

TI 217B

Technical Information Surface Protection Linings
Issue 18.09.2019

OXYDUR VEL U

Laminate system for concrete and steel substrates

Base

Vinyl ester resin

Material Group

Sealing layer

Tank- / vessel linings - laminates

Description

Laminate system for producing chemically resistant and fluid-resistant panels on concrete and steel surfaces. To improve the resistance, it can be covered with tiles or bricks and is suitable for application on concrete and steel surfaces.

It is also possible to apply the system 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 panelling 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

- high chemical resistance
- Thermal resistance (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/cm ³], 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, ASTM C 307	2.8
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531	2.8 x 10 ⁻⁵
Tensile Strength [MPa], DIN EN ISO 527, ASTM C 307	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 engineering for approval of the project-specific possible application.

Substrate

Requirements

Processing temperature	approx. 10–30 °C
Dew point distance	> 3 K
Dew point distance from 70% air humidity	> 5 K

Optimal temperature is 20 °C. Higher and lower temperatures influence the processing time and consistency of the compounds and can change consumption, coating thickness and properties.

Concrete / screed

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

To attain a sufficient adhesive tensile strength, the substrate is generally to be pretreated in such a way that it is free of cement slurry, cement skin, loose and crumbly particles, structure imperfections and separating substances.

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

The condition of the substrate must be documented by STEULER-KCH-Test protocol 006 (concrete) or STEULER-KCH-Test protocol 007 (screed).

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 $R_z = 70 \mu\text{m}$. After blasting, the formation of new rust must be prevented by suitable measures, e. g. priming directly.

The condition of the substrate must be documented by STEULER-KCH-Test-Record 003 (Steel) or STEULER-KCH-Test-Record 004 (Inspection of Grit Blasting Works).

Moisture

During application, the substrate must be kept absolutely dry. Uncured material has to be protected from any kind of moisture (condensation, fog, precipitation or other water source).

System Design

- Oxydur VEL U Primer
- *Alternative: Alkadur HR Primer (preferably on concrete/screed)*
- Oxydur VEL U Filling (application on concrete or on sprinkled primer)
- Oxydur VEL U Laminate (different configurations possible)
- if necessary adhesion layer for subsequent tile- / brick-linings or coating systems

Packaging / Shelf life

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

Components	Item number	Package	Content	Shelf life
Alkadur-HR-Solution	5035197020	Drum	16 kg	24 Months
Alkadur-HR-Hardener	5035198085	Drum	8.8 kg **	24 Months
Oxydur-VEU-Solution	5032042001	Drum	25 kg	6 Months
Oxydur-Accelerator D	5032007023	Jug	2.5 kg	24 Months
Oxydur-Hardener C	5032015007	Bottle	1 kg	12 Months
Oxydur-WV-Powder	5011119002	Bag	20 kg	24 Months
SKC-Filler 16	5011203001	Bag	25 kg	24 Months
Glass-Fibre Mat 450 g/m ²	9300900388	Roll 1.27 m wide		unlimited
Glass-Fibre Mat 300 g/m ²	9300900390	Roll 1.27 m wide		unlimited
Glass Fleece 30 g/m ²	9300900089	Roll 1.00 m wide		unlimited

** predosed packaging

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

Mixing Ratio / Consumption

Oxydur VEL-U Primer

	Part by weight	Part by volume
Oxydur-VEU-Solution	1.00	0.917
Oxydur-Accelerator D	0.021	0.021
Oxydur-Hardener C	0.025	0.025
Consumption	approx. 0.200 kg/m ² on steel approx. 0.250 kg/m ² on concrete	
Work steps	1	
In the case of waiting times longer than 24 h through to the application of the next layer , the primer must always be sprinkled with SKC-Filler 16 when fresh; total consumption: 1.500 kg/m ²		

Alternatively:

Alkadur HR Primer

	Part by weight	Part by volume
Alkadur-HR-Solution	1.8	1.6
Alkadur-HR-Hardener	1.0	1.0
Total consumption in kg/m ² (approx.)	0.250	
Work steps	1	
Sprinkle with SKC-Filler 16; Total consumption: approx. 1.500 kg/m ²		

Oxydur VEL-U Filling

	Part by weight	Part by volume
Oxydur-VEU-Solution	1.000	0.917
Oxydur-Accelerator D	0.021	0.021
Oxydur-Hardener C	0.025	0.025
Oxydur-WV-Powder	1.800	2.308
Consumption	approx. 2.300 kg/m ²	
Layer thickness	approx. 1.5 mm	
Work steps	1	

Oxydur VEL-U Laminate

	Part by weight	Part by volume
Oxydur-VEU-Solution	1.000	0.917
Oxydur-Accelerator D	0.021	0.021
Oxydur-Hardener C	0.025	0.025
Consumption	depends on the configuration	
Work steps	depends on the configuration	
(**) 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 configuration:		
1 layer Glass-Fibre Mat 300 g/m ² + 1 Layer Glass Fleece 30 g/m ²	0.700 kg/m ²	
2 layers Glass-Fibre Mat 300 g/m ² + 1 Layer Glass Fleece 30 g/m ²	1.400 kg/m ²	
1 Layer Glass-Fibre Mat 450 g/m ² + 1 Layer Glass Fleece 30 g/m ²	1.000 kg/m ²	
2 layers Glass-Fibre Mat 450 g/m ² + 1 Layer Glass Fleece 30 g/m ²	2.000 kg/m ²	
3 layers Glass-Fibre Mat 450 g/m ² + 1 Layer Glass Fleece 30 g/m ²	3.000 kg/m ²	
Work steps: depending on configuration		

If required, adhesive layer for subsequent tile or brick coverings, coatings

Oxydur VEL-U Primer	
Consumption	approx. 0.200 kg/m ²
Work steps	1
Sprinkling with SKC-Filler 16; Consumption: approx. 2.000 kg/m ²	

Waiting Times

Between the layers until walkability at least 1.5-3 h, maximum 24 h.

Alkadur HR Primer till an application of the next layer at 20 °C approx. 24 h.

Pot Life

Pot life depends on temperature:

Oxydur VE-mixtures

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

Alkadur HR Primer

20 °C	approx. 30 minutes
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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.

Safety and Disposal

- Sufficient aeration and de-aeration (especially in tanks and pits).
- No smoking/no fire
- Refer to the Safety Data Sheets
- Observe danger references and safety recommendation 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 when sanding (e.g. for repairs).
- Instructions as per § 14 of GefahrstoffV (Toxic Substances Act) and TRGS 507 (Technical regulations for Hazardous Substances - Germany)
- Accident precautions issued by the Liability Insurance Association for the Chemical Industries (Germany)

Do not expose materials to heat or open flame, this applies in particular to welding works (weld beads).

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

GISCODE

Product	GISCODE
Oxydur VEL U Primer	SB-STY 20
Oxydur VEL U Filling	SB-STY 20
Oxydur VEL U Laminate	SB-STY 20

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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This issue replaces all previous versions.