PEXIDAN® SX-0650:CM603

Solar UV resistant, silane crosslinkable, Halogen Free, flame retardant compound for photovoltaic insulation & sheathing

SX-0650:CM603 system is a low smoke, low fume, fire retardant silane crosslinkable compound which can be processed like a thermoplastic material at high output rates. The graft component, SX-0650, is mixed with the crosslinking catalyst masterbatch, catalyst CM603, generally in the ratio 95:5. Catalyst masterbatch CM601 can also be used for faster curing. The SX-0650 system has been developed to meet specification requirements TUV 2Pfg1169:2007, EN 50618:2014 and IEC 62930.

Test	Test method	Unit	Typical value
Physical properties and mechanical properties			
Melt Flow Rate (21.6kg @150°C)	AEI Method	g/10 minutes	12
Tensile strength	IEC 60811-501	N/mm^2	12
Elongation at break	IEC 60811-501	%	220
Density	BS EN ISO 1183-3	g/cm^3	1.47
Typical ageing behaviour after 7 days at 150°C			
Tensile strength	IEC 60811-401	% variation	+15
Elongation at break	IEC 60811-401	% variation	-15
Thermal Endurance 120°C	BS EN 60216-1 BS EN 60216-2	hours	>20,000
Cure assessment by hot set test			
Elongation under load ($20N/cm^2$ at 250°C)	IEC 60811-507	%	45
Permanent elongation after cooling	IEC 60811-507	%	5
Thermo-mechanical properties			
Pressure test at high temperature 140°C	IEC 60811-508	%	35
Resistance against acids & alkaline solutions	EN 60811-404		Pass
Low Temperature Properties			
Cold Impact @ -40°C	IEC 60811-506	-	No cracks
Cold Bending @ -40°C	IEC 60811-504	-	No cracks
Weathering/UV resistance	BS EN 50618 Annex E	-	Pass
Dynamic Penetration	BS EN 50618 Annex D	-	Pass

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Notch Propagation	TUV 2Pfg 1169	-	Pass
Fire and smoke properties			
Vertical flame propagation	BS EN 60332-1-2	-	Pass
Oxygen index	BS ISO 4589-2	%	32
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			
Insulation resistance at 90°C	BS EN 50395	MΩ.km	12
Long term resistance of insulation to D.C. @ 85°C 1800 VDC	BS EN 50395	-	Pass

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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 is not allowed to increase above 160ºC. 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, a draw down ratio of 1.5:1 is recommended to avoid internal stresses.

Crosslinking or Cure

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

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Catalyst and Colour Masterbatches

CM601 or CM603 catalyst masterbatches are normally added at between 3-5%

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 approved light stable coloured masterbatches are used for long term colour stability.

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 in a de-humidifying drier.

Storage and Shelf Life

SX-0650 normally has shelf life of at least 9 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.
- Temperature range 10-30°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 heat sealed moisture resistant liner containing approximately 125kg, 600kg or 1100kg.

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