

TOYO STYRENE High Functional Polystyrene

◆ Extremely Transparent Polystyrene : GA

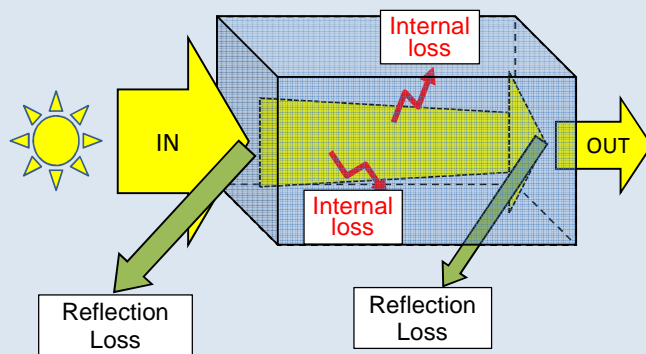
Advantages of polystyrene

Lightweight

Hard to warp

Easy to mold

	PS ⇒ GA	PMMA	PC	TFA
Specific gravity	◎ (1.05)	△ (1.19)	△ (1.20)	◎ (1.07)
Moisture absorption	◎	×	○	○
Formability	◎	○	△	◎
Transparency	○ ⇒ ◎	◎	○	○
Yellowing	○ ⇒ ◎	◎	◎	◎
Strength	○	○	◎	○
Heat resistance	○	○	◎◎	◎



$$\text{Light Transmittance (\%)} = \frac{\text{OUT}}{\text{IN}} \times 100$$

Thin plate (thickness = 2mm)		PS	GA60	PMMA	PC	TFA
Light Transmittance (%)		90	90	92	90	90
Breakdown of Losses	Reflection @ IN	5	5	4	5	5
	Internal	≒ 0	≒ 0	≒ 0	≒ 0	≒ 0
	Reflection @ OUT	5	5	4	5	5

"Light Transmittance of thin plate" ≠ "Transparency of materials"

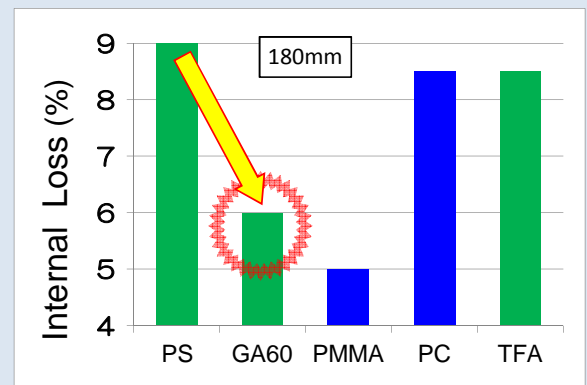
- **Thin plate:** Internal Loss is negligible.
Reflection Loss exclusively determines the Light Transmittance.
- **Thick object:** Internal Loss is **not** negligible.
Internal Loss have a strong effect on the transparency.

"Extremely Transparent Polystyrene" significantly reduced Internal Loss

Internal Loss
for each Light path length

	Light Path	PS	GA60	PMMA	PC	TFA
Internal Loss (%)	2mm	≒ 0	≒ 0	≒ 0	≒ 0	≒ 0
	100mm	5	3	2.5	5	5
	180mm	9	6	5	8.5	8.5

