

TI 227U

Technical Information Surface Protection Linings
Issue 20.06.2023

STEULERFLAKE SPM U

Spray coating with barrier fillers; high temperature and chemical resistance

Base

Epoxy Novolac Vinyl ester resin

Material Group

Tank-/vessel linings – Flake coatings

Description and use

Mineral flake filled system based on vinyl ester resin with good resistance against high temperatures and aggressive chemicals. Due to its high content of flaky-shaped barrier fillers which align themselves parallel to the substrate, very good diffusion and permeation resistance to water vapour is achieved.

The system meets the requirements of US FDA 21 CFR § 175.300 for aqueous and fatty foods. Corresponding external test certificates can be provided on request.

Suitable for ducts, tanks and chimneys of flue gas desulphurisation plants as well as other process plants in various industries.

Properties

- FDA conformity
- High chemical resistance
- Very good diffusion resistance
- Good abrasion resistance
- Good mechanical properties
- Temperature resistant up to 200 °C (dry stress), up to 80 °C (wet stress), up to 100 °C (liquid splashes)

System Design

- Steulerflake Primer HTU
- Steulerflake SPM U

Standard thickness is 1.5 mm.

Physical Data

Property [unit], Test method	Value
Density [g/cm ³], DIN EN ISO 1183-1, ASTM D 792	1.3
Flexural strength [MPa], DIN EN ISO 178, ASTM C 580	48
Compressive strength [MPa], DIN EN ISO 604, ASTM C 579	44
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531	2.2 x 10 ⁻⁵
Tensile strength [MPa], DIN EN ISO 527	20

Data are mean values

Chemical Resistance

Excellent resistance to acids (also condensing sulphuric acid), alkalis, solvents, mineral oils and other chemicals, including those with an oxidising effect.

Please contact our Application Technology Department for approval of the project-specific possible application.

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.

Avoid draughts and solar radiation.

Steel

Refer to DIN EN 14879-1 as well as to STEULER-KCH-Formsheet 020 and 030.

The steel surface is blasted to near white blast cleaning. A surface cleanliness of 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 surface roughness Rz = 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
Steulerflake-HT-Primer-Solution U	5032098001	Hobbock	25 kg	6 Months
Steulerflake-SPM-Solution U	5032104001	Hobbock	25 kg	6 Months
Oxydur-Accelerator OF	5032011023	Canister	2.5 kg	12 Months
Oxydur-Hardener C	5032015007	Bottle	1 kg	12 Months
Steulerflake-Colour-Paste blue	5011015007	Drum	1 kg	12 Months

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

Mixing Ratio / Consumption

Steulerflake Primer HTU

Component	kg/m ²	Part by weight	kg / mix	l / mix
Steulerflake-HT-Primer-Solution U	0.144	1.000	5.000	4.500
Oxydur-Accelerator OF (at over 25 °C) ^[1]	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/m ² (approx.):	0.150	Application steps:	1
		Mix yields in m ² (approx.):	34.7

^[1] Temperatures above 25 °C can be achieved by reducing the Accelerator quantity (in consultation with the Application Technology Department).

Steulerflake SPM U

Component	kg/m ²	Part by weight	kg / mix	l / mix
Steulerflake-SPM-Solution U	0.870	1.000	25.000	21.700
Oxydur-Accelerator OF (at over 25 °C) ^[1]	0.013 (0.011)	0.015 (0.013)	0.375 (0.325)	0.375 (0.325)
Oxydur-Hardener C	0.017	0.020	0.500	0.500
Total	0.900		25.875	
Steulerflake-Colour-Paste blue ^[2]	0.004	0.005	0.125	0.060

Consumption per application in kg/m² (approx.): 0.900 Application steps (min.): 2
 Standard thickness for 3 applications in mm (approx.): 1.5 Mix yields in m² (approx.): 28.8

Pot Life

Pot life depends on the temperature and is (approx.):

Temperature	Primer	Top coats
10 °C	approx. 80 min	approx. 90 min
20 °C	approx. 55 min	approx. 60 min
25 °C	approx. 30 min	approx. 40 min

Waiting and curing times

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

Temperature	At least	At most
10 °C	8 h	120 h
20 °C	6 h	78 h
30 °C	4 h	24 h

To achieve mechanical resistance 3 days and full chemical resistance 7 days at 20 °C.

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.

^[2] In every second layer (for the colour change).

GISCODE

Product	GISCODE
Steulerflake Primer HTU	SB-STY30
Steulerflake SPM U	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.

Steulerflake-Cleaner A to clean the spray equipment.

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This issue replaces all previous versions.