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E Glass Flake

NIPPON SHEET GLASS CO., LTD.

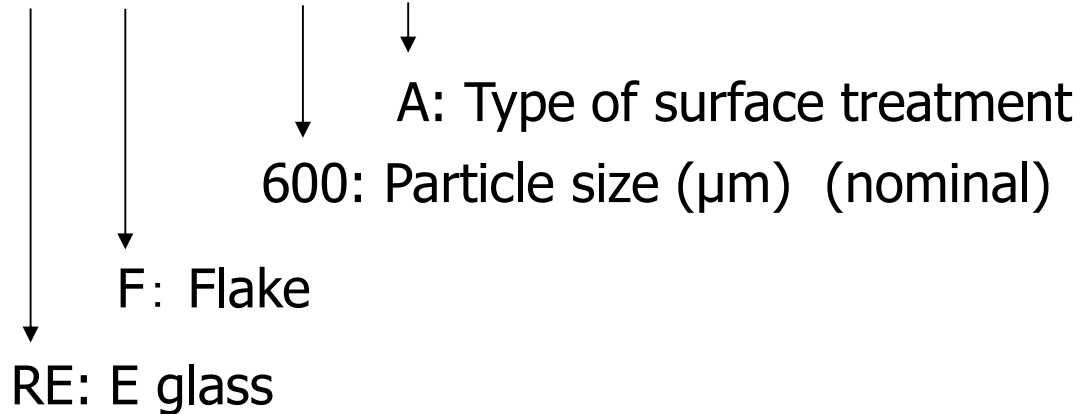
Contents – E Glass Flake

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Identification and classification

- Product code of MICROGLAS® GLASFLAKE

R E F – 600 A



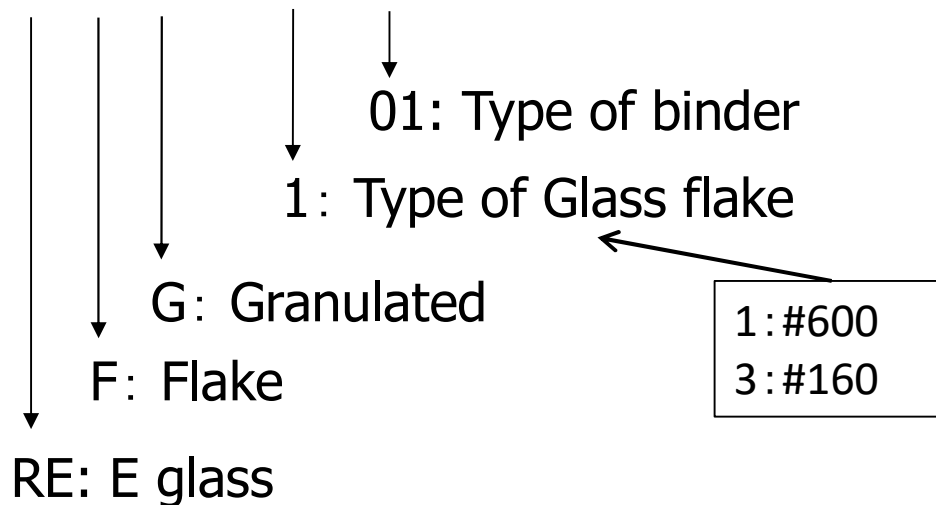
Glass Flake Treatments

- FLEKA®
 - Granular type of GLASFLAKE, where flakes are surface-treated with a binder*
 - The advantages
 - Improving characteristics of molded articles
 - Improving working environments by preventing flying glass
 - Improving workability by preventing bridges in hoppers, etc.

Identification; FLEKA®

- Product code of MICROGLAS® FLEKA®

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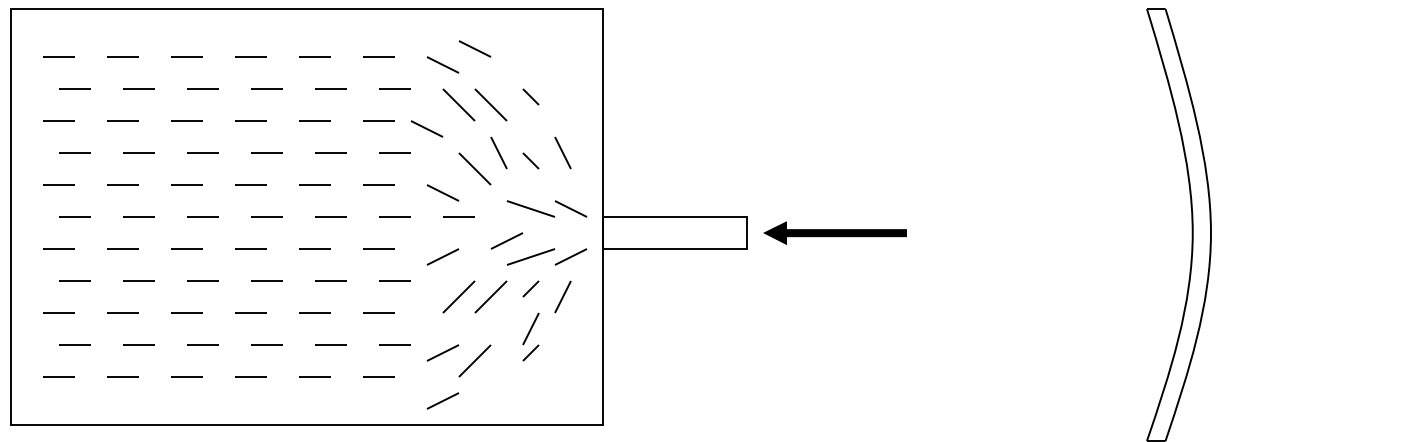
*Trial product code; REFGX(\$###)

