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RUSHIL DÉCOR LIMITED
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Deutsches Institut für Bautechnik DIBt
European Notified Body for construction products 0766
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Dresden, 17/10/2025
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Test Report
Order No. 2724620/1

Client:	RUSHIL DÉCOR LIMITED AHMEDABAD GUJARAT - 380058 INDIEN
Order:	Determination of tests according to EN 438-2
Contractor:	Entwicklungs- und Prüflabor Holztechnologie GmbH Laboratory Unit Surface Testing Zellescher Weg 24 01217 Dresden Germany
Engineer in charge:	Dipl.-Ing. Simone Wenk

Dipl.-Ing. Andreas Möschner
Head of Laboratory Unit Surface Testing

The test report contains 12 pages. Any duplication of extracts requires the written permission of EPH.
The test results refer exclusively to the material tested.
All numerical values within this document are given with a comma as decimal.

1 Task

The accredited Entwicklungs- und Prüflabor Holztechnologie GmbH was instructed by company RUSHIL DÉCOR LIMITED in Gujarat, India to conduct out selected tests in accordance with EN 438-2.

NOTE: All numerical values within this document are given with a comma as decimal.

2 Sample material

The following compact laminate sample and information were selected for testing and submitted to the contractor by the client.
Date of sample receipt: 04/07/2025
Date of sample receipt for retest: 01/10/2025

Sample identification (Sample ID, coded by the client)	**Test pieces / Dimensions [mm]**	
High pressure laminate "HGS/VGS & HGP/VGP"	15 / 100 x 100 x 0,8	19 / 50 x 50 x 0,8
	22 / 230 x 230 x 0,8	6 / 200 x 50 x 0,8
	6 / 50 x 200 x 0,8	7 / 150 x 50 x 0,8
	5 / 300 x 200 x 0,8	3 / 145 x 65 x 0,8
	6 / 100 x 100 x 0,8	6 / 300 x 200 x 0,8

3 Test performance

3.1 Determination of the resistance to surface wear

The test of the behaviour under abrasion stress was carried out according to the method described in EN 438-2:2016-02, part 10, using a Taber Abraser Tester 5151 from Taber Industries (test equipment OF-190). The friction wheels had a Shore A of 66 and were fitted with the sanding paper type S42. The loss of mass during calibration of the abrasive paper was 100 mg, which corresponds to the requirement (120 ± 20) mg.

The test was carried out: 11/07/2025

3.2 Determination of the resistance to immersion in boiling water

The test of resistance to immersion in boiling water was carried out according to EN 438-2:2016-02 part 12. The effects of immersion in boiling water for 2 h by means of the increase in mass and thickness of the test specimens and by detecting changes in appearance (surface and edge).

The test was carried out: 31/07/2025

3.3 Determination of the resistance against water vapour

The test of the resistance to water vapour was carried out according to EN 438-2:2016-02, part 14.
A specimen to be tested is held over the neck of a flask of boiling water in such a way that the decorative surface of the specimen is exposed to water vapour. After 1 hour the specimen is removed and stored for 24 hours under normal ambient conditions for recovery before being examined for changes in appearance.

The test was carried out: 17/07/2025 - 18/07/2025

3.4 Determination of the resistance to dry heat

The test of resistance to dry heat was carried out according to EN 438-2:2016-02, part 16.
A block of a standardised aluminium alloy was heated at a specified test temperature of 160 °C was brought into contact with a specimen taken from one of the laminates to be tested, which was glued to a particle board. After a contact period of 20 minutes the block was removed.
Resistance to these test conditions was assessed by visual inspection.

The test was carried out: 17/07/2025 - 18/07/2025

3.5 Determination of the dimension stability at elevated temperature

The test of dimensional stability at elevated temperature was carried out according to EN 438-2:2016-02, part 17.
In this test, the changes in the lateral dimensions of specimens of the laminates to be tested were determined over an extreme range of relative humidity at elevated temperatures.

The test was carried out: 28/07/2025 - 01/08/2025

3.6 Determination of the resistance to wet heat

The test of resistance to wet heat was carried out according to EN 438-2:2016-02, part 18.
A block of a standardised aluminium alloy was placed on a damp cloth at a specified test temperature of 100 °C in contact with a test specimen taken from the laminate to be tested.
After a contact period of 20 minutes the block was removed.
The resistance to these test conditions was assessed by visual inspection.

