

## TI 216

Technical Information Surface Protection Linings  
Issue 21.04.2023

# OXYDUR LAMINATE UP 410

Laminate system for concrete and steel substrates

## Base

Polyester resin, unsaturated

## Material Group

Sealing layers

Tank- / vessel linings - laminates

## Description

Coating system to produce a highly chemical resistant, impervious lining for concrete and steel substrates. The system can be covered with tiles or bricks to increase durability. It is also possible to applied Oxydur Laminate UP 410 as a self-supporting constructional laminate. The possible application depends on the project-specific demands.

## Use

Production of chemically resistant and fluid-tight linings for tanks, vessels, columns, reactors, towers etc. also against thermal load. Production of chemically resistant protection layers under tile or brick linings for tanks, vessels, columns, reactors, towers, ducts, foundations and floor areas.

Production of chemically resistant and fluid-tight construction laminates.

## Properties

- highly chemically resistant
- temperature resistant depending on chemical exposure up to 70°C at the surface of the laminate

## Physical Data

Property [unit], Test method	Value
Density [g/cm <sup>3</sup> ], DIN EN ISO 1183-1, ASTM D 792	1.42
Flexural strength [MPa], DIN EN ISO 178, ASTM C 580	210
Modulus of elasticity [MPa], DIN EN ISO 178, ASTM C 580	11000
Elongation at tear [%], DIN EN ISO 527	3
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531	2.6 x 10 <sup>-5</sup>
Tensile strength [MPa], DIN EN ISO 527	150
Lowest application temperature [°C]	10
Maximum application temperature [C]	30
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.

## Substrate

### 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 is blasted to near white blast cleaning. The degree of preparation SA 2 ½ according to DIN EN ISO 12944-4 and the degree of roughness "Medium (G)" according to DIN EN ISO 8503-1 must be achieved; minimum roughness depth  $R_z = 70 \mu\text{m}$ . After blasting, the formation of new rust must be prevented by suitable measures, e. g. priming directly.

The substrate should have a temperature of approx. 12 – 25 °C (tropical application 20 - 35 °C).

### 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

- Priming with OXYDUR K 425 (TI 102) + Sprinkling
- Oxydur UP 410 Laminating Scraper Coat
- Oxydur UP 410 Laminate with Oxydur UP 410 Laminating Solution
- Oxydur UP 410 Top Coat

### **Alternative Tropical version for expected working temperatures $\geq 25 \text{ °C}$**

- Priming with OXYDUR K 425 (TI 102) + Sprinkling
- Oxydur UP 410 Laminating Scraper Coat Tropical
- Oxydur UP 410 Laminate with Oxydur UP 410 Laminating Solution Tropical
- Oxydur UP 410 Top Coat Tropical

## 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-UP410-Solution	5036310001	Hobbock	25 kg	6 Months
Oxydur-UP410-Solution Tropical	5036312001	Hobbock	25 kg	6 Months
Oxydur-K425-Solution 1	5036021011	Can	3 kg	6 Months
Oxydur-K425-Solution 2	5036022036	Can	1.5 kg	6 Months
Oxydur-Hardener 20	5011052003	Drum	5 kg	12 Months
Oxydur-Accelerator	5032010007	Bottle	1 kg	12 Months
Oxydur-WV-Powder	5011119002	Bag	20 kg	24 Months
SKC-Filler 16	5011203001	Bag	25 kg	24 Months
Cab-O-Sil TS720	5011016006	Bag	10 kg	24 Months
Cab-O-Sil TS720	5011016003	Bag	5 kg	24 Months
Glass-Fibre-Mat 300 g/m <sup>2</sup>	9300900390	Roll 1.27 m wide		unlimited
Glass-Fibre-Mat 450 g/m <sup>2</sup>	9300900388	Roll 1.27 m wide		unlimited
Glass-Fleece 30 g/m <sup>2</sup>	9300900089	Roll 1.00 m wide		unlimited

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

## Mixing Ratio / Consumption

### OXYDUR K 425

	Part by weight	Part by volume
See TI 102		
Consumption on Steel	Each application 0.150 kg/m <sup>2</sup>	
Application steps	Depends on the surface	
Consumption on concrete	0.350 kg/m <sup>2</sup> (0.200 kg/m <sup>2</sup> and 0.150 kg/m <sup>2</sup> )	
Application steps	2	
Sprinkling with SKC-Filler 16; Consumption: 1.500 kg/m <sup>2</sup>		

### Oxydur UP 410 Laminating Scraper Coat

	Part by weight	Part by volume
Oxydur-UP410-Solution	1.0	0.877
Oxydur-Hardener-20	0.07	0.112
Oxydur-WV-Powder	1.75	2.261
Consumption	1.780 kg/m <sup>2</sup>	
Application steps	1	
Layer thickness	approx. 1.0 mm	