S: number of year end

###: trial number

Performance of E Glass Flake

Glass-fiber reinforced thermoplastics



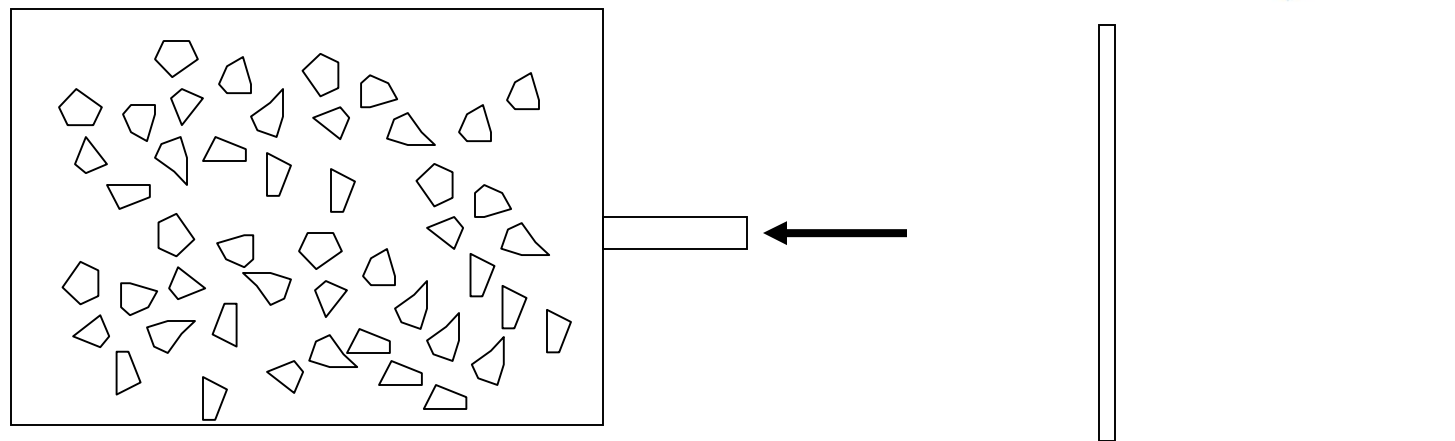
Reinforced in flow direction (MD: machine direction)

Warpage arise in transverse direction (TD)

Bad dimensional stability

Performance of E Glass Flake

Glass flake reinforced thermoplastics



No difference of reinforcing between TD and MD

Low warpage, Low Shrinkage

Improve dimensional stability of plastics

MICROGLAS® FLEKA® application



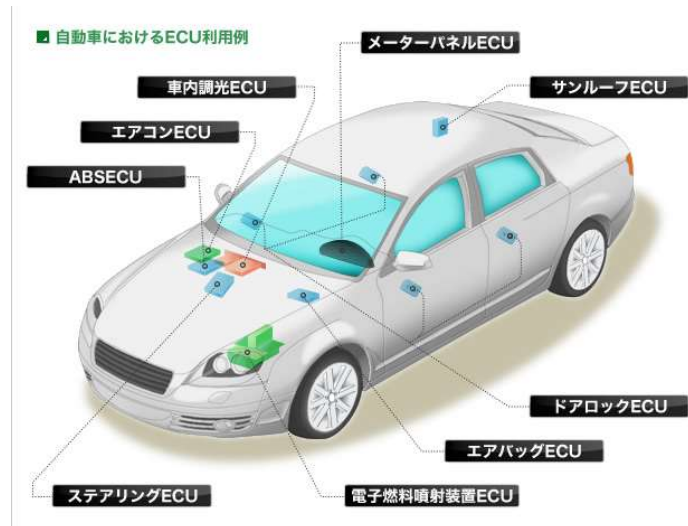
Electronic parts



Automotive parts
Ex. Throttle body



Game (ex. NINTENDO Wii)



