

Quality and surface requirements for wood and wood-based materials**1 Goals**

The aim of this document is to define the quality and surface requirements for wood and wood-based materials. This standard has been updated, includes and replaces the following standards 'VN-02011 Product requirements for melamine-faced table tops' and 'VN-02012 Quality requirement and characteristics of linoleum table tops'.

Confirmation of the company standard is provided by means of the initial sample test report; a test certificate must be provided on request.

2 Technical characteristics and norm requirements of wood and wood-based materials

The technical characteristics and norm requirements of wood and wood-based materials are documented in the material data sheet. Confirmation of receipt of this datasheet is recorded in the initial sample test report.

3 General requirements**3.1 Labelling of samples**

- The supplier is to label samples as follows by means of e.g. a sticker or tag on a suitable surface:
 - Manufacturer
 - Project
 - Sample of surface finish
 - Colour code (powder-coated or lacquered)
 - Date
 - Supplier
 - Manufacturer's reference lacquer, melamine etc.

- Number of test samples

The supplier shall present test samples. This can be in the form of finished products or in some cases sample panels

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4 Requirements

4.1 General features

All components made of wood-based materials must fulfil the following requirements:

- Emission class E1
Reference procedure: DIN EN 16516:2020 / limit value: 0.1ppm
(alternative DIN EN 717-1:2005 / limit value: 0.5ppm)
- TSCA Title VI certificates (incl. labelling on component) are always required for particleboard, MDF, thin MDF and hardwood plywood panels. These certificates are not necessary for moulded plywood parts, OSB panels, hardboard panels and wooden packaging

4.2 Melamine-faced panels (MFB)

- Texture:
 - Solid colours: silk matt or smooth finely textured finish
 - Wood pattern: adapted to design
- Open pored coating is not permissible

4.3 Veneered panels

- Veneer strips must be glued to the narrow surfaces, no adhesive threads may be used
- The veneer pattern, whether crown or quarter cut, is determined on a product-specific basis
- Maximum permissible warpage convex or concave, 1.5mm / 1m (corresponds to 1.5‰)
- Veneer leaves must be 'slip matched'
- A continuous veneer pattern is required for multi-part structures, maximum permissible butt joint offset 5mm
- A continuous veneer pattern is required for flaps
- The veneer pattern must be symmetrical and matched to the part width
- Multi-panel table tops must be labelled and delivered in sets. Labelling must be agreed with Vitra

4.4 Underside of table tops

Fixed-height table top, mounted no higher than seating height.

→ Marked as backside in drawing

- Technical backside as selected by manufacturer (can be a different type of wood with a similar shrinking behaviour)
- If stained, both sides must be of identical colour
- Minor defects permitted (see 6.5)
- Lacquer at manufacturer's discretion

Panels for height-adjustable, foldable or standing-height tables.

→ Marked as B-quality veneer in drawing

- Veneer identical to top (type of wood and thickness)
- Stained in same colour as top
- B-quality veneer or better
- Lacquer identical to top

4.4.1 Veneer variants

If not defined for a specific product, the following applies for veneer variants

Light oak [17]

- Gloss level: dull matt (4-7)
- Open-pore lacquer finish
- A-quality veneer
- Full crown, no half crown
- Colour see limiting samples
- No pronounced ray flecks (maximum 5mm wide)
- No cross-sectional ray flecks
- No sapwood
- Permissible defects see 6.5
- No noticeable colour bleeding

Dark oak [04]

- Gloss level: dull matt (4-7)
- Open-pore lacquer finish
- Full crown, no half crown
- Colour see limiting samples
- No pronounced ray flecks (maximum 5mm wide)
- No sapwood
- A-quality veneer
- Stained
- Evenly spread stain

American walnut [13]

- Gloss level: matt (8-10)
- Open-pore lacquer finish
- Crown-cut
- No sapwood
- Full crown, no half crown
- Colour as uniform as possible from delivery to delivery
- A-quality veneer

4.5 Solid wood

EACH COMPONENT LOOKS DIFFERENT (UNIQUE ITEM!)

