

## PLS 400A

## Product Data Sheet

### Fast Curing Silane Crosslinkable Polyethylene Low Voltage Power Cable Insulation Compound

#### Description

PLS 400A is a Silane grafted, polyethylene insulation compound specially modified to render, **faster crosslinking**. It is designed to be used with Plascom PLS 420 and/or PLS 420D catalyst masterbatch added at a rate of 5 wt.%. The extruded combination is faster crosslinkable on exposure to hot water / low pressure steam or ambient. It is suitable for use in both copper and aluminium cored cables.

#### Specifications

PLS 400A insulated conductors, when manufactured employing sound extrusion practices and strict process control, will comply with the requirements of the following standard: -

UL 854/1581, USE/USE-2

BS 5467/6469, BS 7655.1.3(GP 8) IEC 60502-1

#### Application

PLS 400A is for use by cable manufacturers requiring best performance properties for low voltage, silane crosslinked cable insulation (**up to 1 kV**). It is suitable for a wide range of cable sizes, either copper or aluminium cored and may be colored for identification purposes using suitable LDPE based pigment masterbatches.

#### Packaging

PLS 400A is manufactured in pellet form and is available in the following packages: -

- lined, palletised Octabins 600 kg net

Octabins contain heat-sealed liners to prevent moisture ingress. The palletised package is stretch wrapped for environmental protection. The Octabins may be stacked two high provided the lower packages are unopened and the stretch wrapping is intact. Packages damaged during handling should not be stacked.

#### Processing

PLS 400A requires very precise process control in order to maximise manufacturing efficiency and optimise the final physical and electrical properties of the insulated cable. It will process well on a wide variety of extruders but, as a general guide, extruders having an L:D of less than 25:1 and a compression ratio between 2 and 3 are recommended. A temperature profile rising from about 160°C at zone 1 to about 250°C at the die (when flame is applied). Without flame, the die temperature has to be maintained at 300°C. Screw cooling about 75°C; will suffice for most applications. Pre-drying of the catalyst masterbatch and colour masterbatches is strongly advised. However, ***do not attempt to pre-dry PLS 400A***. When small diameter wires are being manufactured, particularly with larger extruders, the material residence time may be excessive. To minimise scorch in such circumstances it is good practice to maintain as low a temperature profile as possible, consistent with the power requirements and pressure limits of the extruder. Initially a melt temperature of approximately 220°C and a crosshead temperature of 225°C maximum are required. Flaming of the die is advised to maximise surface gloss in all cases. PLS 400A may be utilized in either pressure or tube-on extrusion, although some pressure extrusion configurations may compromise final mechanical properties. Precise processing conditions will vary depending on the extruder type, die tooling, conductor size and line speed employed. Please contact Plascom to determine your specific requirements.

## Physical & Electrical Typical Properties

Test	Typical Value <sup>(1)</sup>	Unit	Test Method
Melt Flow Rate (190/2.16)	1.0	dg/min	ASTM D 1238
Density (Conditioning ISO 1183 - D)	920	kg/m <sup>3</sup>	ASTM D 1505
<b>Final Composition Properties<sup>(2)</sup> (2a)</b>			
Tensile Strength at Break <sup>(2a)</sup>	20	MPa	IEC 60811-1-1
Elongation at Break <sup>(2a)</sup>	600	%	IEC 60811-1-1
Aged Tensile Strength at Break <sup>(2) (3)</sup>	>90	% Retain	IEC 60811-1-2
Aged Elongation at Break <sup>(2) (3)</sup>	>90	% Retain	IEC 60811-1-2
Hot Set <sup>(2a)(4)</sup> (Elongation/Set)	80/0	%	IEC 60811-2-1
Dielectric Strength <sup>(2a)</sup> (short pulse)	>21	kV/mm	IEC 60243
DC Volume Resistivity <sup>(2)</sup>	1 x 10 <sup>15</sup>	Ω cm	ASTM D 257
Dielectric Constant <sup>(2)</sup>	2.3	60 Hz	ASTM D 150
Dissipation Factor <sup>(2)</sup>	0.0004	60 Hz	ASTM D 150

Note:

1. Values may differ when tests are performed on extruded insulation. Typical values should not be used for specification purposes.
2. Determined on 2 mm pressed sheet (PLS 400A:PLS420/420D, 95:5) cured at 90°C in water for 2 hours.
- 2a. Determined on 0.8mm extruded tape (PLS 400A:PLS420/420D, 95:5) cured at 90°C in water for 2 hours.
3. Test condition 135°C, 7 days
4. Test condition 200°C, 20 N/cm<sup>2</sup>, 15 min.

## Health and Safety

PLS 400A ingredients are essentially non hazardous in the delivered compound. Fines and dust particles associated with handling or conveying PLS 400A, as with all polyethylenes, may, under certain circumstances, pose an explosion hazard. Your facilities and procedures must be designed and operated to minimise the exposure of personnel to the dust and the possibility of a dust explosion occurring.

Please refer to the PLS 400A Material Safety Data Sheet for comprehensive information.

## Storage and Handling

PLS 400A may be bulk handled and conveyed using equipment designed for conventional polyethylene pellets. The conveying system should be adequately grounded to prevent accumulation of static charge and equipped with suitable filtration to prevent dust hazards within the factory and local environment. By its nature PLS 400A is moisture sensitive so the use of high humidity conveying air should be avoided. The material must be used within a short time after exposure to humidity in order to minimise the risk of scorching during extrusion. PLS 400A should be used directly from its packaging. Under no circumstances should it be pre dried - even in dehumidified hot air.

PLS 400A must be stored unopened in a dry, stable temperature environment for optimum performance. A temperature range of 10 °C to 35 °C is recommended. Under ideal conditions a shelf life of more than 6 months can be expected. Irreversible damage may occur to the compound if it is not stored in appropriate conditions.

## Third Party Materials

Insofar as materials not supplied by Plascom are used in conjunction with, or instead of Plascom materials, it is the responsibility of the customer to obtain all relevant data pertaining to their use and to satisfy himself as to their suitability. No liability whatsoever can be accepted by Plascom for use of their materials in conjunction with any other material.