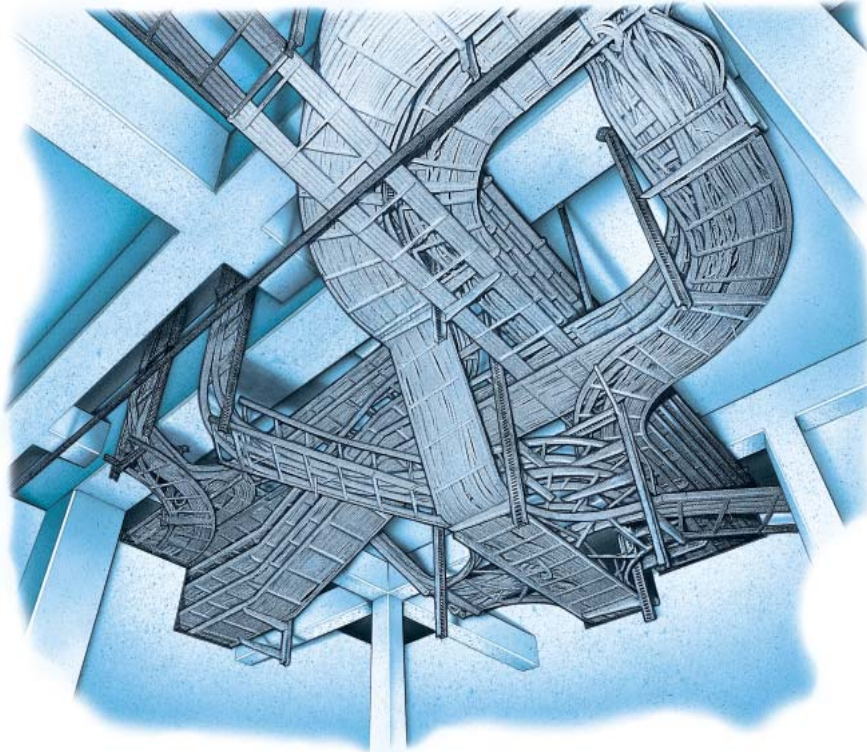


KBS COATING SPRAYABLE



RECOMMENDED INSTALLATION METHODS

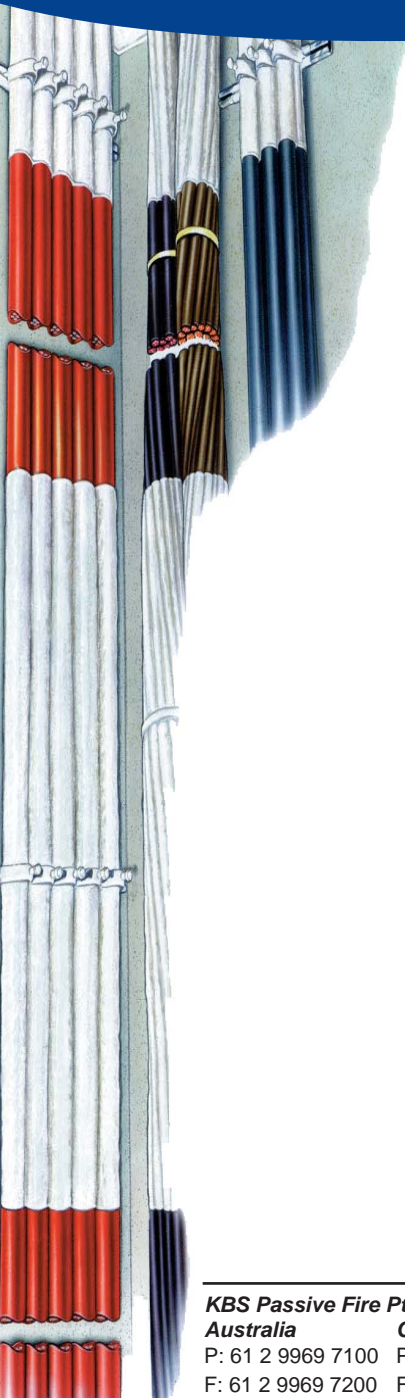
KBS Passive Fire Pty. Ltd.

