November 17, 1998
Kuraray Co., Ltd.

Launch of Acrylic Impact Modifier for PET Resins
Greatly increased range of applications for resins recycled from PET bottles

Kuraray has made possible the use of resin recycled from PET (polyethylene terephthalate) bottles, which had hitherto had limited applications due to its low impact strength, in injection molding. The Company has developed an acrylic impact modifier for PET resins, KURARAY ME-120, and launched it in November 1998.

KURARAY ME-120 is a sub-micron fine particulate composed mainly of acrylic rubber with an outer layer of methacrylic resin. It disperses easily and uniformly in PET resin and improves the impact resistance of the resin.

By adding a volume of KURARAY ME-120 equal to approximately 5% of the recycled PET resin, impact strength can be raised to the same level as that of virgin PET resin or even higher. This makes it suitable for injection molding of such things as different types of containers, cases, and trays, areas in which it was previously difficult to use recycled PET resin.

Estimate of demand for recycled PET resin
(Applicable areas - bottles, films, sheets)

(Ton/Year)

	1998	1999	2000	2003
Total Production	80,000	100,000	140,000	200,000
Of which molded products (% of applicable areas)	4,000 (5)	20,000 (20)	42,000 (30)	60,000 (30)
* Demand for modifiers	60	500	1,050	1,600

* Demand for modifiers is estimated on the basis of adding 5% of the modifier by volume to 30% of all molded products in 1998 and 5% by volume to 50% of all molded products in 1999, 2000, and 2003.

Moreover, adding KURARAY ME-120 to virgin PET resin can improve impact strength by several times, opening up the possibility of new applications in areas where greater impact resistance is required.

Furthermore, to enable as many users as possible to use recycled PET resin, in addition to KURARAY ME-120, Kuraray intends to sell a range of recycled PET resins with 5% or 10% KURARAY ME-120 added. It is possible to recycle PET resin which

contains KURARAY ME-120 a second or even third time without adding extra quantities of the modifier.

Outline of KURARAY ME-120

1. Advantages

1. Increases impact resistance of recycled PET resin (see Table 1)
2. Improves flowability of PET resin in the mold, thus solving mold release problems encountered with PET resin that contains no additives
3. Reduces "drawn down" (resin sagging caused by low viscosity) and improves potential for blow molding
4. Increases impact resistance of virgin PET resin (see Table 2) Virgin PET resin that contains KURARAY ME-120 is a suitable material for injection-molded products which require high impact resistance; for example, it can be used as a substitute for polycarbonate resin.

(Table 1)

Impact strength of recycled PET resin by relative volume of KURARAY ME-120 added

Relative volume of KURARAY ME-120 added	0	5%	10%
Izod impact test/with notch Kgf-cm/cm	2.4	4.3	6.7

* PET resin used: recycled PET resin (notch: v-shaped incision)

(Table 2)

Impact strength of virgin PET resin by relative volume of KURARAY ME-120 added

Relative volume of KURARAY ME-120 added	0	5%	10%
Izod impact test/with notch Kgf-cm/cm	3.0	5.0	8.6

* PET resin used: KURARAY KS750RC (manufactured by Kuraray)

IV value = 0.75 dL/g (IV = Intrinsic Viscosity)

2. Applications

(1) Daily necessities:

Clothes pegs, coat hangers, garbage cans, toothbrushes, etc.

(2) Industrial materials:

Delivery palettes, ink cartridges, substitute paper pipe cores for rolls of fiber, etc.

(3) Construction materials:

Floor support blocks used in underfloor wiring, floor reinforcement material, etc.

3. Price KURARAY ME-120 ¥800/kg

4.Sales Targets Fiscal 2000 1000 tons (¥800 million)
Fiscal 2003 1500 tons (¥1.2 billion)