

RESOPAL® Compact

PRODUCT DATA SHEET

1. MATERIAL DESCRIPTION AND COMPOSITION

RESOPAL Compact panels are decorative high-pressure laminates (HPL) according to EN 438-3 and ISO 4586.

RESOPAL Compact panels consist of layers of fibrous cellulose material (usually paper) impregnated with thermosetting synthetic resins that cure under heat and high pressure. The process, defined as the simultaneous application of heat (≥ 120 °C) and high specific pressure (≥ 5 MPa), enables the flowing and subsequent curing of the thermoset resins to obtain a homogeneous and nonporous material (density ≥ 1.35 g/cm³) with the required surface finish.

Basically, more than 60 % of the RESOPAL Compact consists of paper and the remaining 30 to approximately 40 % consists of phenol-formaldehyde resin for the core layers and melamine-formaldehyde resin for the decorative top layer.

RESOPAL Compact panels are available in various dimensions, thicknesses, and textures. The core is a phenolic black standard core for Compact type CGS. If a fire retardant Compact (type CGF) is required, the black laminate core can be treated with a halogen-free additive.

This product data sheet covers the products RESOPAL Compact (standard (S)) and RESOPAL Compact F (flame-retardant (F)).

RESOPAL surfaces have antibacterial properties. This contributes to surface hygiene. An expert opinion from an independent testing institute confirms a reduction in the number of germs of 99.9% compared to the initial germ count.



- 1 Decor paper both sides, melamine resin impregnated
- 2 Core paper (kraft paper), phenol resin impregnated

2. FORMATS

This information is available on our website www.resopal.de/infobook in accordance with our delivery program.

3. AREAS OF APPLICATION

Table 1 Classification system and typical applications (source EN 438-4)

PERFORMANCE CATEGORY	MATERIAL TYPE	NUMERICAL CLASSIFICATION INDEX NUMBERS			EQUIVALENT ALPHABETICAL CLASSIFICATION	EXAMPLES OF TYPICAL APPLI-CATIONS ¹
		Wear resistance (revolutions)	Impact resistance (max. diameter of indentation)	Scratch resistance (Rating ²)		
high resistance to wear high resistance to impact high resistance to scratching	S, F	≥ 150	Drop height: 1400 mm $2 \text{ mm} \leq t < 6 \text{ mm}$ Drop height: 1800 mm $t \geq 6 \text{ mm}$ diameter of indentation: $< 10 \text{ mm}$	≥ 3	CGS (Compact grade, general purpose, standard grade) CGF (Compact grade, general purpose, flame-retardant grade)	kitchen and office worktops restaurant and hotel desks and tables doors and wall cladding in public spaces interior walls claddings for public transport (trains, buses)

From a material thickness of $\geq 6 \text{ mm}$ RESOPAL Compact panels are also used as self-supporting structural panels. In this case you need no additional substrate.

¹ The examples indicate typical applications of RESOPAL Traceless Premium compact panels. The application of RESOPAL Traceless Premium panels depends on several factors (e.g., temperature, relative humidity, change in climatic conditions, fasteners, fire behavior requirements, etc.). Therefore, the suitability of RESOPAL Traceless Premium compact panels for the respective application must be checked in advance.

² $\geq 90\%$ continuous double circle of scratch marks only clearly visible, Rating 1 - 1N, Rating 2 - 2N, Rating 3 - 4N, Rating 4 - 6N, Rating 5 - > 6N

