Polybutylene Terephthalate (PBT)

DURANEX®

6300B

EF2001/ED3002

Low warpage, HB, standard

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Introduction

Reinforced grades of **DURANEX® PBT** are normally glass fiber reinforced grades. They are highly regarded in various applications for their superior heat resistance, dementional stability, and electric properties. However, there are problems with such glass fiber-reinforced grades in that in certain applications, the glass fibers become oriented, with the end result being the molded product exhibits anisotropy.

In other words, problems are apt to arise in terms of warpage and deformation resulting from anisotropies in properties and mold shrinkage ratios.

For such cases, the glass beads-filled grade **DURANEX 6300B** is offered with the purpose of solving.

These anisotropy problem, while at the same time retaining the advantages of the **DURANEX** glass fiber-reinforced grade 3300.

General Properties of 6300B

table1-1 General Properties（ISO）

Item	Unit	Test Method	Low warpage, HB, standard
			6300B
			GB30%filled, anisotropy improved
Color			EF2001/ED3002
ISO(JIS)quality-of-the-material display:		ISO11469 (JIS K6999)	>PBT-GB30<
Density	g/cm^3	ISO 1183	1.53
Water absorption (23°C,24hrs,1mmt)	%	ISO 62	0.1
Tensile strength	MPa	ISO 527-1,2	55
Strain at break	%	ISO 527-1,2	5.0
Flexural strength	MPa	ISO 178	91
Flexural modulus	MPa	ISO 178	3,900
Charpy notched impact strength (23℃)	kJ/m^2	ISO 179/1eA	2.0
Temperature of deflection under load (1.8MPa)	℃	ISO 75-1,2	110
Coefficient of linear thermal expansion (23 - 55℃、Flow direction)	x10^{-5}/℃	Our standard	9
Coefficient of linear thermal expansion (23 - 55℃、Transverse direction)	x10^{-5}/℃	Our standard	9
Electric strength (3mmt)	kV/mm	IEC 60243-1	20
Volume resistivity	Ω·cm	IEC 60093	8 × 10^{15}
Tracking resistance (CTI)	V	IEC 60112	300
Rockwell hardness	M(Scale)	ISO2039-2	90
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. Processing characteristics of DURANEX® 6300B

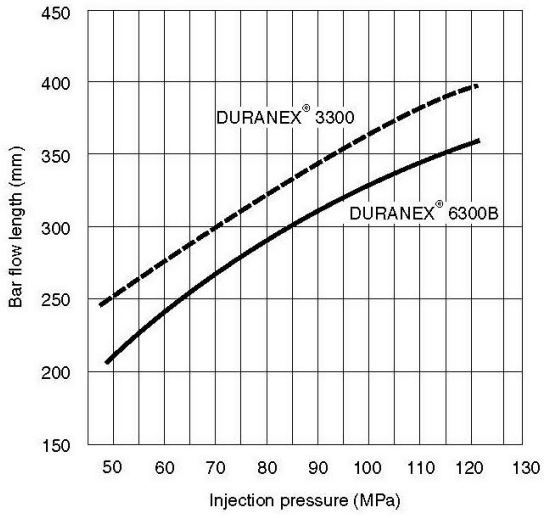
2.1 Flow characteristics

As shown in **Figure 2-1**, which shows the flowability of **6300B** in the injection molding process, flow length is somewhat less than that of 3300, but for a filled plastic, in belongs to a group with exceedingly high flowability, having more than sufficient processability.

