

Practical Use of Biomass-based Plastics

【Background】

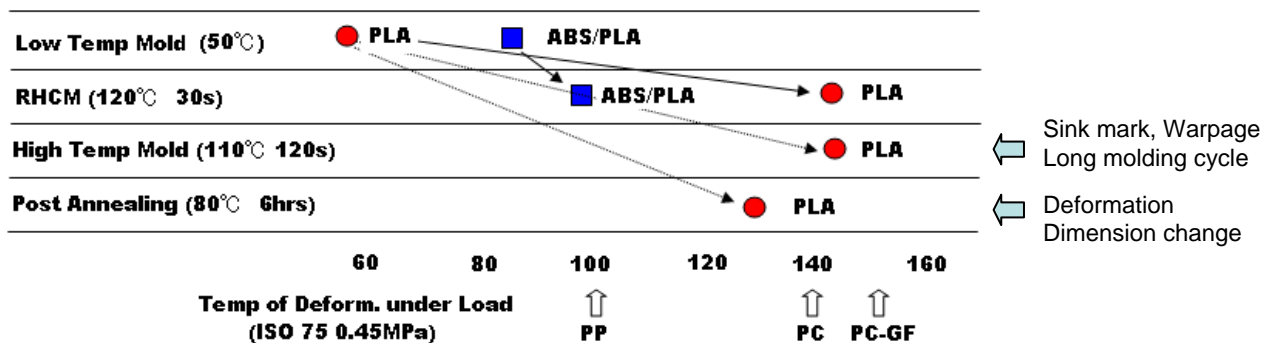
- ◆"Kyoto Protocol" : Reducing Emission of CO₂ by Ave. 5% Below 1990's level
- ◆ Demanding Environmentally Friendly Products

	Biomass-based	Petroleum-based
Bio Degradative	PLA	Aliphatic Polyester
Non Bio Degradative	PA 11 ABS/PLA PC/PLA	Commodity Plastics

1. Bio Degradative Plastics:Crystallization Acceleration of PLA

Since PLA has very low crystallization rate, ordinary PLA is amorphous and is not heat resistant. Before OSK's technology, PLA has been usually molded by using high temperature mold or crystallized by post annealing. Using high temperature mold caused surface appearance issues such as sink mark or warpage and unacceptably long cycle time. Using post annealing, troubles such as deformation or dimension change had occurred.

OSK developed new technology to crystallize PLA in mold within reasonable cycle time by applying RHCM technology. As a result of this technology, shape and dimension stable PLA products are obtained!

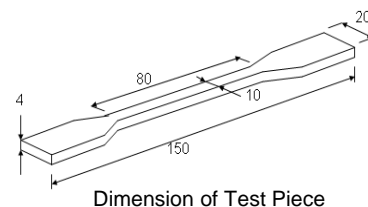


2. Biomass Based Plastics:Commodity Plastics / PLA alloy

PLA based polymer alloy is a series of materials blending 30-50% of PLA into commodity plastics in order to replace oil based commodity plastics by more environmental friendly plastics.

While PLA alloy processed by using conventional injection molding has low temperature of deformation under load because PLA domain exist as an amorphous state, PLA alloy processed by using RHCM has as high deformation temperature as plain commodity plastics.

Material	Condition		Temp. of Deformation (°C)	
	Method	Cycle Time	0.45MPa	1.80MPa
General ABS	Conventional	45	95	80
ABS/PLA=70/30	↑	45	84	66
↑	RHCM	50	89	72
↑	↑	100	93	76



Test Piece : ISO Dumbbell(thickness:4mm)