4. TECHNICAL DATA

4.1 TECHNICAL PROPERTIES ACCORDING TO EN 438-4

Table 2 Technical properties according to EN 438-4

PROPERTY	TEST METHOD EN 438-2: 2016	UNIT	CGS	CGF
Physical properties, dimensions, and tolerances				
Density	EN ISO 1183-1	g/cm ³		≥ 1.35
Thickness	EN 438-2-5	mm		
		2.0 ≤ t < 3.0		± 0.20
		3.0 ≤ t < 5.0		± 0.30
		5.0 ≤ t < 8.0		± 0.40
		8.0 ≤ t < 12.0		± 0.50
		12.0 ≤ t < 16.0		± 0.60
		16.0 ≤ t < 20.0		± 0.70
		20.0 ≤ t < 25.0		± 0.80
		25.0 ≤ t		³
Length and width	EN 438-2-6	mm		+ 10 / - 0
Edge straightness	EN 438-2-7	mm/m		≤ 1.5
Edge squareness	EN 438-2-8	mm/m		≤ 1.5
Edge quality	EN 438-2-4		Edge chipping up to 3 mm on each side is permissible	
Flatness	EN 438-2-9	mm/m		
		2.0 ≤ t < 6.0		≤ 8.0
		8.0 ≤ t < 10.0		≤ 5.0
		10.0 ≤ t		≤ 3.0
Dimensional stability at elevated temperature	EN 438-2-17	%		
		2 mm ≤ t < 5mm		
		Longitudinal		≤ 0.40
		Transverse		≤ 0.80
		5 mm ≤ t		
		Longitudinal		≤ 0.30
		Transverse		≤ 0.60
Co-efficient of thermal expansion	DIN 51045 +80 °C/-20 °C	1/K		
		Longitudinal		0.9 × 10 ⁻⁵
		Transverse		1.6 × 10 ⁻⁵
Mechanical properties				
Resistance to immersion in boiling water	EN 438-2-12	%		
		Mass increase		
		2 mm ≤ t < 5 mm	≤ 5.0	≤ 7.0
		5 mm ≤ t	≤ 2.0	≤ 3.0
		%		
		Thickness increase		
		2mm ≤ t < 5mm	≤ 6.0	≤ 9.0
		5 mm ≤ t	≤ 2.0	≤ 6.0
		Surface rating ⁴	≥ 4	≥ 4
		Edge rating ⁵	≥ 3	≥ 3

³ To be agreed between supplier and customer

⁴ Rating 5 - no visible change, Rating 4 - slight change of gloss and/or color, only visible at certain viewing angles, Rating 3 - moderate change of gloss and/or color, Rating 2 - marked change of gloss and/or color or surface blistering, Rating 1 - Surface layers delamination

⁵ Rating 5 - no visible change, Rating 4 - slight hairline edge cracks visible to the naked eyes, Rating 3 - moderate edge cracks, Rating 2 - severe edge cracks, Rating 1 - core layers delamination

PROPERTY	TEST METHOD EN 438-2: 2016	UNIT	CGS	CGF
Resistance to impact by large-diameter ball	EN 438-2-21	mm 2 mm ≤ t < 6 mm 6 mm ≤ t		≥ 1400 ≥ 1800
		Indentation diameter		≤ 10
Resistance to crazing	EN 438-2-24	Rating ⁶ Appearance t ≤ 20 mm		≥ 4 ⁷
Flexural modulus	EN ISO 178	MPa Longitudinal Transverse		≥ 9000 ≥ 9000
Flexural strength		MPa Longitudinal Transverse		≥ 80 ≥ 80
Surface properties				
Dirts, spots, etc.	EN 438-2-4	mm ² /m ²		≤ 1.0
Fibers, hairs, scratches		mm/m ²		≤ 10
Resistance to surface wear	EN 438-2-10	Revolutions		≥ 150
Resistance to water vapour	EN 438-2-14	Rating ³		≥ 4
Resistance to dry heat (160 °C)	EN 438-2-16	Rating ³		≥ 4
Resistance to wet heat (100 °C)	EN 438-2-18	Rating ³		≥ 4
Resistance to scratching	EN 438-2-25	Rating ²		≥ 3
Resistance to staining	EN 438-2-26	Rating ³		5
		Groups 1 & 2 Group 3		≥ 4
Light fastness (xenon arc)	EN 438-2-27	Grey scale rating		4 - 5
Fire behaviour				
Fire behaviour ⁸ (CWFT ⁹) (Building construction)	EN 13501-1	Building material class		B-s1, d0
		t ≥ 3 mm t ≥ 6 mm t ≥ 10 mm	D-s1, d0 C-s2, d0	B-s1, d0 B-s1, d0
Thermal value	EN ISO 1716	MJ/kg		18-20

CGS: C (Compact grade), G (General purpose), S (Standard grade)

CGF: C (Compact grade), G (General purpose), F (Flame-retardant grade)

Additional information regarding product quality (standard/flame-retardant) is also available on our website www.resopal.de/infobook.

