

Technical Data

Steelmaster - 60/120 Intumescent

Super Durable and Internal Grades



Steelmaster 60/120

Steelmaster 60/120 is an advanced technology thin film intumescent coating for the fire protection of structural steel to provide fire resistance for periods of 30 minutes to 120 minutes.

Steelmaster 60/120 is available in both internal and super durable grades, the latter providing outstanding resistance where arduous or external environments are encountered (refer to the section on "life expectancy").

Product features

- Fully EPA Compliant
- Complements CDM regulations
- Up to 1.4mm DFT per coat (by spray)
- Manufactured to BS EN ISO 9001:2000
- No sealer coat for C1 and C2 environments (refer to the section on "life expectancy")
- Tested to BS 476 Part 21

Super durable grade

- Outstanding water resistance / Excellent durability

General information

Storage Temperature:	Minimum 5°C. Maximum 40°C
Shelf Life:	12 months in sealed containers (at 20°C)
Pack Size:	20 litre and 200 litres
Pot Life:	Indefinite (single pack)
Colour:	White
Drying:	Air-dry or force dry
Appearance when dry:	Low sheen

Technical information

Flash Point:	25°C ± 2°C (Setaflash)
Specific Gravity:	Approx. 1.28 Kg/Litre
Volume Solids:	68% ± 3%
VOC:	335 grams/litre

Loading requirement

In order to establish the dry film thickness (DFT) required for the specified period of fire resistance, it is necessary to first calculate the Hp/A value (also known as section factor, massivity and A/V values). The DFT can then be calculated from the current Steelmaster 60/120 loading tables.

DFT (microns)	500	1000	1500	2000	2500	3000	3500
WFT (microns)	735	1471	2206	2941	3676	4412	5147
Theoretical Coverage (m ² /litre)	1.36	0.68	0.45	0.34	0.27	0.23	0.19

DFT = Dry Film Thickness • WFT = Wet Film Thickness

Application

In specialist units, approved by Jotun, Steelmaster 60/120 Super Durable Grade can be applied direct to steel without primer. In all other cases, the use of Jotun primers is recommended (see below - refer also to the Steelmaster 60/120 Application Procedural Manual).

Primers

When applied over other manufacturers primers, compatibility should be checked. Consult Jotun's Technical Department for recommendations. Compatible primer should be applied and over coated in accordance with the manufacturers instructions. For optimum results, mean thickness of the primer should not exceed 150 microns.

Suitable Jotun primers include Penguard Primer, Penguard Special and Pilot Industry Primer.

Certain types of primers must be avoided as they could cause adhesion problems. These include thermoplastic materials such as Chlorinated Rubber and bituminous primers. Certain "mastic" products and primer / finish products may also prove to be unsuitable for a number of reasons including short overcoating times.

Surface preparation

Prior to application of a compatible primer, the substrate must be abrasive blast cleaned in accordance with standard ISO 8501-1:1988. Cleanliness Sa 2.5. Roughness 50 to 85 microns Ry5. Coating should occur before degradation of the surface takes place (normally within 4 hours). If oxidation take place, the steel must be re-prepared. The surface must be dry and free of dust, salts, grease and any other contaminants immediately before coating.

Site conditions during steelmaster application

The steelwork should be protected from rain or condensation during the application and initial drying stages of Steelmaster 60/120. The surface must be dry and free of dust, salts, grease and any other contaminants immediately before coating.

Thinning/Cleaner: Thinning is not normally required. Clean equipment with Jotun thinner number 7.

Surface Temperature: Minimum 5°C maximum 35°C. The temperature of the substrate must also be at least 3°C above the dew-point

Relative Humidity: Maximum 85%

Application methods

Mixing: Stir thoroughly before use until product is homogeneous

Application: Normally applied by airless spray (brush/roller small areas only - see below)

Airless Spray Application:

Pump ratio: minimum 45:1
Pressure at tip: 25 MPa (250kp/cm² 3600 psi)
Tip size: 19-27 thou (0.48-0.68mm)
Tip angle: 30° - 50°
Filters: 30 mesh internal filter normally required
Hose diameter: (ID) 10mm
Hose length: Maximum 60 metres

Brush/Roller Application: For brush application, use a "laying on" technique to avoid heavy brush marking. The maximum DFT achievable is 400 microns per brush coat. For roller application, a short piled roller will produce a light textured finish. The maximum DFT achievable is 250 microns per roller coat

Multi-coat spray application guidance

Steelmaster 60/120 can be applied at up to 1.4mm DFT achievable* (2.06mm WFT) in a single spray coat.

One method of achieving higher builds is detailed below:

Required DFT/WFT	No. of Coats	1 st Coat*	2 nd Coat	3 rd Coat	4 th Coat
1.40mm dry 2.06mm wet	1	1.40mm dry* 2.06mm wet	None	None	None
1.41-2.20mm dry 2.07-3.33mm wet	2	1.40mm dry* 2.06mm wet	up to 0.8mm dry 1.18mm wet	None	None
2.21-3.00mm dry 3.24-4.40mm wet	3	1.40mm dry* 2.06mm wet	0.8mm dry 1.18mm wet	up to 0.8mm dry 1.18mm wet	None
3.01-3.80mm dry 4.43-6.47mm wet	4	1.40mm dry* 2.06mm wet	0.8mm dry 1.18mm wet	0.8mm dry 1.18mm wet	up to 0.8mm dry 1.18mm wet

Note: 0.8mm dry = 1.18mm wet. Where two (or more) coats are required, allow a minimum air-drying period of 4 hours at 20°C between coats.

