

# PLAMMAL 3D

*Fire protection system for steel constructions*  
*ANTIKOROZIN E- epoxy based anticorrosive coating*  
*PLAMMAL 3D- expansive solvent based acrylate coating*  
*PLAMMAL 3D varnish- final protective coating*

## FILED OF APLICATION

Fire protection system used for indoor and outdoor steel constructions. It is used in residential, administrative, industrial, energetic buildings or similar. The advantage of the system is the simple application, which can be executed before or after the installation of the construction. Using this system the steel construction is visible, that enable its supervision during the exploitation of the building.

## FIRE PROTECTION SYSTEM DESCRIPTION

The system for fire protection Plammal 3D contains three different coatings:

- Antikorozin E- two component, epoxy based, anticorrosive coating with excellent adhesion to steel substrate and high resistance to mechanical and chemical damages. It is appropriate substrate for the other layers of this system.
- Plammal 3D- expansive layer of this fire protection system, which exposed to high temperature increases its volume 10-20 times and forms structure that function as thermal insulation around the steal element.
- Plammal 3D varnish- protective, acrylate based, final decorative coating, which protects the system of weather and mechanical damages.

## FIRE PROTECTION SYSTEM PROPERTIES

- Exposed to heat and high temperature the system trigger the expansion of active layer Plammal 3D
- Suitable to apply on existing and on new construction before or after its installation
- Excellent adhesion to the substrate
- It prolongs the period of reaching the critical temperature for steel constructions

## TECHNICAL FEATURES

### ANTIKOROZIN E

PROPERTY	METHOD	DECLARED VALUE
Appearance	-	A component- red paste B component- yellow viscous liquid with specific smell
Density	-	1,7-1,8 g/cm <sup>3</sup>
Mixing ratio	-	6:1
Touch dry for layer 100μ thick, on 20°C	-	30-40min
Completely dry for layer 100μ thick, on 20°C	-	1-2h

### PLAMMAL 3D

PROPERTY	METHOD	DECLARED VALUE
Appearance	-	white paste
Density	-	1,32-1,46 g/cm <sup>3</sup>

## PLAMMAL 3D VARNISH

PROPERTY	METHOD	DECLARED VALUE
Appearance	-	paste
Density	-	1,47-1,53 g/cm <sup>3</sup>

### METHOD STATEMENT

#### SUBSTRATE PREPARATION

The steel substrate must be dry, clean, without grease and dust, sandblasted to SA2½, according to EN ISO 8501-1. It is highly recommended to take care of the application conditions, especially of the ambient and substrate temperature and of the relative air humidity. Each coating should be applied according to the application recommendations.

When the substrate has not been prepared corresponding to the application requirements, the adhesion (bond) between the coatings and the construction or the entire system can be disintegrated.

The three coatings of the fire protection system are compatible one to another in terms of their composition and solvents. Each substitution of the layers with another product enables the fire protection system to lose its function or to shorten its exploitation period significantly.

#### APPLICATION

The application of all the layers in fire protection system Plammal 3D should be between 5-30°C, substrate temperature between 5-25°C and relative air humidity lower than 70%. During the application and also during the setting period for each coating it is required to protect the coated surfaces of moisture.

#### ANTIKOROZIN E

Apply the coating not later than 4h after the preparation of the substrate (cleaning and sandblasting). To prepare the product, mix separately A and B component and then put B component into A. Mix the material using slow mixer (200-300 revolutions/min) until it homogenize. Apply it using brush, roller or by spraying under pressure of 200-300bar on 20-30cm distance from the substrate. When the application of the material is affected by temperature conditions, add max.5% Solvent P in the prepared mixture (A+B component). The thickness of one dry layer should be between 50-70µ.

#### PLAMMAL 3D

Apply Plammal 3D on sound, clean and dry substrate. The previous applied coating of Antikorozin E must be completely set in the entire thickness of the layer. Before the application mix the material until it homogenize. Apply it using brush, roller or by spraying using airless applicator under pressure with nozzle 7.45 at distance of 20-30cm from the substrate. To provide the specified fire protection, it is required to apply several layers of Plammal 3D. The entire thickness of the layer should be in compliance with calculations for the fire protection. The thickness of one dry layer should be under 200µ. Apply the first layer at least 24h after the application of Antikorozin E. The period between two layers of Plammal 3D should be between 6-12h, on 10-30°C and relative air humidity less than 70%.

When the previous layer of Antikorozin E has been left unprotected longer than 48h after the application and the final surface have dirt or dust it is required to clean the surface (without rubbing) using clean towel dampened with Solvent P.

#### Thickness control of the applied coating

Dry layer thickness of Plammal 3D is relevant for the fire protection level of steel constructions. Measure the thickness after the last applied layer of the coating is completely set (dry). Use standard electromagnetic or ultrasound instrument. Apply Plammal 3D varnish after the required thickness of Plammal 3D is confirmed. The calculations and required thicknesses for specified fire protection levels are given in the consumption part of this technical data sheet.

#### PLAMMAL 3D varnish

Apply Plammal 3D varnish on clean and dry substrate. The previous applied coating of Plammal 3D must be completely dry into the entire thickness of the layer. Before the application mix the material until it homogenize. Apply it using brush, roller or by spraying using airbrush applicator under pressure of 200-300bar on 20-30cm distance from the substrate. Apply following layer of Plammal 3D varnish on completely dry and hardened previous layer. The period between two layers should be between 5-8h on 20°C. The thickness of the dry layer should be up to 80µ.

## CLEANING

Clean tools and equipment right after the application, using Solvent P.

## CONSUMPTION

Antikorozin E: 0.17-0.19kg/m<sup>2</sup> (for one layer 100μ thick)  
Plammal 3D: according to the calculations in table below  
Plammal 3D varnish: 0.12-0.15kg/m<sup>2</sup> (for one layer)

Calculation for Plammal 3D:

F/A- section factor of the steel profile

F-perimeter of the steel profile exposed to fire

A-area of the steel profile section

F/A (m <sup>-1</sup> )	fire protection for 15 min		fire protection for 30 min		fire protection for 60 min	
	thickness of dry layer (mm)	consumption (kg/m <sup>2</sup> )	thickness of dry layerj (mm)	consumption (kg/m <sup>2</sup> )	thickness of dry layer (mm)	consumption (kg/m <sup>2</sup> )
0-100	0,30	0,70	0,60	1,30	0,75	1,70
100-150	0,50	1,10	0,60	1,30	0,75	1,70
150-200	0,55	1,20	0,60	1,30	1,50	3,30
200-250	0,65	1,50	0,75	1,70	1,80	4,00
250-300	0,75	1,70	1,20	2,60	2,20	5,00

## PACKAGING

Antikorozin E- sets of 4.67kg and 21kg  
Plammal 3D- 4kg and 20kg  
Plammal 3D varnish- 4kg and 20kg  
Solvent P- 0.9kg and 4kg

## STORAGE

In the original packaging, placed at temperature between 5°C and 30°C. Shelf life: 9 months.

**Health hazards:** It is necessary that the premises in which the system is applied be permanently ventilated. It is mandatory to wear protective gloves, safety glasses and masks. If the material splashes into eyes, immediately rinse the eyes with clean water and seek medical care.

**Fire:** Materials should be handled with care since they contain solvents which are easily flammable.

**Cleaning and disposal:** Residues of the Plammal 3D system should be cleaned with Solvent P which is intended for the system. The old and used packing should be disposed of in accordance with the local rules and regulations for that type of waste.