⁶ Rating 5 - Surfaces and edges unchanged from 'as received' condition, Rating 4 - Surfaces unchanged with slight hairline edge cracks visible to the naked eye, Rating 3 - Surface cracks visible to the naked eye and/or moderate edge cracks, Surface 2 - Moderate surface cracks and/or severe edge cracks, Rating 1 - Severe cracks and/or delamination

⁷ Thickness t > 20 mm: rating < 4

⁸ Consider details (e.g., Classification report, Official Journal of the European Union); e.g., validity in combination with substrate, adhesive system

⁹ CWFT-Certified without further testing - see Official Journal European Union

4.2 ADDITIONAL TECHNICAL PROPERTIES AND SAFETY INFORMATION

Table 3 Additional technical properties

PROPERTY	DESCRIPTION
Physical and chemical properties	
Physical state	Solid
Solubility	Insoluble in water, oil, methanol, diethyl ether, n-octanol, acetone
Boiling point	None
Evaporation rate	None
Melting point	RESOPAL Compact does not melt
Calorific value	18-20 MJ/kg
Heavy metals	RESOPAL Compact panels contains no toxic compounds based on antimony, barium, cadmium, chromium III, chromium VI, lead, mercury, selenium
Bisphenol A (BPA)	RESOPAL Compact contains no components
Asbestos	RESOPAL Compact contains no components
Pentachlorophenol (PCP)	RESOPAL Compact contains no components
RoHS	RESOPAL Compact meets the requirements of EU guidelines 2011/65, 2015/863 RoHS (Restriction of Hazardous Substances). RESOPAL Compact contains none of the following restricted substances: lead, mercury, cadmium, chromium, polybrominated biphenyls (PBB), polybrominated diphenyl ether (PBDE), pentabromodiphenyl ether (PentaBDE), octabromodiphenyl ether (OctaBDE); Bis(2-ethylhexyl)phthalate (DEHP), butyl benzyl phthalate (BBP), dibutyl phthalate (DBP), diisobutyl phthalate (DIBP)
BPR - Biocidal Product Regulation	Resopal Compact complies with Biocidal Regulation EU Nr. 528 2012
Safety data sheet	RESOPAL Compact panels boards are not hazardous substances within the meaning of the Chemicals Act / no special labelling or safety data sheet is required
Stability and reactivity information	
Stability	RESOPAL Compact panels are stable and durable; it is neither reactive nor corrosive
Hazardous/dangerous reactions	None
Incompatibility	Strong acids or alkaline solutions may damage the surface
Fire and explosion protection data	
Ignition temperature	approx. 400 °C
Flashpoint	None
Thermal decomposition	Possible above 250 °C. Toxic gases (e.g. carbon monoxide, carbon dioxide, ammonia) may arise depending on the fire conditions (temperature, oxygen content, etc.)
Smoke and toxicity	RESOPAL Compact panels can be used in areas where smoke and toxicity is controlled (e.g. railway construction)
Flammability	RESOPAL Compact panels are classified as non-flammable. It only burns in real fires in which open flames are present.
Extinguishing agent	Class A
Explosion hazards	Dust class ST-1
Explosion limits	Maximum dust concentration 60 mg/m ³
Electrostatic behaviour	Compact panels minimize the generation of charges due to contact separation or friction with another material. It does not need to be grounded. The surface resistance is between 10 ⁹ -10 ¹² Ohm and the chargeability is V < 2 kV according to EN 61340-4-1, making RESOPAL Compact panels an antistatic material.

