

TI 510

Technical Information Surface Protection Linings
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OXYDUR EP HT

Coating system for concrete and steel substrates with high chemical and thermal resistance

Base

Epoxy resin / vinyl ester resin

Material Group

Tank- / vessel linings - Floor coatings

Description and use

Combined material system based on an epoxy resin laminate with a vinyl ester resin top coat with high thermal and chemical resistance. This enables the use in many industrial areas.

Properties

- High chemical resistance
- High resistance to thermal and mechanical shock loads
- Jointless
- Plain

System Design

Alkadur EPL Laminate

- Alkadur EPL Primer
- **If necessary:** Alkadur EPL Filling with sprinkling
(for substrate levelling or to increase the layer thickness of the entire system)
- Alkadur EPL Filling
- Alkadur EPL Laminate

Alternative Top Coat 1:

Oxydur VE ES

- Alkadur EPL Primer + Sprinkling with SKC-Filler 16
- Oxydur VE Floor Filling + Sprinkling with SKC-Filler 16
- Oxydur VE Sealing with different design options

Alternative Top Coat 2:

Steulerflake SPG U

Alternative Top Coat 3:

Steulerflake STG

Physical Data

Property [unit], Test method	Value
Density [g/cm ³], DIN EN ISO 1183-1, ASTM D 792 (laminate)	1.28
Tensile strength [MPa], DIN EN ISO 527 (laminate)	130
Flexural strength [MPa], DIN EN ISO 178, ASTM C 580 (laminate)	61
Modulus of elasticity [MPa], DIN EN ISO 178, ASTM C 580 (laminate)	18300
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531 (laminate)	2.2 x 10 ⁻⁵
Data are mean values.	

Chemical Resistance

Extensive resistance to acids (also concentrated sulphuric acid), alkalis, mineral oils, solvents and other oxidising chemicals.

Please contact our Application Technology Department 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 pot life and consistency of the mixtures.

Avoid draughts and solar radiation.

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) or STEULER-KCH-Test-Record 007 (screed).

Steel

Refer to DIN EN14879-1 as well as to STEULER-KCH-Formsheet 020 and 030.

The steel surface is to be blasted to a metallic bright finish. The degree of preparation Sa 2½ according to DIN EN ISO 12944-4 and the roughness grade "Medium (G)" according to DIN EN ISO 8503-1 must be achieved; minimum roughness depth R_z = 70 µm. After blasting, the formation of new rust must be prevented by suitable measures, such as priming directly.

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

Moisture

During application, the substrate must be kept dry. No moisture (condensate, mist, etc.) must get onto the material.

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
Alkadur-EPL-Solution	5035555006	Drum	10 kg	24 Months
Alkadur-EPL-Solution	5035555001	Hobbock	25 kg	24 Months
Alkadur-EPL-Hardener	5035467003	Drum	5 kg	24 Months
Alkadur-EPL-Hardener	5035467017	Drum	12.5 kg	24 Months
Oxydur-VEU-Solution	5032042001	Hobbock	25 kg	6 Months
Oxydur-Accelerator OF	5032011044	Bottle	0.5 kg	12 Months
Oxydur-Accelerator D	5032007023	Jug	2.5 kg	24 Months
Oxydur-Hardener C	5032015007	Bottle	1 kg	12 Months
Oxydur-VE-ES-Solution RAL7030*	5032028001	Hobbock	25 kg	6 Months
Oxydur-VE-ES-Solution RAL7032*	5032030001	Hobbock	25 kg	6 Months
Steulerflake SPG-U	5032102001	Hobbock	25 kg	6 Months
Steulerflake STG	5032012001	Hobbock	25 kg	6 Months
SKC-Filler 11	5011198002	Bag	20 kg	24 Months
SKC-Filler 12	5011199001	Bag	25 kg	24 Months
SKC-Filler 16	5011203001	Bag	25 kg	24 Months
Oxydur-WV-Powder	5011119002	Bag	20 kg	24 Months
Steulerflake-Colour-Paste blue	5011015007	Drum	1 kg	12 Months
Glass-Fibre-Mat 300 g/m ²	9300900390	Roll 1.27 m wide		unlimited
Glass-Fibre-Mat 450 g/m ²	9300900388	Roll 1.27 m wide		unlimited
Glass-Fleece 30 g/m ²	9300900089	Roll 1.00 m wide		unlimited

* The colours may differ slightly from the RAL colour template. Other colours on request.

