

NSG

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MICROGLAS® GLASFLAKE

Nippon Sheet Glass Co., Ltd.
Specialty Glass Material Business
Functional Products Division
Glass Flake & Metashine Business Unit

MICROGLAS® GLASFLAKE

- Flake shape glass
 - Average thickness: 2 μ m or 5 μ m
 - Particle size: 10-4000 μ m
- GLASFLAKE of E-glass: For plastics
- GLASFLAKE of C-glass: For anti-corrosion coatings



Fig.1 Appearance of GLASFLAKE®

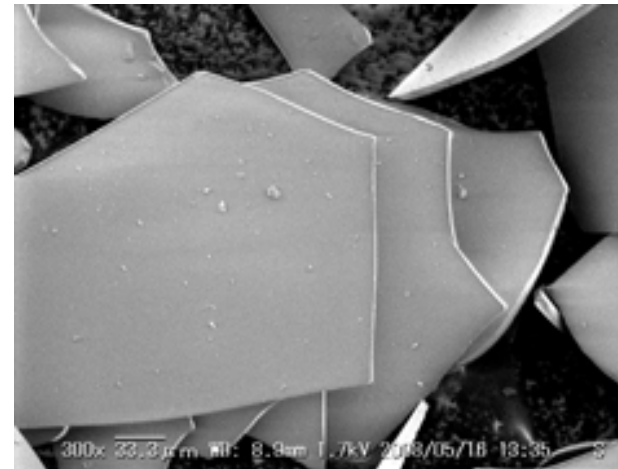


Fig.2 SEM image of GLASFLAKE®

Characteristics of glasses

Name of glass		E	C
Type of glass		No alkali glass	Alkali glass
Feature		Electrically insulating	Acid-proof
Specific gravity		2.6	2.5
Young's modulus (GPa)		87	80
Coefficient of linear expansion ($\times 10^{-7}/^{\circ}\text{C}$)		60	78
Index of refraction		1.56	1.52
Softening point($^{\circ}\text{C}$)		851	718
Constituent component (wt%)	SiO ₂	52-56	65-72
	Al ₂ O ₃	12-16	1-7
	CaO	16-25	4-11
	MgO	0-6	0-5
	B ₂ O	5-13	0-8
	ZnO	-	0-6
	Fe ₂ O ₃	0-0.4	-
	TiO ₂	0-1	-
	F ₂	0.1-1	-
	R₂O	0-0.8	9-17

R₂O: Na₂O+K₂O

GLASFLAKE of E-glass For plastics

Feature of GLASFLAKE for plastics

- Flaky glass with:
 - Average thickness: Approx. 5 μ m
 - Particle size: 10-4000 μ m
- Preventing a warp, and improving dimensional accuracy of molded plastic parts.
- Preventing hydrolysis of plastics and not influencing on property of the plastics, because this glass flake is made of E-glass.
- Very low impurity, because GLASFLAKE is made by industrial process.

Line-up of GLASFLAKE of E-glass



Product name		REF-600	REF-160	REF-015
Glass composition		E-glass		
Specific gravity		2.6		
Average thickness(μm)		5±2		
Particle diameter distribution (%)	>1700μm	0	0	0
	1700-300	80 or higher	11 or lower	12 or lower
	300-150		64 or higher	
	150-45	20 or lower	25 or lower	88 or higher
	45μm>			

MICROGLAS® FLEKA®



- Granulated GLASFLAKE with binder.
- In addition to the same features of GLASFLAKE, FLEKA® has the following features.
 - Improving characteristics of molded articles.
 - Improving working environments by preventing flying glass.
 - Improving workability by preventing choking in hoppers, etc.