The test was carried out: 17/07/2025 - 18/07/2025

3.7 Determination of the resistance to impact by small-diameter ball

The resistance to impact by small-diameter ball was carried out in accordance with EN 438-2:2016-02, part 20, using the small ball impact device (test equipment - OF 02) described in the standard.

The test was carried out: 17/07/2025

3.8 Determination of the resistance to impact by large-diameter ball

The determination of the resistance to impact with a large ball was carried out according to EN 438-2:2016-02, part 21, using the large ball impact device (test equipment OF-44) described in the standard.

The test was carried out: 17/07/2025

3.9 Determination of the susceptibility to cracking under stress

The determination of the Susceptibility to cracking under stress was carried out according to EN 438-2:2016-02, part 23.
A test specimen of the laminate to be tested was exposed by heating to 50 °C for 6 h and the susceptibility to stress cracking was assessed by visual inspection after cooling.

The test was carried out: 17/07/2025

3.10 Determination of resistance to scratching

The determination of the resistance to scratching was carried out according to EN 438-2:2016-02, part 25. A Universal Scratch Tester Model 413 from Erichsen (test equipment OF-45) was used as a testing device. The evaluation of the results was carried out using reference samples according to EN 438-2:2016-02, Figure 22, and the evaluation scale from Table 6, part 25.7.

The test was carried out: 08/07/2025
The retest was carried out: 06/10/2025

3.11 Determination of the resistance to staining

The determination of the resistance to staining was carried out with 5 selected staining substances from groups 1 - 3 according to EN 438-2:2016-02, part 26.

The test was carried out: 08/07/2025 - 09/07/2025
The retest was carried out: 06/10/2025 - 07/10/2025

3.12 Determination of the light fastness

The light fastness test was carried out according to EN 438-2:2016-02 part 27 with a Xenon Weather Ometer Ci3000+ (KL-108) using the following test parameters according to EN ISO 4892-2:2013-03:

- Synchronous operation (water cooled equipment)
- Global irradiation
- (65 ± 3) °C Black standard temperature
- (50 ± 5) % Relative Humidity
- (60 ± 3) W/m² Irradiance at wavelength range of 300 nm - 400 nm
- 36 720 kJ/m² Irradiation duration - Radiant exposure dose according to devices with an irradiance of (60 ± 3) W/m² with a wavelength range of 300 nm - 400 nm, which means includes an exposure time of 170 h with. (This irradiation dose corresponds to the duration until the contrast between the unexposed area and exposed area of the blue wool light fastness type 6 was equal to the value 4 of grey scale according to ISO 105-A02:1993-09).

The light fastness was determined according to EN 438-2:2016-02 part 27 as the evaluation of the contrast (colour change) between exposed specimen and the control specimen (reference) with respect to the grey scale according to ISO 105-A02 :1993-09.

To avoid an incorrect assessment of colour fastness of the sample due to photochromism, the specimens were stored in the dark at ambient interior conditions prior to the assessment of colour fastness for (24 ± 2) hours.

The test was carried out: 07/07/2025- 15/07/2025

3.13 Determination of the density

The density was determined according to EN 323:1993 "Wood based panels - Determination of density". 10 specimens of 50 mm x 50 mm x thickness were tested. The density was calculated by the use of measured values of length, width, thickness and mass of the specimens.

The test was carried out: 31/07/2025

3.14 Sample preparation (bonding to chipboard material)

The variant was bonded to chipboard material using PUR adhesive from Würth, D4, transparent, Art. No. 0892 100 180 according to EN 438-2:2016-02 for the tests 3.3, 3.4, 3.6, 3.7 and 3.8.

4 Results

4.1 Resistance to surface wear

Number of revolutions until the initial abrasion point (IP) is reached test specimen			Resistance to surface abrasion up to IP (mean value rounded to 50)
1	2	3	
> 400	> 400	> 400	> 400

4.2 Resistance to immersion in boiling water

4.2.1 Increase of mass

Increase of mass after 2 h water storage in % (n = 3)
2,7

4.2.2 Increase of thickness

Increase of thickness after 2 h water storage in % (n = 3)
2,2

4.2.3 Visual Examination (changing the appearance of the surface and edge)

Visual assessment after 2 h water storage in rating	
Surface	Edge
5	5

Evaluation criteria according to to EN 438-2:2016-02 part 12:

Grade 5 no visible change
Grade 4 slight change of gloss and/or colour, only visible at certain viewing angles
Grade 3 moderate change of gloss and/or colour
Grade 2 marked change of gloss and/or colour
Grade 1 blistering and/or delemination

4.3 Resistance against water vapour

Result of the visual examination in rating
Grade 4

Evaluation criteria according to EN 438-2:2016-02 part 14:

Grade 5 no visible change
Grade 4 slight change of gloss and/or colour, only visible at certain viewing angles
Grade 3 moderate change of gloss and/or colour
Grade 2 marked change of gloss and/or colour
Grade 1 blistering and/or delamination

4.4 Resistance against dry heat

Result of the visual examination in rating by 160 °C
Grade 4

Rating scale according to EN 438-2:2016-02 table 1

Grade 5 *No change*
test area indistinguishable from adjacent surrounding area

Grade 4 *Slight change*
test area distinguishable from adjacent surrounding area, only when the light source is mirrored on the test surface and is reflected towards the observer`s eye, e.g. discoloration, change in gloss and colour

Grade 3 *Moderate change*
test area distinguishable from adjacent surrounding area, visible in several viewing directions, e.g. discoloration, change in gloss and colour, no change in the surface structure, e.g. deformation, cracking, blistering

Grade 2 *Significant change*
test area clearly distinguishable from adjacent surrounding area, visible in all viewing directions, e.g. discoloration, change in gloss and colour and/or the structure of the surface slightly changed, e.g. slight cracking, slight blistering

Grade 1 *Strong change*
The structure of the surface being distingly changed e.g. strong cracking, strong blistering and/or discoloration, change in gloss and colour
and/or the surface material being totally or partially delaminated

4.5 Dimension stability at elevated temperature

Dimension stability at elevated temperature in %	
L (longitudinal)	T (transversal)
0,40	0,7

4.6 Resistance against wet heat

Result of the visual examination in rating by 100 °C
Grade 5

Rating scale according to EN 438-2:2016-02 table 3

Grade 5 *No change*
test area indistinguishable from adjacent surrounding area

Grade 4 *Slight change*
test area distinguishable from adjacent surrounding area, only when the light source is mirrored on the test surface and is reflected towards the observer`s eye, e.g. discoloration, change in gloss and colour

Grade 3 *Moderate change*
test area distinguishable from adjacent surrounding area, visible in several viewing directions, e.g. discoloration, change in gloss and colour, no change in the surface structure, e.g. deformation, cracking, blistering

Grade 2 *Significant change*
test area clearly distinguishable from adjacent surrounding area, visible in all viewing directions, e.g. discoloration, change in gloss and colour and/or the structure of the surface slightly changed, e.g. slight cracking, slight blistering

Grade 1 *Strong change*
The structure of the surface being distingly changed e.g. strong cracking, strong blistering and/or discoloration, change in gloss and colour
and/or the surface material being totally or partially delaminated

4.7 Determination of the resistance to impact by small-diameter ball

Determined impact resistance with the small ball - Maximum spring force in N			
Single value e			Mean value
> 32,9	> 32,9	> 32,9	> 33

4.8 Determination of the resistance to impact by large-diameter ball

Determined impact strength with a large ball in mm drop height					
Single value					Mean value
> 1800	> 1800	> 1800	> 1800	> 1800	> 1800
Indentation diameter at drop height in mm					
9	9	9	8	9	9

4.9 Resistance against to crazing

Visual examination			
Test specimen 1	Test specimen 2	Test specimen 3	Result (lowest value of the 3 test specimens)
5	5	5	5

Rating scale

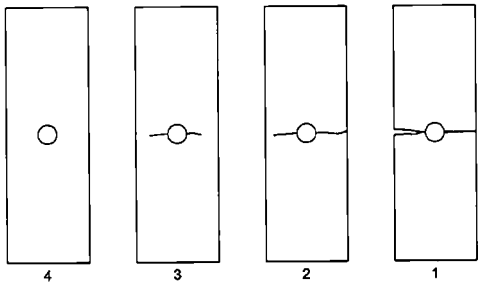
Rating 5: No evidence of cracking.

Rating 4: Hairline cracks only visible under x 6 magnification.

Rating 3: Cracks visible with normal vision (corrected if necessary) from the edge of the hole, but not extending to either edge of the specimen.

Rating 2: A crack visible with normal vision (corrected if necessary) from the edge of the hole, extending to one edge of the specimen such that the specimen is not broken into two pieces.