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

Mixing Ratio / Consumption

Alkadur EPL Primer

Component	kg/m ² (steel)	kg/m ² (concrete)	Part by weight	kg / batch	Batch
Alkadur-EPL-Solution	0.133	0.167	2.0	2.00	1.80 l
Alkadur-EPL-Hardener	0.067	0.083	1.0	1.00	1.00 l
Total	0.200	0.250		3.00	

Consumption in kg/m² (approx.): 0.200 (on steel) Work steps: 1
 0.250 (on concrete)

Batch yields in m² (approx.): 15 (on steel)
 12 (on concrete)

If necessary: Alkadur EPL Filling sprinkled for substrate levelling or to increase the layer thickness of the entire system

Component	kg/l	Part by weight	kg / batch	Batch
Alkadur-EPL-Solution	0.390	2.00	2.00	1.80 l
Alkadur-EPL-Hardener	0.195	1.00	1.00	1.00 l
Oxydur-WV-Powder	0.905	4.65	4.65	6.00 l
Total	1.490		7.65	

If necessary: Sprinkling with SKC-Filler 16; Consumption: approx. 3.00 kg/m²

Consumption per mm thickness in kg/m² (approx.): 1.49 Work steps: 1

Batch yields per mm thickness in m² (approx.): 5

Alkadur EPL Filling

Component	kg/l	Part by weight	kg / batch	Batch
Alkadur-EPL-Solution	0.390	2.00	2.00	1.80 l
Alkadur-EPL-Hardener	0.195	1.00	1.00	1.00 l
Oxydur-WV-Powder	0.905	4.65	4.65	6.00 l
Total	1.490		7.65	

Consumption in kg/l (approx.): 1.49 Work steps: 1

Batch yields per mm thickness in m² (approx.): 5 Layer thickness in mm (approx.): 1.0

Alkadur EPL Laminating Solution

Component	Part by weight	kg / batch	Batch
Alkadur-EPL-Solution	2.0	12.50	3.60 l
Alkadur-EPL-Hardener	1.0	6.25	2.00 l

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.

Consumption depends on design:

2 Layer Glass-Fibre-Mat 300 g/m ² + 1 Layer Glass-Fleece 30 g/m ²	1.60 kg/m ²
2 Layer Glass-Fibre-Mat 450 g/m ² + 1 Layer Glass-Fleece 30 g/m ²	2.40 kg/m ²

Alternative Top Coat 1: Oxydur VE ES

Alkadur EPL Primer + Sprinkling

Component	kg/m ²	Part by weight	kg / batch	Batch
Alkadur-EPL-Solution	0.167	2.00	2.00	1.80 l
Alkadur-EPL-Hardener	0.083	1.00	1.00	1.00 l
Total	0.250		3.00	

Sprinkling with SKC-Filler 16, Consumption: approx. 2.00 kg/m²

Consumption in kg/m² (approx.): 0.250 Work steps: 1
 Batch yields in m² (approx.): 12

Oxydur VE Floor Filling

Component	kg/m ²	Part by weight	kg / batch	Batch
Oxydur-VEU-Solution	0.825	1.000	2.180	2.00 l
Oxydur-Accelerator D	0.017	0.021	0.045	45 ml
Oxydur-Hardener C	0.021	0.025	0.055	55 ml
SKC-Filler 12	1.477	1.789	3.900	3.00 l
Total	2.340		6.180	

Sprinkling with SKC-Filler 16, Consumption: approx. 3.00 kg/m²

Consumption in kg/m² (approx.): 2.34 Work steps: 1
 Batch yields in m² (approx.): 2.6

A complete 25 kg hobcock of Oxydur-VEU-Solution can be pre-accelerated with 0.5 kg Accelerator D and then further processed in partial quantities. A standard batch uses 2.2 kg of the accelerated solution (2 litres).

Oxydur VE Sealing

Component	Part by weight	kg / batch	Batch
Oxydur-VE-ES-Solution	1.000	4.30	4.0 l
Oxydur-Accelerator D	0.021	0.09	90 ml
Oxydur-Hardener C	0.025	0.11	110 ml
Total		4.50	
SKC-Filler 11 (not when using the smoothing trowel)	0.875	3.80	2.80 l
Total		8.30	

Rough: Consumption: 0.83 kg/m²; Work steps: 1 (rubber grouting float)

Medium: Consumption: 1.12 kg/m²; Working steps: 2 (rubber chip + mohair roller)

Smooth: Consumption: 1.30 kg/m²; Work steps: 1 (smoothing trowel)

A complete 25 kg hobcock of Oxydur-VE-ES-Solution can be pre-accelerated with 0.5 kg Accelerator D and then further processed in partial quantities. A standard batch uses 4.4 kg of the accelerated solution (4 litres).