Australia

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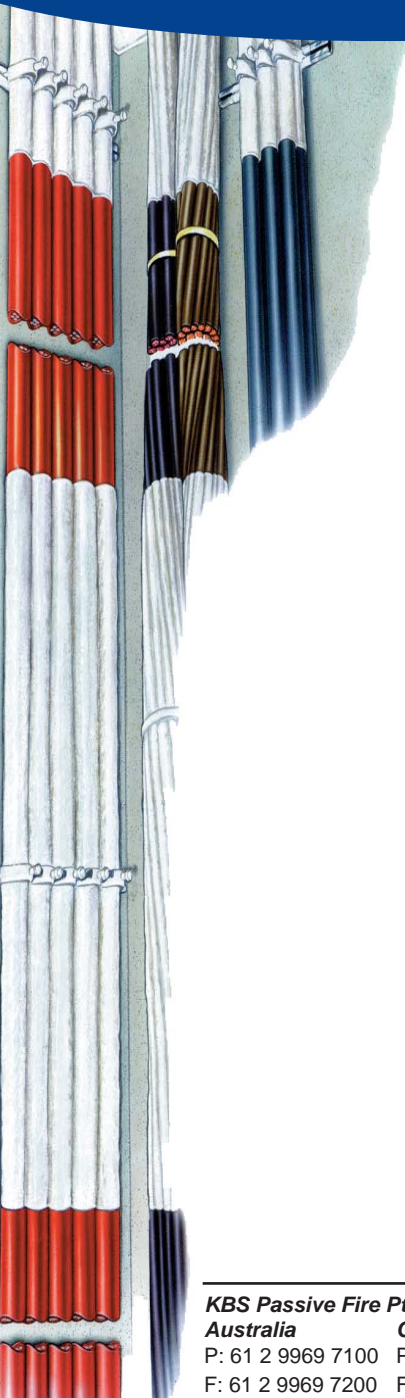
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1. Introduction

Why do cables have to be fire protected? Electrical cables themselves can be the cause of a fire (short-circuit, electrical overload, arcing). They allow the rapid spread of flame mainly in vertical cable shafts and can cause secondary fires. The rapid propagation of flame is the biggest risk in cable fires. Propagation rate is 20metres/min (66ft/min) in vertical runs, that means 5 storeys/min.

Insulating and jacketing of most cables used today consist of plastics; polyvinylchloride (PVC) contributes by the largest part, but plastics such as polyethylene (PE), polypropylene (PP) and others are used to lesser extents. PVC contains chlorine which in fire is emitted as hydrogen chloride. This gas is carried by the air through the entire building structure reaching parts which are not affected by heat or flames. This hydrogen chloride condensates after combining with water vapour to produce hydrochloric acid, which is deposited on all surfaces and may cause severe corrosive damage to metal surfaces, for instance in electrical or electronic installations and cement or concrete structure.



The purpose of fire protection for electrical installations must be:

- Preventing flame propagation through cable-ways.
- Preventing or delaying fire damage to cables to preserve their integrity.
- Segregating cable-ways into fire zones thus isolating the possible cable fires to their source.

One way of cable protection is fire protective coatings. These coatings must meet a list of requirements which are:

- Prevent flame propagation along cable ways.
- Delay damage to cables in a fire keeping them functional for a period of time.
- Not reducing the current carrying capacity (ampacity).
- Be resistant to humidity, moisture and water contact.
- Have good chemical resistance.
- Does not affect cable jackets.
- Have good adhesion to cables.
- Does not cause health problems during application.
- Is easy to install.
- Have a long durability (as long as cables themselves).