- Wood must be healthy (free of fungi and insects that can destroy wood)
- Moisture content 6-10%
- Wood patterns are not specified.
- Slats must be mark-free.
- Different slat widths are authorised.
- With table tops: slat width min. 60mm, max. 110mm, with max. 1/3 of slats between 60-70mm, the remaining 2/3 min. 70mm
- With 2-piece tops: the slat widths must be identical at joint.
- All slats must be a single piece.
- Widths glued with butt joint.
- Glued joints must be tight.
- When gluing widths, the slats must be positioned to create a uniform appearance. (No very light slats next to very dark ones)
-> see 6.5.3 defect description
- If permitted to achieve a uniform appearance, conventional gluing rules must be observed when gluing widths (core to core, sapwood to sapwood // alternate sides with flat grain, right, left, right, etc.).
- Annual growth rings as upright as possible
- Maximum permissible warpage, convex or concave, 2mm / 1m (equivalent to 2‰)

4.6 Special requirements of certain wood types

Natural oak [70]

- Oiled surface
- Ray flecks up to 5mm wide.
- No sapwood

Dark oak [04]

- Oiled surface
- Ray flecks up to 5mm wide
- No sapwood

Walnut [75]

- Oiled surface
- No sapwood

4.7 Powder-coated panels

- See assessment of surface defects 6.3

4.8 Panels covered with HPL

- Identical HPL (colour and thickness) must be used on the underside.
⇒ In special cases a different HPL may be used in the same thickness.
A separate instruction will appear in the order
- B-quality may be used as the backside

4.9 Panels covered with linoleum

- The underside must be covered with the same linoleum as the top
 - ⇒ in special cases backing paper of 0.7-0.8mm may be used by agreement. A separate instruction will appear in the order
- Linoleum may not be butt-jointed on the top of a panel
- With certain linoleum panels, e.g. solid wood edging, it may be necessary to seal the surface with an additional clear varnish
- Linoleum edges may be glued with a light-coloured adhesive as standard. Should a dark-coloured adhesive be preferred, feasibility must be tested
- For multi-panel table tops, the rolling direction of the linoleum must be observed; it must be uniform for all parts
- Multi-panel table tops must be labelled and delivered in sets. Labelling must be coordinated with Vitra

4.10 Edge bands for melamine panels

- Maximum glue line width for edge band 0.1mm
- Circumferential edge band, max. butt joint width filled with wax 1.0mm!
- In the case of welded edge bands, the joint must be neatly finished so that it is no longer noticeable
- With black edge bands, black coloured adhesive must be used
- A white joint is not authorised
- ABS edge bands in solid colours must be dyed through
- ABS texture:
 - Solid colours: smooth
 - Wood pattern: smooth

5 Test requirements surface finish

Types of test	Type of surface finish	Valid (yes/no)	Vitra standard	Requirements	Test samples
Cross-cutting test (DIN EN ISO 2409)	MFB	Yes	7.017	Gt 1	1 piece Testing directly on product
	HPL / CPL	No			
	Clear lacquer	Yes			
	Pigmented lacquer	Yes			
	Oil/wax	No			
	Powder-coating	Yes			
	Linoleum	No			
Scratch resistance (DIN 68 861-4)	MFB	Yes	7.015	4B (> 2 N to 4 N)	1 sample panel 100mm x 100mm x 6 mm
	HPL / CPL	Yes			
	Clear lacquer	No			
	Pigmented lacquer	Yes			
	Oil/wax	No			
	Powder-coating	Yes			
	Linoleum	No			
Abrasion resistance (acc. to DIN 68861-2)	MFB	Yes	7.014	2B (>350≤650 revolutions)	1 sample panel 100mm x 100mm x 6 mm
	HPL	Yes			
	Clear lacquer	No			
	Pigmented lacquer	Yes			
	Oil/wax	No			
	Powder-coating	Yes			
	Linoleum	No			
Lightfastness / UV stability	MFB	Yes	3.042	Indoor = 600h Outdoor = 2000h Blue scale ≥7	2 sample panels 60mm x 20mm x 5mm
	HPL	Yes			
	Clear lacquer	No			
	Pigmented lacquer	Yes			
	Oil/wax	No			
	Powder-coating	Yes			
	Linoleum	No			