Alternative Top Coat 2: Steulerflake SPG U

Component	kg/m ²	Part by weight	kg / batch	Batch
Steulerflake SPG-U	0.675	1.000	25.00*	2.0 l
Oxydur-Accelerator OF	0.011	0.015	0.38 (380 ml)**	35 ml**
Oxydur-Hardener C	0.014	0.020	0.50 (500 ml)	48 ml
Steulerflake-Colour-Paste blue***	(0.004)	(0.005)	(0.13)	(6 ml)
Total	0.700		25.88	

* Pre-dosed package. ** At temperatures of 25–30 °C only 0.33 kg (resp. 330 ml). For the small batch 30 ml.

*** In every second layer (for the colour change).

Consumption per application in kg/m ² (approx.):	0.700	Work steps:	at least 2
The 25 kg batch results per application in m ² (approx.):	36.9	Layer thickness:	by 3 work steps approx. 1.2 mm

A complete 25 kg hobcock of Steulerflake-SPG-U can be pre-accelerated with 0.38 kg Accelerator OF and then further processed in partial quantities. A standard batch uses 2 litres of the accelerated solution.

Alternative Top Coat 3: Steulerflake STG

Component	kg/m ²	Part by weight	kg / batch	Batch
Steulerflake STG	0.260	1.000	5.00	4.0 l
Oxydur-Accelerator D	0.005	0.020	0.10*	100 ml*
Oxydur-Hardener C	0.005	0.020	0.10	100 ml
Steulerflake-Colour-Paste blue**	(0.003)	(0.010)	(0.05)	(24 ml)
Total	0.270		5.20	

* at temperatures of 25-30 °C only 0.08 kg (resp. 80 ml).

** In every second layer (for the colour change).

Consumption per application in kg/m ² (approx.):	0.270	Work steps:	6
Batch yields in m ² per layer (approx.):	19	Layer thickness:	6 work steps approx. 1.2 mm

A complete 25 kg hobcock of Steulerflake STG can be pre-accelerated with 0.5 kg Accelerator D and then further processed in partial quantities. A standard batch uses 5 kg of the accelerated solution (4 litres).

Pot Life

Pot life depends on temperature:

Alkadur EPL: approx. 60–120 minutes

Oxydur VE Components

Temperature	Pot life
10 °C	approx. 70 minutes
20 °C	approx. 40 minutes
25 °C	approx. 25 minutes

Steulerflake STG

Temperature	Pot life
10 °C	approx. 70 minutes
20 °C	approx. 40 minutes
25 °C	approx. 25 minutes
30 °C	approx. 25 minutes*

* With reduced accelerator quantity

Steulerflake SPG U

Temperature	Pot life
10 °C	approx. 90 minutes
20 °C	approx. 60 minutes
25 °C	approx. 40 minutes
30 °C	approx. 40 minutes*

* With reduced accelerator quantity

Waiting and curing times

The waiting times between the individual applications depend on temperature:

Alkadur EPL layers

Temperature	Walkable after	Maximum waiting time
10 °C	24 h	72 h
20 °C	12 h	48 h
25 °C	8 h	36 h

Alkadur EPL Laminate as substrate for subsequent Steulerflake Coatings

Temperature	Walkable after	Maximum waiting time
20 °C	16 h	14 d

For sprinkled layers, the maximum waiting time for next layers does not apply as long as the sprinkling is intact and clean.

Oxydur and Steulerflake layers

Temperature	Walkable after	Maximum waiting time
10 °C	8 h	120 h
20 °C	6 h	78 h
30 °C	4 h	24 h

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

Safety and Disposal

The following points should be observed:

- Sufficient ventilation and venting (especially in pits and tanks)
- No smoking and no fire
- 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 protection soap (no solvents!) and skin protection cream
- Wear a dust mask when grinding (e.g. for 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
Alkadur EPL	RE 80
Oxydur VE ES	SB-STY 20
Steulerflake SPG U	SB-STY 30
Steulerflake STG	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.