Ablative Coating - KBS Coating

Ablative coatings have a different formulation compared to intumescent coatings. They do not contain chemicals that are soluble in water or changable by water as intumescents do.

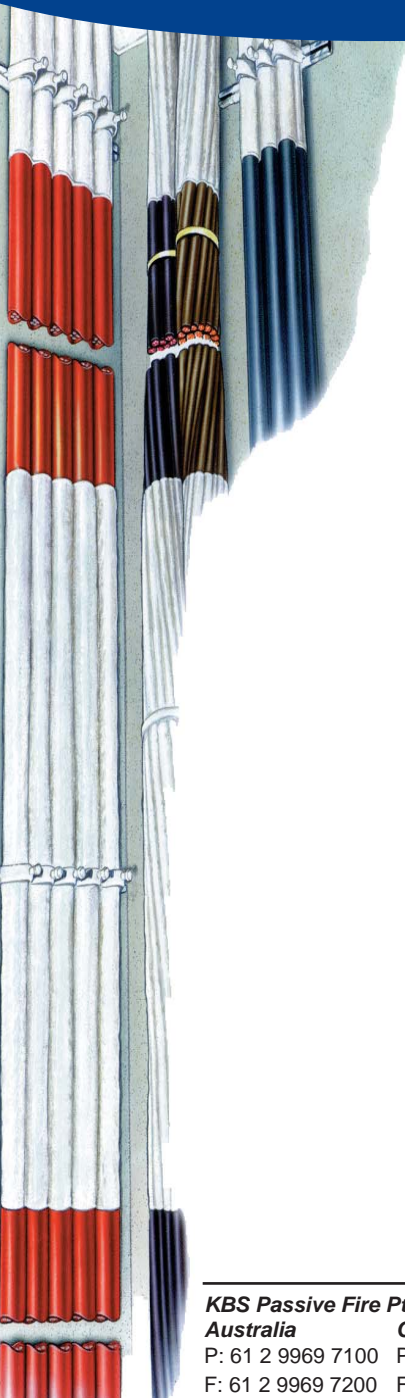
The fire protective effect of an ablative coating is as follows:

- At elevated temperatures energy-consuming, physical or chemical reactions (as melting, sublimation, evaporation for instance) occurs. Effectively the cable, is cooled. Additionally developed inert gases or vapours replace the oxygen in the air and prevent combustion. Furthermore some ablative coatings produce chemical substances which react in the flame directly interrupting the chemical chain reaction of ignition, this means that they are making use of the “anticatalytic effect” of the fire reaction.

2. Application of KBS Coating

Required equipment for the application of KBS Coating:

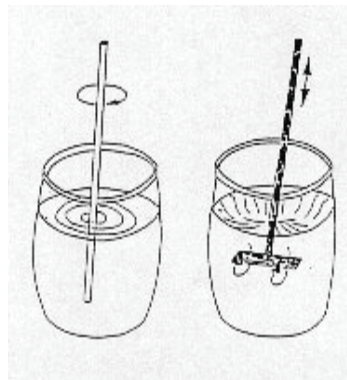
- KBS Coating.
- For spray application: Airless Graco Texspray Mark V
- Pressure pot equipment, spray gun for underbody sealing, compressor device/2601/min).
- Mixer (drilling machine).
- Masking Tape
- 1 bucket of water.
- Large drop sheets for the protection against overspray.



Before beginning with the coating of the cables in an area of approx. 1m² around the cable trays/cables to be coated you have to cover the floor, walls and ceiling with PE-foil in order to avoid spills and a dirty area.