5.1 UV stability and colour variation

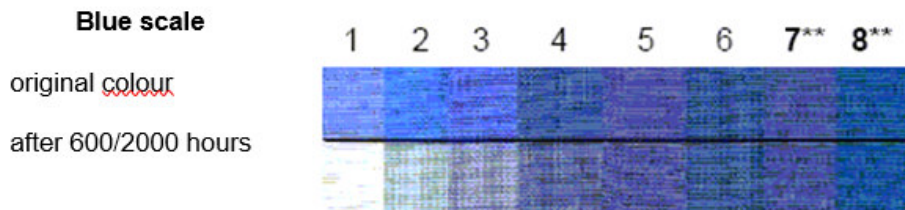
5.1.1 UV stability

Lightfastness of melamine surfaces and opaque pigmented lacquers:

- Inspection requirement for indoor use 600h
- Inspection requirement for outdoor use 2000h

Test requirement: according to Vitra test instructions (acc. to EN ISO 105- B02)

Testing device: Suntest CPS, Xenon lamp 1500 B + UV filter + Quartz glass



** = fulfills Vitra requirement (at least grade 7)

Required test samples: 3 samples 20mm x 60mm, thickness ≤6mm

5.1.2 Colour variation

5.1.2.1 Solid colours

The metric assessment of colour is carried out using the CIELAB system with the following types of light:

- **D 65**, daylight
- **F 11 or TL84**, artificial daylight

Optical evaluation is carried out in a light booth (ASTM D 1729) with the aforementioned light types

Permissible tolerances during measurement:

- ΔL < 1
- Δa < 1
- Δb < 1
- ΔE < 1
- Metameric index: < 0.5

The optical assessment takes precedence over the measured value. Slight optical deviations from the original pattern are permissible, see stage 4 of EN 14323:2004 (D)

Required test sample: Ideally DIN A6, in exceptional cases also smaller.

5.1.2.2 Natural or stained wood surfaces (solid wood / veneer)

Optical evaluation is carried out on the basis of limit samples in a light booth (ASTM D 1729) with the light types D65 and F11 or TL84.

The colour samples must be within the limit samples.

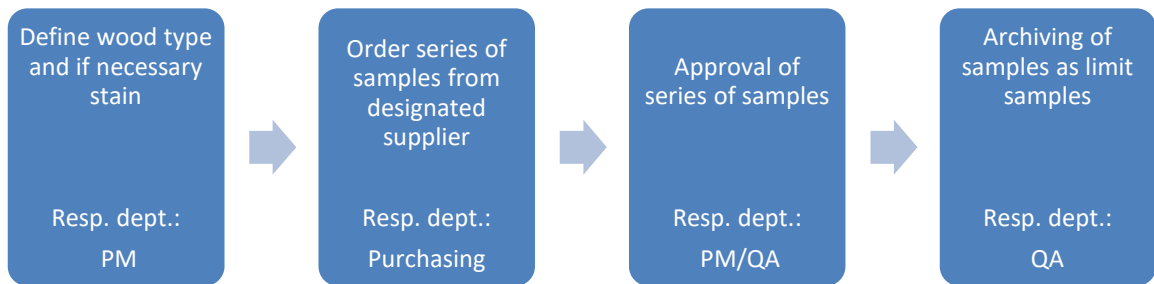
Required test sample: DIN A4

Process description:

- New requirement (new supplier, dealer, PM etc.) for existing surface finish



- New surface finish

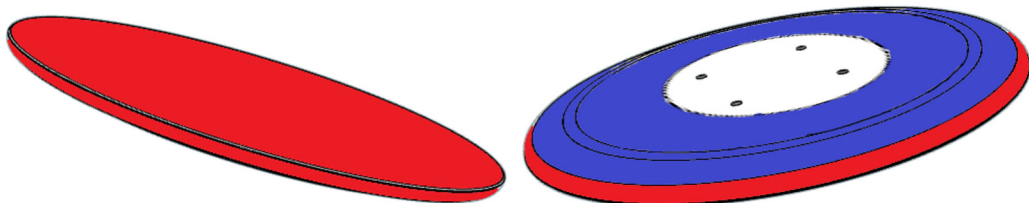


Before release, limit samples for colour as to be defined with Vitra team.

