

QC methods to check UV coated (pre-finished) floors (short description)

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1. Adhesion

There are several procedures to check the adhesion between lacquer film and substrate on the one hand and to check the adhesion between the different lacquer layers on the other hand.

Please find the three most common possibilities as follows:

a. Coin-test

The coin-test: you take a sharp edged coin between the forefinger and thumb, press firmly on the lacquer surface and pull with constant pressure across the film. In the case of bad adhesion between film and surface, the film will dissolve, scratches will occur and there will be a typical stress whitening. This procedure is the simplest method for checking the adhesion. Only expertised personal will be able to determine the quality of the surface. The quality is based on a combination of variables (sharpness of edges, coin angle, pressure, etc.) and is therefore indefinable. As a result, norms are not possible.



Fig. 1: Surface before coin-test



Fig. 2: Surface with bad adhesion after coin-test

b. Hamberger Planer

Hamberger Industrierwerke has developed a testing device called the "Hamberger Planer" (Fig. 3) which can be used to conduct a coin test under certain defined conditions.

A piece of metal with a coin-like edge is pushed across the covered surface at a pre-definable pressure. The test result is the force applied until the appearance of first white marks. It is measured in Newton.



Fig. 3: The Hamberger Planer

c. Grid cut According to DIN EN ISO 2409

The adhesive properties of the varnish film to the substrate and to itself is tested using a single or multiple blade cutter. As shown (Image 4), the blade is used to make a cross-cut on the test specimen offset by 90°. This produces a kind of chessboard pattern. The blades must cut through the varnish film. After cutting, any loose parts are removed from the surface with a brush. An initial inspection is carried out. Afterwards, an adhesion test is carried out with a defined adhesive tape. The tape is pressed onto the lattice with force before being pulled off at an even speed (between 0.5 – 1 seconds).

The surface is rated according to the Table, as follows:



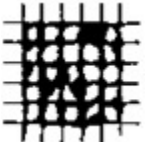
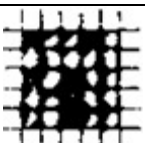
Grid Cut Classification	Description	Appearance of surface in area of grid-cut where flaking has occurred (example is for six parallel cuts)
0	The edges of the cuts are completely smooth, none of the lattice squares is detached.	-
1	Small flakes of coating have detached at the intersections of the cuts. The area affected is not significantly greater than 5% of the cross-cut area.	
2	The coating has flaked along the edges and/or the intersections of the cuts. Area of the cross-cut considerably greater than 5% but not significantly greater than 15% of the total cross-cut area.	
3	The coating has flaked along the edges of the cuts in wide strips partly/completely and/or partial/complete flaking on some of the squares. A cross-cut area considerably greater than 15% but not significantly greater than 35% is affected.	
4	The coating has flaked along the edges of the cuts in wide strips and/or partial/complete flaking on some of the squares. A cross-cut area considerably greater than 35% but not significantly greater than 65% is affected.	
5	Any flaking that cannot be classified under Category 4.	-



Fig. 4: Multiple blade cutter

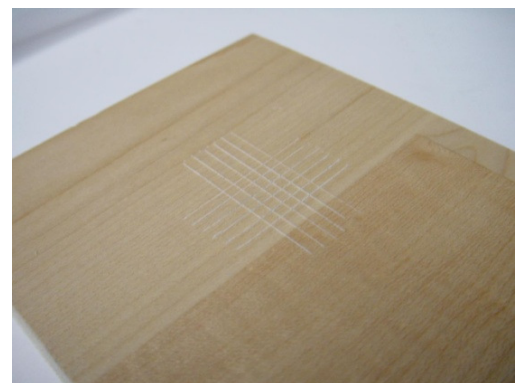


Fig. 5: Sample with grid cut

2. Gloss value

According to ISO 2813, 60° geometry

Radiation from a light source is reflected off the surface of the floor at a defined angle (normally 60° for coated parquet surfaces) and measured by a sensor. The more glossy the surface, the less light gets reflected from its surface, and the lower the specular gloss. The specular gloss readings are too imprecise for very matt surfaces meaning that surfaces with identical gloss value may look considerably different. In the gloss value test it is therefore necessary to carry out a visual inspection of the test surfaces against a master sample.



Fig. 6: Gloss value test device

3. Colour tones

Colour variations should be checked against the master sample. In case of stains, transparent systems or metallic lacquer, the colour tone depends on applied quantity, application method and substrate. Colour variations are possible even if colour quality remains constant. The master samples need to be stored under cover of darkness to avoid colour tone variations due to light exposure. Whilst manufacturing master samples with transparent finishing, one section on the surface of the raw wood should be taped and protected against the coating. This makes it possible to distinguish between changes of the wood colour and of the coating itself. Furthermore the colour should be checked using different types of light (day-, neon- and light bulb light). The release of the current production sample should be carried out by two persons. If you intend to coat bigger objects like furniture fronts, always use lacquer material of the same batch because a 100% adjustment of different batches is technically impossible.