5. CERTIFICATIONS AND TESTS

Table 4 Certifications and test reports

PROPERTY	TEST METHOD	UNIT	CGS	CGF
Fire behaviour ⁸ (CWFT) ⁹ (Building construction)	EN 13501-1	Building material class t ≥ 3 mm t ≥ 6 mm t ≥ 10 mm	D-s1, d0 C-s2, d0	B-s1, d0 B-s1, d0
Fire behaviour ⁸ (Transportation/Train)	EN 45545-2	Class 2 mm ≤ t < 20 mm	-	HL2
Fire behaviour ⁸ (Transportation/motor vehicle)	ECE R118 Annex 6, 7, 8	2 mm ≤ t < 6 mm	pass	-
Declaration of Performance (DoP)	EN 438-7	System t ≥ 6 mm	3	1
Emission VOC (Volatile organic compounds)	ISO 16000-9	Emission class according to French regulation (Décret no 2011-321)	A (scenario wall) A+ (scenario door)	
Emission Formaldehyde	EN 16516	Classification	E1 (≤ 0.1 ppm)	
DE-UZ 76 (Blue Angel)	EN 16516; ISO 16000; Blue Angel (DE-UZ 76)	Conclusion	Pass Emission requirements according to DE-UZ 76 ("low emission panel materials for interior design") are met	
Declaration of harmlessness food safe	EN 1186 EN 13130 CEN/TS 14234	Contact with food	Yes	
Environmental product declaration (EPD) ¹⁰	ISO 14025 / DIN EN 15804	Available	Yes	
Antibacterial effect ¹¹	JIS Z 2801/ ISO 22196	Reduction in %	99.9	
Decontamination	DIN 25415:2012; ISO 8690:2020	Ease of decontamination	Excellent	
PEFC ¹²		Certification	Upon request	
FSC ^{®12}		Certification	Upon request	
Allergy-friendly products	ECARF quality label	Allergy-friendly Certification	ECARF-certificate allergy-friendly quality confirmed	

6. TRANSPORT AND STORAGE

RESOPAL Compact panels must be transported and stored flat, horizontal, with full-surface contact and on a sufficiently large pallet. RESOPAL Compact panels are not dangerous goods as defined by transport regulations, therefore labeling is not required.

Panels must be stored in a closed storage area under normal indoor conditions (10-30 °C and 40-65 % relative humidity), and protected against moisture and mechanical damage, with suitable protection. The protection placed on top of the pallet must be maintained whenever panels are

¹⁰ Environmental product declaration (EPD-ICL-20220237-CBE1-EN) dated 18.11.2022

¹¹ Information Sheet Biocidal Regulation EU Nr. 528/2012

¹² Specify with order

removed from the stack. If the panels are stored for a long period of time, ensure flat storage, and place a panel on top to weigh on the laminates, otherwise the panels may warp or deform. In case of vertical storage, we recommend an inclined position at 80 ° with full-surface support and a counter bearing on the floor to prevent slipping.

7. HANDLING AND MACHINING

Before starting, please inspect the product for damage and defects between panels prior to cutting or installation (including color and texture) and ensure that the production direction is considered. The product direction has an influence on the dimensional change as well as on mechanical strength and can have an influence on the appearance due to the reflection of light.

Due to the product-specific differences in production technologies (e.g., RESOPAL Compact, RESOPAL HPL and RESOPAL MFB etc.), even identical decor, structure or core board combinations can result in slight optical and tactile deviations across different product groups and formats.

A consistent core color cannot be guaranteed for the product RESOPAL Compact panels (CGS/CGF).

The usual safety regulations regarding dust removal and fire protection must be observed when processing RESOPAL Compact panels. Due to possible sharp edges, protective gloves should always be worn when handling RESOPAL Compact panels. Contact with dust does not cause any issues; nevertheless, there are a limited number of people who may have an allergic reaction to processing dust of all kinds (and therefore also to HPL/Compact dust).

RESOPAL Compact is a wood-based product, and its dimensions are constantly adapting to ambient conditions. The product can be processed with woodworking machines. For a suitable tool recommendation of your individual machining please contact the tool manufacturer directly.