6 Assessment of surface defects

6.1 Inspection conditions

- **Inspection personnel**
 - Normal vision
- **Lighting**
 - Daylight (D65) and artificial light (F11), low reflection of 1,000 lux
- **Observation distance**
 - When possible, the observation distance should reflect the real usage/installation conditions
 - The surfaces are generally to be assessed at a distance of 0.3-0.9 metres. The surface to be assessed must be evaluated from different viewing angles
 - ⇒ Example table top 30cm
 - ⇒ Example leg 90cm
 - With linoleum, distance of 1.5m at an angle of 30° to 60°
- **Condition for inspection**
 - The surfaces must be assessed in a clean condition
- **Detection / identification of defects**
 - Defects in the zone being assessed must be detected within a maximum of 10 seconds
- **Definition of ABC zones**
 - Component-specific information on A/B/C zones can be found in the product-related Q specification
- **Meaning**
 - Red = A zone// directly visible zones
 - Blue = B zone// indirectly visible zones
 - Grey = C zone// non-visible zones
- **Example**



6.2 Tool for countable defects

Countable defects are defined in number and size per zone category (A/B/C) and assessed. To determine authorised defect sizes, an evaluation card ('Fehlergrößen-Bestimmungstabelle') can be used. This evaluation tool is provided by Vitra on request.



6.3 Melamine facing (MFB, HPL, CPL), power-coating and pigmented lacquer

6.3.1 Authorised characteristic

No.	Characteristic	For use with:		
		Melamine-facing	Powder-coating	Pigmented lacquer
1.	'Unevenness' visible in oblique light, especially on dark and smooth surfaces.	X	X	X

6.3.2 Uncountable / poorly countable characteristics

Uncountable / poorly countable defects are to be assessed as described below. Exact error description is defined according samples.

No.	Characteristic / defect	For use with:		
		Melamine-facing	Powder-coating	Pigmented lacquer
2.	Roughness		X	X
3.	Cracks	X	X	X
4.	Ghost lines		X	X
5.	Palpable pressure marks	X	X	X
6.	Open porosity	X		
7.	Orange skin		X	X
8.	Lacquer runs			X
9.	Scratches	X	X	X

- **A zones:** no defects must be visible when inspected under the conditions listed in 6.1
- **B zones:** defects must not be visible from a distance of 1m
- **C zones:** technical requirements apply

If the listed defects cannot be avoided, product-specific limit samples must be created in collaboration with Vitra.



6.3.3 Countable defects

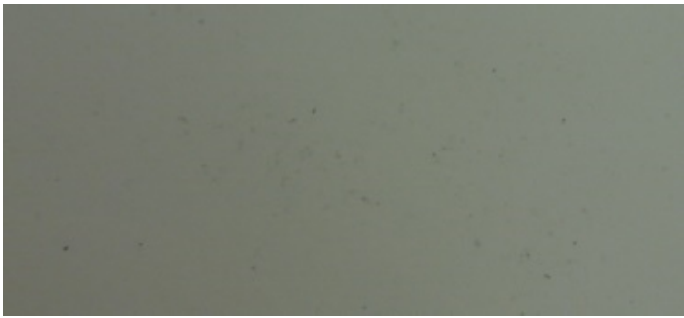




See 6.2

No.	Characteristic / defect	For use with:		
		Melamine-facing	Powder-coating	Pigmented lacquer
10.	Spots >0.2mm ²	X	X	X
11.	Palpable inclusions >0.2mm ²	X	X	X

