 12720. Coffee is one of the most important substances that is used because it is a widely-loved drink all over the world. However if it accidentally drips out from the cup, it may permanently stain the furniture surfaces, especially those painted. Therefore, the “coffee test” frequently represents a significant fear, as it may define the pass or fail of the entire test.

In order to understand what are the general performance of painted surfaces against coffee, all the tests performed at catas

in accordance with EN 12720 during year 2016, where coffee has been applied for 1 hour, have been analyzed.

2445 tests were performed according to this method, 560 of them (22,9 %) on painted surfaces.

The results obtained (see table 1, figure 1) show that the 92 % of the samples pass the test, achieving evaluation 5 - no change (84,1 %), or 4 - minor change, only visible under reflected light (7,9 %).

Only the 8 % of the samples fail the test, with evaluation 3 - moderate change, visible from several viewing directions - (5,3 %), 2 - significant change and/or slight change of structure (2,5 %), or 1 - strong change (0,2 %).

Assessment	%	
5 – No change	84,1	Pass: 92,0 %
4 – Minor change (only visible under reflected light)	7,9	
3 – Moderate change (visible from several viewing directions)	5,3	Fail: 8,0 %
2 – Significant change in colour or gloss and/or slight change of structure (swelling, fibre rising, cracking, blistering, ...)	2,5	
1 – Strong change	0,2	

Table 1 – Percentages for each level of the examined samples.

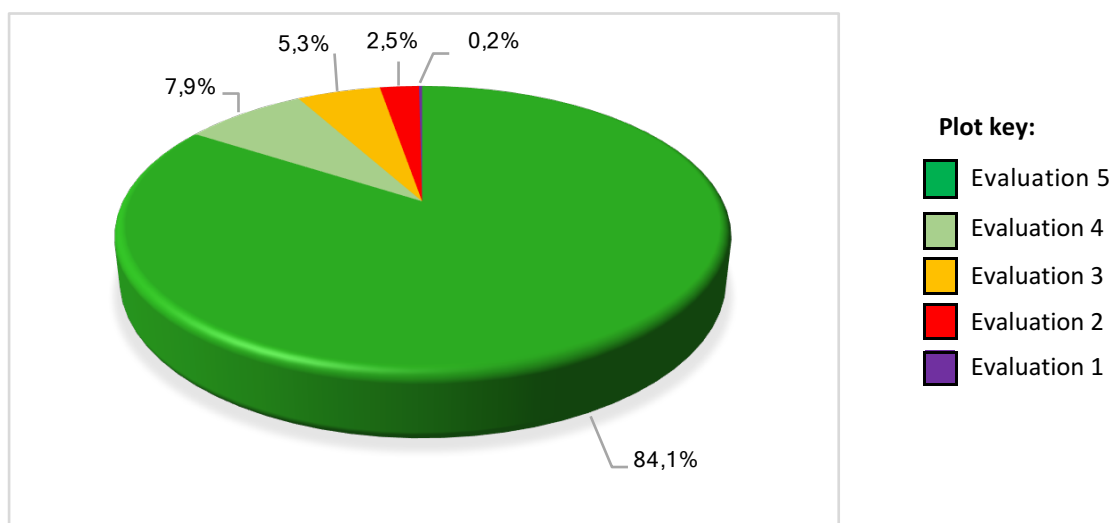


Figure 1 - Distribution of the results

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In particular, considering the colour of the samples (see table 2), white coated surfaces are, obviously, the most sensitive to staining.

However, dark coated surfaces may also show alterations, typically due to a discoloration maybe caused by the high water content of the coating material. This is especially the case of blue surfaces: the majority of the samples has obtained evaluation 4, showing a slight mark only visible under reflected light.

COLOUR	Percentages of samples with evaluation				
	5	4	3	2	1
Black	83,0	10,0	5,0	2,0	/
Black-brown	95,9	/	4,1	/	/
Brown	96,8	/	3,2	/	/
Grey	95,7	4,3	/	/	/
Red	94,4	5,6	/	/	/
White	72,3	13,6	8,7	4,9	0,5
Blue	16,7	66,6	16,7	/	/
Other colour*	71,4	19,1	9,5	/	/

Table 2 – Percentages of examined samples, distinguished by colour.

* Other colour: beige, green, pink, yellow.

Considering more specifically the white samples coated with a specified coating type (see table 3), the most critical samples were those painted with acrylic coatings and water based coating systems.

Moreover, we can see that the percentage of samples coated with traditional photo-curing coatings (UV) reaching score 5 - no change (67,9 %) is significantly lower than the percentage of samples coated with water based UV coatings (95,7 %). However, we would like to underline that this investigation is strictly related to the examined cases and therefore it should not be considered as an indication of the general performance of the different coating products.

COATING TYPE	Percentages of white coated samples with evaluation				
	5	4	3	2	1
Acrylic	22,2	11,1	44,5	22,2	/
Powder	100,0	/	/	/	/
Polyurethane	100,0	/	/	/	/
UV	67,9	20,8	7,5	3,8	/
Water based	47,1	11,8	17,6	23,5	/
Water based - UV	95,7	4,3	/	/	/

Table 3 – Percentages of white samples, distinguished by coating type.

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Finally, we have also considered the wood surfaces coated with clear coatings (see table 4). The results show that the resistance to coffee appears different among the different wood species; birch and beech seem to be the most sensitive substrates (12,9 and 12,5 % of fails, respectively). The resistance of oak substrates is higher (3,2 % of fails), while ash, pine and walnut pass the test in the 100% of the examined cases.

These results are obviously dependant as well by the wood species, also on the coating system (type, thickness, etc.) that was not declared in the majority of the cases.

SUBSTRATE	Percentages of samples with evaluation				
	5	4	3	2	1
Birch	80,6	6,5	9,7	3,2	/
Beech	87,5	/	/	12,5	/
Oak	96,8	/	/	3,2	/
Pine	100,0	/	/	/	/
Ash	100,0	/	/	/	/
Walnut	100,0	/	/	/	/

Table 4 - Percentages of natural substrates with transparent coating samples.

In conclusion, the most relevant data shown by this investigation is the high percentage of samples that, regardless of colours and coating types, pass the “coffee test”.

Therefore, we hope that this stimulating result may encourage both the producers and the users of different coating products to study and test new and increasingly more “coffee-resistant” formulations and coating cycles.

Contacts:

Sara Moruzzi
 tel. +39 0432 -747262
 e-mail moruzzi@catas.com