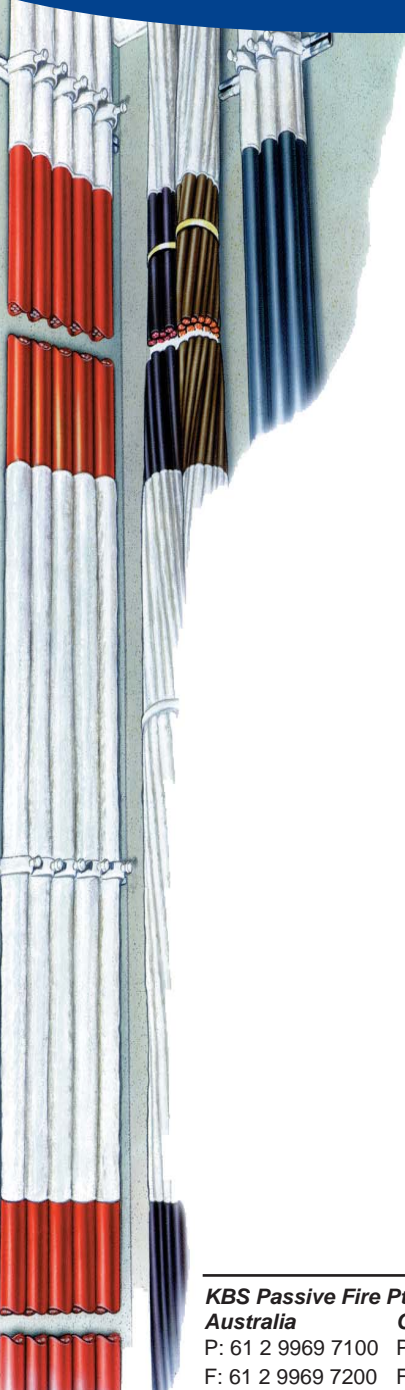
Control the temperature before starting your work: do not apply KBS Coating or KBS Brushable at temperatures below 5 degrees Celcius.



Not Recommended Recommended

Thoroughly stir the KBS Coating or KBS Coating brushable inside its original drum. You can take a special mixer, a drilling machine or take a hand mixer as shown.

KBS Coating is a water based coating, but thinning with water for both types of KBS Coating (KBS Coating is supplied in Sprayable and Brushable form) should not be necessary

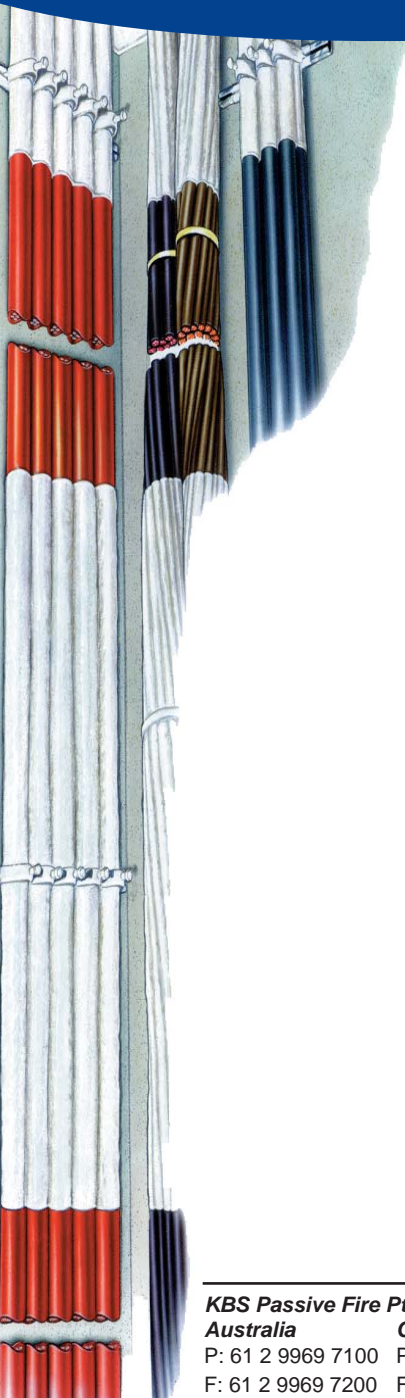


Surface Preparation of cables:

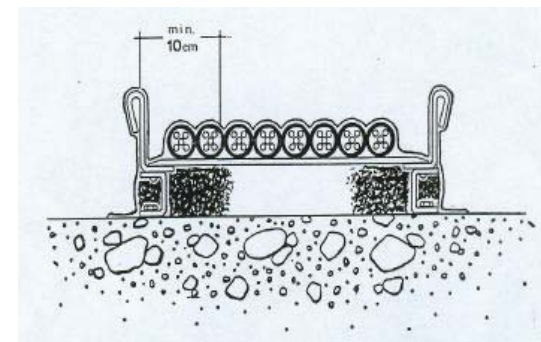
A thorough cleaning of cables is not required. However, oil and grease should be removed with dry rags (no solvent!). Using a broom or vacuum cleaner to remove heavy layers of dust is sufficient.

Application by Spray:

Application by spray is done in the conventional way. The white of the coating must cover the colour of the cable jacket. The wet film thickness of the coating must be at least 2.5mm on all exposed sides.



Where cables are close to a wall, pack mineral wool between the cables and wall and coat over. we recommend applying a fog coat first and let it dry, then apply the final coat.



Spray equipment:

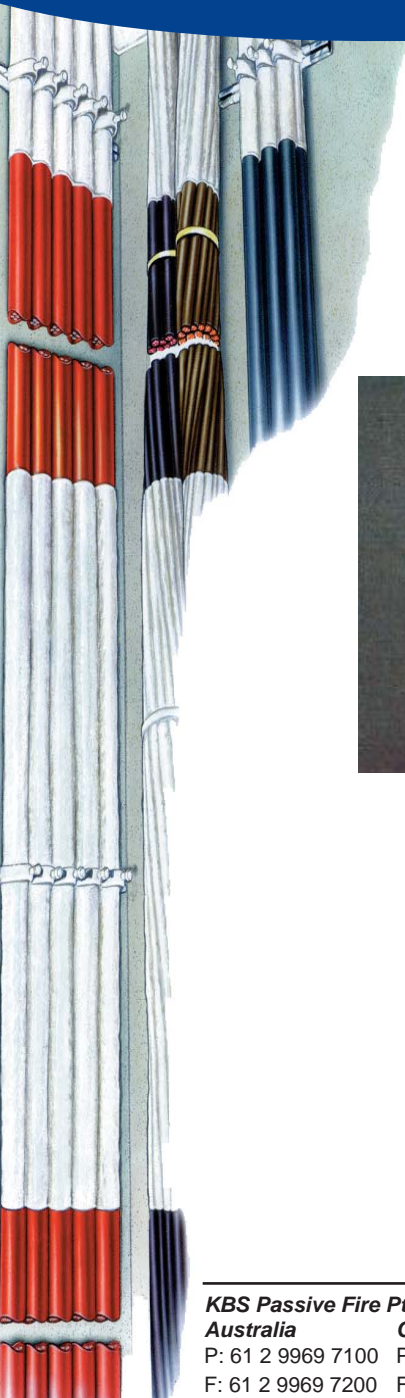
KBS Coating can be applied with a great variety of spray equipment designed for application of high viscosity materials. Good results have been obtained with the following:



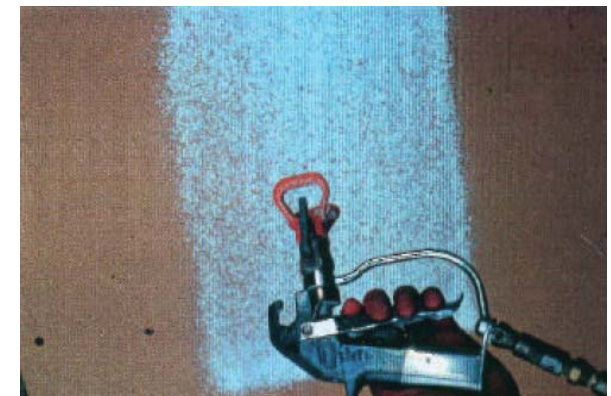
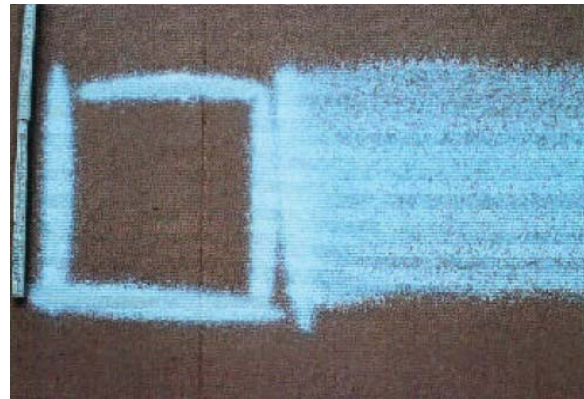
Airless spray Graco texspray Mark V
Up to 210 bar maximum pressure
Spray gun orifice: 0,9-1,0mm (preferably reversable tip)



Conventional spray equipment (with pressure pots): Binks, de Vilbis Mastic, wally or SATA: Material pressure: 4-5bar. Pressure at gun 4 bar Spray gun orifice: minimum 3mm diametre material hose: minimum 3/4" diametre Air supply: compressor capable of delivering 200 l/min (tank volume at least 40 l) 6 bar



Air supply, air pressure, diameter of material hose as well as minimum orifice must be adhered to as recommended. All filters of the equipment must be removed prior to operating with KBS Coating.



KBS Passive Fire Pty. Ltd.

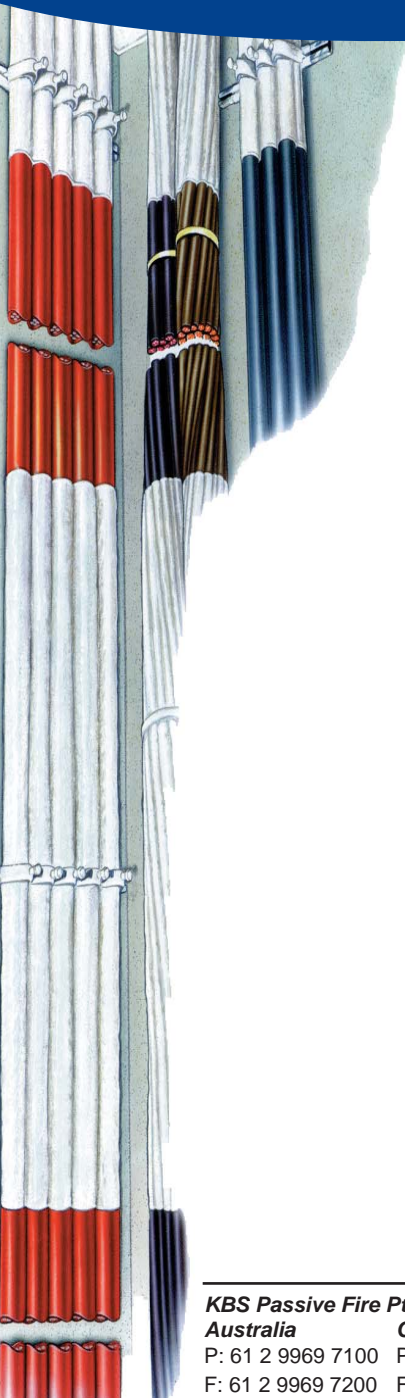
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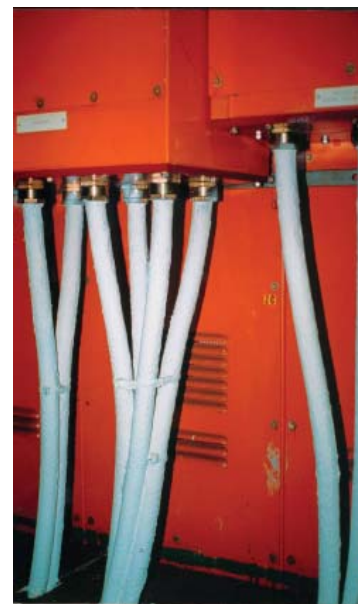
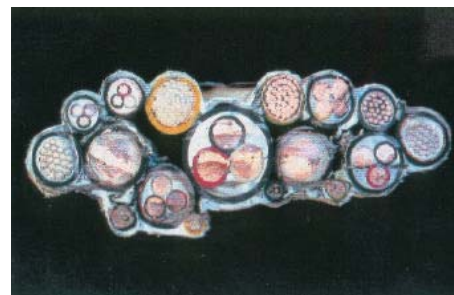
Installation Methods - KBS Coating Sprayable

