

TESTING REPORT 05-11

Subject: scratch tests according to pencil hardness

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1. Scope of test:

The scope of the present testing report is to supply details regarding the hardness of different coating products used with the sublimation process using the pencil hardness test (according to: UNI EN 13523-4:2001).

2. Date of execution of tests: 04/20/2011

3. Description of samples:

The samples tested are aluminum Qpanels pretreated and powder coated with different powders which are part of the class 7XX (textured powders with different finish).

Ref. Lab	Material, Area and thickness of support	Powder coating code	Serie
24161	Aluminum Qpanel	DS 716	DS 7XX (Classe Standard textured)
24162	Aluminum Qpanel	DS 716 H	DS 7XX H (Classe Standard Supertexture)
24163	Aluminum Qpanel	DS 707 I	DS 7XXI (Classe Standard No-Skid)
24164	Aluminum Qpanel	DS 707 S	DS 7XX S (Classe 2 Superdurable)
24165	Aluminum Qpanel	DS 707 SH	DS 7XX SH (Classe 2 Superdurable Supertexture)

4. Testing apparatus:

Testing apparatus complete of :

- a. Elcometer 501, matricola H501 —1;
- b. Set of pencils of different hardness Faber-Castell 501, code T50115771;
- c. Pencil sharpener from 6H a 2B, code T501190452;
- d. Pencil sharpener from 3B a 6B, code T501190451;
- e. Abrasive paper.

5. Tests executed:

Before the test the samples have been kept at controlled conditions for 24 hours in a room at $(70 \pm 2) ^\circ\text{F}$ e $(50 \pm 5)\%$ of relative humidity.

We then have tested the hardness looking to intentionally scratch the layer of powder coating using pencils with increasing hardness (in order: 2B, B, HB, F, H, 2H, 3H, 4H, 5H and 6H) following the normative UNI EN 135234:2001.

The choice to start from the pencil with hardness 2B is not accidental, but determined the fact that the pencils 6B, 5B, 4B e 3B do not occur any damage to the surface of Decoral powder coating that need to be tested.

The hardness of the powder is determined by the hardness of the pencil which did not mark the layer the powder.

Here below, just as example, we show some samples after the tests.

On samples we wrote all the codes of the pencil used in the test.

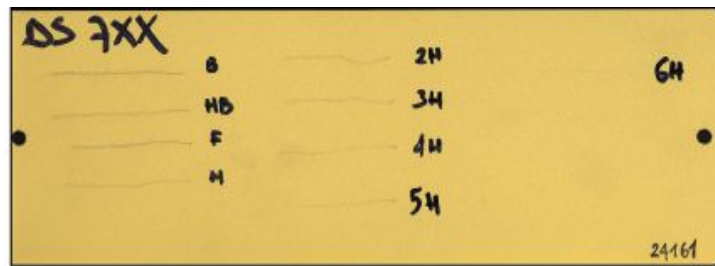


Figura 1: Campione 24161 dopo il test

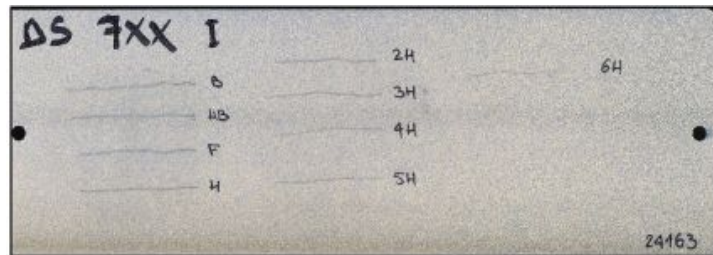
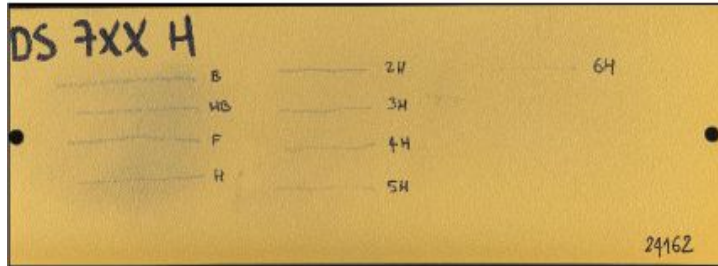


Figura 3: Campione 24163 dopo il test

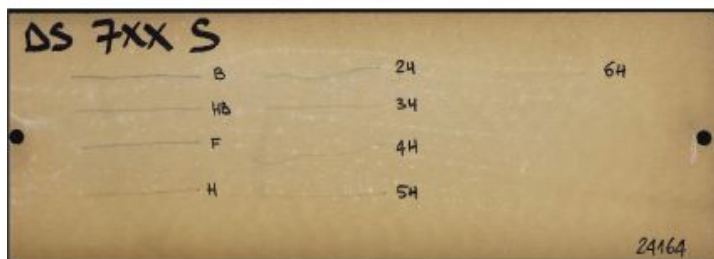


Figura 4: Campione 24164 dopo il test

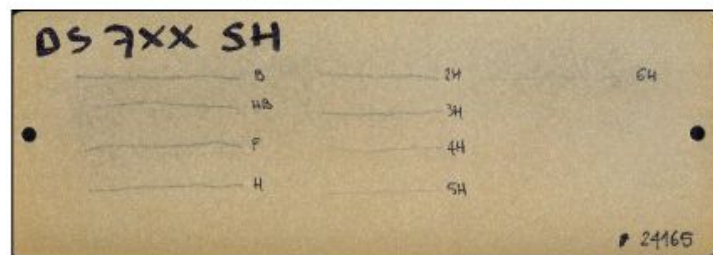


Figura 5: Campione 24165 dopo il test

RESULTS

Ref. Lab	Powder Coating code	Serie	HARDNESS RESULT
24161	DS 716	DS 7XX (Classe Standard raggrinzato)	HB
24162	DS 716 H	DS 7XX H (Classe Standard Supertexture)	No scratch with any pencil used
24163	DS 707 I	DS 7XX I (Classe Standard No-Skid)	No scratch with any pencil used
24164	DS 707 S	DS 7XX S (Classe 2 Superdurable)	F
24165	DS 707 SH	DS 7XX SH (Classe 2 Superdurable Supertexture)	No scratch with any pencil used

6. CONCLUSIONS:

For the samples "DS 7XX" and "DS 7XX S" it was possible to determine with certain accuracy the value of hardness (these powder coatings have a light texture).

For the remaining samples (DS 7XX H, DS 7XX I e DS 7XX SH) we can confirm that:

- all the used pencils DID NOT make any visible marks;
- the special surface finish, very textured, seems to preserve from scratches the powder coating layer, confirming a much higher hardness;

Decoral Laboratory
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