PLASCOM

Wire & Cable Compounds

بلاسكوم
PLASCOM
الشركة العربية لانتاج حبيبات الكوابل المحدودة
ARAB COMPANY FOR CABLE POLYMERS LTD.

PLS 400M Product Data Sheet

Silane Crosslinkable Polyethylene Medium Voltage Power (up to 35 kV) Cable Insulation Compound

DESCRIPTION

PLS 400M is a silane grafted, polyethylene insulation compound. It is designed to be used with Plascom PLS 420 catalyst masterbatch added at a rate of 5 wt.%. The extruded combination is crosslinkable on exposure to hot water or low pressure steam. It is suitable for use in both copper and aluminium cored cables.

Specifications

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

AEIC CS 5-94 (10th edition) ICEA S66 - 524, NEMA WC7
IEC 60502-2 BS 6622

Application

PLS 400M is for use by cable manufacturers requiring best performance properties for medium voltage, silane crosslinked cable insulation **(up to 35 kV)**. It is suitable for a wide range of cable sizes, either copper or aluminium cored.

Packaging

PLS 400M 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

Great care should be exercised, at all manufacturing stages, to prevent ingress of local contamination into the finished cable insulation. **PLS 400M** requires 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 130 °C at zone 1 to about 190 °C at the die, with screw cooling about 75 °C, will suffice for most applications. Pre-drying of the catalyst masterbatch is strongly advised. However, *do **not** attempt to pre-dry* **PLS 400M**. To minimise scorch 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 170 °C maximum and a crosshead temperature of 175 °C maximum are recommended to avoid scorching. 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.

cleanliness DETERMINATION

PLS 400 M is manufactured and packaged as a continuous process. Consequently, very little blending occurs. Product cleanliness is monitored by visual inspection of pellets, Unidot® SHR examination of extruded tapes and Unipel® examination of a pellet side stream. The process stream is sampled continuously at a rate of 3.2 $kg.hr^{-1}$ and the sample conveyed to the hopper of a special extruder located in a clean room. Tapes are extruded for examination by a Unidot® SHR, which analyses and reports on each 500g of material, thus ensuring a

minimum of 0.25 wt. % of the process stream is inspected. A Unipel® pellet inspection device, fed from a continuous side stream, examines a minimum of 25 wt. % of the product and removes any contaminated pellets for subsequent laboratory inspection, prior to recombining the analysed stream with the main process stream. Regular samples of 2.0 kg are taken during packaging for visual inspection in high light conditions. Observation of any contamination will cause the affected material to be rejected.

Physical & Electrical Typical Properties

Test	Typical Value(1)	Unit	Test Method
Melt Flow Rate (190/2.16)	0.7	dg/min	ASTM D 1238
Density (Conditioning ISO 1183 - D)	922	kg/m^3	ASTM D 1505
Final Composition Properties(2) (2a)			
Tensile Strength at Break(2a)	17	MPa	IEC 60811-1-1
Elongation at Break(2a)	400	%	IEC 60811-1-1
Aged Tensile Strength at Break (2) (3)	>85	% Retain	IEC 60811-1-2
Aged Elongation at Break (2) (3)	>85	% Retain	IEC 60811-1-2
Hot Set (2a)(4) (Elongation/Set)	80/0	%	IEC 60811-2-1
Dielectric Strength(2) (short pulse)	>27	kV/mm	IEC 60243
DC Volume Resistivity(2)	1 x 10^{15}	Ω cm	ASTM D 257
Dielectric Constant (2)	2.3	60 Hz	ASTM D 150
Dissipation Factor (2)	0.0004	60 Hz	ASTM D 150
Tape Contamination(5)	0/0/3/10	#kg^{-1} (6)	Plascom Interna

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 400M:PLS420, 95:5) cured at 80°C in water for 4 hours.

2a. Determined on 0.8mm extruded tape (PLS 400M:PLS420, 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^2, 15 min.
5. Unidot examination as described in the section "Cleanliness Determination".
6. Size range >500µm/500µm-250µm/250µm-125µm/125µm-50µm

Health and Safety

PLS 400M ingredients are essentially non hazardous in the delivered compound. Fines and dust particles associated with handling or conveying **PLS 400M**, 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 400M** Material Safety Data Sheet for comprehensive information.

Storage and Handling

PLS 400M may be bulk handled and conveyed using equipment designed for conventional polyethylene pellets. *The conveying system must not introduce any contamination which would disqualify **PLS 400M** for use as a medium voltage insulation.* Adequate grounding to prevent accumulation of static charge and filtration to prevent dust hazards within the factory and local environment are recommended. By its nature **PLS 400M** 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 400M 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.