- **A surface:** max. size of defect, individual or in total = 0.8 mm²/m²
(can also be spread across several defects e.g. 0.4mm² + 0.4mm² / 0.5mm² + 0.3mm² etc.), maximum one defect per DIN A4 zone
A defect measuring 0.2mm² is generally accepted. Exception: concentration of defects (nests) (based on DIN EN 14322)
- **B surface:** max. size of defect, individual or in total = 1.5 mm²/m²
- **C surface:** technical requirements apply
- A defect measuring ≤ 0.2mm² is generally accepted, with the exception of nests (more than 5 points per 10cm x 10cm)

6.4 Description of characteristics / defects

No.	Characteristic / defect	Description / image
1.	'Unevenness'	
2.	Roughness	
3.	Cracks	
4.	Ghost lines	
5.	Palpable pressure marks	

6.	Open porosity	
7.	Orange skin	
8.	Lacquer runs	
9.	Scratches	
10.	Spots	
11.	Palpable inclusions	

6.5 Veneer and solid wood

6.5.1 Uncountable / poorly countable defects

Uncountable / poorly countable defects are to be assessed as described below. Exact error description is defined according samples.

No.	Characteristic / defect	For use with:	
		Solid wood	Veneer
1.	Scratches	X	X
2.	Cracks	X	X
3.	Ghost lines	X	X
4.	Glue patches	X	X
5.	Pressure marks	X	X
6.	Blisters		X
7.	Orange skin	X	X
8.	Open glue joint	X	X
9.			
10.	Visible substrate		X
11.	Multi-panel table tops, offset of veneer joint $\geq 5\text{mm}$	X	X
12.	Colour variations between adjoining slats (see description 6.5.3)	X	

- **A zones:** no defects must be visible when inspected under the conditions listed in 6.1
- **B zones:** defects must not be visible from a distance of 1m
- **C zones:** technical requirements apply

If the listed defects cannot be avoided, product-specific limit samples must be defined in collaboration with Vitro.


6.5.2 Countable defects




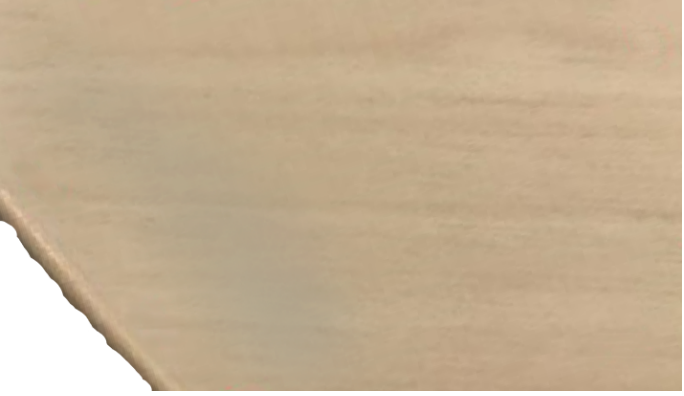
See 6.2

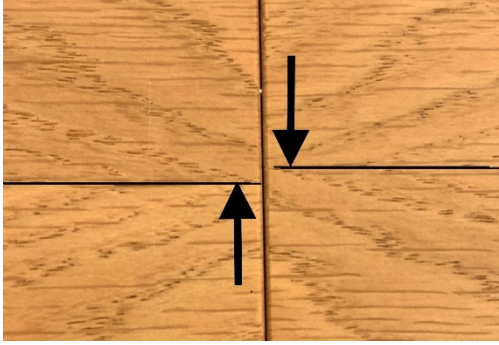



No.	Characteristic / defect	To be used for:	
		Solid wood	Veneer
13.	Healthy knots $\leq \varnothing 5\text{mm}$	X	X
14.	Cracks filled with wax etc.	X	

- **A zones:** 5x per zone authorised, minimum distance 20cm
- **B zones:** 10x per zone authorised. Minimum distance 10cm
- **C zones:** Technical requirements apply.

