PBT(Polybutylene terephthalate)

DURANEX®

2000

EF2001/PLT9908

(HB, Standard grade)

WinTech Polymer Ltd.

NOTES TO USERS

- All property values shown in this brochure are the typical values obtained under varying conditions prescribed by applicable standards and test method.
- This brochure has been prepared based on our own experiences and laboratry 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 the appropriate **“Technical Catalog”** for specific material processing.
- For safe handling of materials we supply, it is advised to refer to the Material Safety Data Sheet **“MSDS”** of the proper material. This brochure is edited based on reference literatures, information and data currently available to us. So the contents of this brochure are subject to change without notice due to 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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Introduction

Noted for its excellent properties and superior injection molding characteristics, **Duranex** PBT resin has been widely used in a variety of industries such as electrical/electronics and automotive manufacturing.

Various **Duranex** grades are available to meet specific requirements in a wide range of applications.

The general-purpose (slow burning) glassfiber reinforced grades offer high strength, high rigidity, and superior heat resistance (available with glass fiber contents of 15%, 20%, 30%, 40% and 45%). However, these grades are sometimes prone to problems such as distortion, deformation, and anisotropic physical properties due to the orientation of the glass fiber.

Consequently, for applications where flexibility is more important than rigidity, the general-purpose (slow burning) unfilled grades, **Duranex 2000** are more suitable.

Duranex 2000 has superior flow characteristids during injection molding.

General Properties of 2000

table1-1 General Properties（ISO）

Item	Unit	Test Method	HB, Standard
			2000
			Unfilled, High Flow
Color			EF2001/PLT9908
ISO(JIS)quality-of-the-material display:		ISO11469 (JIS K6999)	>PBT<
Density	g/cm^3	ISO 1183	1.31
Tensile strength	MPa	ISO 527-1,2	60
Strain at break	%	ISO 527-1,2	20※1
Flexural strength	MPa	ISO 178	89
Flexural modulus	MPa	ISO 178	2,500
Charpy impact strength (notched)	kJ/m^2	ISO 179/1eA	3.2
Temperature of deflection under load (1.8MPa)	℃	ISO 75-1,2	73
Coefficient of linear thermal expansion (23～55℃、Flow direction)	x10^{-5}/℃	ISO 11359-2	11
Coefficient of linear thermal expansion (23～55℃、Transverse direction)	x10^{-5}/℃	ISO 11359-2	11
Dielectric breakdown strength (3mmt)	kV/mm	IEC 60243-1	17
Volume resistivity	Ω･cm	IEC 60093	5 × 10^{16}
Tracking resistance (CTI)	V	IEC 60112	-
Flammability		UL94	HB
The yellow card File No.			E213445
Appropriate List number of Ministerial Ordinance for Export Trade Control			Item 16 of Appendix -1

※1) Nominal strain at break

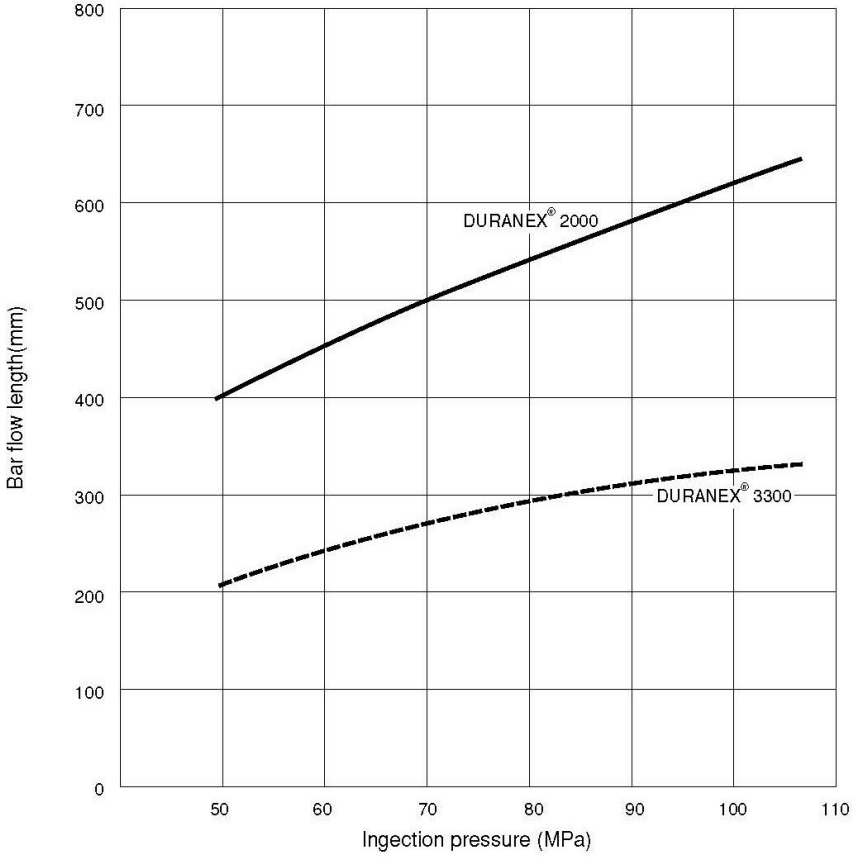
All figures in the table are the typical values of the material and not the minimum values of the material specifications.

