Issued June 2010

SX522A:CM401 and SX522A:CM401CDS

Ambient cure, silane crosslinkable polyethylene for low voltage power cable insulation

This crosslinkable polyethylene compound is designed for the insulation of power cables; possessing outstanding extrusion properties at high output rates. The graft component SX522A is mixed with the crosslinking catalyst masterbatch CM401 generally in the ratio 95:5. It exhibits minimum point and die drool, low scorch characteristics and high production efficiency.

It can be cured at ambient temperatures and is specifically designed for small and sector shaped conductors.

Test	Test method	Unit	Typical value
Physical properties and mechanical properties			
Density	BS 2782 Pt. 6 Mtd 620A-D	g/cm^3	0.92
Melt flow rate (2.16kg at 190°C)	AEI Method	g/10min	1.4
Tensile strength	BS EN 60811-1-1	N/mm²	18
Elongation at break	BS EN 60811-1-1	%	450
Typical ageing behaviour after 7 days at 135°C			
Tensile strength	BS EN 60811-1-2	%Variation	+7
Elongation at break	BS EN 60811-1-2	% Variation	-7
Thermo mechanical properties			
Cold bend at -70°C	IEC 60811-14	-	Pass
Cure assessment			
Hot set (20N/cm² at 200°C)	BS EN 60811-1-2	%	0
Hot elongation (20N/cm² at 200°C)	BS EN 60811-1-2	%	<100
Cure assessment (ambient cure at 20°C and 50% humidity)			
Insulation thickness 0.8mm	<100% Hot elongation	Days	5
Insulation thickness 1.5mm	<100% Hot elongation	Days	14
Electrical properties			
Volume resistivity at 20°C	BS 6622	Ohm.cm	>1 x 10^{16}
Dielectric strength at 20°C	IEC 60243	kV/mm	21
Power factor at 50Hz at 23°C	IEC 6025	-	0.0003
Permittivity at 50Hz at 23°C	IEC 6025	-	2.0

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Recommended processing and handling conditions

Extruder

Most modern thermoplastic extruders will process SX522A:CM401 & CM401-2 compounds, particularly if a screw suitable for polyethylene extrusion is available.

Extruder temperature conditions

As a guide the following temperature profile is recommended:-

Zone 1	Zone 2	Zone 3	Zone 4	Head	Die
130°C	150°C	170°C	190°C	200°C	210°C

This profile will vary slightly depending on extruder type, head design and output.

Screw water temperature 70°C

Recommended screen pack 30, 100, 30 (mesh apertures per linear inch) or 600,150, 600 micron

Head and tool design

The head and tools should be so designed as to allow streamlined flow without the possibility of stagnation of material (where pre-curing could take place). To obtain the optimum in physical properties in the case of tubing tools, it is generally recommended that a draw down ratio not greater than 3.5 is used.

Catalyst and colour masterbatches

CM401 catalyst masterbatch is normally added at 5% to 95% of SX552A graft. It is advisable to use CM401-2 for less than 1mm thin wall applications; this is normally added at 10% to 90% graft.

An alternative catalyst masterbatch CM401CD or CM401CDS, containing a copper deactivator, are used where the material is required to undergo a 168 hour ageing test at 150°C on bare copper conductor.

Addition of approved colour masterbatches, including black, up to a maximum of 1%, has no detrimental effect on the properties or crosslinking capability.

It is recommended that all masterbatches, including those containing the catalyst, should be thoroughly dried at 60°C for 8 hours or at 80°C for 4 hours.

Storage & shelf life

SX522A normally has shelf life of at least 6 months from the date of manufacture. The storage of silane crosslinkable compounds in cool dry conditions will maximise useful shelf life. Other precautions are:-

- Packaging should remain sealed
- Avoid temperature above 25°C
- Avoid storage outside and in direct sunlight
- Use within 8 hours of opening packaging

Form and packaging

Form – pellets

Packaging – The following possibilities are available:-

- Moisture resistant sacks containing 25kg.
- Boxes with a moisture resistant heat sealed liner containing approximately 125kg, 500kg or 1000kg.

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