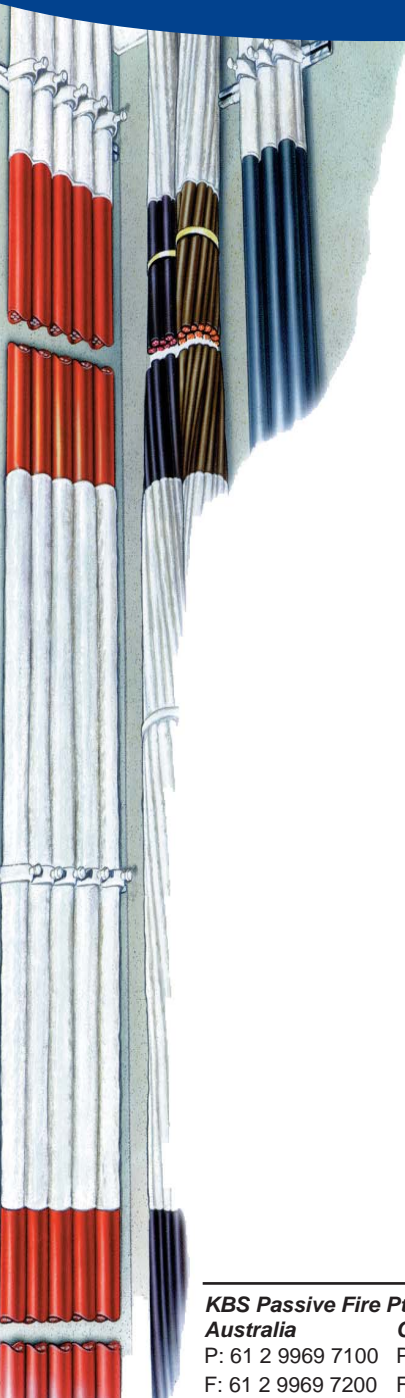


The necessary DFT of KBS Coating or KBS Coating brushable must be 1.6mm. With high humidity in the air, a reinforced air movement (ventilator) will help to accelerate drying of the coating.



Cleaning: After having applied on the cable surface the required coating thickness you can remove the PE-foil, clean up the room and consign it again to the client for further utilization





Approximate Spread Rates (Metric)

KBS Cable Coating (FM Rated):

To calculate the material required for a given cable tray:
TRAY SIZE = 600mm x 130mm

Perimeter of the cable tray = 600mm + 600mm + 130mm + 130mm = 1.46 metres
Say the cable tray is 200 metres long
Then 200 X 1.46 = 292m²
Coverage = 3.15kg/m² plus 30% for contours and wastage = 4.1kgs/m²
292m² X 4.1kg = 1197.2kgs of cable coating required.

Supplied in 35kg pails, the requirement for this calculation would be:
34.2 pails (35 pails in total)

NOTE! Wastage may vary depending on the loading and size of the cables in the tray. The lighter the loading the greater the wastage. The greater the cable dia. The more material required.