When planning and processing compact panels, please note the fiber direction (fiber course along the length dimension). This has an influence on the dimensional change as well as on mechanical strength.

CONDITIONING

RESOPAL Compact panels must be conditioned on a flat surface before processing (≥ 3 days). A good conditioning is achieved in a moderate interior climate (18-25 °C and 40-65 % relative humidity). These conditions are also recommended for the location where the product will be used later.

If RESOPAL Compact panels will be exposed to consistently low or high humidity during its subsequent use, it is advisable to expose RESOPAL Compact panels to a correspondingly low or high level of humidity or increased temperature during conditioning.

Further processing instructions for RESOPAL Compact panels can be found in the Technical Manual (Processing RESOPAL Massiv).

8. CLEANING AND CARE

RESOPAL Compact surfaces do not require special care due to their homogenic and resistant surface, even too many substances/chemicals¹³. Surfaces and edges require no further treatment (e.g., with lacquers, paints, oils, waxes etc.), as they are neither corrosive nor oxidized.

For residue-free cleaning of RESOPAL Compact surfaces, four steps should be followed:

01 Choose the appropriate cleaning aids (cloth/sponge/brush) - depending on the structure

Choose the appropriate solvent - depending on dirt residues

02 Clean the surface with the appropriate cleaning aids and solvents

03 Rinse of all solvent with warm water

04 Dry the surface with a soft cloth after cleaning to preserve a perfect aspect

Clean the entire surface without too much "pressure" to avoid traces and polishing marks.

Especially matt textures/structures of RESOPAL Compact, it is important to regularly clean the surface according to the above instruction and clean with warm water to avoid the accumulation of dirt and residue of cleaning agent/solvent into the tight structure folding.

In case of stubborn stains and soiling which lay in the depth of the microstructure, the dirt can be removed with the help of a humid melamine sponge (magic sponge) or microfiber cloth (e.g., Jemako¹⁴ or similar). Other stubborn stains (e.g., varnish) can be removed with organic solvents (e.g., ethanol, isopropanol, acetone etc.).

Abrasive cleaning aids (e.g., scouring powder, steel wool) must not be used, as these alter the surfaces. Please always carry out cleaning tests with every cleaning agent on non-visible areas at the beginning.

Strongly staining substances (e.g., mustard, curcuma) may leave slight stains on the surface of RESOPAL Compact panels. To avoid permanent staining these stains must be removed immediately.

The visual perception of traces of daily use (e.g., gloss deviations, dirt and grease stains etc.) are influenced by the decor and surface texture. The traces of use are more visible on smooth surfaces and are even more emphasized in combination with dark decors.

For further information, please refer to the technical data sheets on cleaning and care of RESOPAL melamine and acrylic surfaces.

¹³ Data_Sheet_Resistance_RESOPAL_HPL, Data_Sheet_Resistance_to_Desinfectant_RESOPAL_HPL

¹⁴ Further information available in our data sheets for tested cleaners

9. SUSTAINABILITY AND ENVIRONMENT

Resopal is certified according to EN ISO 14001 and EN ISO 50001.

RESOPAL Compact is cured, and therefore inert, duroplast. The formaldehyde emission complies with the limit value of 0.1 ppm according to EN 16516 (corresponds to 0.05 ppm according to EN 717-1) and the German requirements (Chemikalienverbotsverordnung).

Furthermore, the emissions of volatile organic compounds (VOC) are so low that, depending on the test scenario, the following classifications according to the French VOC regulation have been given by Eurofins test reports:

Class A+ (with the test scenario for small areas (e.g., doors) with a loading factor of 0.05 m²/m³)

Class A (with the test scenario for walls with a loading factor of 1.0 m²/m³)

RESOPAL Compact panels are suitable for direct contact with all foods and can be safely used as intended during food processing.

