High-performance polyamide

Genestar®

(PA9T)

Injection Molding Recommendations

(Glassfiber reinforced grades)

May.2006

KURARAY CO., LTD.

Genestar

Typical cylinder and mold temperature

KURARAY CO., LTD.
Genestar

Table 1　Temperature settings

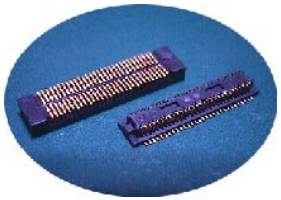
		Genestar (PA9T)	PA6T	PA46	PPS	LCP（I）
Melting point	˚F	583	590	563	536	608
	℃	306	310	295	280	320
Preferred cylinder temperature	˚F	590～625	600～635	570～605	590～625	625～660
	℃	310～330	315～335	300～320	310～330	330～350
Glass transition temperature	˚F	257	185	140	194	–
	℃	125	85	60	90	–
Preferred mold temperature	˚F	265～285	230	175～210	265～300	160～230
	℃	130～140	110	80～100	130～150	70～110

From each company's catalogue

Typical cylinder and mold temperature are given in Table 1. The correct temperature should show a neat sprue end and no drooling or prematurely freeze off from the nozzle. To limit the thermal degradation of the Genestar resins, the hold time of the resin in the cylinder should be less than 15min.

Example of molding conditions

KURARAY CO., LTD.
Genestar

0.5mm pitch 60pin	Board to Board connector
Injection molding machine	FANUC α-15B（15t） Screw diameter：18mmϕ,nozzle diameter：2.0mmϕ
Molded article	Board to Board connector （0.5mm pitch） （L×W×H：17mm×2.4mm×2.2mm）
Molding conditions 	Cylinder settings：nozzle/Front/Center/Rear/HP 315℃/325℃/310℃/300℃/120℃ 600˚F/615˚F/590˚F/570˚F/250˚F Mold temperature：140℃（285˚F） Injection speed：V1/V2=60mm/sec / 30mm/sec Injection pressure：1200kg/cm^2 Sub-pressure：750kg/cm^2,0.3sec Cooling time：3.0sec、Cycle time：8.0sec Screw revolution：100rpm、Back pressure：20kg/cm^2
Mold type	Four-cavity　Tunnel gate：0.6mmϕ

1.0mm pitch 168pin	RIMM connector
Injection molding machine	SUMITOMO SG100（100t） Screw diameter：32mmϕ,nozzle diameter：3.0mmϕ
Molded article	RIMM connector （1.0mm pitch） （L×W×H：141mm×11mm×7.5mm）
Molding conditions 	Cylinder settings：nozzle/Front/Center/Rear/HP 310℃/320℃/310℃/300℃/120℃ 590˚F/610˚F/590˚F/570˚F/250˚F Mold temperature：140℃（285˚F） Injection speed：V1/V2=45mm/sec / 30mm/sec Injection pressure：1000kg/cm^2 Sub-pressure：300kg/cm^2,2.0sec Cooling time：8.0sec、Cycle time：19.0sec Screw revolution：120rpm、Back pressure：2kg/cm^2
Mold type	Four-cavity　2 point side gate：0.8mmϕ

Mold shrinkage ratio

KURARAY CO., LTD.
Genestar

Table 2 Mold shrinkage ratio（%）

		Genestar (PA9T)		PA6T	PA46	PPS	LCP (I)
		GN2330	G2450				
Filler content（%）		33	45	30	40	40	30
after molding	MD	0.1	0.1	0.1	0.1	0.04	0.1
	TD	0.6	0.5	0.7	0.7	0.5	0.7
after annealing	MD	0.15	0.12	—	—	—	—
	TD	0.7	0.6	—	—	—	—

mold：100×40、t=1mm flat plate（fan gate） mold temp：285°F（140℃） （Genestar）
annealing conditions：250°F（120℃）×5hr

The mold shrinkage of glass-reinforced Genestar resins depends on the composition, the amount and orientation of the glass fibers, part thickness and part design, mold design and processing conditions. The mold shrinkage data in Table 2 are intended as a guide.

