

# System FLAMMOTECT-A

Ablative coating system for protecting cable installations from fire and other external factors



## Field of Application

- prevents flame spread
- maintains the functional integrity of cables in the event of a fire
- protects cables from external factors
- designed for indoor and outdoor use
- suitable for many different environments, e.g. (nuclear) power plants, electrical substations, production and industrial facilities, infrastructure objects or public buildings.

## Products



### FLAMMOTECT-A Coating

- 5 kg pail – Art. no. 01155132
- 12.5 kg pail – Art. no. 01155131
- 15 kg pail – Art. no. 01155150



### FLAMMOTECT-A Solid emulsion

- 5 kg pail – Art. no. 01155121
- 12.5 kg pail – Art. no. 01155136
- 15 kg pail – Art. no. 01155151

## Benefits

- product available in various viscosities
- high film thicknesses can be applied in one go
- highly suitable for airless spray guns
- no electrical derating necessary
- various certificates for use in nuclear facilities
- no explosion protection for the application necessary
- does not have an effect on other building materials such as polyethylene (PE) und polyvinyl chloride (PVC)
- resistant to moisture, freeze-thaw cycling, UV radiation as well as various oils and chemicals.
- salt water tested
- no spalling of material because of mechanical stress, high coating flexibility
- solvent and halogen free
- free of asbestos, lead, mercury, hexavalent chromium and polybrominated biphenyl ethers
- does not emit toxic gases

## Services

	Cables	☑
	Cable bundles	☑
	Cable trays	☑

## System FLAMMOTECT-A

### Basic physical and chemical properties

<b>State of aggregation</b>		liquid or paste-like	
<b>Colour</b>		white	
<b>Odour</b>		Almost odourless	
<b>pH value</b>		7.0–7.8	
<b>pH solution</b>		10 % in water	
<b>Density (at +20 °C)</b>		1.34–1.48 g/cm <sup>3</sup>	
<b>Viscosity (at +20 °C)</b>	<b>Coating</b>	6000–10 000 mPa·s	(Viscosity can be adjusted by adding water.)
	<b>Solid emulsion</b>	25 000–40 000 mPa·s	
<b>Non-volatile compounds</b>		66–86 % in acc. with EN ISO 3251	
<b>Loss of mass on heating</b>		38–48 % in acc. with EN ISO 3451-1 / EOTA TR024 at 400 °C over a period of 30 min.	
<b>LOI (Limited Oxygen Index)</b>		52–58 % in acc. with ISO 4589; sample thickness 1.5 mm	
<b>Coating flexibility</b>		≥ 5 mm in acc. with EN ISO 1519; sample thickness 1.5 mm	

### Fire protection and reaction to fire

<b>Reaction to fire</b>	class E	in acc. with EN 13501-1
<b>Flame spread</b>	Cat. A: 2018 for 60 min. dry film thickness ≥ 0.5 mm	in acc. with IEC 60332-3-22 (DNV GL Certificate No. TAE00003BN)
	Cat. A for 60 min. dry film thickness ≥ 1.0 (PE); 1.4 mm (PVC)	GOST IEC 60332-3-22
	Class Rating: A (0-25 flame spread, 0-450 smoke developed) Flame spread index: 15 Smoke developed index: 60	ASTM E84
<b>Maintenance of functional integrity</b>	Tests up to 180 min. for various cable types and voltage ranges.	in acc. with IEC 60331-21
<b>FM Approval Class 3971</b>	FM Approvals – Certificate of Compliance Approval Identification: 3037058 certified dry film thickness of 1.6 mm	
<b>Smoke density</b>	DS (4) = 81, VOF4 = 154 min., DS (max) = 85 DS Average = 174.36	in acc. with DIN EN ISO 5659-2 in acc. with ASTM E 662
<b>Smoke toxicity</b>	CITG = 0.20 (Conventional Index of Toxicity) No HCl, HF, HBr or HCN emission	EN 45545-2 Annex C and ISO 5659-2

## System FLAMMOTECT-A

### Electrical specifications

Heating of cables	No derating necessary	in acc. with FM Approval Class 3971
	Temperature comparison of coated and uncoated cables. Difference in temperature: $\leq 2\%$	GOST IEC 60332-3-22
	No difference in temperature for coated and uncoated cables with a current load for over 8 hours	Test report No. 00541 Elektrisches Prüfamnt München
Dielectric strength	leakage current $\leq 5.0$ mA between conductor and outer jacket during high potential test	in acc. with FM Approval Class 3971
Surface resistance	$\geq 1000$ M $\Omega$	in acc. with DIN VDE 0427/05.85, Sektion 503-4.2

### Resistances

Ageing resistance	Aging does not have an effect to the general properties of FLAMMOTECT-A.	
	<b>Artificial ageing without impairment</b>	in acc. with FM 3971 in acc. with EOTA TR024
	<b>Indoor / outdoor areas:</b> Extreme temperature changing from +71 °C to -40 °C, UV radiation and humidity	
Weather resistance	<b>Long-term ageing without impairment</b>	
	<b>Outdoor areas:</b> Material was exposed for five years to outdoor weathering without any changes in its reaction to fire (MPA Nordrhein-Westfalen (notified body 0432), report no. 230006109-1)	
	<b>Indoor areas:</b> Material was stored for 10 years in an indoor area without any changes in its reaction to fire (MPA Braunschweig (notified body 0761), report no. 3224/821/11)	
Salt water resistance	Use category X (product suitable for use in areas exposed to weathering)	in acc. with EOTA TR024
Radiation resistance	Long-term exposure to salt water	in acc. with FM 3971 in acc. with EOTA TR024 in acc. with EN ISO 2812-1
Resistance against aggressive deactivation media	Certified as radiation resistant at a radiation dosage of $1.0 \times 10^6$ Gy (108 rad)	
	Approved to withstand various types of deactivation media, e.g. nitric acid, sodium hydroxide, boric acid	