Effect of sizing treatment

- Mechanical characteristic
 - Non-surface treatment / FLEKA®

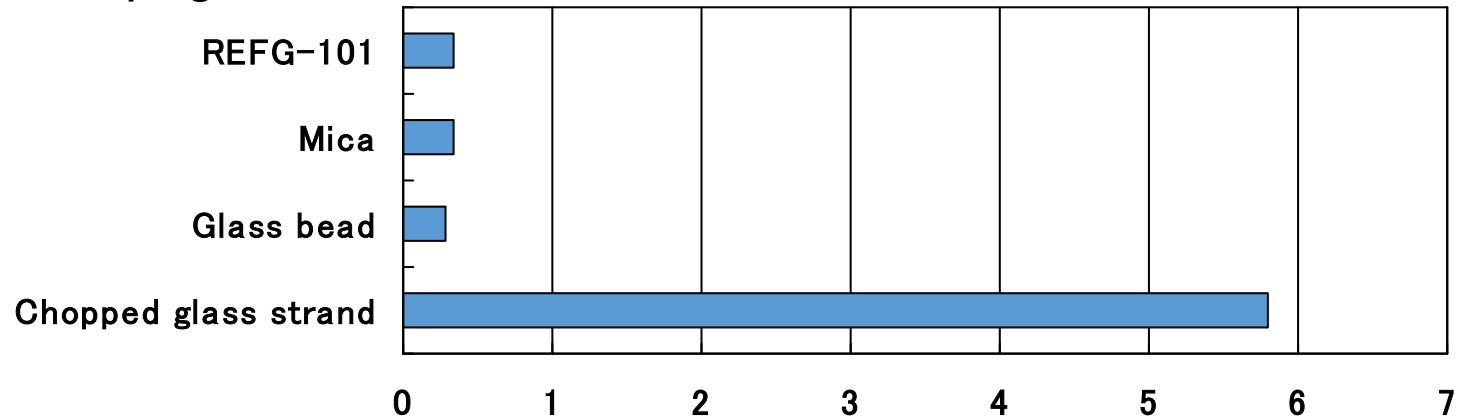
Glass flake reinforced PBT		Non-surface treatment	FLEKA®
		REF-600	REFG-101
Tensile strength	MPa	53.4	71.3
Flexural strength	MPa	94.6	129.6
Flexural modulus	MPa	7110	7679
Izod impact (notched)	J/m	26.4	28.4
Weld strength	MPa	22.9	50.6
Melting flow rate (MFR)	g/10min	50	50
Warpage (120 x 120 x 3mm) plate size	mm	0.3	0.3
Shrinkage			
Flow direction (MD)	%	0.53	0.52
Transverse direction (TD)		0.76	0.68

