

TI 244E

Technical Information Surface Protection Linings
Issue 23.11.2020

OXYDUR VEL SR PROTECT 2

Electrically conductive lining system consisting of a crack-bridging and highly chemically resistant laminate system with subsequent tile or brick lining. General construction technique permit of the DIBt, Berlin: Z-59.31-488.

Base

Vinyl ester resin (sealing layer)

Material Group

Secondary containments

Combined lining system

Description and use

Combined lining system consisting of a crack-bridging laminate system with subsequent tile or brick lining. The system is highly chemically resistant and electrically conductive. The sealing layer can be produced either by machine using special spraying techniques or conventionally using Glass-Fibre-Mats.

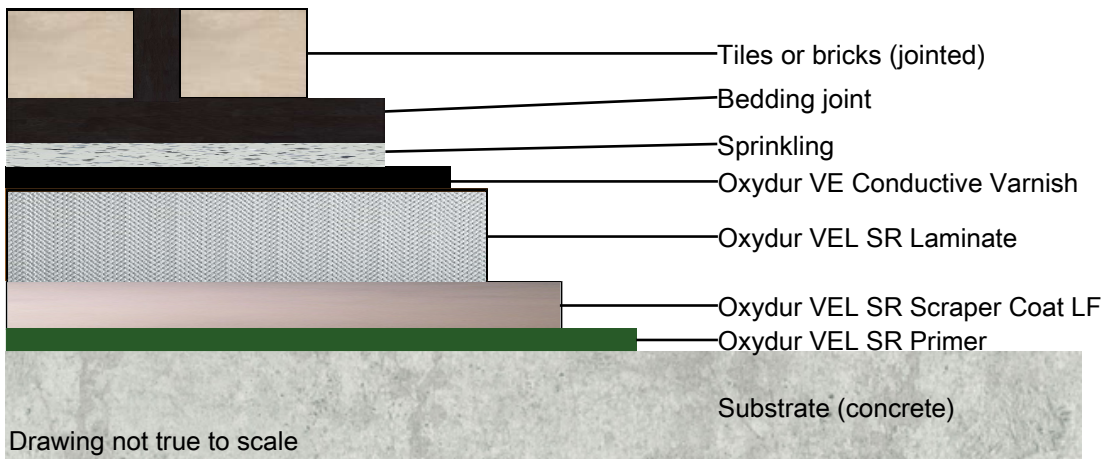
For sealing structural installations such as secondary containments in which water-polluting liquids are stored, filled and handled.

Properties

- highly chemically resistant
- The temperature resistance can reach the resistance of the mortars used, depending on the thickness of the tile and brick layer and the duration of the load. The temperature resistance will be advised in individual cases by our Application Technology Department.
- slip-resistant surface (depending on the tiles and bricks used)
- fit for vehicles with pneumatic, solid rubber, Vulkollan or polyamide tyres
- sealing layer crack-bridging up to 0.4 mm
- electrically conductive

System Design

- Oxydur VEL SR Primer
- Oxydur VEL SR Scraper Coat LF
- Spray Laminate or *alternative* Hand Laminate (with two Glass-Fibre-Mats of 300 g/m² each)
- Oxydur VE Conductive Varnish (sprinkled)
- Mortar bed und butt joints with OXYDUR VEC (see TI/VA 317) or FURADUR MORTAR (see TI/VA 322)
- Tiles or bricks (15-115 mm thick, acid-resistant bricks, red coloured ceramics or porcelain stoneware)



Physical Data

Parameters for the sealing layer

Property [unit], Test method	Value
Density [g/cm ³], DIN EN ISO 1183-1, ASTM D 792	1.4
Tensile strength [MPa], DIN EN ISO 527, ASTM C 307	60.0
Flexural strength [MPa], DIN EN ISO 178, ASTM C 580	140.0
Elongation at tear [%], DIN EN ISO 527, ASTM C 307	3.5
Modulus of elasticity [MPa], DIN EN ISO 178, ASTM C 580	5,500
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531	2.8×10^{-5}
Dissipation resistance [Ohm] to DIN EN 14879-3 at a relative humidity of > 70 %, ASTM F 150/98	$\leq 10^6$
Data are mean values	

Please refer to the corresponding technical information for the physical data of the mortars.

Chemical Resistance

Information of chemical resistance is available on request.

For use in "LAU-Anlagen" (plants for storage, filling and handling), the approved chemical resistance can be found in the respective general construction technique permit.

Substrate

Requirements

Application 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 pot life and consistency of the mixtures.

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 be pre-treated 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 %.

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

Moisture

During application, the substrate must be kept dry. The material has to be protected from any kind of moisture (condensation, fog, washing water) (except for washable joints according to the Application Instructions of the mortars used).

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-SR-Solution	5032034001	Hobbock	25 kg	6 Months
Oxydur-Accelerator OF	5032011044	Bottle	0.5 kg	12 Months
Oxydur-Hardener C	5032015007	Bottle	1 kg	12 Months
SKC-Filler 3L	5011194017	Bag	12.5 kg	24 Months
SKC-Filler 4L	5011195017	Bag	12.5 kg	24 Months
SKC-Filler 16	5011203001	Bag	25 kg	24 Months
PE-Fibre 940T	5119125007	Drum	1 kg	24 Months
Carbon-Fibre fine	5019090007	Drum	1 kg	24 Months
Spray-Roving 2400tex	5019004002	Coil	20 kg	unlimited
Glass-Fibre-Mat 300 g/m ²	9300900390	Roll 1.27 m wide		unlimited
Copper strip self-adhesive	9703301015	Roll 19-20 mm wide		unlimited

Plus the components for the mortar used.