2. Processing characteristics of DURANEX® 2000

2.1 Flow characteristics

In **Figure 2-1**, the bar flow lengths of **2000** are compared with that of the standard glass-fiber reinforced grade 3300. Compared to 3300, the bar flow length of **2000** is much longer. The grade most suitable for the shape of the molding and type of application should be selected.

Figure 2-1 Bar Flow Lengte of DURANEX® 2000

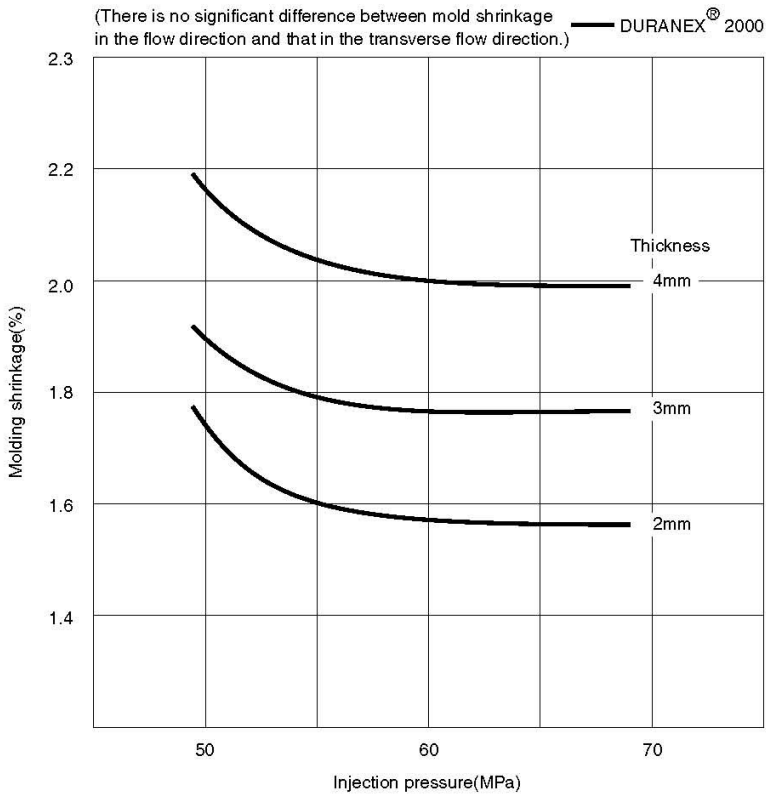


Processing parameters (Nozzle)
Cylinder temperature : 250-240-220-200˚C
Mold temperature : 75˚C
Injection speed : 50mm/s
Cycle time : 12s hold phase/8s cooling
Mold : Bar flow test mold
Cavity depth : 2mm

2.2 Molding shrinkage

Figure 2-2 shows the molding shrinkage of **2000.** Unlike the glass-fiber reinforced grades, its molding shrinkage does not show any anisotropic behavior.

Figure 2-2 Molding shrinkage of DURANEX® 2000 (Flow Direction)



Processing parameters (Nozzle)
Cylinder temperature : 240-240-220-220°C
Mold temperature : 65°C
Injection speed : 33mm/s
Cycle time : Thickness 2*t* 3*t* 4*t*
Hold phase 10s 20s 30s
Cooling 10s 10s 10s
Mold : 20×120mm×2, 3, and 4mmt flat plate
Gate size : 4 (w) × 2 (t)

3. Mixing DURANEX® 2000 with 3300

By mixing **2000** with 30% glassfiber reinforeced grade 3300, moldings of an intermediate nature can be obtained. This method is useful when the strength, rigidity, and heat resistance do not need to be as high as those of the 3300 grade, but the elongation at breaking point needs to be slightly better than that of 3300. UL(Underwriters' Laboratories Inc.) recognition for these mixtures has already been obtained at all ratios. The UL-recognized values for 3300/**2000** mixtures are shown in **Table 3-1**. The most economical way of mixing is simply tumbling pellets of each type together and then feeding them into the hopper of an injection molding machine. When doing so, however, it is recommended to set the cylinder tempareture under the hopper slightly higher than the standard shown in **Figure 2-2** in order to facilitate the feeding of the pellets from the hopper into the barrel.

Table 3-1 Values recognized by UL for DURANEX® 2000 and their mixtures with DURANEX® 3300 (File No. E213445)

Grade designation	Minimun thickness	Continuous use temperature (°C)			Hot Wire Ignition (s)	Flammability UL 94	High Amp. Arc Ignition	High Voltage Arc Tracking Rate (mm/min)	D-495 Arc Resistance (s)	IEC tracking (CTI) (V)
		Electrical	Mechanical							
			With impact	Without impact						
DURANEX® 2000	0.71	130	–	–	11	HB	200+	0.5	–	–
	1.47	130	120	130	15	HB	200+	0.5	–	–
	3.05	130	120	130	15	HB	200+	0.5	173	600+
DURANEX® 3300/2000*	0.71	130	–	–	11	HB	140	–	–	–
	1.47	130	120	130	15	HB	189	0.5	–	–
	3.05	130	120	130	15	HB	99	0.5	125	500
DURANEX® 3300/2000**	0.71	130	–	–	9	HB	135	–	–	–
	1.47	130	120	130	15	HB	189	0.7	–	–
	3.05	130	120	130	26	HB	99	0.5	125	500

Note : * 3300/2000 shows the mixture of 3300 and 2000 in an arbitrary ratio
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