2.2 Mold shrinkage ratio

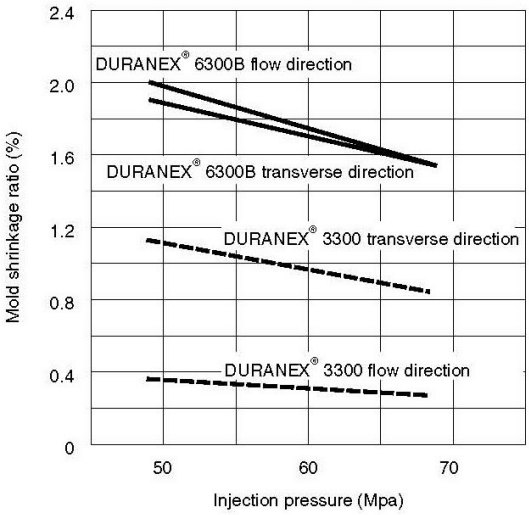
The mold shrinkage ratio for **6300B** is a lot higher than that of 3300. However, the anisotropy in relation to resin flow is small, and this is reflected in warpage and deformation effects. **Figure 2-2** compares mold shrinkage ratios.

Figure 2-1 DURANEX® 6300B bar flow length (2mm*t*)



Processing parameters
Cylinder temperature:250-240-220-210˚C
Mold temperature:65˚C
Injection speed:67mm/sec
Mold:2mmt bar flow mold

Figure 2-1 Mold shrinkage ratio for DURANEX® 6300B (120□×2mm*t*)



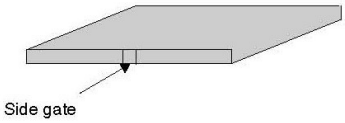
Processing parameters
Cylinder temperature:240-240-220-200˚C
Mold temperature:65˚C
Injection speed:17mm/sec
Cycle:25 s hold phase/15 s colling
Mold:120□×2mm*t* flat plate
Side gate 4(W)×2*t*

2.3 Deformation(1)

The main characteristic of **6300B** is its low deformation compared with **3300**. It is very effective in preventing warpage deformation, which normally occurs through alignment of glass fibers.

Table 2-1 Warpage deformation of flat plate (120□×2mm*t*)

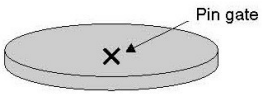
	DURANEX® 6300B	DURANEX® 3300
Warpage deformation	0	23.3



Processing parameters
Cylinder temperature:250-250-220-200˚C
Mold temperature:65˚C
Injection speed:50mm/sec
Injection pressure:68MPa
Cycle:15 s hold phase/10 s cooling
Mold:120□×2mm*t* flat plate
Side gate:4*w*×2*t*

Table 2-2 Deformation of ϕ120 a 2mm*t* flat disc

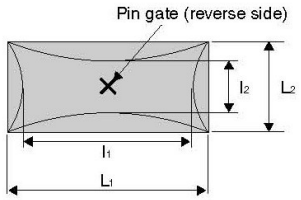
	DURANEX® 6300B	DURANEX® 3300
Surface flatness	0.18	0.33
Surface oscillation	0.09	0.27



Processing parameters
Cylinder temperature:250-250-220-200˚C
Mold temperature:65˚C
Injection speed:67mm/sec
Injection pressure:68MPa
Cycle: 15 s hold phase/10 s cooling
Mold: ϕ120 a 2mmt (flat disc)
Pin gate (□1.0)

Table 2-3 Inner warpage of 40(*W*)×80(L)×20(H)×2mm*t* box

	DURANEX® 6300B	DURANEX® 3300
Inner warpage	0.79	1.82



Processing parameters
Cylinder temperature:250-250-220-200˚C
Mold temperature:65˚C
Injection speed:17mm/sec
Injection pressure: 68MPa
Cycle: 15 s hold phase/10 s cooling
Mold:40(W)×80(L)×20(H)×2mm*t* box
Pin gate (ϕ1.5)

2.4 Deformation (2)

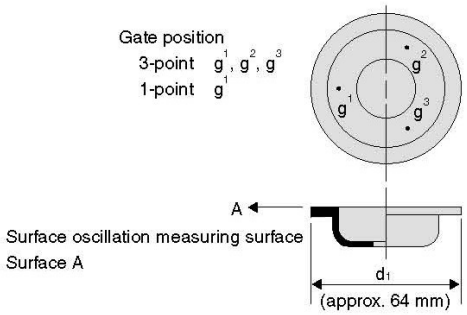
The main characteristic of **6300B** is its low deformation compared with **3300**. It is very effective in preventing warpage deformation, which normally occurs through alignment of glass fibers. Representative examples are given in the following.