Rating 1: Specimen broken into two pieces.



(hairline cracks only visible under 6x magnification)

4.10 Resistance to scratching

Interrupted scratches, faint polishing marks or no visible traces	Scratching load leading to double rings with ≥ 90 % closeness	Scratch resistance according to EN 438-2 2016-02, Table 6, as rating number
1 N	2 N	**Grade 2**

Result of retest

Interrupted scratches, faint polishing marks or no visible traces	Scratching load leading to double rings with ≥ 90 % closeness	Scratch resistance according to EN 438-2 2016-02, Table 6, as rating number
2 N	4 N	**Grade 3**

Rating scale according to EN 438-2:2016-02 table 6

Rating scale	Interrupted scratches, faint polishing marks or no visible traces	Scratching load leading to double rings with ≥ 90 % closeness
Grade 5	6 N	> 6 N
Grade 4	4 N	6 N
Grade 3	2 N	4 N
Grade 2	1 N	2 N
Grade 1	-	1 N

4.11 Resistance to staining

Visual examination with covering in rating				
Acetone	**Coffee**	**Sodium hydroxide (NaOH)**	**Hydrogen peroxide (H_2O_2,)**	**Carbon black shoe suspension in paraffin oil (shoe polish simulant)**
Group 1	Group 2	Group 3		
16 h	**16 h**	**10 min**	**10 min**	**10 min**
Grade 1	Grade 4	Grade 5	Grade 5	Grade 4

Result of retest

Acetone	**Coffee**	**Sodium hydroxide (NaOH)**	**Hydrogen peroxide (H_2O_2,)**	**Carbon black shoe suspension in paraffin oil (shoe polish simulant)**
Group 1	Group 2	Group 3		
16 h	**16 h**	**10 min**	**10 min**	**10 min**
Grade 5	Grade 5	Grade 5	Grade 5	Grade 4

Rating scale according to EN 438-2:2016-02, Table 8 (comparison of the tested area with the surrounding area)

Grade 5 *No change*
test area indistinguishable from adjacent surrounding area

Grade 4 *Slight change (Minor change)*
test area distinguishable from adjacent surrounding area, only when the light source is mirrored on the test surface and is reflected towards the observer`s eye, e.g. discoloration, change in gloss and colour

Grade 3 *Moderate change*
test area distinguishable from adjacent surrounding area, visible in several viewing directions, e.g. discoloration, change in gloss and colour, no change in the surface structure, e.g. deformation, cracking, blistering

Grade 2 *Significant change*
test area clearly distinguishable from adjacent surrounding area, visible in all viewing directions, e.g. discoloration, change in gloss and colour and/or the structure of the surface slightly changed, e.g. slight cracking, slight blistering

Grade 1 *Strong change*
The structure of the surface being distingly changed e.g. strong cracking, strong blistering and/or discoloration, change in gloss and colour
and/or the surface material being totally or partially delaminated

4.12 Light fastness

Contrast (colour change) from test sample to reference by grey scale according to ISO 105-A02:1993-09 Light fastness after 36 720 kJ/m2 radiant exposure dose
4 - 5

Rating scale for the colour change by grey standard evaluation

Grey scale value 5	no change of colour
Grey scale value 4 - 5	very small change of colour
Grey scale value 4	small change of colour
Grey scale value 3 - 4	recognisable change of colour
Grey scale value 3	clearly recognisable change of colour
Grey scale value 2 - 3	very clearly recognisable change of colour
Grey scale value 2	strong change of colour
Grey scale value 1	very strong change of colour

4.13 Density according to EN 323:1993

Density (n = 10) in g/cm³
1,09

n = number of samples

5 Evaluation

The tested product can be evaluated for the several properties according to with EN 438-3:2016-02, Table 3 (General requirements):

(Grey marking = Requirements for the property)