* our observed data

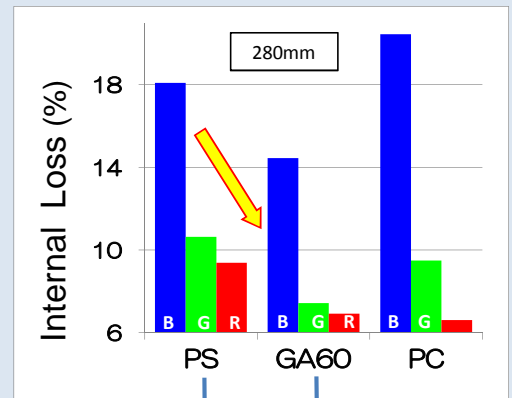
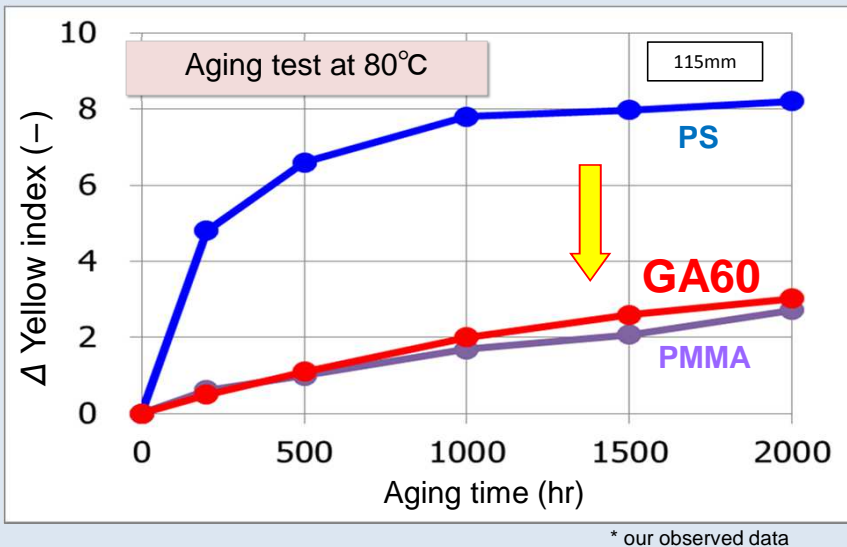


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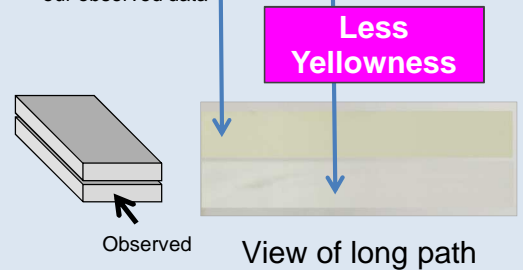
GA60 is prevented from yellowing

Internal Loss of blue light is lower !



【 Applications 】

Light guide plates for TV set and Lightings
Optical components, etc.



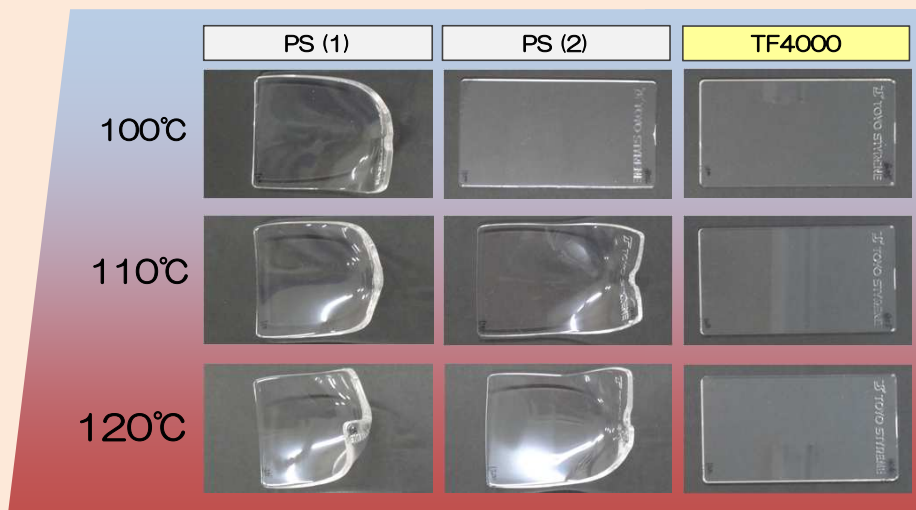
◆ High Heat Resistant Polystyrene : TFA

Vicat softening temp. of **TFA is 20°C higher** than that of a normal PS

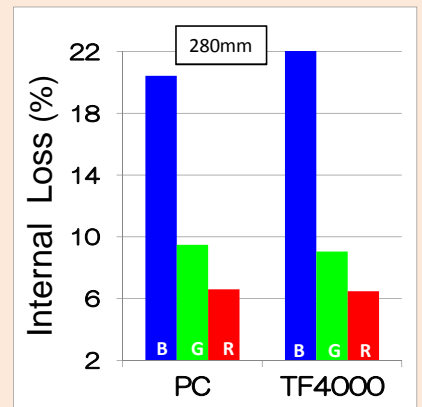
	PS(1) for Injection	PS(2) for Extrusion	TF4000	PMMA	PC
Vicat softening temp. (°C)	92	103	122	100~109	145~150

Test pieces after heated

after 20 min.



Equivalent transparency and yellowness to PC



【 Applications 】 Items needed heat resistance and transparency