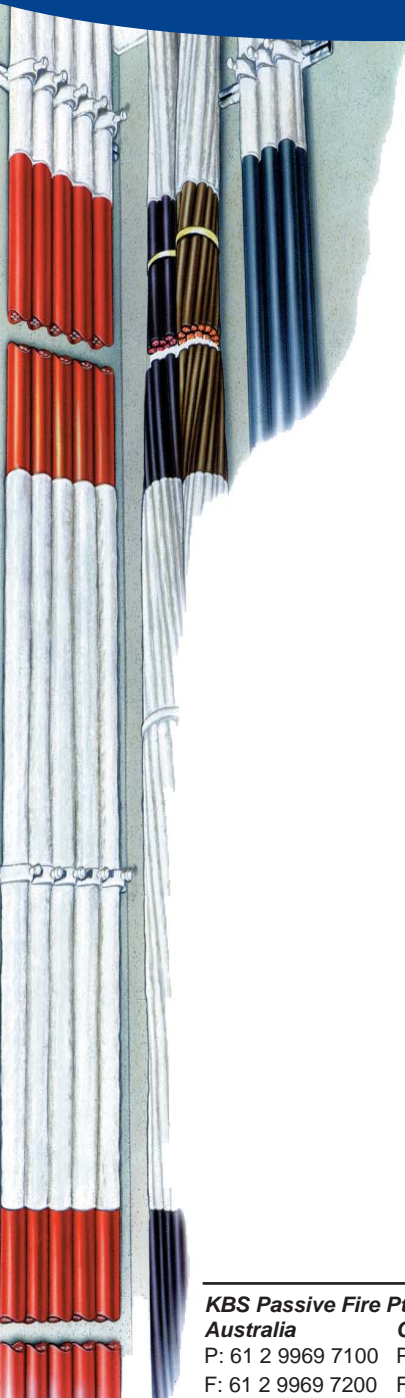
Film Thickness (FM3971):

Dry film thickness = 1.6mm
Wet film thickness = 2.5mm

Film Thickness (IEC60 311-11 - Fire Rating: 52 minutes):

Dry film thickness = 3.6mm
Wet film thickness = 5.1mm

Note: Spread rate for IEC is approx. 7.3kg/m²



Approximate Spread Rates (Imperial)

KBS Cable Coating (FM Rated):

To calculate the material required for a given cable tray:

TRAY SIZE = 24" X 6"

Perimeter of the cable tray = 24" + 24" + 6" + 6" = 5'

Say the cable tray is 100' long

Then 100' X 5' = 500ft²

Coverage = 0.7lbs/ft² plus 30% for contours and wastage = 0.91lbs/ft²

500ft² X 0.91lbs = 455lbs of cable coating required

Supplied in 77lbs pails, the requirement for this calculation would be:

5.9 pails (6 pails in total)

Approx. Rate/Pail = 85ft²

NOTE! Wastage may vary depending on the loading and size of the cables in the tray. The lighter the loading the greater the wastage. The greater the cable dia. The more material required.

Film Thickness:

Dry film thickness = 0.62" / 62.99mil / 1.6mm

Wet film thickness = 0.98" / 98.43mil / 2.5mm

The data contained in this document, particularly the recommendations for the application and use of KBS products are based on the manufacturer's knowledge and experience. Due to different materials and conditions of application, which are beyond our control, we recommend in any case to carry out sufficient tests in order to ensure that KBS products are suitable for the intended processes and applications. Therefore, any liability for such recommendations or any oral advice is expressly excluded unless we have acted wilfully or by gross negligence. It is always the responsibility of the Installer / purchaser to guarantee correct preparation, DFT (KBS Coatings) and thickness (KBS Penetration Seals) of all KBS Materials. KBS Passive Fire Pty. Ltd. is not responsible for installation or faulty installation. It is always the responsibility of the installer / purchaser to guarantee and certify the installation of materials.