Polybutylene Terephthalate (PBT)

DURANEX®

201EB

ED3002

Electric Conductive

POLYPLASTICS CO., LTD.

Introduction

DURANEX® PBT is a polybutylene terephthalate (PBT)-based crystalline engineering plastic.

Thanks particularly to its superior heat-resistant and electrical properties in addition to good molding properties, it has earned a reputation for high reliability as a material suitable for electric and electronic components, auto parts, various precision components, and more.

Here we will introduce DURANEX® PBT 201EB. Its electrical conductivity and electromagnetic noise absorption effects in the millimeter wave band make it an ideal grade for improving the detection accuracy of millimeter wave radar.

General Properties of 201EB

table1-1 General Properties（ISO）

Item	Unit	Test Method	Electric Conductive
			201EB
			Unfilled
Color			ED3002
ISO(JIS)quality-of-the-material display:		ISO11469 (JIS K6999)	>PBT-CD20<
Density	g/cm^3	ISO 1183	1.38
Water absorption (23°C,24hrs,1mmt)	%	ISO 62	0.25
Tensile strength	MPa	ISO 527-1,2	60
Strain at break	%	ISO 527-1,2	2.5
Flexural strength	MPa	ISO 178	106
Flexural modulus	MPa	ISO 178	3,780
Charpy notched impact strength (23℃)	kJ/m^2	ISO 179/1eA	1.7
Temperature of deflection under load (1.8MPa)	℃	ISO 75-1,2	130
Coefficient of linear thermal expansion (23 - 55℃、Flow direction)	x10^{-5}/℃	Our standard	8.5
Coefficient of linear thermal expansion (23 - 55℃、Transverse direction)	x10^{-5}/℃	Our standard	8.5
Electric strength (3mmt)	kV/mm	IEC 60243-1	-
Volume resistivity	Ω·cm	IEC 60093	-
Volume resistivity (Our standard)	Ω·cm		4×10^1
Tracking resistance (CTI)	V	IEC 60112	-
Rockwell hardness	M(Scale)	ISO2039-2	-
Flammability		UL94	HB
The yellow card File No.			E213445
Appropriate List number of Ministerial Ordinance for Export Trade Control			Item 16 of Appendix -1

All figures in the table are the typical values of the material and not the minimum values of the material specifications.

2. Millimeter wave absorption properties

Figure 2-1 shows comparison of transmissibility (S_{21}), reflectivity (S_{11}), and absorption rate when irradiating flat plate test pieces with electromagnetic waves (77 GHz millimeter waves).

- Fundamentally, millimeter waves transmit through PBT-GF30 (PBT glass fiber 30%) with no electromagnetic wave shielding effect.

- POM-CF10 (POM carbon fiber 10%) reflects millimeter waves and has great electromagnetic wave shielding effects. However, since it reflects electromagnetic wave noise, there is concern that it could negatively impact the performance of electronic equipment (“self-poisoning”) such as millimeter wave radar.

- 201EB (electrically conductive, unreinforced PBT) is highly absorbent of millimeter waves, and has electromagnetic wave shielding effects. Absorption of electromagnetic wave noise is expected to mitigate negative impact on electronic equipment more than when electromagnetic wave noise is reflected.

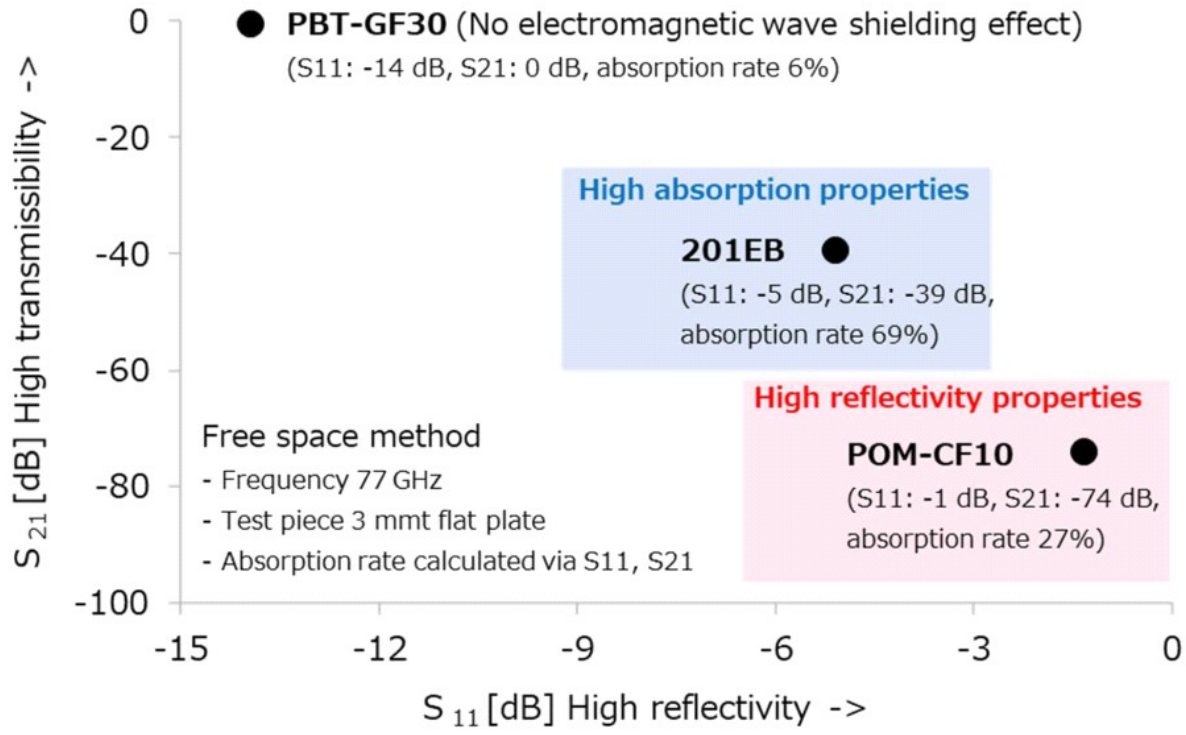
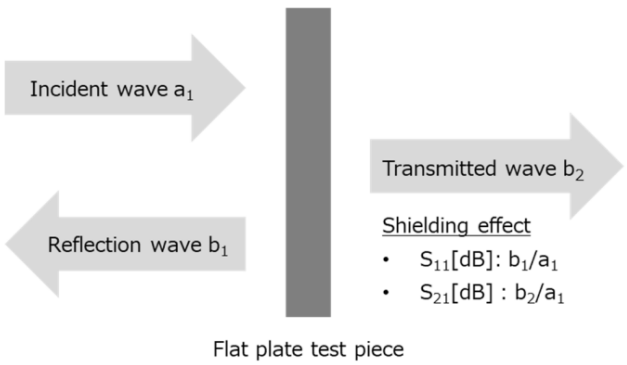