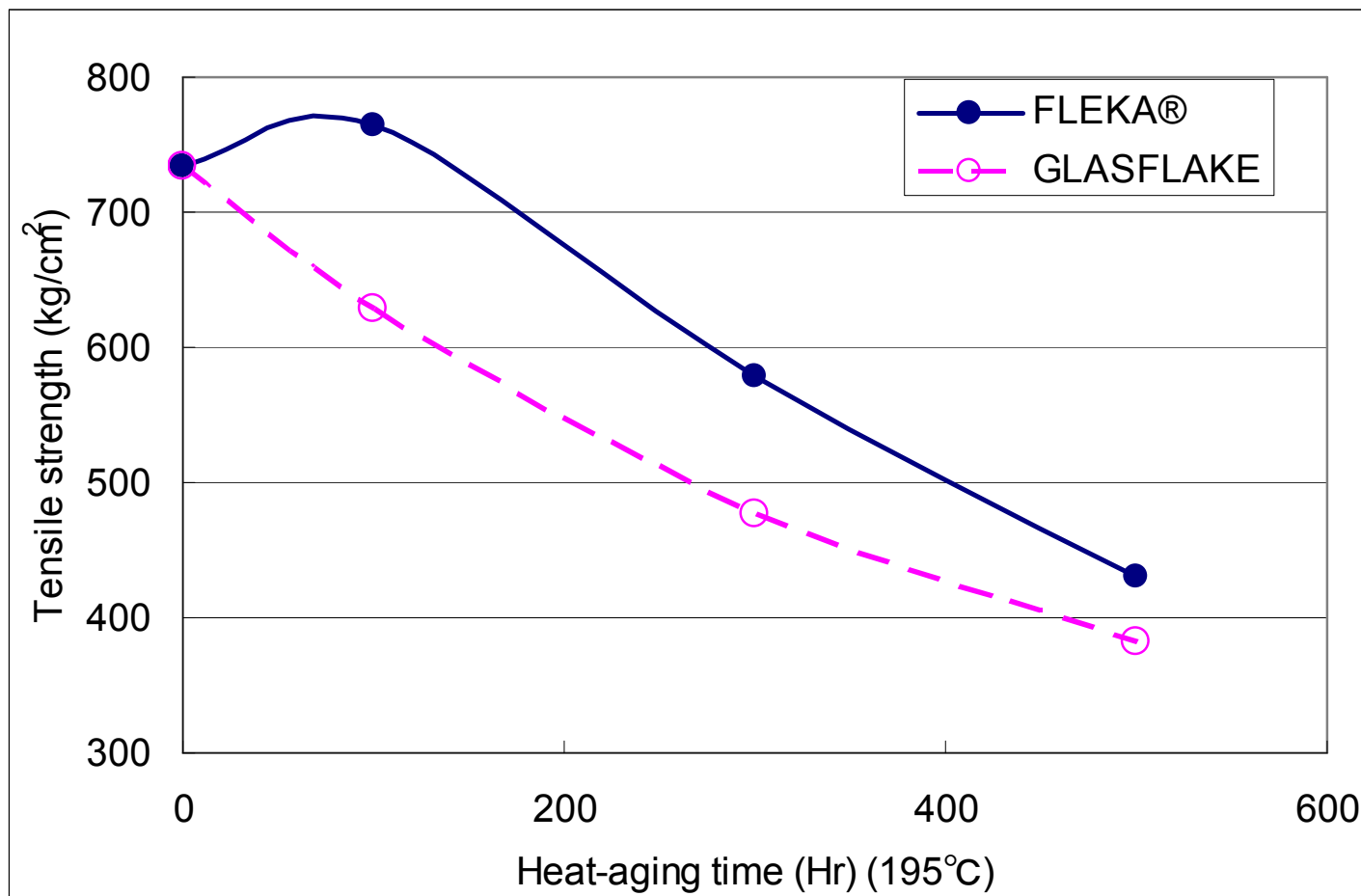
FLEKA® vs. GLASFLAKE



		GLASFLAKE	FLEKA®
Product name		REF-600	REFG-101
Tensile strength	kg/cm ²	545	727
Flexural strength	kg/cm ²	965	1322
Flexural modulus	kg/cm ²	72500	78300
Izod impact strength (notch)	kg·cm/cm	2.7	2.9
Weld strength	kg/cm ²	234	516
Melting flow rate (MFR)	g/10min	50	50
Mold shrinkage factor			
MD: Machine direction	%	0.53	0.52
TD: Transverse direction		0.76	0.68

- Resin: PBT
- Weld strength: Tensile strength of a dumbbell with a weld part formed of resin injected from both ends of the die.
- Mold shrinkage factor: Percentage of the length of a molded article of 60x60x3mm shrinking from the die dimensions.