Drying conditions

KURARAY CO., LTD.
Genestar

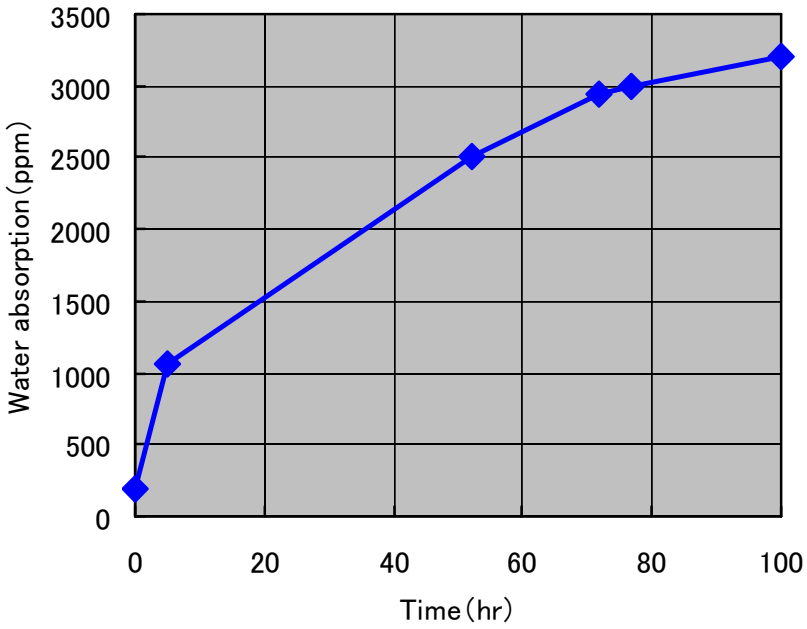


Fig.1 Water absorption profile of Genestar
(73゜F (23℃) × 50%RH)

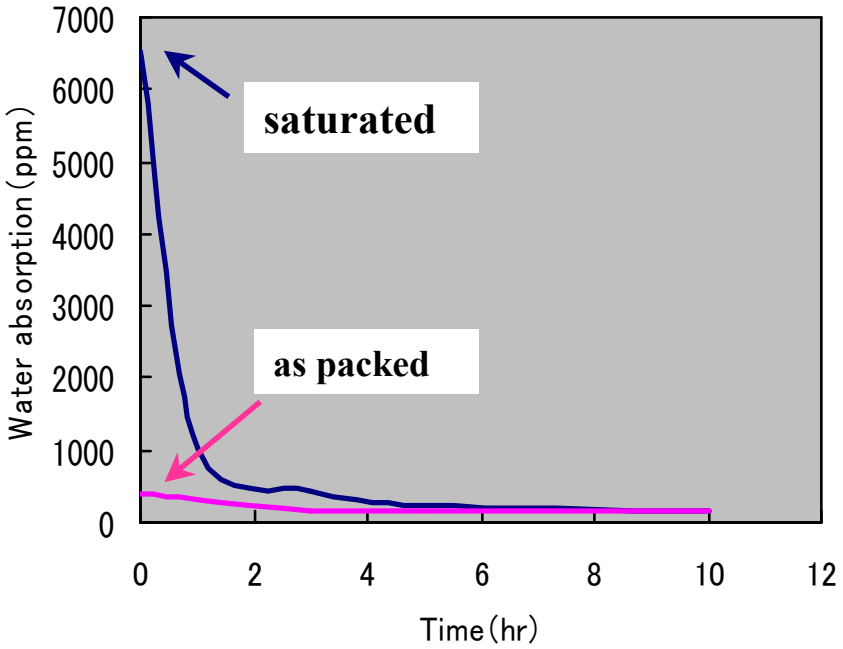


Fig.2 Drying profile of Genestar
(Hot air at 250゜F (120℃))

Genestar is packed dry (moisture content ＜0.05%) and does not require pre-drying. Drying is required when the material is exposed to humid air.

Drying conditions : 250゜F (120℃) × 5hr (air circulation ovens)

Mold temperature setting

KURARAY CO., LTD.
Genestar

Table 3 Degree of crystallinity（relative value、%）

	Wall Thickness (mm)	Mold temperature （℃）				
		80	100	120	130	140
Genestar (PA9T)	0.5	80	85	95	100	100
	1.0	88	91	96	100	100
	2.0	94	100	100	100	100
	3.0	100	100	100	100	100

（melt temp:610゜F（320℃）、Mold:10×30mm flat plate）

Non-crystallinity　100%crystallinity

Mold surface temperature of 175° to 300゜F（80° -150℃）are used but 265° to 285゜F（130° -140℃）is recommended.

Please note that low crystallinity tend to give bad effect on reflow performance.