THERMODAN® TP521

Thermoplastic, low smoke, halogen free, flame retardant compound
for cable insulation and sheathing

This is a flame retardant, low smoke, thermoplastic compound which has been specially developed to meet the requirements of limited toxic and corrosive fume emission, having good moisture resistance and hot pressure performance.

TP521 has been specially developed to comply with the requirements of BS7655 Section 6 for types LTS1, 2, 3 and 4; BS EN 50290-2-27 for type HM2 and HD 604 for type HM4. Cables made with TP521 have passed the $3m^3$ smoke density chamber test to IEC 61034-2.

Test	Test method	Unit	Typical value
Physical properties and mechanical properties			
Density	BS EN ISO 1183-3	g/cm^3	1.48
Tensile strength	IEC 60811-501	N/mm^2	13
Elongation at break	IEC 60811-501	%	180
Tear Strength	BS 6469-99.1	N/mm	7
Melt Flow Rate (21.6kg @150°C)	AEI Method	g/10 minutes	6
Hardness (N)	Shore A	-	90
Typical ageing behaviour after 7 days at 100°C			
Tensile strength	IEC 60811-401	% Variation	-10
Elongation at break	IEC 60811-401	% Variation	+13
Thermo mechanical properties			
Hot pressure deformation at 100°C	IEC 60811-508	%	30
Cold bend test at -50°C	IEC 60811-504	-	pass
Elongation at break at -30°C	IEC 60811-505	%	60 (pass)
Cold impact at -30°C	IEC 60811-506	-	pass
Thermal crack resistance @ 80°C	AEI internal method	-	pass
Fire & smoke properties			
Oxygen Index	BS ISO 4589-2	%	30
Temperature Index	BS ISO 4589-3	°C	270
Halogen Acid Gas Evolution	IEC 60754-1	%	<0.5
Electrical properties			
Insulation Constant Ki at 20°C	BS EN 50395	MΩ.km	7.7
Insulation Constant Ki at 90°C	BS EN 50395	MΩ.km	0.057

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Fluid resistance	Time (hrs)	Temperature °C	% Variation in TS	% Variation in EB
ASTM No2	4	23	9	2
ASTM No2	4	70	14	24
ASTM No2	4	100	28	48

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Recommended processing and handling conditions

Extruder

An extruder with an L/D ratio (length/diameter) of 15-24 and an extruder screw with a compression ratio 1.5:1 or less are recommended.

Extruder temperature conditions

It is important that the melt temperature is not allowed to rise above 170°C.

As a guide the following temperature profile is recommended:-

Zone 1	Zone 2	Zone 3	Zone 4	Head	Die
120°C	130°C	140°C	150°C	160°C	160°C

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

Screw water temperature Depends upon screw design, but should be 30-50°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 of material. To obtain the optimum in physical properties in the case of tubing tools, draw down ratio of 1.5:1 is recommended to avoid internal stress.

Masterbatches

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

It is recommended that all masterbatches should be thoroughly dried at 60°C for 8 hours or at 80°C for 4 hours in a de-humidifying drier.

Storage and shelf life

TP521 has an unlimited shelf life. However, the following precautions should be observed:-

- Packaging should remain sealed
- Avoid storage outside and in direct sunlight.

Form and packaging

Form – pellets

Packaging – the following possibilities are available:-

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- Moisture resistant sacks containing 25kg.
- Boxes with a moisture resistant heat sealed liner containing approximately 125kg, 600kg or 1100kg.

Additional grade information

TP521 is available in the following versions:-

TP521N (natural colour)
TP521NU (with a non-staining UV stabiliser added)
TP521B (coloured black)
TP521BU (carbon black added to give UV stability)
TP521NUT (with a non-staining UV stabiliser added with anti-termite additive)

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