6.5.3 Description of characteristics / defects

No.	Characteristic / defect	Description / image
1.	Scratches	
2.	Cracks	
3.	Ghost lines	
4.	Glue patches	
5.	Pressure marks	

6.	Blisters	
7.	Orange skin	
8.	Open glue joint	
9.	Visible substrate	

<p>10.</p>	<p>Multi-panel table tops, offset of veneer joint $\geq 5\text{mm}$</p>		
<p>11.</p>	<p>Healthy knots</p>		
<p>12.</p>	<p>Colour variations between adjoining slats</p>	<p>Not authorised</p> 	<p>Authorised</p>
<p>13.</p>	<p>Cracks filled with wax - Matching colour - Max. $\varnothing 3\text{mm}$ or $1 \times 40\text{mm}$</p>		

6.6 Linoleum

6.6.1 Authorised characteristics

No.	Characteristic
1.	'Unevenness' visible in oblique light, especially on dark surfaces.
2.	Visible cloudiness with an additional coat of lacquer.
3.	If narrow surfaces in cut-outs have to be covered manually, small inaccuracies are permissible, such as cut edges that are not quite straight or edges not quite evenly broken.
4.	Pressure marks resulting from prolonged pressure at specific points. (=> generally disappear after a longer period of time)

6.6.2 Uncountable / poorly countable defects

No.	Characteristic / defect
5.	Mechanical damage to the surface
6.	Elevations
7.	Cracks
8.	Scratches

- **A zones:** no defects must be visible when inspected under the conditions listed in 6.1
- **B zones:** defects must not be visible from a distance of 2m
- **C zones:** technical requirements apply



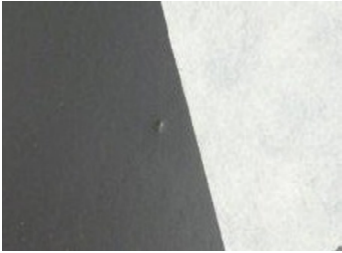
6.6.3 Countable defects

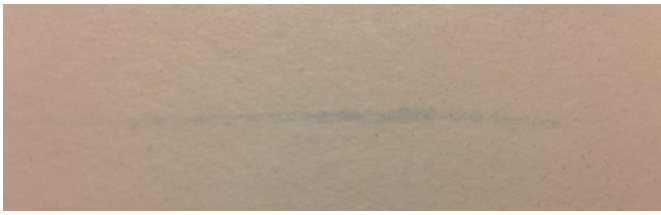



See 6.2

No.	Characteristic / defect	Defect from size: [mm]		
		Width:	Length:	Height:
9.	Fibres	0.1	5.0	0.1
10.	Inclusions that are visible or palpable	1.0	1.0	0.1
11.	Streaks of pigments or linoleum granules of a different colour	1.0	5.0	uncountable
12.	Sanding dust visible as a beige or white spot	0.2	1.0	uncountable
13.	Other impurities in linoleum	1.0	1.0	uncountable
14.	Slight pressure marks	up to Ø12mm		-
15.	Lacquer sags in glued edge joints	0.5	3.0	Per 1m
16.	Split on narrow sides of cut-outs	0.5		

- **A zones:** Max. 2 defects at minimum distance of 1.5m
- **B zones:** 5x per zone authorised, min. distance 0.5.
- **C zones:** Technical requirements apply.

6.6.4 Description of characteristics / defects

No.	Characteristic / defect	Description / image
1.	Unevenness	
2.	Cloudiness	
3.	Inaccuracies	
4.	Pressure marks	
5.	Mechanical damage	
6.	Elevations	
7.	Cracks	
8.	Scratches	
9.	Fibres	
10.	Inclusions	

<p>11.</p>	<p>Streaks of pigment</p>	
<p>12.</p>	<p>Sanding dust</p>	
<p>13.</p>	<p>Other impurities in linoleum</p>	
<p>14.</p>	<p>Slight pressure marks</p>	
<p>15.</p>	<p>Lacquer sags</p>	
<p>16.</p>	<p>Splits in narrow sides</p>	