

Polybutylene Terephthalate (PBT)

DURANEX®

3400

EF2001/ED3002

HB, standard

POLYPLASTICS CO., LTD.

Introduction

DURANEX® PBT 3300 is offered as a general-purpose glass fiber-reinforced grade with a fiber loading of 30% but in

applications where high strength and high stiffness are demanded, we offer two suitable grades in **3400** (with a 40% glass fiber loading), and **3405** (with a 45% glass fiber loading).



General Properties of 3400

table1-1 General Properties (ISO)

Item	Unit	Test Method	HB, standard
			3400
			GF40% reinforced
Color			EF2001/ED3002
ISO(JIS)quality-of-the-material display:		ISO11469 (JIS K6999)	>PBT-GF40<
Density	g/cm ³	ISO 1183	1.64
Water absorption (23°C,24hrs,1mmt)	%	ISO 62	0.1
Tensile strength	MPa	ISO 527-1,2	155
Strain at break	%	ISO 527-1,2	2.0
Flexural strength	MPa	ISO 178	245
Flexural modulus	MPa	ISO 178	12,500
Charpy notched impact strength (23°C)	kJ/m ²	ISO 179/1eA	12
Temperature of deflection under load (1.8MPa)	°C	ISO 75-1,2	214
Coefficient of linear thermal expansion (23 - 55°C、Flow direction)	x10 ⁻⁵ /°C	Our standard	1
Coefficient of linear thermal expansion (23 - 55°C、Transverse direction)	x10 ⁻⁵ /°C	Our standard	8
Electric strength (3mmt)	kV/mm	IEC 60243-1	24 -don't break
Volume resistivity	Ω·cm	IEC 60093	3 × 10 ¹⁶
Tracking resistance (CTI)	V	IEC 60112	-
Rockwell hardness	M(Scale)	ISO2039-2	100
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.



In addition, **Figures 1-1 and 1-2** show the temperature dependence of flexural properties as examples of the temperature dependence of mechanical properties. The dart drop impact strength, which is considered representative of practical impact properties, is also superior for **3400** and **3405** when compared with **3300**.

Figure 1-3 compares an example of dart drop impact strength for a flat plate molded from **3400** with one molded from **3300**.