FLEKA® vs. GLASFLAKE



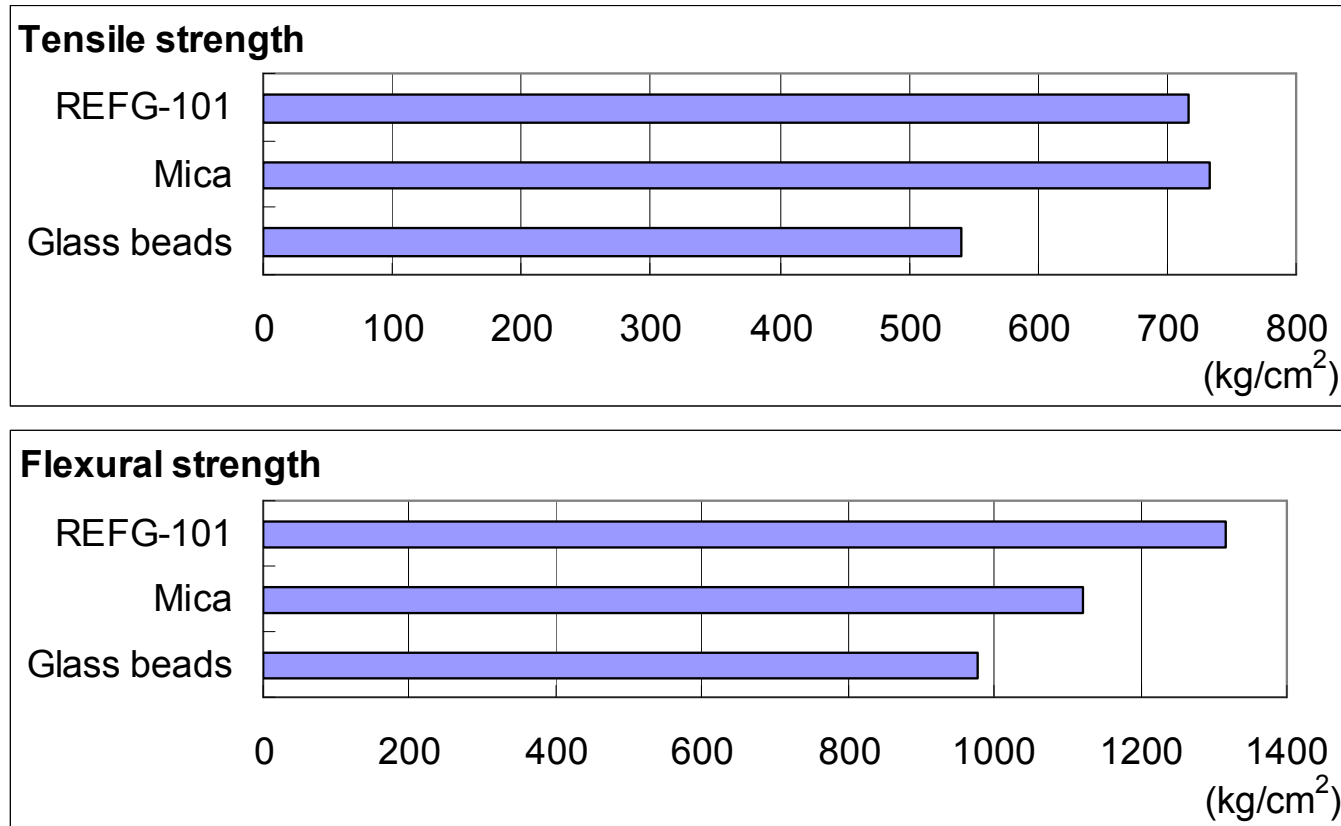
- Resin: PBT

Line-up of FLEKA®



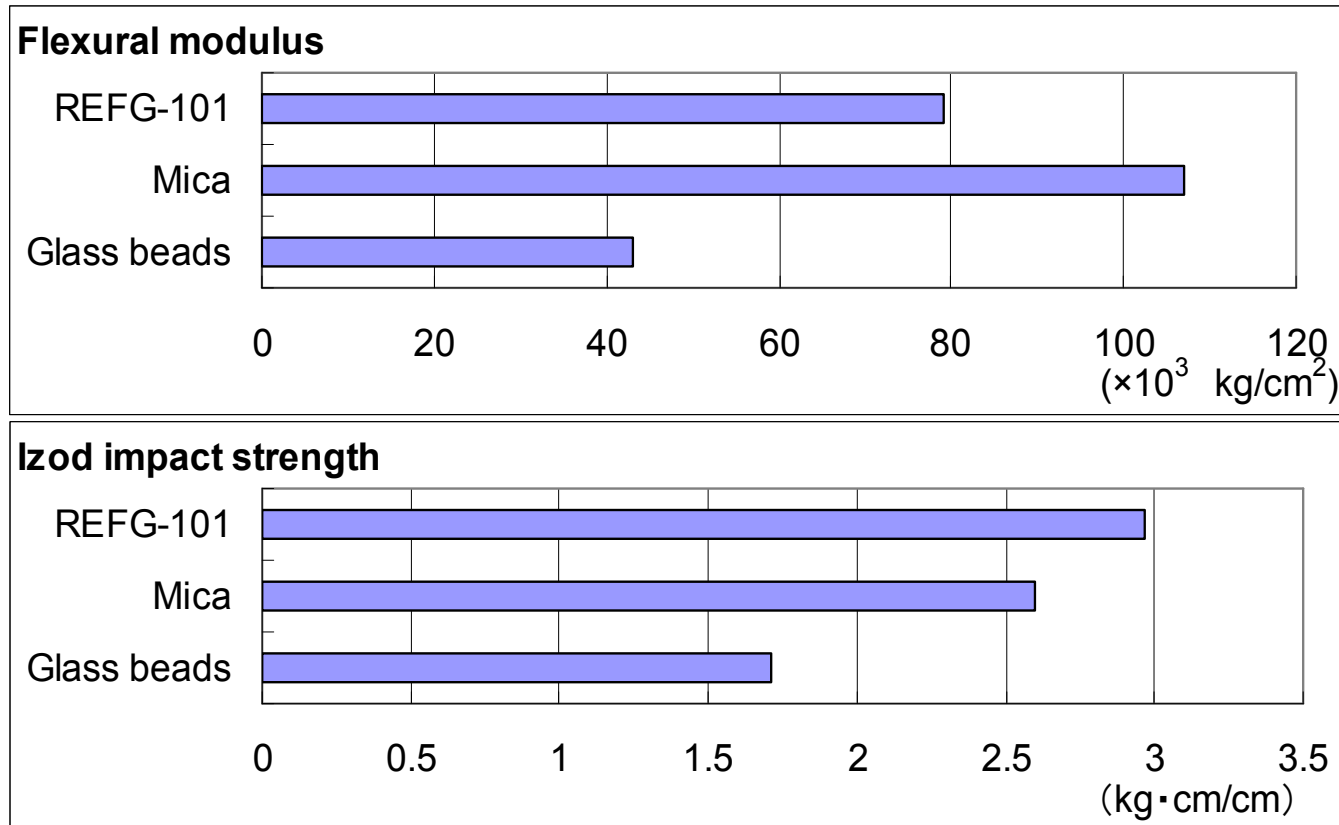
Product name		REFG-101	REFG-112	REFG-301	REFG-315
Glass composition		E-glass			
GLASFLAKE® as a source		REF-600		REF-160	
Particle diameter distribution (%)	>2.0mm	10 or lower	20 or lower	20 or lower	20 or lower
	2.0-1.4	70 or higher	60 or higher		
	1.4-0.5			60 or higher	60 or higher
	0.5-0.15	20 or lower	20 or lower		
	0.15mm>				
Average particle diameter (mm)		Approx. 1	Approx. 1	Approx. 0.5	Approx. 0.5
Example of applicable resin		ABS, PET, PBT, PC, PPS	PET, PBT, PPS	ABS, PET, PBT, PC, PPS	PA, PPO, PPE

