STEULER | Linings

TI 217

Technical Information Surface Protection Linings
Issue 12.01.2023

OXYDUR VEL

Laminate system for concrete and steel substrates

Base

Vinyl ester resin

Material Group

Sealing layers

Tank- / vessel linings - laminates

Description

Laminate system for producing chemically resistant and fluid-resistant linings on concrete and steel surfaces. The system can be covered with tiles or bricks to increase durability. It is also possible to applied the laminate as a self-supporting constructional laminate. The possible application depends on the project-specific demands.

Use

To produce chemically resistant, fluid-resistant and thermally stable layers. For tanks, columns, reactors, towers or channels or as the surface for tiles or bricks, also for foundations or concrete surfaces; as a part of construction laminates.

Properties

- highly chemically resistant
- temperature resistant (load at the surface of the laminate): up to 60 °C as sealing layer on concrete substrates; up to 100 °C on steel substrates depending on chemical load; up to 120 °C as sealing layer under tile or brick linings, to 180 °C with dry exposure on steel substrates

Physical Data

Property [unit], Test method	Value
Density [g/cm³], DIN EN ISO 1183-1, ASTM D 792	1.43
Flexural strength [MPa], DIN EN ISO 178, ASTM C 580	170
Modulus of elasticity [MPa], DIN EN ISO 178, ASTM C 580	18,300
Elongation at tear [%], DIN EN ISO 527	2.8
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531	2.8×10^{-5}
Tensile strength [MPa], DIN EN ISO 527	170
	Data are mean values

Chemical Resistance

For detailed information about the chemical resistance please refer to Technical Information TI 210A.

Please contact our Application Technology Department for approval of the project-specific possible application.

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Substrate

The substrate should have a temperature of approx. 10–30 °C.

Concrete / screed

Refer to DIN EN 14879-1 as well as to STEULER-KCH-Formsheet 010.

To achieve sufficient adhesive tensile strength, the substrate must generally to be pretreated in such a way that it is free of cement slurry, cement skin, loose and friable parts, structural defects and separating substances.

The residual moisture of cementitious substrates must not exceed 4 %.

Steel

Refer to DIN EN 14879-1 as well as to STEULER-KCH-Formsheet 020.

The steel surface shall be sandblasted to a metallic bright finish. A preparation degree of SA 2 ½ as specified in DIN EN ISO 12944-4 and a roughness grade “medium (G)” as specified in DIN EN ISO 8503-1 must be achieved; minimum surface roughness R_z = 70 µm. After blasting, the formation of new rust must be prevented by suitable measures, e. g. priming directly.

Moisture

During application, the substrate must be kept absolutely dry. No moisture (condensate, mist, etc.) must get onto the material. Distance to dew point has to be at least 3 K, at a relative humidity of above 70 % at least 5 K.

System Design

- Primer with OXYDUR VEV (see TI 115)
- Oxydur VEL Laminate (different designs possible)
- OXYDUR VEV TOP COAT (see TI 115)

Packaging / Shelf life

All components must be stored and transported dry. The minimum shelf life applies to a storage temperature of 20 °C, unless otherwise specified. Higher temperatures reduce, lower temperatures increase the minimum shelf life.

Component	Item number	Package	Content	Shelf life
Oxydur-VEL-Solution	5032033001	Hobbock	25 kg	6 Months
Oxydur-Accelerator OF	5032011023	Canister	2.5 kg	12 Months
Oxydur-Hardener 20	5011052003	Drum	5 kg	12 Months
Glass-Fibre-Mat 300 g/m²	9300900390	Roll 1.27 m wide		unlimited
Glass-Fibre-Mat 450 g/m²	9300900388	Roll 1.27 m wide		unlimited
Glass-Fleece 30 g/m²	9300900089	Roll 1.00 m wide		unlimited

For handling, transport and storage observe the relevant safety data sheets.

Mixing Ratio / Consumption

OXYDUR VEV Primer

	Part by weight	Part by volume
See TI 115		

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Oxydur VEL Laminate

	Part by weight	Part by volume
Oxydur-VEL-Solution	5.0 kg	4.6 l
Oxydur-Accelerator OF	0.1 kg	105 ml
Oxydur-Hardener 20	0.3 kg	0.5 l
Depending on the project specific geometry, necessary additional consumption for overlaps of Glass-Fibre-Mats and laminating solution are to be considered.		
Consumption depends on design		
1 layer Glass-Fibre-Mat 300 g/m² + 1 layer Glass-Fleece 30 g/m²	0.800 kg/m²	
2 layers Glass-Fibre-Mat 300 g/m² + 1 layer Glass-Fleece 30 g/m²	1.600 kg/m²	
1 layer Glass-Fibre-Mat 450 g/m² + 1 layer Glass-Fleece 30 g/m²	1.250 kg/m²	
2 layers Glass-Fibre-Mat 450 g/m² + 1 layer Glass-Fleece 30 g/m²	2.500 kg/m²	
3 layers Glass-Fibre-Mat 450 g/m² + 1 layer Glass-Fleece 30 g/m²	3.600 kg/m²	
Application steps: depending on configuration		
For Glass-Fibre-Mat and Glass-Fleece a consumption of 1.1 m² per layer is to be considered due to the necessary overlapping.		

OXYDUR VEV Top Coat

	Part by weight	Part by volume
See TI 115		
Consumption	approx. 0.400 kg/m²	
Application steps	2	

Waiting Times

Between the layers to support foot traffic at least 1.5 h, max. 24 h.

Top Coat minimum 2 h, maximum 12 h.

Pot Life

Pot life depends on temperature:

10 °C	approx. 70 minutes
20 °C	approx. 40 minutes
25 °C	approx. 15 minutes

Curing times

Time to walkability between single applications depend on the temperature:

10 °C	minimum 10 h	maximum 48 h
20 °C	minimum 3 h	maximum 24 h
25 °C	minimum 1.5 h	maximum 8 h

The finished coating is fully mechanically and chemically resistant at 20 °C after 7 days.

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Safety and Disposal

- Sufficient ventilation and venting (especially in pits and tanks).
- No smoking/no fire
- Refer to the safety data sheets.
- Observe hazard warnings and safety instructions on labels.
- Wear required personal protective equipment (avoid skin contact with materials).
- Clean and protect hands with skin protective soap and skin protection cream (no solvents).
- Wear a dust mask during grinding work (e.g. during repairs).
- Operating instructions as per § 14 of GefahrstoffV (Toxic Substances Act) and TRGS 507 (Technical regulations for Hazardous Substances - Germany).
- Accident prevention regulations by the Liability Insurance Association for the Chemical Industries (Germany).

Avoid direct contact of the materials with the flame, especially during welding work (welding beads) on site.

Preferably consume residual quantities. Do not pour into a spout or dustbin! Collect separately for disposal in durable, lockable and labelled containers.

GISCODE

Product	GISCODE
Oxydur VEV Primer	SB-STY30
Oxydur VEL Laminate	SB-STY30
Oxydur VEV Top Coat	SB-STY30

Cleaning of Equipment

Tools soiled with uncured materials can be cleaned with STEULER UNIVERSAL CLEANER (Technical Information TI 190). Only clean in well ventilated areas.

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