



COTSWOLD

COMPANY

Testing Protocol: Surface Coatings

Product Name: Description		Photos
Surface Type: Color:		
Substrate Type:	<i>Solid Wood/Veneer/Metal</i>	
Coating Type/Processes:	<i>PU/Water based/NC/UV</i>	
Supplier:		
Country:		
Tested by:		
Approved by:		
Overall Result	PASS/FAIL/DATA	

Executive Summary:

*The sample meets all applicable tests, refer to the following pages for more detail of each test.
(Delete this statement if have any failure test)*

The sample does not meet the following test (s), refer to the test line in the next pages for more detail: (Delete this statement if all tests are passed)

Ex:

- 1. The sample does not meet the Pencil hardness test due to gouge being detected at 2H pencil.*

1) Performance Testing:

Scope: The internal testing protocol is to be conducted on all primary surfaces with a coating. Appropriate for indoor and outdoor products.

Please include photos of the testing and document any damage.

Reference Table:

Full Test procedures detailed below.

Tests 1 and 2 apply to ALL surfaces and must be completed in-house for all finished products.

Evaluation	Test Method	Cotswold Standard	Test Requirement - Substrate	Test Requirement - Product Type
1) Coating Adhesion	ISO 2409 :20	Cross cut, tape test. Plating/finish	All substrates - excluding wire brushed wood,	All product types

		must stay affixed. Specimen must meet Maximum class 2 result	natural fibers and Stone (marble, travertine, concrete)	
2) Stain Resistance	EN 127-20	Expose the surface to specific liquids for a period of 2hrs. Wipe clean. Specimens must not show visual stains or damage.	Wood Stone (inc. marble, travertine, concrete)	All tabletop surfaces (inc. dining tables, coffee & side tables, desks)
3)Corrosion Resistance	ISO 9227-2012	It was conducted in a controlled corrosive environment such as a salt spray cabinet. Specimens must exhibit no visible change, oxidation or corrosion after 48hrs.	Metal Only	All product types
4)Pencil Hardness	ASTM D3363-2020	To determine the hardness of a coating using pencil lead.	Wood, Veneer	All tabletop surfaces (inc. dining tables,

		Gouge and scratch hardness must be 2H or above.		coffee & side tables, desks)
5)Temperature Change	ASTM D1211-97(Mod.)	To determine the resistance to checking and cracking of clear NC lacquer films applied to wood substrate. Specimen must not display lacquer checking, discoloration, spotting or knot bleeding	Wood, Veneer	Tabletops... using 3rd party test
6)Abrasion Resistance	EN 15185-2011	Test Must be conducted 3rd Party - loaded cylindrical wheels covered with abrasive paper are rotated on the specimen. The number of revolutions required to cause one defined degree of abrasion must be at least 80 cycles.	Wood, Veneer	All tabletop surfaces (inc. dining tables, coffee & side tables, desks) using 3rd party test

7) Surface Scratching	CPSD-HL-01055-MTHD	Surface shall not be marred or scratched after 6 cycles of 6 in (Back and Forth) with standard tableware. Detail below	Wood, Veneer	All tabletop surfaces (inc. dining tables, coffee & side tables, desks) - In-house test
8) Resistance to Hot Water	EN 127-20	There should be no visual change/defects of the surface after pouring boiling water.	Wood, Veneer	All tabletop surfaces (inc. dining tables, coffee & side tables, desks)
9) Cold Damage	EN 127-20	Ice is left in a glass beaker on the surface for 60 mins. without causing any rings or stains or other damage to the table.	Wood, Veneer	All tabletop surfaces (inc. dining tables, coffee & side tables, desks)
10)Colorfastness-Operating Fluorescent Light apparatus for UV Exposure materials	ASTM G154-23	Indoor - 104 hours in 9 cycles UVA 351 Bulb. No Water spray required Grade 4.0 minimum.	Wood, veneer,	All white finish, light oak, natural oak, ash using 3rd party. Testing frequency is every 6 months

		Review the sample after 48 hours, 72 hours, 96 hours and 104 hours. Sample size: 75 mm x 150 mm (max size) 1 cycle = 8 hr UV + 4 hr condensation		
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IN-HOUSE PERFORMANCE TESTING INSTRUCTION

1. *Scratch resistance test* - All tabletop surfaces (inc. dining tables, coffee & side tables, desks)

Pre-test setup

- Fill the ceramic plate with steel shots or appropriate dead weight up to **5 lbs** (± 0.25 lbs),
- fill the ceramic mug with steel shots or appropriate dead weight up to **3 lbs** (± 0.15 lbs)
- Mark the distance for test on sample, 6 inches is distance requested from start to end.