Performance of E Glass FLEKA®

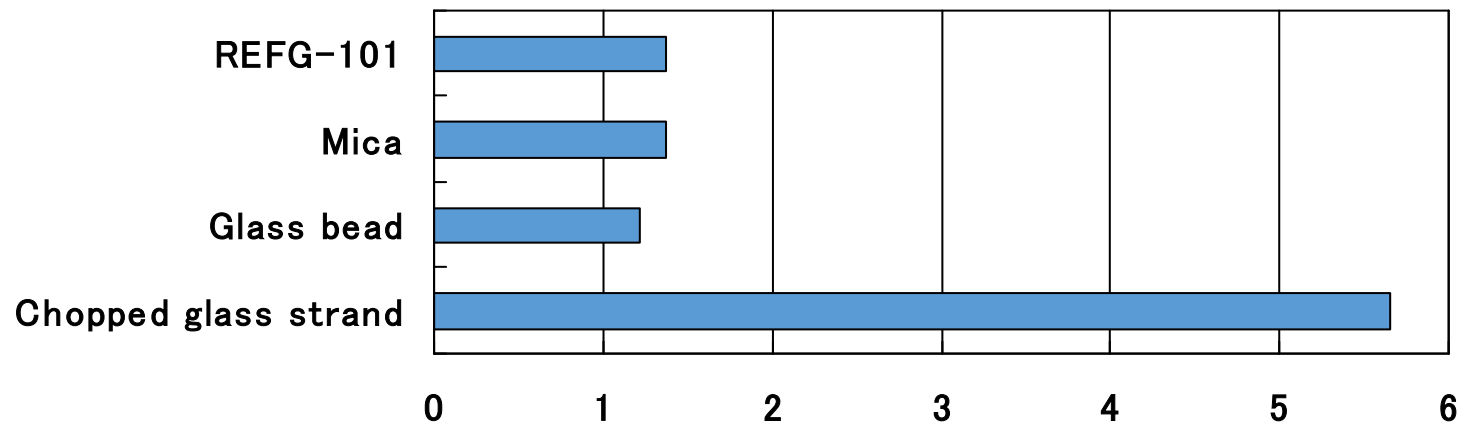
- Glass flake reinforced PBT

Filler content : 30wt%

➤ Warpage mm



➤ Shrinkage ratio % TD/MD

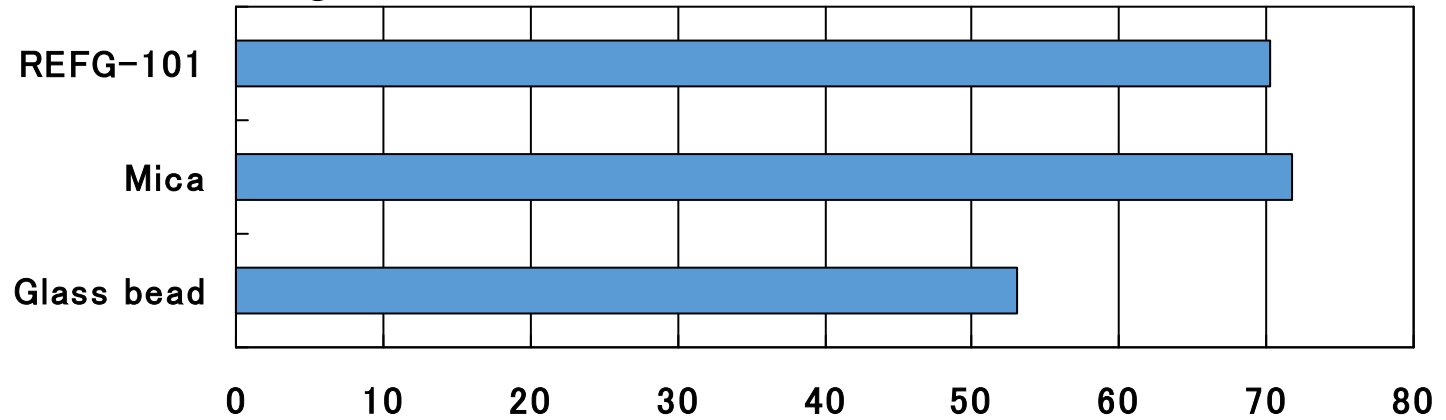


FLEKA® shows much higher dimension stability than Chopped glass strand

