

## PLC 201 / PLC 201vc

## Product Data Sheet

### Peroxide Crosslinkable Polyethylene Medium / High Voltage Power Cable Insulation Compounds

#### DESCRIPTION

PLC 201 / PLC 201vc are clean and very clean, peroxide crosslinkable, polyethylene cable insulation compounds containing a stabilisation package to impart long term thermo-oxidative degradation resistance to the finished cable. PLC 201 / PLC 201vc is suitable for use in both dry (N<sub>2</sub>) and steam curing processes. It is available for use in Medium / High Voltage Power Cables.

PLC 201: up to 35 kV

PLC 201vc: above 35 kV - Because of its high level of cleanliness, it is classified as VC (Very Clean).

#### Specifications

PLC 201 / PLC 201vc insulated cores and finished cables, when manufactured employing sound extrusion practices and strict process control, will comply with the requirements of the following standards: -

AEIC CS 5-94 (10 <sup>th</sup> edition)	IEC 60502	ICEA S66 – 524	NEMA WC7
AEIC CS 7-93 (3 <sup>rd</sup> edition)	IEC 60840	VDE 0273	BS 6622

#### Application

PLC 201 / PLC 201vc is for use by cable manufacturers requiring best performance properties for medium / high voltage cables. The use of inner and outer semiconductive shield layers, applied during triple head extrusion, is required to comply with cable standard requirements. Please contact Plascom for approved semiconductive compounds.

#### Packaging

PLC 201 / PLC 201vc is sold in pellet form and is available in the following package:-

- PE lined, palletised Octabins 550 kg net

Octabins contain heat sealed polyethylene liners and may be top or bottom unloaded.

#### Processing

PLC 201 / PLC 201vc requires very precise process control in order to maximise manufacturing efficiency and optimise the final physical and electrical properties of the insulated cable. As a general guide, a maximum melt temperature of 130 °C is recommended. Precise processing conditions will vary depending on the extruder type, die tooling, conductor size, CCV tube configuration and line speed employed. Please contact Plascom to determine your specific requirements.

#### Cleanliness determination

PLC 201 / PLC 201vc 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<sup>-1</sup> 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 <sup>(1)</sup>	Unit	Test Method
Melt Flow Rate <sup>(2)</sup> (190/2.16)	2.0	dg/min	ASTM D 1238
Density <sup>(2)</sup> (Conditioning ISO 1183 - D)	922	kg/m <sup>3</sup>	ASTM D 1505
Tensile Strength at Break <sup>(5)</sup>	17	MPa	IEC 60811-1-1
Elongation at Break <sup>(5)</sup>	540	%	IEC 60811-1-1
Aged Tensile Strength at Break <sup>(3)(5)</sup>	>90	% Retain	IEC 60811-1-2
Aged Elongation at Break <sup>(3)(5)</sup>	>90	% Retain	IEC 60811-1-2
Hot Set <sup>(4)(5)</sup> (Elongation/Set)	80/0	%	IEC 60811-2-1
Methanol Wash	500	ppm	Plascom Internal
Dielectric Strength <sup>(5)</sup> (short pulse)	>22	kV/mm	IEC 60243
DC Volume Resistivity <sup>(5)</sup>	1 x 10 <sup>15</sup>	Ω cm	ASTM D 257
Dielectric Constant <sup>(5)</sup>	2.3	at 60 Hz	ASTM D 150
Dissipation Factor <sup>(5)</sup>	0.0003	at 60 Hz	ASTM D 150
Tape Contamination <sup>(6)</sup>			
PLC 201	0/0/3/10	#kg <sup>-1</sup> (7)	Plascom Internal
PLC 201vc	0/0/3/5	#kg <sup>-1</sup> (7)	Plascom Internal

Note:

1. Do not use these values for specification purposes
2. Determined on base resin prior to peroxide addition
3. Test condition 135<sup>o</sup> C, 7 days
4. Test condition 200<sup>o</sup> C, 20 Ncm<sup>-2</sup>, 15 min.
5. Data obtained from pressed sheet cured at 180<sup>o</sup> C for 15 min.
6. Unidot examination as described in the section "Cleanliness Determination".
7. Size range >500µm/500µm-250µm/250µm-125µm/125µm-50µm

## Health and Safety

PLC 201 / PLC 201vc ingredients are essentially non-hazardous in the delivered compound. Fines and dust particles associated with handling or conveying PLC 201 / PLC 201vc, as with all polyethylenes, may, under certain circumstances, pose an explosion hazard. Facilities and procedures must be designed and operated so as to minimise the exposure of personnel to the dust and the possibility of a dust explosion occurring.

Please refer to the PLC 201 / PLC 201vc Material Safety Data Sheet for comprehensive information.

## Storage and Handling

PLC 201 / PLC 201vc must be stored unopened in a dry, vibration free, constant temperature environment for optimum performance. A temperature range of 15 °C to 30 °C is recommended with minimum variation over a 24 hour period. Deep temperature cycling over an extended period, particularly outside the above limits, will induce exudation of additives from the compound. Irreversible damage may occur to the compound if it is not stored in ideal conditions.

PLC 201 / PLC 201vc 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. Care must be exercised during conveying of the material to avoid ingress of contamination.

## 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.