Testing process- Test with mug and plate - Surface shall not be marred, scratched or gouge after test

- Place the loaded ceramic mug on the sample's primary use surface
- Use the middle of the base of the plate and mug as a reference point for sliding. Mark the reference point on the ceramic mug with a marking device. Place the rule on the reference point, along the sliding direction.

- Slide the ceramic mug 6 in. ($\pm 1/4$ in.) forward at a speed of approximately 1 in/s and then repeat in reverse direction. Ensure that by sliding the sample, no additional downward load is imparted onto the articles.
- Repeat for a total of 6 cycles over the same area. One cycle shall consist of both forward and backward motion.
- Visually evaluate the sample wood panel surface for any scratching or gouging (smaller scratches may not be easily discovered, look closer or at different angles in a bright lit room; other tools such as magnifying glass, light, etc. could also be utilized to aid in visual inspection for scratches).

Record all observations on the report.



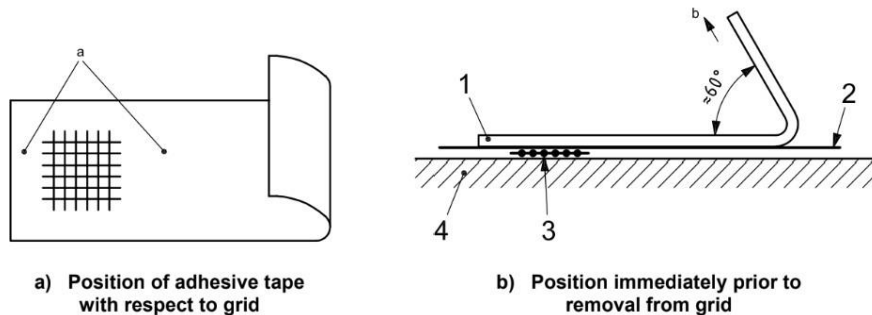
2. Cross-cut Requirements:

- There is to be 6 cuts vertically and horizontally forming a lattice pattern
- Spacing of the cuts to be determined based on coating thickness and type of substrate

Thickness of Coating	Substrate	Spacing
up to 60 μm :	Hard (eg. metal)	1mm spacing
up to 60 μm :	Soft (eg. wood and plaster)	2mm spacing
61 μm to 120 μm :	For both hard and soft substrates	2mm spacing
121 μm to 250 μm :	For both hard and soft substrates	3mm spacing

Process:

- With even pressure on the cutting tool make six cuts in the coating following the spacing indicated above ● All the cuts should penetrate the substrate surface.
- Repeat this operation, crossing the original cuts at 90° to form a lattice panel
- Brush the panel lightly with a soft brush several times backwards and several times forwards along each of the diagonals of the lattice pattern.
- For hard substrates and for wood, apply adhesive tape over the lattice. Tape not required for soft substrates.
- Place the centre of the tape over the lattice in a direction parallel to one set of cuts as shown in the figure below and smooth the tape into place over the area of the lattice and for a distance of at least 20 mm beyond with a finger.
- To ensure good contact with the coating, rub the tape firmly with a fingertip or fingernail
- Within 5 min of applying the tape, remove the tape by grasping the free end and pulling it off steadily in 0,5 s to 1,0 s at an angle which is as close as possible to 60° (see figure below).



Key

4 tape

4 coating

4 cuts

4 substrate a Smoothed down. b Direction of removal.

Evaluation of Results

Soft Substrates: To be reviewed after brushing

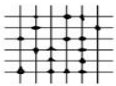
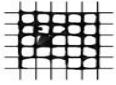
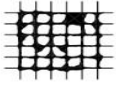
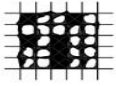
Hard substrates and wood: To

be reviewed after the

removal of the tape To be

classified according to the
table below.