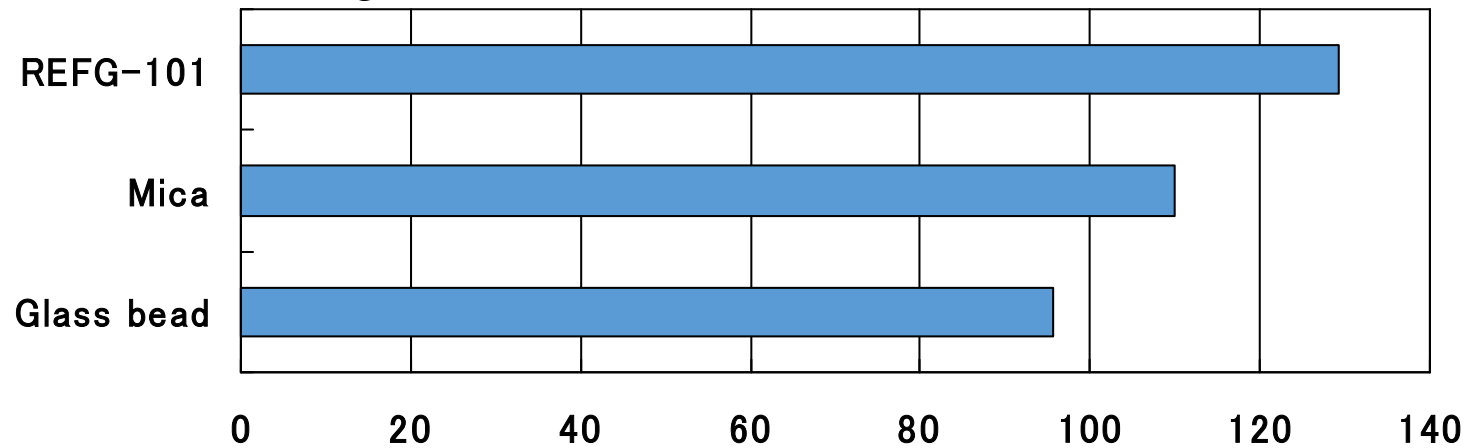
Performance of E Glass FLEKA®

- Glass flake reinforced PBT
- Tensile strength MPa

Filler content : 30wt%

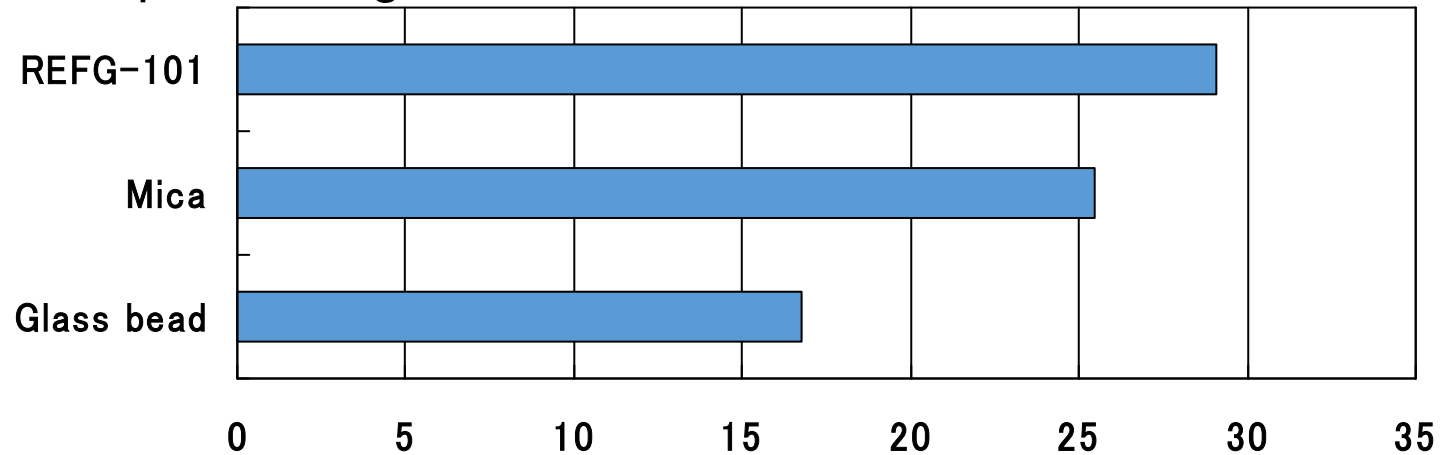


- Flexural strength MPa

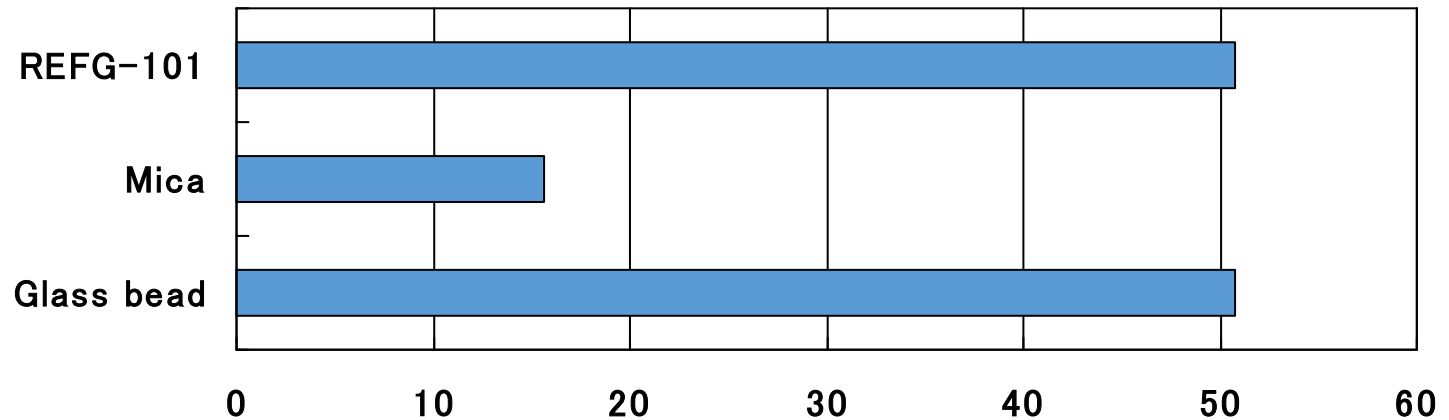


Performance of E Glass FLEKA®

- Izod impact strength J/m