The ICDLI's Environmental Product Declaration (EPD) outlines Compact's excellent environmental properties. Using clearly defined parameters, it provides quantitative, verified, and objective information about the effects of Compact on the environment and could be used for sustainable building certification. (e.g., DGNB, LEED, BREEAM). The entire lifecycle of Compact (raw material extraction, production, transport, use, disposal) is taken into consideration.

RESOPAL Compact panels can be offered as a PEFC or FSC® certified product on request. In addition, all the paper used (core paper and decorative paper) comes from non-controversial or controlled sources and meets the requirements of EUTR Act (EU) No. 995/2010 requirements.

RESOPAL Compact panels are articles and not chemical substances, therefore the REACH ordinance is not applicable. However, it is important to ensure the exchange of information between RESOPAL and the raw material suppliers regarding REACH-relevant components (for more information, please refer to the REACH technical data sheet). We hereby confirm that no substance from the Candidate List is used in our above-mentioned products in a quantity requiring information ($\geq 0,1\%$ w/w) and that we comply with the requirements of Annexes XIV and XVII of the REACH Regulation.

10. DISPOSAL AND ENERGY RECOVERY

RESOPAL Compact panels can be disposed of at controlled waste disposal facilities (e.g., landfills) that comply with the applicable national and regional regulations. According to the European Waste List Regulation, HPL/Compact waste is classified with code 030105 (wood wastes), 200301 (mixed municipal waste).

RESOPAL Compact panels are particularly suitable for thermal recycling due to its high calorific value (18–20 MJ/kg). During complete combustion at 700 °C, the boards burn to form water, carbon dioxide and nitrogen oxides. Therefore, RESOPAL Compact panels meet the requirements for energy recovery

according to § 8 of the German Recycling Management Act. The conditions for good combustion are met in modern, officially approved industrial incineration facilities. The ashes from these incineration processes can be taken to controlled landfills.

11. OVERVIEW OF TECHNICAL DOCUMENTS

General

Resopal Brochure INFOBOOK
 Technical Manual - General Processing Recommendations for RESOPAL HPL
 Technical Manual - Processing of RESOPAL Massiv
 Technical Manual - Shaped parts made of RESOPAL Massiv
 Declaration of Conformity; CE
 HPL Compendium

Certifications and test reports

Official Journal European Union EN 13501-1; D-s2, d0
 Declaration of Conformity RoHS
 Classification Report EN 13501-1 core black 10mm; C-s2, d0 (Building construction)
 Classification Report EN 13501-1; B-s1, d0 (Building construction)
 Classification Report EN 13501-1; 3mm; B-s1, d0 (Building construction)
 Test Report EN 45545; HL 2 (Transportation/train)
 Test report ECE R118 (Transportation/bus)
 Test Report VOC Indoor Air Comfort Gold A+ (small area, e.g., doors)
 Test Report VOC Indoor Air Comfort Gold A (area wall)
 VOC Emission Test Report DE-UZ 76 (Blue Engel)
 Attestation RAL DE-UZ 76 Blue Engel
 Expert opinion antibacterial efficiency
 Information sheet biocidal regulation
 Certificate of Compliance ISEGA (contact with food harmless)
 ECARF Certificate
 Decontamination test report

Cleaning and Care

Data Sheet cleaning and care of Resopal melamine and acrylic surfaces
 Data Sheet Cleaning and care instructions tested cleaners
 Data Sheet Resistance Resopal HPL
 Data Sheet Resistance to disinfectant Resopal HPL
 Technical manual - RESOPAL in situations with particular problems due to chemicals

Sustainability and environmental

Environmental Product Declaration (EPD) for Compact (ICDLI)
 Environmental Product Declaration (EPD) - Explanation of the EPDs (ICDLI)
 Certificate PEFC
 Certificate FSC
 Certificate EN ISO 9001
 Certificate EN ISO 14001
 Certificate EN ISO 50001
 Building Environmental data sheet DGNB
 Building Environmental data sheet LEED

Building Environmental data sheet BREEAM
Environmental passport Compact
Regulation REACH
Customer information on melamine as SVHC substance

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