



CT06-30:CT06-81B

Ambient Cure, low smoke, low-toxicity, halogen-free, flame-retardant compound for insulation and sheathing of cables

This is a low smoke, low fume, fire retardant silane crosslinkable compound which can be processed as a thermoplastic at high output rates. The crosslinking catalyst masterbatch CT06/81B is mixed with the CT06/30 graft component at an addition rate of between 2.5 and 5%, the rate dependent upon the extruder residence time. It has been designed to satisfactorily cure at ambient temperature and humidity conditions.

The compound combines good mechanical, electrical and fire retardant properties to meet demanding insulation specifications such as BS7211 and IEC 60092-351/HF90. This compound can also be used for sheathing of cables which require high levels of levels of fire retardancy

Test	Test method	Unit	Typical value
Physical properties and mechanical properties			
Melt Flow Rate (21.6kg @150°C)	AEI Method	g/10 minutes	8
Tensile strength	IEC 60811-1-1	N/mm ²	13
Elongation at break	IEC 60811-1-1	%	180
Density	BS 2782 Pt. 6 Mtd 620A-D	g/cm ³	1.47
Typical ageing behaviour after 7 days at 135°C			
Tensile strength	IEC 60811-1-2	% Variation	+5
Elongation at break	IEC 60811-1-2	% Variation	-10
Cure assessment			
Hot elongation (20N/cm ² at 200°C)	IEC 60811-2-1	%	50
Hot set (20N/cm ² at 200°C)	IEC 60811-2-1	%	0
Thermo mechanical properties			
Pressure Deformation at 100°C (K=1)	IEC 60811-3-1	%	40
Fire and smoke properties			
Smoke density	ASTM 2843:2004	%	<3.5
Oxygen index	BS ISO 4589-2	%	29
Temperature index	BS ISO 4589-3	°C	245
Halogen Acid gas evolution	IEC 60754-1	%	<0.5
Corrosivity of Gases	IEC 60754-2	pH	4.6
Conductivity of gases	IEC 60754-2	µS/cm	13
Electrical properties at 90°C			
Insulation resistance	IEC 60502	MΩ.km	5
Insulation resistance Constant (K)	IEC 60502	MΩ.km	1.5
Volume resistivity	IEC 60502	Ohm.cm	4.4 x 10 ¹²

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Recommended processing and handling conditions

Extruder

Many modern thermoplastic extruders will process the material, although a screw designed to give good homogenisation without excessive shear (which could cause unacceptable increases in melt temperature) should be used. An extruder with an L/D ratio (length/diameter) of 15-24 and an extruder screw with a compression ratio 1.2:1 are recommended.

Extruder temperature conditions

It is important that the melt temperature profile is not allowed to increase above 160°C. As a guide the following temperature profile is recommended:-

Zone 1	Zone 2	Zone 3	Zone 4	Head	Die
130°C	140°C	145°C	150°C	160°C	160°C

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

Screw water temperature 40-60°C

Recommended screen pack 50 (mesh apertures per linear inch) or 300 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, the smallest possible draw down ratio is recommended to avoid internal stresses.

Crosslinking or cure

This compound has been designed to cure, post extrusion, when exposed to ambient temperature and humidity conditions. Satisfactory cure is typically obtained within 7 days of extrusion. However, the cure time will depend upon cable geometry and cable storage conditions.

A satisfactory cure can also be obtained either by immersion in hot water or exposure to low pressure steam at a temperature up to 70°C.

Catalyst and colour masterbatches

CT06/81B catalyst masterbatch is normally added at between 2.5-5%.

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 before use for 8 hours at 60°C or 4 hours at 80°C.

Storage and shelf Life

CT06/30 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 special heat sealed moisture containing approximately 125kg, 500kg or 1000kg.

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