Comparison to other filler -1



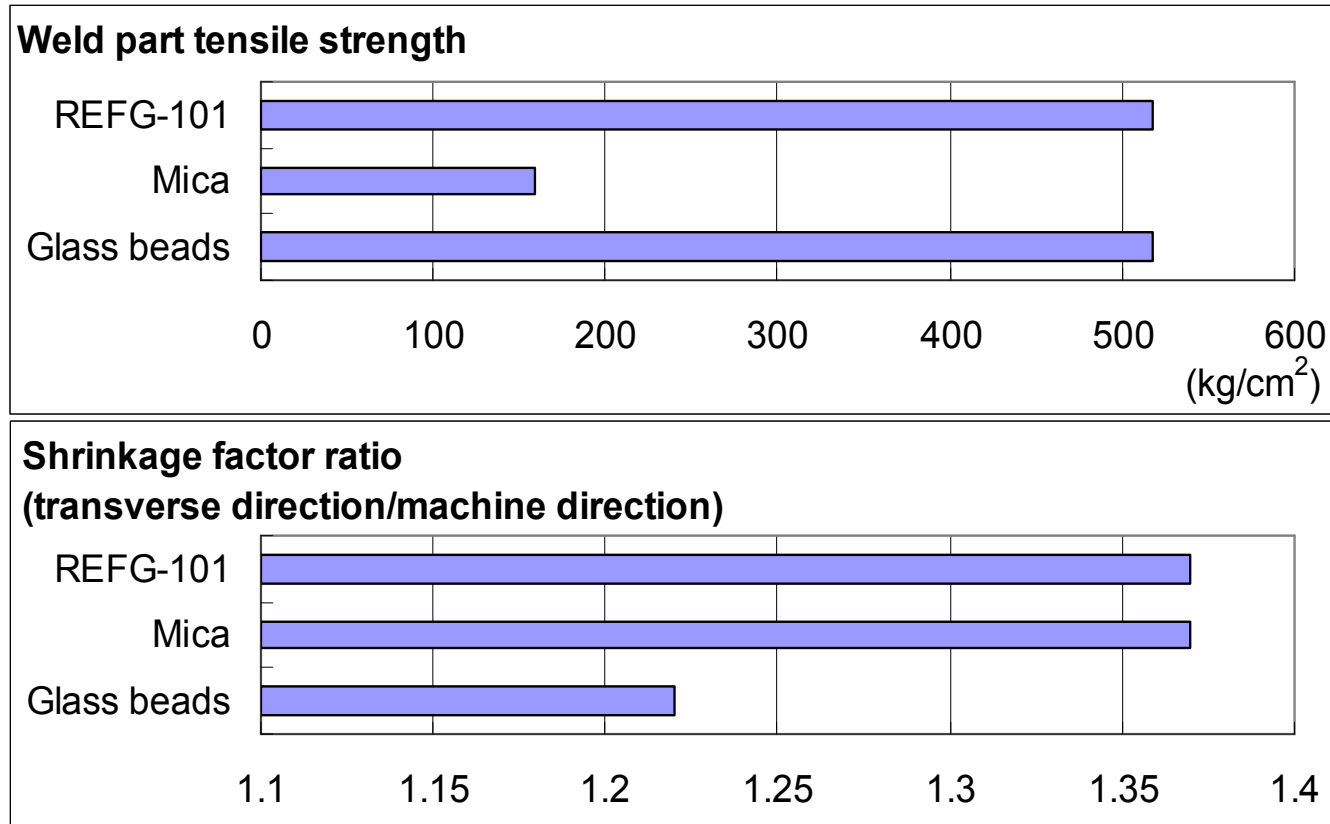
- Resin: PBT
- FLEKA®: REFG-101
- Mica: Potash mica with surface treatment, an average particle diameter of 90μm, and an aspect ratio of 50.
- Glass beads: With surface treatment and an average particle diameter of 50μm.