Figure 2-1: DURANEX® PBT 201EB millimeter wave transmissibility, reflectivity, and absorption rate

Footnote: About the free-space method



3. Molding properties

3.1 Mold shrinkage

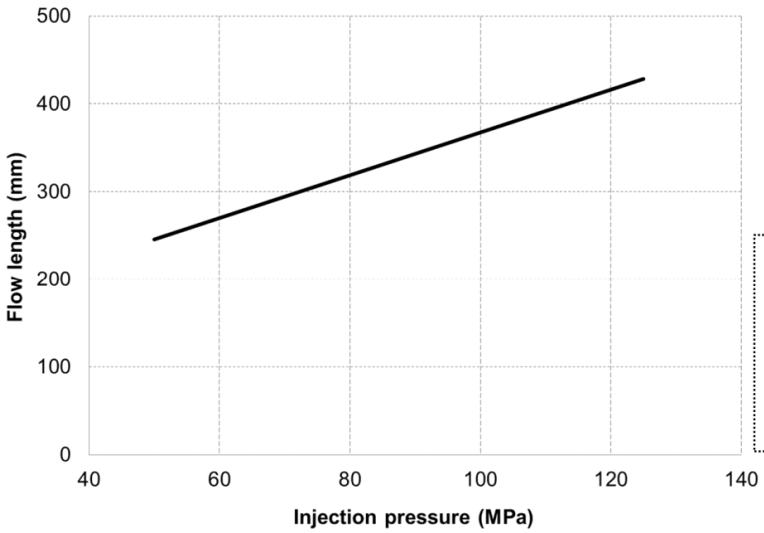
Table 3-1. Mold shrinkage of DURANEX® PBT 201EB

Cavity pressure		201EB
60 MPa	Flow direction	1.7
	Transverse flow direction	1.8
70 MPa	Flow direction	1.6
	Transverse flow direction	1.6

(Unit: %)

[Molding conditions]
Cylinder temperature : 260°C
Mold temperature : 80°C
Injection speed : 24 mm/s
Mold used : 60 x 60 x 2 mmt flat plate
Film gate 1.5 mmt

3.2 Flowability



[Molding conditions]
Cylinder temperature : 260°C
Mold temperature : 65°C
Injection speed : 66.7 mm/s
Mold used : 2 mmt bar flow test mold

Figure 3-1. Flowability of DURANEX® PBT 201EB

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NOTES TO USERS

- All property values shown in this brochure are the typical values obtained under conditions prescribed by applicable standards and test methods.
- This brochure has been prepared based on our own experiences and laboratory test data, and therefore all data shown here are not always applicable to parts used under different conditions. We do not guarantee that these data are directly applicable to the application conditions of users and we ask each user to make his own decision on the application.
- It is the users' responsibility to investigate patent rights, service life and potentiality of applications introduced in this brochure. Materials we supply are not intended for the implant applications in the medical and dental fields, and therefore are not recommended for such uses.
- For all works done properly, it is advised to refer to appropriate technical catalogs for specific material processing.
- For safe handling of materials we supply, it is advised to refer to the Safety Data Sheet "**SDS**" of the proper material.
- This brochure is edited based on reference literature, information and data available to us at the time of creation. The contents of this brochure are subject to change without notice upon achievement of new data.
- Please contact our office for any questions about products we supply, descriptive literatures or any description in this brochure.

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