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

Mixing Ratio / Consumption

Oxydur VEL SR Primer

Component	kg/m ²	Part by weight	kg / batch	l / batch
Oxydur-VEL-SR-Solution	0.249	1.0	2.180	2.000
Oxydur-Accelerator OF	0.005	0.020	0.045	0.045
Oxydur-Hardener C	0.006	0.025	0.055	0.055
Total	0.260		2.280	

Total consumption in kg/m² (approx.): 0.260 Batch yields in m² (approx.): 8.7

Oxydur VEL SR Scratch Filling LF

Component	kg/m ²	Part by weight	kg / batch	l / batch
Oxydur-VEL-SR-Solution	0.328	1.0	2.180	2.000
Oxydur-Accelerator OF	0.007	0.020	0.045	0.045
Oxydur-Hardener C	0.008	0.025	0.055	0.055
SKC-Filler 3L	0.247	0.750	1.640	1.950
PE-Fibre 940T	0.010	0.030	0.065	1.600
Total	0.600		3.985	

Total consumption in kg/m² (approx.): 0.500–0.800 Work steps: 1
 Batch yields in m² (approx.): 6.6 Layer thickness in mm (approx.): 0.5

Oxydur VEL SR Spray Laminate

Component	kg/m ²	Part by weight	kg / batch	l / batch
Oxydur-VEL-SR-Solution	1.532	1.000	25.000	22.900
Oxydur-Accelerator OF (10 °C)*	0.038	0.025	0.625	0.625
(20 °C)	0.030	0.020	0.520	0.520
(30 °C)*	0.023	0.015	0.375	0.375
Oxydur-Hardener C	0.038	0.025	0.620	0.620
Total	1.600		26.140	
Spray-Roving 2400tex	0.700			

One coil of Spray-Roving is sufficient for an area of approx. 25 m².

Consumption laminating solution in kg/m² (approx.): 1.600 Work steps: 1
 Batch yields in m² (approx.): 16.3 Layer thickness in mm (approx.): 1.5–2.5

Alternative: Oxydur VEL SR Hand Laminate

Component	kg/m ²	Part by weight	kg / batch	l / batch
Oxydur-VEL-SR-Solution	1.341	1.000	25.000	22.900
Oxydur-Accelerator OF (10 °C)*	0.033	0.025	0.625	0.625
(20 °C)	0.026	0.020	0.520	0.520
(30 °C)*	0.020	0.015	0.375	0.375
Oxydur-Hardener C	0.033	0.025	0.620	0.620
Total	1.400		26.140	
Glass-Fibre Mat 2x300 g/m ²	0.600			

Depending on the project-specific geometry, additional consumption of glass fibre materials and laminating solution must be planned due to the fact that the glass fibre reinforcement are overlapped.

* The pot life can be regulated by the temperature-dependent addition of Oxydur-Accelerator OF. At 10 °C, the proportion is increased by 20% (to 0.625 kg kg/batch). At 30 °C, it is reduced by 30% (to 0.375 kg/batch).

Consumption laminating solution in kg/m² (approx.): 1.400 Work steps: 1
 Batch yields in m² (approx.): 18.6 Layer thickness in mm (approx.): 1.2–1.7

Oxydur VE Conductive Varnish

Component	kg/m ²	Part by weight	kg / batch	l / batch
Oxydur-VEL-SR-Solution	0.235	1.000	2.180	2.000
Oxydur-Accelerator OF	0.005	0.020	0.045	0.045
Oxydur-Hardener C	0.006	0.025	0.055	0.055
SKC-Filler 4L	0.087	0.367	0.810	1.150
Carbon-Fibre fine	0.017	0.077	0.160	0.230
Total	0.350		3.250	

Sprinkle with SKC-Filler 16. Consumption approx. 2.0 kg/m²

Total consumption in kg/m² (approx.): 0.350 Work steps: 1
 Batch yields in m² (approx.): 9.3

Bedding and jointing mortar

- FURADUR MORTAR: see Application Instruction VA 322, electrically conductive
- OXYDUR VEC: see Application Instruction VA 317, electrically conductive

Pot Life

Pot life depends on temperature:

20 °C	approx. 50 minutes
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The pot life of the laminate is regulated by the temperature-dependent addition of Oxydur-Accelerator OF.

The pot life of the mortars can be found in the corresponding Application instructions.

Waiting and curing times

The minimum waiting time until further processing and the maximum waiting time between application steps are as follows (approx.):

Temperature	Minimum waiting time	Maximum waiting time
20 °C	12 h	36 h
30 °C	6 h	12 h

With the sprinkled conductive varnish, the maximum waiting time to be observed for subsequent tile lining does not apply as long as the sprinkling is intact and clean.

The waiting time until walkability of tiles and bricks depends on mortar is used.

At 20 °C it is:

OXYDUR VEC	4 h
FURADUR MORTAR	5 h

For further data, please refer to the corresponding Application Instruction.

The finished combined lining system can be fully loaded mechanically and chemically at 20 °C after 5 days.

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 VEL SR Primer	SB-STY 30
Oxydur VEL SR Scratch Filling LF	SB-STY 30
Oxydur VEL SR Spray Laminate	SB-STY 30
Oxydur VEL SR Hand Laminate	SB-STY 30
Oxydur VE Conductive Varnish	SB-STY 30

Please refer to the corresponding Application instructions for the GISCODES of the mortars.

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.