### Alternative Oxydur UP 410 Laminating Scraper Coat Tropical

	Part by weight	Part by volume
Oxydur-UP410-Solution Tropical	1.0	0.877
Oxydur-Hardener-20	0.07	0.112
Oxydur-Accelerator	0.003 – 0.005	0.003 – 0.005
Oxydur-WV-Powder	1.75	2.261
Consumption	1.780 kg/m <sup>2</sup>	
Application steps	1	
Layer thickness	approx. 1.0mm	

## Oxydur UP 410 Laminating Solution

	Part by weight	Part by volume
Oxydur-UP410-Solution	1.0	0.877
Oxydur-Hardener-20	0.07	0.112
Cab-O-Sil TS 720	if necessary (wall / slope surfaces, heard temperatures), max. 2% related to Oxydur-UP410-Solution	
Consumption depends on design:		
1 layer Glass-Fibre-Mat 300 g/m <sup>2</sup> + 1 layer Glass-Fleece 30 g/m <sup>2</sup>	0.700 kg/m <sup>2</sup>	
2 layers Glass-Fibre-Mat 300 g/m <sup>2</sup> + 1 layer Glass-Fleece 30 g/m <sup>2</sup>	1.400 kg/m <sup>2</sup>	
1 layer Glass-Fibre-Mat 450 g/m <sup>2</sup> + 1 layer Glass-Fleece 30 g/m <sup>2</sup>	1.000 kg/m <sup>2</sup>	
2 layers Glass-Fibre-Mat 450 g/m <sup>2</sup> + 1 layer Glass-Fleece 30 g/m <sup>2</sup>	2.000 kg/m <sup>2</sup>	
3 layers Glass-Fibre-Mat 450 g/m <sup>2</sup> + 1 layer Glass-Fleece 30 g/m <sup>2</sup>	3.000 kg/m <sup>2</sup>	
Depending on the project specific geometry, necessary additional consumption for overlaps of Glass-Fibre-Mats and laminating solution must be taken into account.		
Application steps: depends on design		

## Alternative Oxydur-UP410 Laminating Solution Tropical

	Part by weight	Part by volume
Oxydur-UP410-Solution Tropical	1.0	0.877
Oxydur-Hardener-20	0.07	0.112
Oxydur-Accelerator	0.003 – 0.005	0.003 – 0.005
Cab-O-Sil TS 720	if necessary, max. 2% related to Oxydur-UP410-Solution	
Consumption depends on design	see OXYDUR UP 410 Laminating Solution	
Application steps	depends on design	

## Oxydur UP 410 Top Coat

	Part by weight	Part by volume
Oxydur-UP410-Solution	1.0	0.877
Oxydur-Hardener-20	0.07	0.112
Oxydur-K425-Solution 2	0.07	0.061
Consumption	approx. 0.300 kg/m <sup>2</sup>	
Application steps	1	
For subsequent coatings / tile linings / brick linings, sprinkling with Filler 16		
Consumption	approx. 1.500 kg/m <sup>2</sup>	

### Alternative Oxydur UP 410 Top Coat Tropical

	Part by weight	Part by volume
Oxydur-UP410-Solution Tropical	1.0	0.877
Oxydur-Hardener-20	0.07	0.112
Oxydur-K425-Solution 2	0.07	0.061
Oxydur-Accelerator	0.003 – 0.005	0.003 – 0.005
Consumption	approx. 0.300 kg/m <sup>2</sup>	
Application steps	1	
For subsequent coatings / tile linings / brick linings, sprinkling with Filler 16		
Consumption	approx. 1.500 kg/m <sup>2</sup>	

## Waiting Times

Between primer and laminate: 4 h, maximum 24 h

Between the layers at least 4 h, max. 12 h.

## Pot Life

Pot life depends on temperature:

20 °C	approx. 25 - 40 minutes
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By expected working temperatures  $\geq 25$  °C the "Tropical" version should be used.

## Curing times

To support foot traffic between single applications depending on the temperature 5 - 24 h.

The finished coating is fully mechanically and chemically resistant at 20 °C after 7 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 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
Oxydur K 425	SB-STY20
Oxydur UP 410 Laminating Scraper Coat	SB-STY10
Oxydur UP 410 Laminating Scraper Coat Tropical	SB-STY30
Oxydur UP 410 Laminating Solution	SB-STY10
Oxydur UP 410 Laminating Solution Tropical	SB-STY30
Oxydur UP 410 Top Coat	SB-STY20
Oxydur UP 410 Top Coat Tropical	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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This issue replaces all previous versions.