- Weld strength MPa



FLEKA® shows good performance than Mica and Glass bead

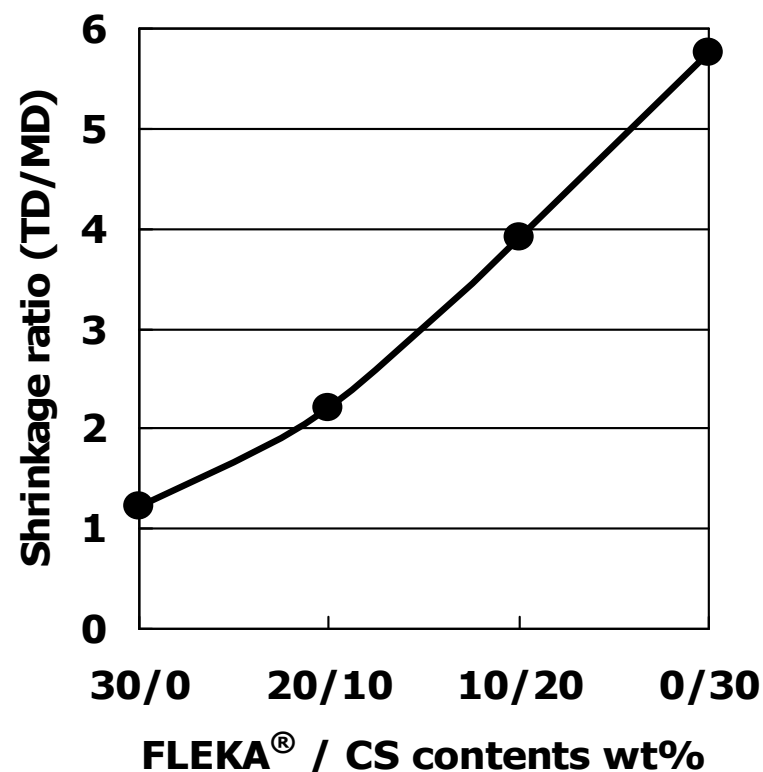
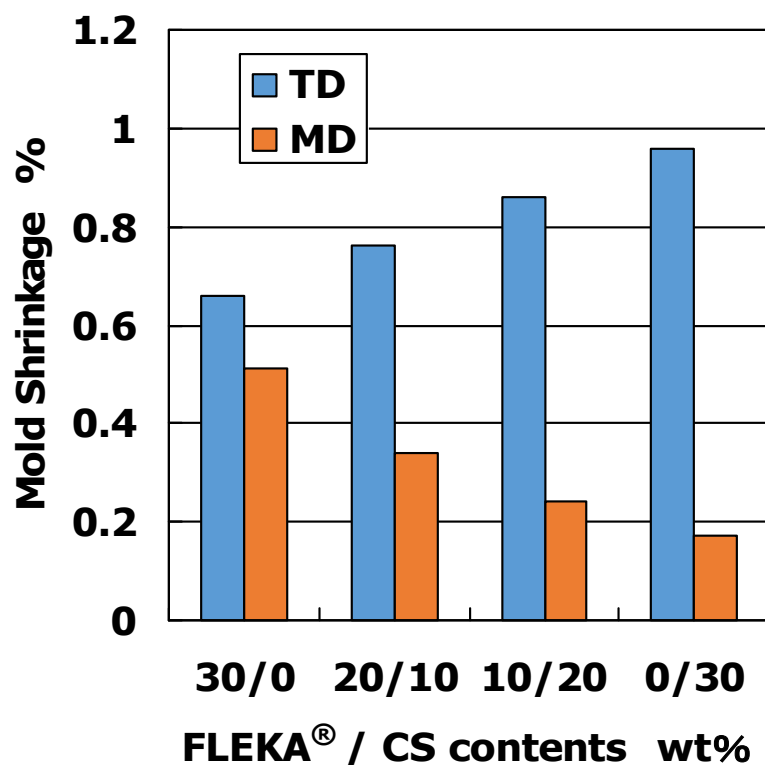
Performance of E Glass FLEKA®

- Glass Flake can be used together with chopped glass strand in thermoplastics applications