Property	**Results**	**Assessment* regarding Requirements in accordance with according to EN 438-3:2016-02, Tables 4 and 5**		
		Laminate		
		HDS HDF HDP	***HGS HGF HGP***	***VGS VGF VGP***
		444	**333**	**222**
Resistance to surface wear (EN 438-2:2016-02, p. 10)	*revolutions until IP*	*≥ 350*	*≥ 150*	*≥ 50*
	> 400	fulfilled	fulfilled	fulfilled
Resistance to immersion in boiling water (EN 438-2:2016-02, p. 12)	*Appearance gloss finish* ***other finishes***	*≥ Grade 3* ***≥ Grade 4***	*≥ Grade 3* ***≥ Grade 4***	*≥ Grade 3* ***≥ Grade 4***
	Grade 5	fulfilled	fulfilled	fulfilled
Resistance to water vapour (EN 438-2:2016-02, p. 14)	*Appearance gloss finish /* ***other finishes***	*≥ Grade 3* ***≥ Grade 4***	*≥ Grade 3* ***≥ Grade 4***	*≥ Grade 3* ***≥ Grade 4***
	Grade 4	fulfilled	fulfilled	fulfilled
Resistance to dry heat (160 °C) (EN 438-2:2016-02, p. 16)	*Appearance gloss finish /* ***other finishes***	*≥ Grade 3* ***≥ Grade 4***	*≥ Grade 3* ***≥ Grade 4***	*≥ Grade 3* ***≥ Grade 4***
	Grade 4	fulfilled	fulfilled	fulfilled
Dimensional stability at elevated temperature (EN 438-2:2016-02, p. 17)	*cumulative dimensional change longitudinal L: % (max) transversal T: % (max)*	*0,45 0,90*	*0,55 1,05*	*0,75 1,25*
	L: 0,40	fulfilled	fulfilled	fulfilled
	T: 0,70	fulfilled	fulfilled	fulfilled
Resistance to wet heat (100 °C) (EN 438-2:2016-02, p. 18)	*Appearance gloss finish /* ***other finishes***	*≥ Grade 3* ***≥ Grade 4***	*≥ Grade 3* ***≥ Grade 4***	*≥ Grade 3* ***≥ Grade 4***
	Grade 5	fulfilled	fulfilled	fulfilled
	Spring force [N]	*≥ 25*	*≥ 20*	*≥ 15*

Property	Results	Assessment* regarding Requirements in accordance with according to EN 438-3:2016-02, Tables 4 and 5		
		Laminate		
		HDS HDF HDP	***HGS HGF HGP***	***VGS VGF VGP***
		444	**333**	**222**
Resistance to impact with a small diameter ball (EN 438-2:2016-02, p. 20)	**> 33**	fulfilled	fulfilled	fulfilled
Resistance to impact with a large diameter ball (EN 438-2:2016-02, p. 21)	*Drop height [mm]* *Indentation diameter [mm]*	*≥ 1000* *≤ 10*	*≥ 800* *≤ 10*	*≥ 600* *≤ 10*
	> 1800 **9**	fulfilled	fulfilled	fulfilled
Susceptibility to cracking (laminate thickness ≤ 2 mm) (EN 438-2:2016-02, p. 23)	*Appearance*	*≥ Grade 4*	*≥ Grade 4*	*≥ Grade 4*
	Grade 5	fulfilled	fulfilled	fulfilled
Resistance to scratching (EN 438-2:2016-02, p. 25)	*Force (min.)* ***smooth surface /*** *structured surface*	***≥ Grade 3*** *≥ Grade 4*	***≥ Grade 3*** *≥ Grade 4*	***≥ Grade 3*** *≥ Grade 4*
	Grade 3	fulfilled	fulfilled	fulfilled
Resistance to staining (EN 438-2:2016-02, p. 26)	*Appearance* *Group 1* *Group 2* *Group 3*	 *= Grade 5* *= Grade 5* *≥ Grade 4*	 *= Grade 5* *= Grade 5* *≥ Grade 4*	 *= Grade 5* *= Grade 5* *≥ Grade 4*
	Grade 5 and Grade 5 **Grade 4**	fulfilled	fulfilled	fulfilled
Light fastness (EN 438-2:2016-02, p. 27)	*Contrast Grey scale*	*4 - 5*	*4 - 5*	*4 - 5*
	4 - 5	fulfilled	fulfilled	fulfilled
Density (EN 323:1993)	*g/cm³*	*≥ 1,35*	*≥ 1,35*	*≥ 1,35*
	1,09	fulfilled	fulfilled	fulfilled

* Statements on conformity assessment/classification are made on the basis of the measurement results obtained. Measurement uncertainties are not included in the assessment/classification. Here we follow: ILAC G8:09/2019 "Guidelines on Decision Rules and Statements of Conformity" 4.2.1 Binary Statement for Simple Acceptance Rule (*w*=0).

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