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Polyplastics

Innovation News

Flame Retardant DURANEX® PBT Series

Polybutylene terephthalate (PBT) is an engineering polymer widely used in automobiles, appliances, and electronic devices. Many of these applications must conform to challenging flame retardant standards.

New Challenges

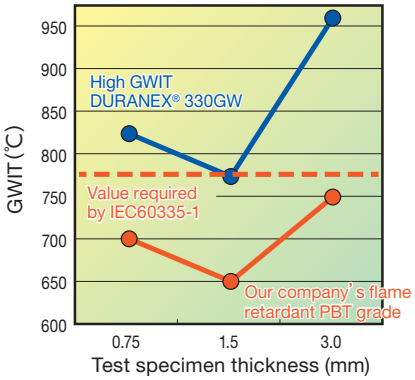
Flame retardant (FR) requirements have rapidly evolved in recent years. New demands include:

- Non-halogenated FR grades
- Glow wire test compliance
- Improved heat shock performance
- Hydrolysis resistant FR grades
- Low warpage FR grades

Polyplastics has developed PBT offerings that address these concerns and enable the next generation of OEM products to meet higher performance standards.

Non-halogen FR

The drive to eliminate halogenated FR continues across all industries. Polyplastics has developed a slate of non-halogenated products, available as the DURANEX PBT NF series. Impressively, these resins not only retain general properties and moldability equivalent to traditional halogenated FR PBT grades, but also greatly improve anti-tracking properties lacking in conventional halogenated FR PBT grades (*1). All NF grades meet both UL94 V-0 and tracking resistance.

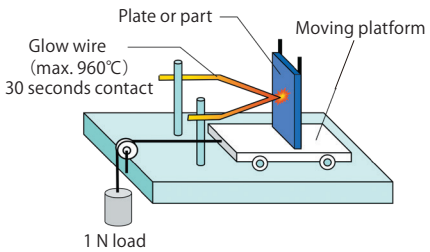


*3 GWIT and Specimen Thicknesses

Glow Wire Performance

In recent years, ignition safety requirements (glow wire testing) have come to the fore in the appliance sector. The objective is to reduce fires caused by electrical ignition (electrical short; IEC60335-1, etc.). In the glow wire test, a wire heated to a specific temperature contacts a test specimen to assess the glow wire ignition temperature (GWIT) and the glow wire flammability index (GWFI). A GWIT of 775°C or above is considered excellent, and enables part testing to be waived in some cases (*2). DURANEX 330GW has a GWIT of more than 775°C at thicknesses of 0.75mm or more (*3). Furthermore, the material is UL94 V-0 rated at 0.32 mm.

*2 Glow Wire Test



GWIT Test Overview
The molded product is placed in contact with a glowing wire. The temperature at which the product does not ignite plus 25°C is taken as the GWIT.

Heat Shock and Low Hydrolysis Performance

The LT Series of DURANEX PBT resins delivers dramatically enhanced heat shock resistance compared with conventional PBT resins, and improved hydrolysis resistance, normally a limitation of polyesters. The grade LT530FR is our lead offering in this sector. Heat shock rupture is caused by differences in the expansion rate between metals and plastics because internal stress occurs. Among plastics, polyphenylene sulfide (PPS) has top class heat shock resistance. DURANEX PBT LT Series resins exhibit heat shock properties on a par with PPS (*4). The LT Series are considered appropriate materials for parts currently using PPS where cost reduction is required, or those using polyamides where moisture adsorption is an issue.

*1 DURANEX® PBT NF Series UL Certification

*Natural, black only

Grade		UL94		UL746A			UL746B RTI		
		V-0	5VA	CTI	HWI	HAI	Elec	Imp	Str
201NF	non-reinforced	All color 0.75mm	-	0	3	0	125	110	125
310NF	GF10%	All color 0.75mm	3mm	1	1	0	130	125	125
315NF	GF15%	All color 0.75mm	3mm	1	2	0	130	120	120
315NFK	GF15%	0.40mm	3mm	0	2	0	130	120	120
320NF	GF20%	All color 0.75mm *0.40mm	3mm	1	1	0	125	125	125
330NF	GF30%	All color 0.75mm *0.40mm	3mm	0	1	0	125	140	140

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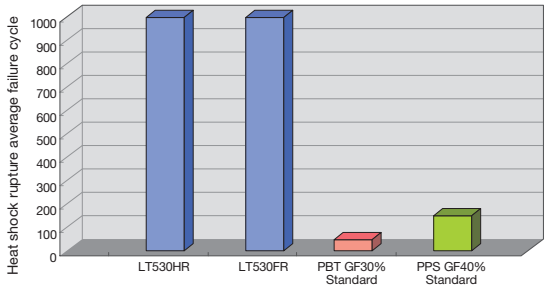


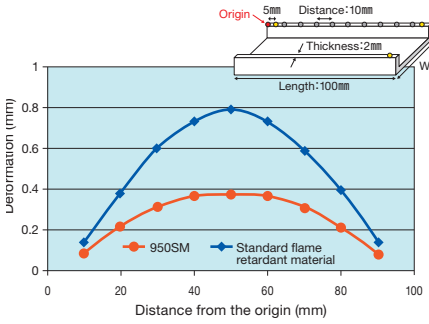
*4 Heat Shock Resistant DURANEX® PBT LT Series

Low Warp & Hydrolysis Resistant FR

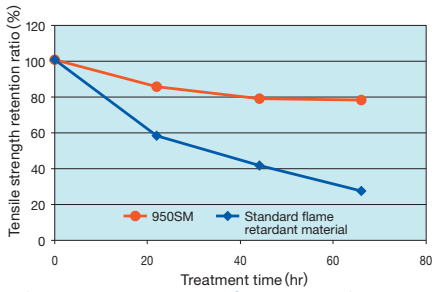
DURANEX 950SM has been developed for next generation electric network equipment such as photovoltaic power generation. Besides flame retardance, the material possesses low warpage and hydrolysis resistance. It can be applied in housings that require accuracy, and in outdoor components requiring hydrolysis and severe environment resistance (*5, 6 and 7).

*5 Basic Properties of DURANEX® PBT 950SM

Property	Test method	Unit	950SA
Tensile strength	527-1,2	MPa	140
Tensile strain at break	527-1,2	%	1.7
Flexural strength	178	MPa	190
Flexural modulus	178	MPa	9800
Charpy impact strength (notched)	179/1eA	kJ/m2	6.6
Flammability (1.5mmt)	UL94	-	V-0 equivalent



*6 Warpage Properties of DURANEX® 950SM



*7 Hydropysis Resistance of DURANEX® 950SM

DURACON® POM
POM (Acetal Copolymer)

DURAFIDE® PPS
PPS (Polyphenylene Sulfide)

DURANEX® PBT
PBT (Polybutylene Terephthalate)

TOPAS® COC
COC (Cyclic Olefin Copolymer)

About Polyplastics

Polyplastics is a global leader in the development and production of engineering plastics solutions. With more than 50 years of experience, its technical experts enhance manufacturing and product performance with a proficiency that has become second nature. Backed by a strong global network of R&D, production and sales resources, the team is able to create advanced solutions for an ever-evolving market.

For more information, visit our website, www.polyplastics.com/en/.

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