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## Chemical resistance in accordance with EN ISO 2812-1

The chemical resistance of FLAMMOTECT-A was assessed in accordance with DIN EN ISO 2812-1 (Paints and varnishes - Determination of resistance to liquids – Part 1: Immersion in liquids other than water).

The series of tests comprises the most common chemicals which may occur in sensitive or dangerous areas. Tests range from minor exposure caused by accidental contact (generally not longer than 30 minutes) to lasting exposure (measured on the basis of a residence time of 28 days).

The coated cable samples were exposed to the respective chemicals at 80 % of their length. After exposure the samples were cleaned with distilled water, dried for 24 hours and assessed according to the intactness of the coating.

### Assessment criteria

Complete resistance; no changes occurred.	+++
Resistance is intact; slight changes are noticeable.	++
Resistance is still intact, there are visual and slight mechanical changes.	+
Resistance is no longer intact; mechanical changes have a limiting effect on the function.	-
Resistance is no longer intact; the chemicals destroy parts of the coating.	--

Chemical	Concentration	Short term exposure	Long term exposure
Boric acid	5%	+++	+++
Acetic acid	undiluted	--	--
	10%	+++	-
Nitric acid	undiluted	+++	--
	10%	+++	--
	1%	+++	+++
Hydrochloric acid	undiluted	+++	--
	10%	+++	++
	1%	+++	+++
Sulfuric acid	undiluted	+++	--
	10%	+++	+++
	1%	+++	+++
Phosphoric acid	undiluted	+	--
	10%	++	--
	1%	+++	--
Potassium chloride	10%	+++	+++
Caustic potash	50%	++	--
	10%	+++	--
	1%	+++	+++
Caustic soda	50%	+++	-
	10%	+++	-
	1%	+++	+
Sodium chloride	10%	+++	+++

Chemical	Concentration	Short term exposure	Long term exposure
Ammonia	undiluted	+++	--
	3.5%	+++	--
Hydrogen peroxide	undiluted	--	--
	3%	+++	--
Seawater	3%	+++	+++
Natron	10%	+++	+++
Tap water	undiluted	+++	+++
Urea	undiluted	+++	+++
Formaldehyde	30%	+++	+++
	3%	+++	+++
Hydrogen fluoride	undiluted	--	--
Butyl acetate (ester)	undiluted	++	--
Acetone	undiluted	+++	+
Isopropyl alcohol	undiluted	+	--
Methanol	undiluted	++	--
Ethanol	undiluted	++	+
	20%	+++	+
Butanol	undiluted	++	--
White spirit (odourless)	undiluted	+++	++
White spirit	undiluted	+++	++
Glycerol	undiluted	+++	++
Heating oil / diesel	undiluted	+++	++

## System FLAMMOTECT-A

### Application and workability properties

Field of application	Coating	thin layer application quantities		
	Solid emulsion	thick layer application quantities		
Type of application	<ul style="list-style-type: none"> <li>brush or roller application,</li> <li>airless spray gun</li> <li>recommended application: <ul style="list-style-type: none"> <li>coating: recommended nozzle orifice &gt; 0.019" = 0.48 mm</li> <li>solid emulsion: recommended nozzle orifice &gt; 0.021" = 0.53 mm</li> <li>pressure: 150-180 bar</li> </ul> </li> </ul>			
Example consumption	solid body (weight)	application quantity [g/m <sup>2</sup> ]	film thickness [mm]	
			wet	dry
	66 – 86 %	1000	approx. 0.9	approx. 0.5
		2000	approx. 1.8	approx. 1.0
		3200	approx. 2.9	approx. 1.6
4000	approx. 3.6	approx. 2.0		
Drying times at +23 °C and 65 % relative humidity		dust-dry	can be coated over with itself	dried through
	Coating	min. 4 hours	min. 8 hours	min. 4 days
	Solid emulsion	min. 4 hours	min. 8 hours	min. 4 days

### Delivery and packaging

- Storage at room temperature (+5 °C to +30 °C).
- Protect from frost.
- Can be stored for at least 18 months in the original sealed container.
- No hazardous material according to German Hazardous Substances Act (GefStoffV) and no hazardous material according to the German Act on the Transport of Dangerous Goods (GGVS/ADR).

Product	Art. no.	Packaging	Pail/pallet	Net weight / pallet
FLAMMOTECT-A Coating	01155132	5 kg pail	60 pcs.	300 kg
	01155131	12.5 kg pail	40 pcs.	500 kg
	01155150	15 kg pail	32 pcs.	480 kg
FLAMMOTECT-A Solid emulsion	01155121	5 kg pail	60 pcs.	300 kg
	01155136	12.5 kg pail	40 pcs.	500 kg
	01155151	15 kg pail	32 pcs.	480 kg