Table 1 — Classification of test results

Classification	Description	Appearance of surface of cross-cut area from which flaking has occurred (Example for six parallel cuts)
0	The edges of the cuts are completely smooth; none of the squares of the lattice is detached.	—
1	Detachment of small flakes of the coating at the intersections of the cuts. A cross-cut area not greater than 5 % is affected.	
2	The coating has flaked along the edges and/or at the intersections of the cuts. A cross-cut area greater than 5 %, but not greater than 15 %, is affected.	
3	The coating has flaked along the edges of the cuts partly or wholly in large ribbons, and/or it has flaked partly or wholly on different parts of the squares. A cross-cut area greater than 15 %, but not greater than 35 %, is affected.	
4	The coating has flaked along the edges of the cuts in large ribbons and/or some squares have detached partly or wholly. A cross-cut area greater than 35 %, but not greater than 65 %, is affected.	
5	Any degree of flaking that cannot even be classified by classification 4.	—



Test Results - Any classification greater than 2 will be considered a fail

3. Stain Resistance

To be conducted on any large surface areas that could come into contact with the end customer during regular use such as a tabletop, shelf or top of a dresser.

Expose finished sample for two hours with the following materials:

- Ketchup
- Mustard
- Coffee
- Tea
- Soy Sauce
- Cooking Oil
- Wipe surface clean with a damp cloth to remove liquids
- Leave for 24 hours and assess if any visible stains are present

4. Pencil hardness test

Note: This test method is based on the equipment NEWTRY 500g Pencil Hardness Tester. If the other testing equipment is used, the technician must follow the instruction manual of that equipment to do testing properly.

4.1 Purpose of the test: To determine the hardness of a coating on a substrate using drawing leads of the known hardness.

4.2 Scope: This test is applicable to the coating applied on the flat surface of substrates only (ex: wood, metal, marble, cement, ...)

3.3 Definition

- Gouge Hardness – the hardest pencil lead that will leave the coating uncut for a stroke length of at least 3 mm ($\frac{1}{8}$ in).
- Scratch Hardness – the hardest pencil lead that will not rupture or scratch the coating.
- One Unit of hardness – the hardness difference between two adjacent leads
- Rupture – the process of breaking through or damaging.

4.4 Equipment





1. NEWTRY 500g Pencil Hardness Tester
2. Pencil Set (13 pencils, grades 6H – 6B)
6B – 5B – 4B – 3B – 2B – 1B – HB – H – 2H – 3H – 4H – 5H – 6H

Softer
Harder
3. Pencil Sharpener
4. Paper knife
5. Magnifier
6. Ruler, with resolution of 1 mm.
7. Abrasive Paper, grit No. 400

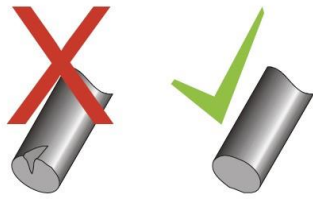
4.5. Testing procedure

The test should be carried out at $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($73.5^{\circ}\text{F} \pm 3.5^{\circ}\text{F}$) and $50\% \pm 5\%$ relative humidity, unless otherwise agreed. ● Prepare the pencil using the special pencil sharpeners supplied.

- Sharpen until approximately 5 mm to 6 mm (0.25") of lead is exposed, taking care to leave the exposed lead unmarked.



- Hold the pencil at 90° to the abrasive paper and rub the lead until a flat, smooth and circular cross section is achieved. Ensure that the edge is free of chips or nicks.



- Place the pencil tester horizontally on the test sample (if the test sample is smaller than the pencil tester, put the test sample in front of the instrument, under the front end of the pencil tester) in order to keep the instrument level.
- Support the Pencil Tester on the setting block
- Insert the hardest pencil (6H) into the hole on the main body of the pencil tester, and make the pencil edge to contact the test surface, then tighten the thumbscrews and remove the setting block.
- Apply the push force to the back of the unit, between the wheels, so as not to contribute to the load on the pencil to push the Tester a distance of approximately 6 mm (0.25"). The speed of the Pencil Tester should be between 0.5 mm/s to 1 mm/s.
- Check the surface for scratches or gouges by either close visual inspection, by feel using a fingernail or, using a magnifier with x10 magnification. Any defacement (marks) of the coating other than a cut is considered a scratch. Measure the length of cut by using a caliper or ruler.
- Repeat the test with the same pencil at 12 mm (0.5") away from the first test. When repeating the test, rotate the pencil to ensure that the edge of the lead in contact with the test panel is not chipped or crumbled. If necessary the pencil should be prepared again. If the two test results differ by more than one unit of pencil hardness, discard the results and repeat the test.
- If no marking (gouge or scratch) has occurred, repeat the test with the next softer hardness pencil until a pencil is found that will neither cut through nor scratch the surface of the coating.

4.6 Requirement

Paint finish: Pencil gouge hardness shall be 2H or above.

Stained finish: Pencil gouge hardness shall be HB or above.