Comparison to other filler -2



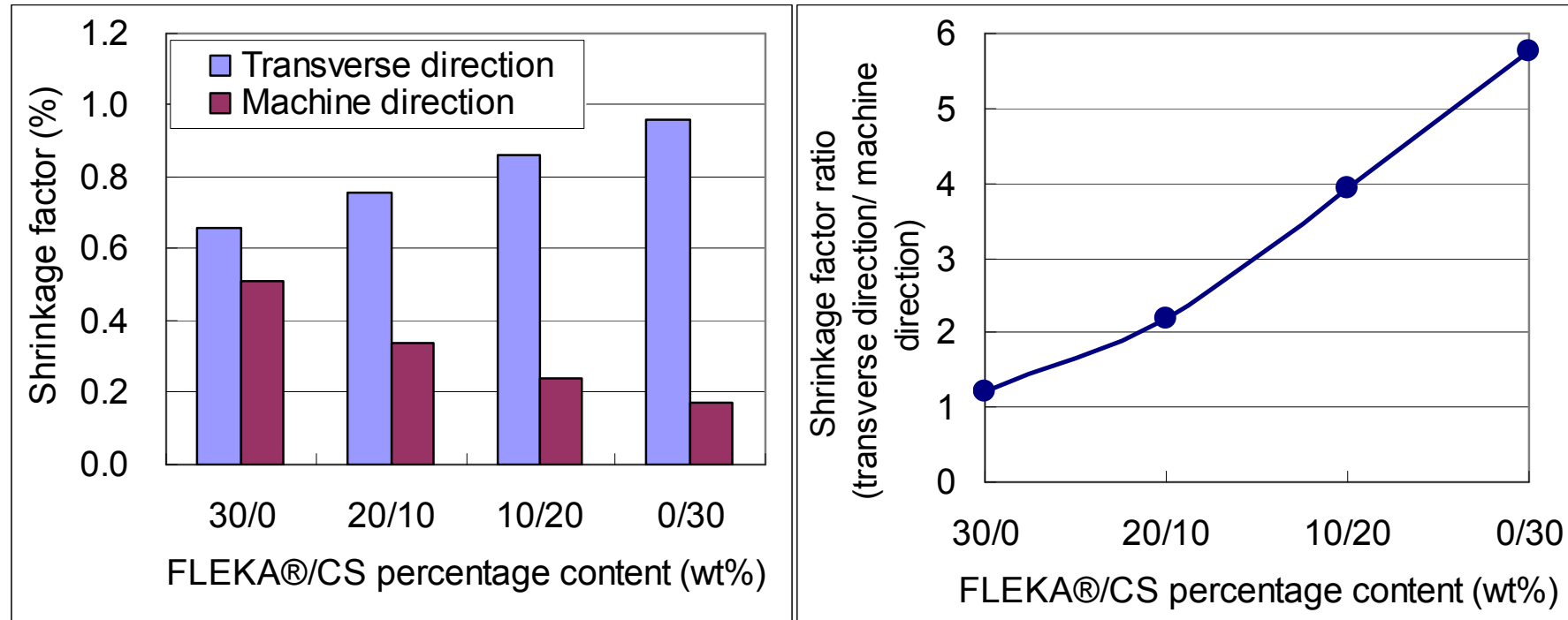
- Resin: PBT
- FLEKA®: REFUG-101
- Mica: Potash mica with surface treatment, an average particle diameter of 90 μ m, and an aspect ratio of 50.
- Glass beads: With surface treatment and an average particle diameter of 50 μ m.