Resin :PBT

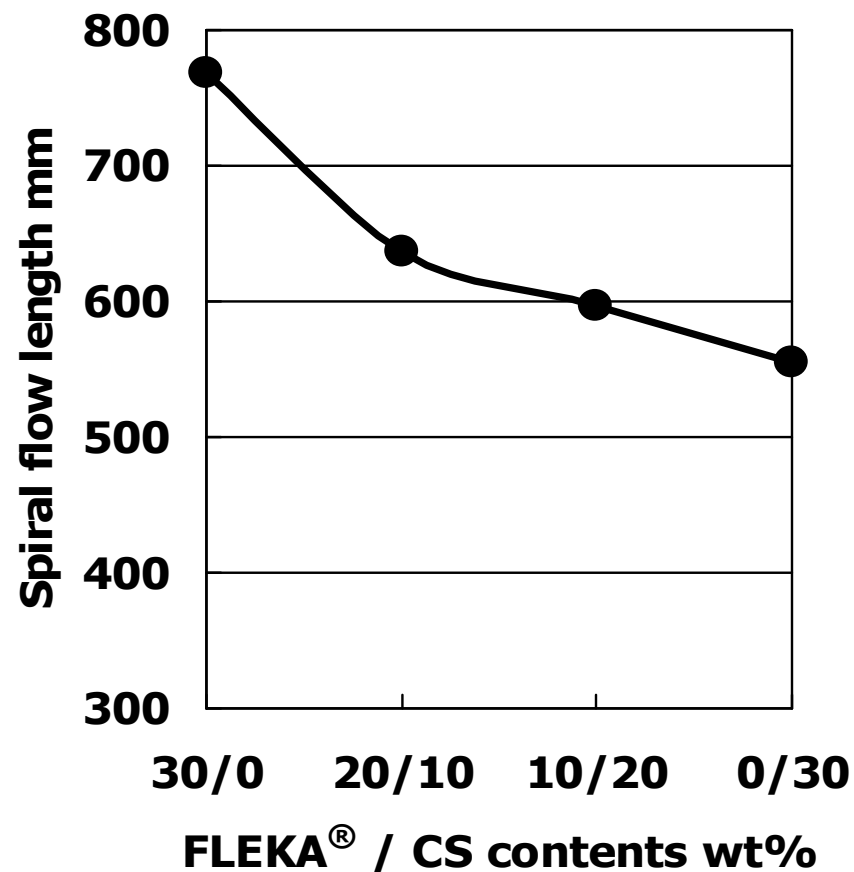
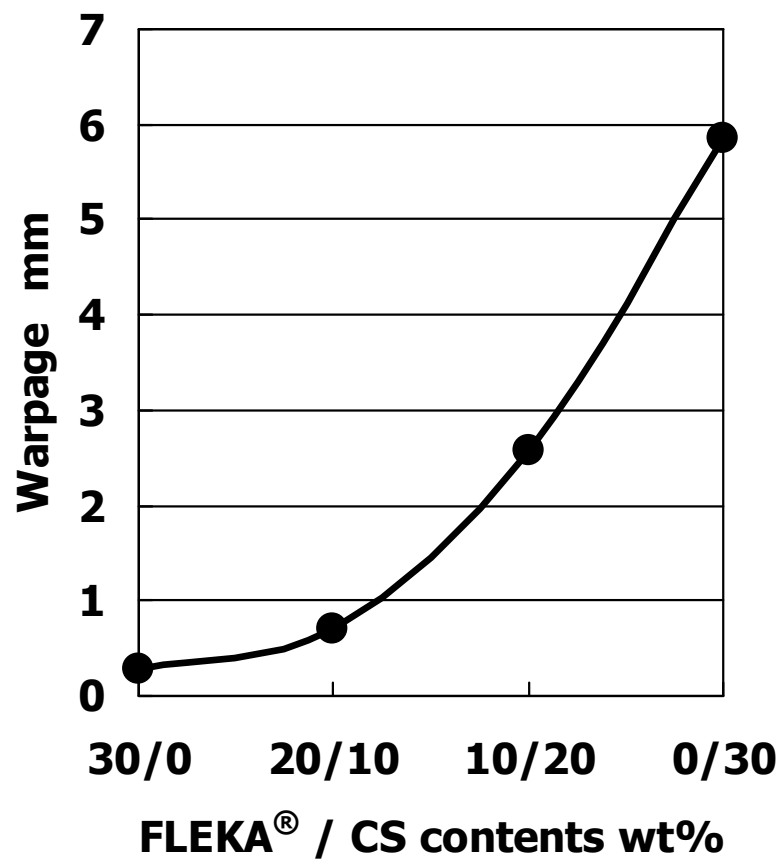
Chopped strand (CS) :Fiber dia. 10μm, cut length 3mm