Figure 1-1 Temperature dependence of flexural strength

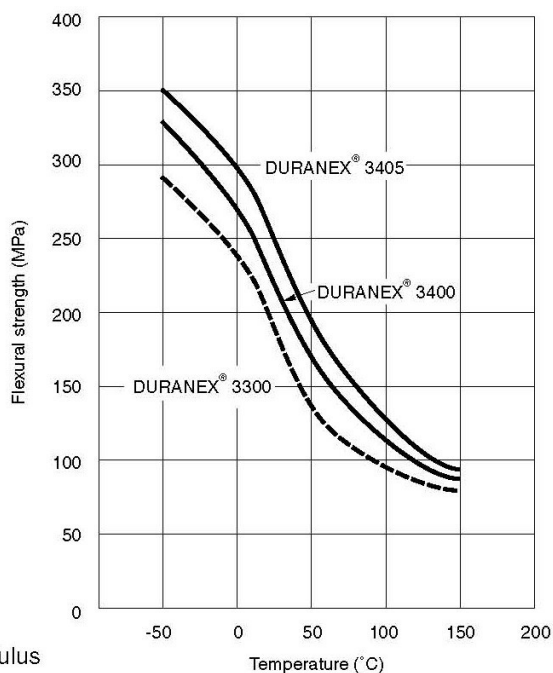


Figure 1-2 Temperature dependence of flexural modulus

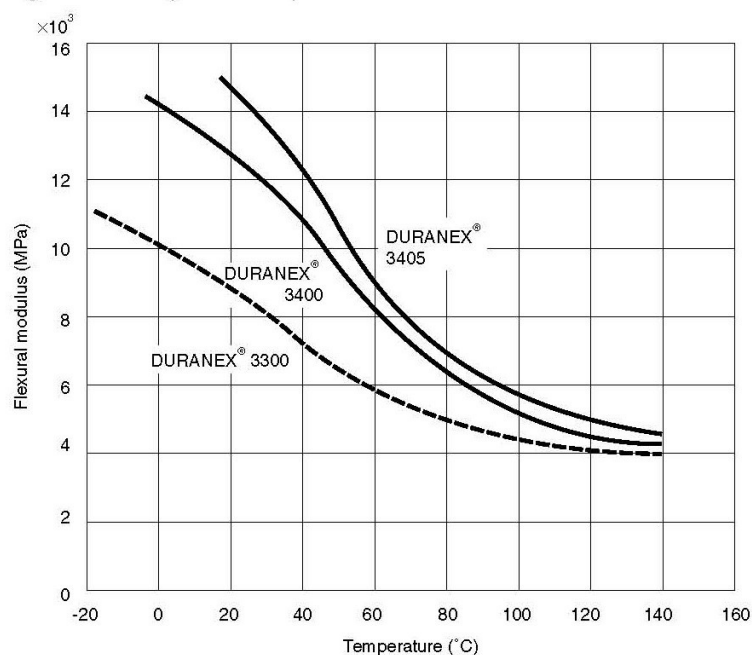
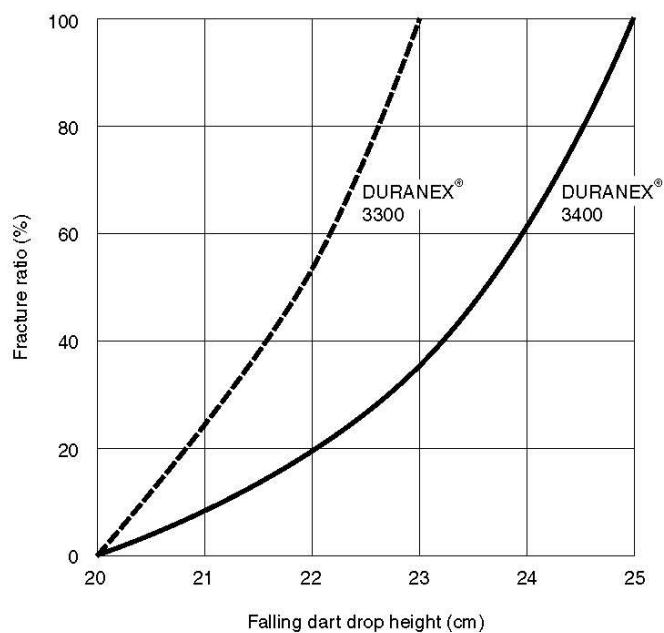
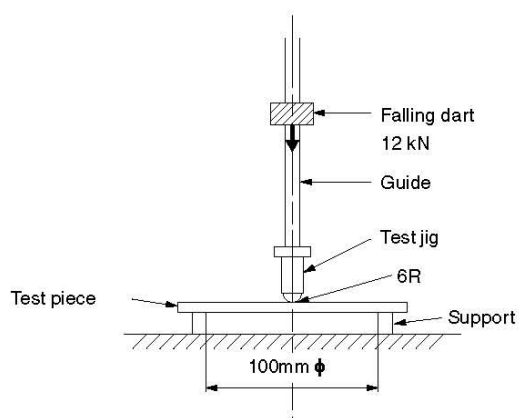


Figure 1-3 Dart drop impact strength for DURANEX® 3400
(relationship between fracture ratio and falling dart drop height)



As shown in the diagram below, a flat plate test piece (120×120×3 mm) is placed on a support (100 mm ϕ), and after the test jig has been set, a weighted dart is dropped, and the dart's drop height is correlated with the fracture ratio.



2. Thermal properties of DURANEX® 3400 and 3405

As indicated by **Table 2-1**, the thermal properties of **3400** and **3405** hardly vary from those of **3300**. However, the linear coefficient of thermal expansion is slightly higher for **3405**.

Table 2-1 Thermal properties of DURANEX® 3400 and 3405

Item		Test Method (ASTM)	Unit	DURANEX® 3405	DURANEX® 3400	DURANEX® 3300
Melting point		—	°C	228	228	228
DTUL * (1.82 MPa)		D648	°C	214	2 ~ 4	213
Coeff. of Thermal Expansion**	Flow Direction	—	10 ⁻⁵ /°C	1.5	1.5	2.0
	Transverse Direction			12	12	12.5

* Using an annealed test piece.

** 30 ~ 140°C value



3. Processing characteristics of DURANEX® 3400 and 3405

3.1 Flow characteristics

As shown in **Table 3-1**, which indicates test results from a bar flow length test mold, the flowability of **3400** is somewhat lower than that of **3300**. The flowability of **3405** is even lower than that of **3400**. It is therefore recommended that the cylinder and mold temperatures be maintained at slightly higher temperatures than indicated below when molding.

Table 3-1 Flow lengths of DURANEX® 3400 and 3405 (mm)

Grade Injection Pressure	(2mm)		
	DURANEX® 3405	DURANEX® 3400	DURANEX® 3300
49MPa	135	160	225
73MPa	185	220	295
98MPa	220	270	350

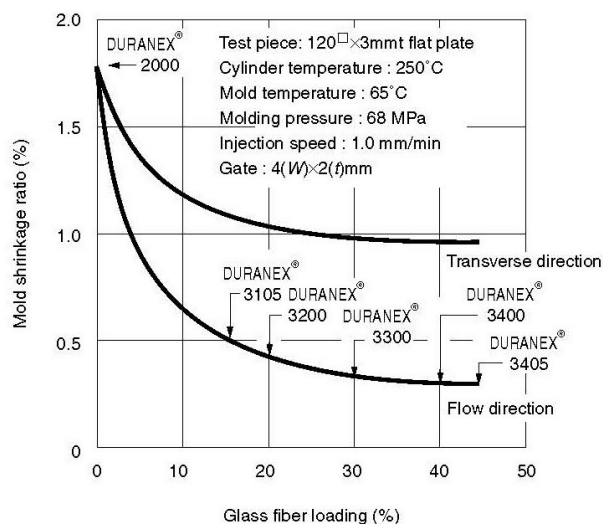
Processing parameters

(nozzle)
Cylinder temperature : 240-220-200°C
Mold temperature : 65°C
Injection speed : 67mm/sec
Cycle time : 12 s holding phase/7 s cooling
Cavity thickness : 2 mm
Gate : 20(W)×2(t)mm

3.2 Mold shrinkage ratio

As seen from **Figure 3-2**, there is no great difference in terms of mold shrinkage ratio compared with **3300**.

Figure 3-2 Glass fiber loadings and mold shrinkage ratios for Duranex slow-burning grades



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.
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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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- Please contact our office for any questions about products we supply, descriptive literatures or any description in this brochure.

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(R190507-1920)