Table 2-4 Deformation of circular molded part A

		1-point gate		3-point gate	
		DURANEX® 6300B	DURANEX® 3300	DURANEX® 6300B	DURANEX® 3300
Upper cover	Concentricity of d1	0.05	0.07	0.03	0.05
	Oscillation of surface A	0.03	0.18	0.01	0.08
Lower cover	Concentricity of d2	0.05	0.14	0.03	0.10
	Oscillation of surface B	0.01	0.28	0.02	0.21

Processing parameters
Cylinder temperature:240-240-220-200˚C
Mold temperature:70˚C
Injection speed:50mm/sec
Injection pressure:68MPa
Cycle: 12 s hold phase/7 s cooling

1) Top cover. The gate is at the apex of an equilateral triangle.



2) Bottom cover. The gate is at the apex of an Isosceles triangle.

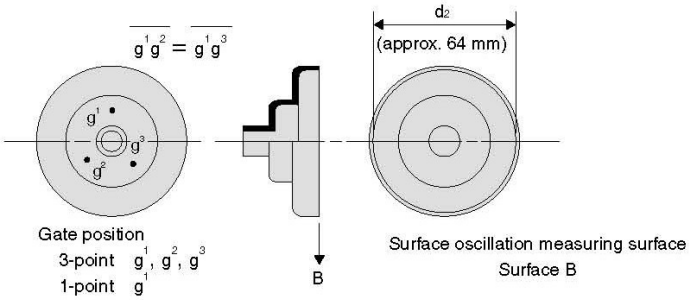
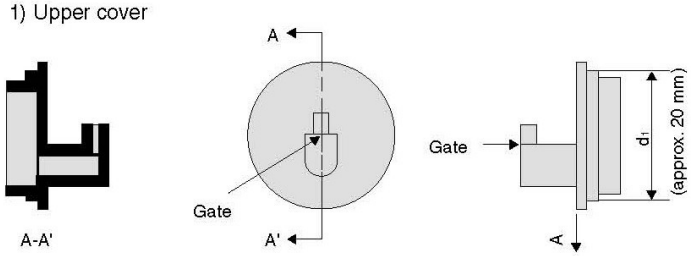


Table 2-5 Deformation of circular molded part B

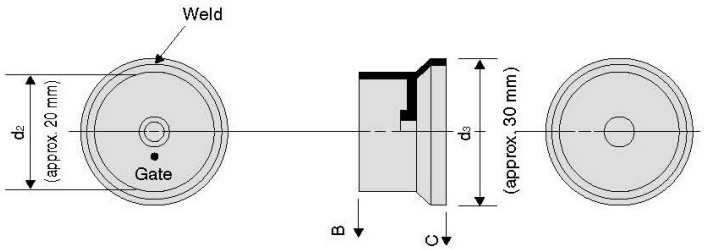
		DURANEX® 6300B	DURANEX® 3300
Upper cover	Concentricity of d1	0.05	0.05
	Oscillation of surface A	0.02	0.04
Lower cover	Concentricity of d2	0.03	0.11
	Concentricity of d3	0.04	0.09
	Oscillation of surface B relative to surface C	0.05	0.11
	Oscillation of surface B	0.05	0.22

Processing parameters
Cylinder temperature:240-240-220-200˚C
Mold temperature:70˚C
Injection speed:50mm/sec
Injection pressure:68MPa
Cycle: 12 s hold phase/7 s cooling

1) Upper cover



2) Lower cover



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NOTES TO USERS

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- 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.
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- For safe handling of materials we supply, it is advised to refer to the Safety Data Sheet "**SDS**" of the proper material.
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