FLEKA® :REFG-101



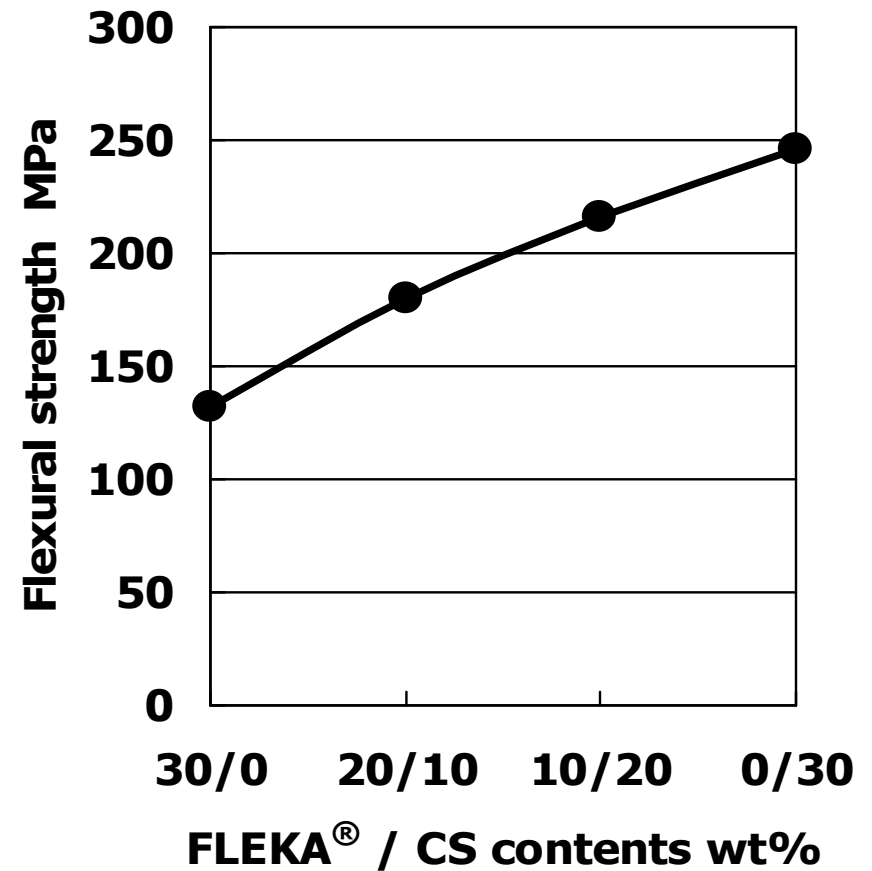
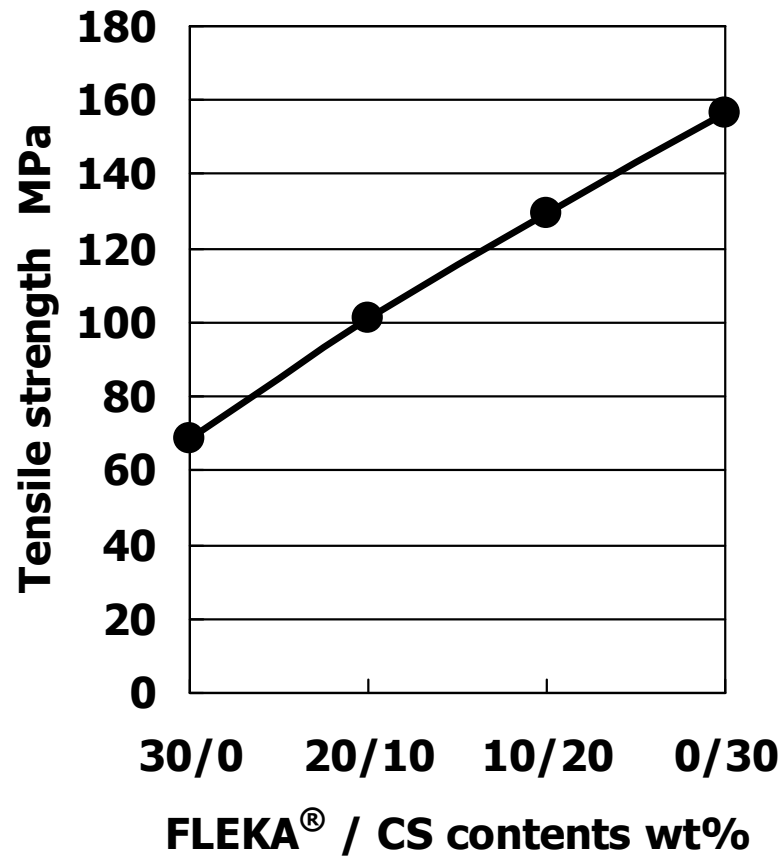
Performance of E Glass FLEKA®

- Combination of Glass Flake and chopped glass strand



Performance of E Glass FLEKA®

- Combination of Glass Flake and chopped glass strand



Identification and classification

• Classification of MICROGLAS[®] FLEKA[®]

Product code		REFG-101	REFG-301	REFG-112	REFG-315				
Glass composition		E glass							
Average particle size of base FLAKE	(μm)	600	160	600	160				
Average thickness of base FLAKE	(μm)	5 \pm 2							
Loss on ignition	(%)	0.60 \pm 0.15	0.60 \pm 0.15	0.50 \pm 0.15	0.50 \pm 0.20				
Particle size distribution	2.0mm on	(%)	10 or less	20 or less	20 or less	20 or less			
	2.0 ~ 1.4mm		70 or more	60 or more	60 or more				
	1.4 ~ 0.5mm					20 or less	20 or less	20 or less	60 or more
	0.5 ~ 0.15mm								
	0.15mm pass		20 or less	20 or less	20 or less	20 or less			
Particle size of FLEKA	(mm)	~ 1	~ 1	~ 1	~ 0.6				
Applicable resins		PC, PPE, PBT, PET, (LCP, PPS)	PC, PPE, PBT, PET, (LCP, PPS)	PPS, PA	LCP (PA, PP)				

GLASFLAKE; Registered Trade Mark in Japan, Europe, Singapore, Malaysia and China.

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