Comparison to other filler -3



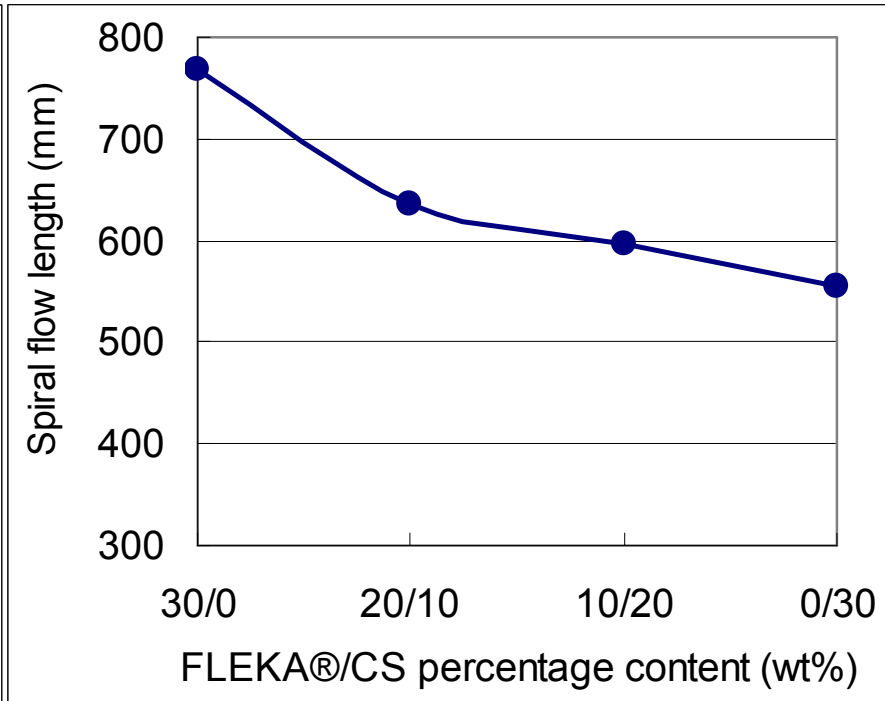
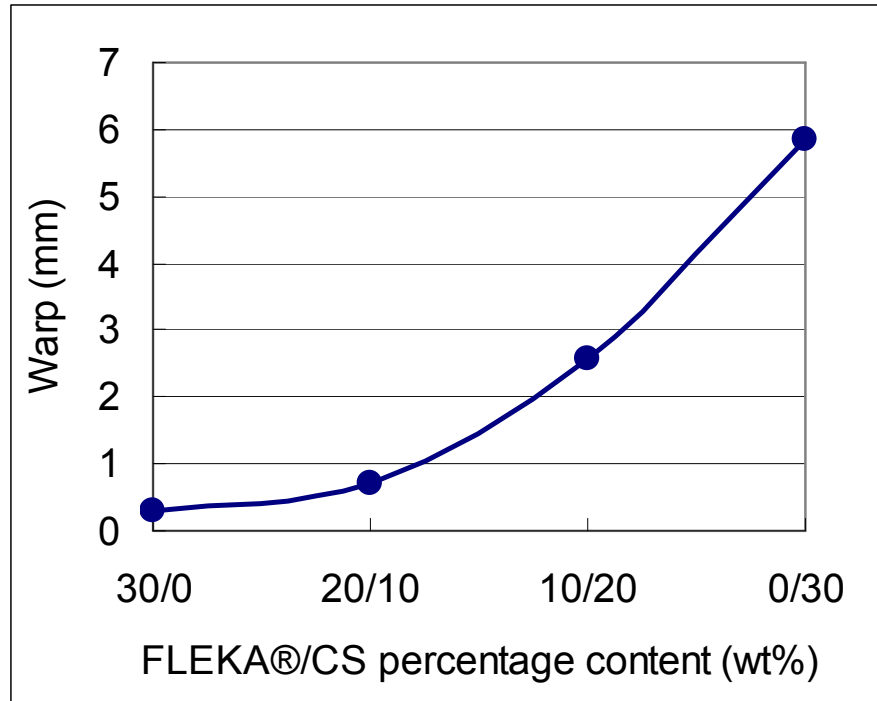
- Resin: PBT
- FLEKA®: REFUG-101
- Mica: Potash mica with surface treatment, an average particle diameter of 90µm, and an aspect ratio of 50.
- Glass beads: With surface treatment and an average particle diameter of 50µm.

Combination with chopped strands - 1



- FLEKA®: REFG-101
- Chopped strands (CS): With a fiber diameter of 10 μ m and a cut length of 3mm.

Combination with chopped strands -2



- FLEKA®: REFG-101
- Chopped strands (CS): With a fiber diameter of 10μm and a cut length of 3mm.

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