**actual film thickness achievable on first coat will depend upon a number of factors including ambient conditions (air temperature, humidity, air-movement, steel temperature, spray tip size and angle, steel section size etc).*

Wet film thickness determinations

Wet film readings should be taken regularly during application, using a clean accurate aluminium or metal wet film thickness comb. The readings should be regarded as a guide only to enable the applicator to establish a technique for achievement of the required dry film thickness specification. During multi-coat operations, wet film readings will prove unreliable when applying subsequent coats of Steelmaster 60/120.

Drying

Drying times will vary considerably depending upon ambient conditions, method of application, air movement, ventilation, etc. As a guide, a dry film thickness of 700 microns will be touch dry in approximately 2 hours and hard dry in approximately 48 hours.

Water-resistance

Steelmaster 60/120 Super Durable can be left externally without a Topsealer for up to 6 months. Steelmaster 60/120 Internal SHOULD NOT be left externally without a Topsealer.

During this period of exposure, however, Steelmaster 60/120 Super Durable grade must be protected from pooling water, hot humid environments or immersed conditions.

Prior to placing steelwork coated with Steelmaster 60/120 Super Durable (without Topsealer) in an external environment, it should be allowed to dry internally (or in a watertight environment) as follows:

Intumescent DFT (mm)	Interior Drying Period at 20°C	Interior Drying Period at 10°C
Up to 1.00	12 hours minimum	24 hours minimum
1.01-1.40	16 hours minimum	32 hours minimum
1.41-2.20	20 hours minimum	40 hours minimum
2.21-3.00	24 hours minimum	48 hours minimum
Over 3.00 mm	36 hours minimum	72 hours minimum

Relates to the interior drying time after application of the final coat

Dry film thickness determinations

Take dry film thickness readings (DFTs) as soon as the coating is sufficiently hard to allow readings without indenting the surface.

All DFT specifications are mean values and the DFT of the primer must be deducted from the readings to give the intumescent only dry film thickness. (The DFT of Topsealer must also be deducted when present).

Do not apply Topseal until all the readings are in accordance with the specified thickness.

Topsealer

(PIONER)

Before applying Topsealer, the applicator must ensure that the specified intumescent DFT has been achieved.

Where a sealercoat is required - either for aesthetic reasons or to protect against atmospheric attack, then PIONER TOPCOAT should be applied.

The minimum Dry Film Thickness (DFT) requirement will vary depending upon the end use (see table below). 75 microns of Top Sealer may be sufficient for some INTERNAL projects or where applied purely for cosmetic reasons.

For exterior applications, Steelmaster 60/120 Super Durable must be applied, followed by Top Sealer at a minimum DFT of 100 microns. Two coat application may be necessary.

A further coat of Pioneer Topsealer is recommended after 10 years exposure to maintain the original aesthetic appearance of the system.

Note: Jotun Pioneer is available in an extensive colour range. However deep/dark (and black) colours should be avoided if the completed steelwork is to be directly exposed to ultraviolet light (sunlight).

Steelmaster 60/120 overcoating time (with Pioneer):

INTUMESCENT DFT (MM) OVERCOATING	MINIMUM OVERCOATING Time at 20°C	MINIMUM Time at 10°C
Up to 1.00	4 hours minimum	8 hours minimum
1.01-1.40	6 hours minimum	12 hours minimum
1.41-2.20	8 hours minimum	16 hours minimum
2.21-3.00	16 hours minimum	32 hours minimum
Over 3.00 mm	24 hours minimum	48 hours minimum

Life expectancy (Exposure conditions are defined in ISO 12944)

Exposure Conditions (ISO 12944)	C1	C2	C3	C4	C5
Description	Dry internal controlled	Internal semi-controlled dry environments subject to temperature fluctuation/ no condensation	Internal damp semi-controlled environment	Internal uncontrolled frequently wet with condensation	Most External environments
Use	Steelmaster 60/120 Internal	Steelmaster 60/120 Internal	Steelmaster 60/120 Super Durable	Steelmaster 60/120 Super Durable	Steelmaster 60/120 Super Durable
Life expectancy	Life of building	Up to 20 years	Up to 20 years	Up to 20 years	Up to 20 years
Top Sealer	None	None	75-100 microns*	100 microns*	100-125 microns*

It should be noted that all areas of mechanical damage must be repaired properly before the onset of localised breakdown.

* A further coat of Top Sealer is recommended after 10 years exposure to maintain the original aesthetic appearance of the system.

Health and safety

Please observe the precautionary notices displayed on the container. Apply under well-ventilated conditions. Do not breath or inhale spray mist/vapours. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

For detailed information on the health and safety information with precautions for the use of this product, please refer to the appropriate Material Safety Data Sheet.

DISCLAIMER

The information in this data sheet is given to the best of our knowledge based on laboratory testing and practical experience. However, as the product is often under conditions beyond our control, we can not guarantee anything but the quality of the product itself. We reserve the right to change the given data without notice.

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