

## PLS 420 / PLS 420D

## Product Data Sheet

**Catalyst Masterbatch with / without Metal Deactivator for use with Silane Crosslinkable Polyethylene Cable Insulation Compounds**

### DESCRIPTION

PLS 420 / PLS 420D is a masterbatch comprising polyethylene, a catalyst to induce silane crosslinking and a stabilisation package to impart long term thermo-oxidative degradation resistance to the final cable insulation. It is designed to be used, at a rate of 5 wt.% with Plascom's silane crosslinkable compounds. The extruded combination is crosslinkable on exposure to hot water or low pressure steam. PLS 420D's stabilization package contains a metal deactivator as well to inhibit copper catalysed thermo-oxidation of the crosslinked polyethylene. It is particularly suitable for use on thin walled, copper cored conductors where a very high degree of thermo-oxidative stability will be required during service but, it is equally effective for aluminium cored cables and cable constructions with larger wall thickness.

**PLS 420:** To use with Plascom's PLS 400A / PLS 400 / PLS 400M.

**PLS 420D:** To use with Plascom's PLS 400A/ PLS 420 (for thin walled copper cored conductors).

### Specifications

**PLS 420 / PLS 420D** with PLS 400, PLS 400M and/or PLS 400A insulated conductors, when manufactured employing sound extrusion practices and strict process control, will comply with the requirements of the following standards: -

UL 94, XHHW	UL 854/1581	IEC 60502/60811	BS 5467/6469 / IEC A S66-524
NEMA WC7	IEC 60502-1	IEC 60502-2	AEIC CS5-94 (10 <sup>th</sup> edition)

### Application

**PLS 420 / PLS 420D** are for use by cable manufacturers requiring best performance properties for silane crosslinked cable insulation. When used at the recommended concentration with PLS 400, PLS 400M and/or PLS 400A scorch free extrusion and rapid crosslinking on exposure to hot water are achievable. It is suitable for a wide range of cable sizes, either copper or aluminium cored and it is compatible with a wide range of LDPE based pigment masterbatches used for cable colour identification purposes.

### Packaging

**PLS 420 / PLS 420D** are manufactured in pellet form and is available in the following packages: -

- lined Aluminum sacks of 25 kg, palletised 500 kg net

Lined sacks are multi-layer heat-sealed to prevent moisture ingress. The palletised package is stretch wrapped for environmental protection. Packages damaged during handling should not be stacked.

### Processing

**PLS 420 / PLS 420D** is specifically designed to be used with PLS 400, PLS 400M and/or PLS 400A at a concentration of up to 5.0 wt.%. In some cable manufacturing scenarios pre-cure, or scorch, of PLS 400A/PLS 400/PLS 400M may be apparent. In such cases it may be permissible to reduce the addition rate of **PLS 420 / PLS 420D** below the recommended 5 wt.%. Such an action should only be taken after remedying other potential causes of scorch. The consequences of reducing the **PLS 420 / PLS 420D** addition rate are; slower crosslinking rate and reduced long term thermo-oxidative stability. On no account should the addition rate be reduced below 3.5 wt.% as the final insulation may not comply with the accelerated aging requirement defined in cable standards. Pre-drying of **PLS 420 / PLS**

**420D** (and any colour masterbatches being used) is strongly advised to minimise the risk of scorch. Please study the processing guidelines given in Plascom's data sheet for PLS 400, PLS 400M and PLS 400A.

## Physical & Electrical Typical Properties

Test	Typical Value <sup>(1)</sup>	Unit	Test Method
Melt Flow Rate (190/2.16)	3.5	dg/min	ASTM D 1238
Density (Conditioning ISO 1183 - D)	930	kg/m <sup>3</sup>	ASTM D 1505
<i>Final Composition Properties<sup>(2)</sup> (2a)</i>			
Tensile Strength at Break <sup>(2a)</sup>	17	MPa	IEC 60811-1-1
Elongation at Break <sup>(2a)</sup>	450	%	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 (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	at 60 Hz	ASTM D 150
Dissipation Factor <sup>(2)</sup>	0.0004	at 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/PLS 400/PLS 400M:PLS420/420D, 95:5) cured at 80°C in water for 3 hours.
- 2a. Determined on 0.8mm extruded tape (PLS 400A/PLS 400/PLS 400M:PLS420/420D, 95:5) cured at 90°C in water for 3 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 420 / PLS 420D** ingredients are essentially non-hazardous in the delivered compound. Fines and dust particles associated with handling or conveying **PLS 420 / PLS 420D**, 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 420 / PLS 420D** Material Safety Data Sheet for comprehensive information.

## Storage and Handling

**PLS 420 / PLS 420D** 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 420 / PLS 420D** 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 420 / PLS 420D** may be used directly from its packaging but it is recommended to dry it with warm, dehumidified air before use.

PLS 420 must be stored unopened in a dry, stable temperature environment for optimum performance. A temperature range of 5°C to 40°C is recommended. Under ideal conditions a shelf life in excess of 24 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.