

TI 218

Technical Information Surface Protection Linings
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OXYDUR FLAKE

Coating for high chemically and thermally stressed steel substrates

Base

Epoxy Novolac Vinyl ester resin

Material Group

Tank-/vessel linings – Flake coatings

Description and use

OXYDUR FLAKE is extremely resistant to permeation. Due to its rich content on glass flakes which are orientated parallel to the substrate an outstanding resistance against diffusion / permeation of water vapour is given. A high-quality resin in combination with a precisely coordinated system of accelerator and hardener leads to excellent chemical and mechanical resistance.

Suitable for lining containers, columns, reactors, towers or flue gas ducts. Production of protective layers under panel or brick linings.

Properties

- high diffusion resistance
- thermal resistance up to 180 °C (for a layer maximum 2.5 mm)

System Design

- Steulerflake Primer HTU
- Oxydur Flake (3-4 Top-Coat, smoothed)
- *If required:* Oxydur VEU finishing coat

Total thickness is approx. 2-3 mm.

Physical Data

Property [unit], Test method	Value
Density [g/cm³], DIN EN ISO 1183-1, ASTM D 792	1.45
Flexural strength [MPa], DIN EN ISO 178, ASTM C 580	24
Compressive strength [MPa], DIN EN ISO 604, ASTM C 579	100
Modulus of elasticity [MPa], DIN EN ISO 178, ASTM C 580	6000
Barcol hardness, DIN EN 59	40
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531	3.5×10^{-5}
Adherence to steel [MPa], DIN EN ISO 4624	> 5
Tensile Strength [MPa], DIN EN ISO 527, ASTM C 307	22
Data are mean values	

Chemical Resistance

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

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.

* Temperatures above 30 °C can be achieved by reducing the accelerator by 20 % (in consultation with the application engineers).

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 dry. No moisture (condensate, mist, etc.) must get onto the material.

Packaging / Shelf life

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

Components	Item number	Package	Content	Shelf life
Steulerflake-Priming-Solution HTU	5032098001	Hobbock	25 kg	6 Months
Oxydur-Flake	5032004001	Hobbock	25 kg	6 Months
Oxydur-VEU-Solution	5032042001	Hobbock	25 kg	6 Months
Oxydur-VEU-Solution	5032042015	Barrel	200 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
Diluent M	5060006006	Can	10 kg	12 Months
Steulerflake-Colour-Paste blue	5011015007	Drum	1 kg	12 Months
Steulerflake-Colour-Paste blue	5011015003	Drum	5 kg	12 Months

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

Mixing Ratio / Consumption

Steulerflake Primer HTU

Components	kg/m ²	Part by weight	kg / batch	l / batch
Steulerflake-Priming-Solution HTU	0.144	1.000	5.000	4.500
Oxydur-Accelerator OF* (at over 30 °C)	0.003 (0.003)	0.020 (0.016)	0.100 (0.080)	0.100 (0.080)
Oxydur-Hardener C	0.003	0.020	0.100	0.100
Total	0.150		5.200	

Total consumption in kg/m² (approx.): 0.150 Work steps: 1
 Batch creates in m² (approx.): 34.7

Oxydur Flake

Component	kg/m ² (2 mm)	kg/m ² (3 mm)	Part by weight	kg / batch	l / batch
Oxydur-Flake	2.884	4.230	1.000	5.000	3.730
Oxydur-Accelerator D* (at over 30 °C)	0.058	0.085	0.020 (0.016)	0.100 (0.080)	0.100 (0.080)
Oxydur-Hardener C	0.058	0.085	0.020	0.100	0.100
Total	3.000	4.400		5.200	
Steulerflake-Colour-Paste blue**	(0.011)	(0.017)	(0.004)	(0.020)	(0.012)
Diluent M (for wetting of the mohair roller)	(0.100)	(0.100)			

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

Total thickness in mm (approx.) **2.0** Work steps 3
 Total consumption in kg/m² (approx.) 3.000 Batch creates the following quantity in m² 5.2
 per layer (approx.)
Total thickness in mm (approx.) **3.0** Work steps 4
 Total consumption in kg/m² (approx.) 4.400 Batch creates the following quantity in m² 4.7
 per layer (approx.)

The applied coats should not exceed a thickness of 1 mm per layer (approx. 1.5 kg/m²). If possible 3 layers with 2 mm layer thickness or 4 layers with 3 mm layer thickness.

Oxydur VEU finishing coat (if required)

Component	kg/m ²	Part by weight	kg / batch	l / batch
Oxydur-VEU-Solution	0.191	1.000	2.180	2.000
Oxydur-Accelerator D* (at over 30 °C)	0.004 (0.003)	0.021 (0.016)	0.045 (0.036)	0.045 (0.036)
Oxydur-Hardener C	0.005	0.025	0.055	0.055
Total	0.200		2.280	

Total consumption in kg/m² (approx.) 0.200 Work steps 1
 Batch creates in m² (approx.) 11.4

* Temperatures above 30 °C can be achieved by reducing the accelerator by 20 % (in consultation with the application engineers).

Pot Life

Pot life depends on temperature:

Temperature	Primer	Top coats
10 °C	approx. 80 minutes	approx. 70 minutes
20 °C	approx. 55 minutes	approx. 40 minutes
25 °C	approx. 30 minutes	approx. 15 minutes

Waiting and curing times

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

Temperature	Min. Time	Max. 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

- 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
Steulerflake Primer HTU	SB-STY 30
Oxydur Flake	SB-STY 20
Oxydur VEU Finishing Coat	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.