

KompoGTe®

Long Fiber Reinforced Thermoplastic
& Continuous Fiber Reinforced
Thermoplastic Composite

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KOLON ENP at a glance

KOLON ENP is dedicated to making the world a better place by drawing on the DNA of KOLON Group, 'LifeStyle Innovator.' As a leading engineering plastics manufacturing company in Korea, it has developed a diverse product portfolio, which includes POM, PA, PBT, TPEE, and supplies these products to over 90 countries worldwide.

KOLON ENP is committed to providing unique value to its customers, through continuous research and development and by improving the competitiveness of its products.

KOLON ENP has gained market recognition and the trust of its customers. In the future, We will continue to grow as a company that garners attention in the market and earns the trust of its customers by providing even greater value to them.



ESTABLISHMENT
March 15, 1996



HEAD OFFICE
Korea



SALES
350 mil. USD (2023)



PRODUCTS
8 Brands, 400 Grades

KompoGTe®

Long Fiber Reinforced Thermoplastic &
Continuous Fiber Reinforced Thermoplastic Composite

KompoGTe®

KompoGTe® is reinforced composite material. Two or more materials are artificially bind to bring out the superior characteristics from each or to create a whole new properties.

KompoGTe® can be categorized into two, Long Fiber Reinforced Thermoplastic (LFT) which is discontinuous reinforced composites and Continuous Fiber Reinforced Thermoplastic Composite (CFRP), & Fabric sheet which is continuous reinforced composites.

KompoGTe® has superior properties comparing to traditional materials in properties such as strength, fatigue resistance, wear resistance, impact resistance, and etc.

Therefore, not only auto industry have large interest in KompoGTe®, but sports, ship, construction, energy industries also have their highlight on it. We, KOLON ENP, have our own unique impregnation technology enable us to produce reinforced composite material with excellent performance.

CHARACTERISTIC OF KompoGTe®

LFT

MECHANICAL PROPERTIES

KompoGTe® LFT is produced through optimized impregnation technology. Continuous Glass Fiber and Carbon Fiber are added to Polypropylene and Polyamide to acquire better stiffness and strength.

Grades reinforced with glass fiber have superior stiffness, and we provide various glass fiber reinforced grades.

LENGTH OF REINFORCEMENTS

The length of KompoGTe® LFT pellet is controlled by pultrusion method to 6 ~ 12mm. Remaining length of glass fiber after injection molding is 10 times longer than SGF(shot glass fiber) reinforced grade, enabling KompoGTe® LFT to perform better mechanical properties.

UD TAPE

MECHANICAL PROPERTIES

KompoGTe® UD Tape is a material manufactured using optimized impregnation technology of Kolon ENP. It exhibits higher specific modulus and strength compared to traditional metal materials and plastic materials, and has higher impact strength than thermoset composite materials. By selectively using reinforcement materials and base materials according to the application field, we supply customers with Grade optimized for customers.

EFFICIENT MOLDING PROPERTIES

The KompoGTe® UD Tape is able to form a process that can be molded in less time and with less energy than conventional thermosetting composite materials. These processes enable efficient production and can be applied to the development of high quality applications.

APPLICATIONS (LFT)

APPLICATIONS (Composite)

ENGINE COVER

LE1G30HSBL

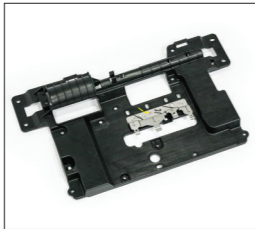
- ▶ Easy to Mold
- ▶ Low Density



SEAT UNDER COVER

LE1G40HIBL2

- ▶ High Stiffness
- ▶ High Impact



BATTERY TRAY

LE1G50BL

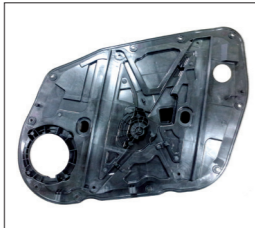
- ▶ High Stiffness
- ▶ Easy to Mold



DOOR MODULE PLATE

LE1G20HIBL

- ▶ Dimensional Stability
- ▶ High Impact



ION FILTER HOUSING

LE1G30BL1

- ▶ Low Cation Migration
- ▶ Easy to Mold



IP CORE

LE1G20HIBL

- ▶ Easy to Mold
- ▶ High Impact



HEAD LAMP BRACKET

LE1G30HIBL

- ▶ High Stiffness
- ▶ High Impact



REAR ARM REST

LE1G30BL1

- ▶ High Stiffness
- ▶ Easy to Mold



BATTERY TUB

LE1G60BL

- ▶ High Stiffness
- ▶ Dimensional Stability



C/Z CHANNEL

US1C60W

- ▶ High Stiffness
- ▶ High Impact



BMA BOTTOM COVER

UE1G60BLWFR

- ▶ Flame Retardance
- ▶ High Impact



REAR BACK BEAM

UE1G60BL

- ▶ High Stiffness
- ▶ High Impact



FEM CARRIER

UE1G60BL

- ▶ High Stiffness
- ▶ High Impact



BRAKE PEDAL ARM

UN1G67BLW

- ▶ High Stiffness
- ▶ High Impact



DOOR MODULE PANEL

LE1G30BL

- ▶ High Stiffness
- ▶ Dimensional Stability



OVERVIEW PRODUCT PORTFOLIO

CATEGORY	FEATURE	GRADE	MAIN APPLICATION
LFT	GF Reinforced	LE1G20BL1	Glove Box
		LE1G25BL	Hunting Gun Body
		LE1G30BL1	Window Motor Housing, Arm Rest, Arm Rest Box
		LE1G30HBL	Accelerator Pedal Module
		LE1G40	TGS Bracket
		LE1G40BL1	Headlamp Bracket
		LE1G502	Washing Machine Tub
		LE1G50BL1	Battery Tub
	GF Reinforced, Impact Modified	LE1G60BL	Battery Tub
		LE1G30HSBL	Engine Cover
		LE1G20HIBL	Door Module
		LE1G30HI	Headlamp Bracket
		LE1G30HIBL	
		LE1G40HIBL2	Seat Under Cover
	Flame Retardance	LE1G50HIBL	
	Weather Resistance	LE1G10V0BL	
	Polyamide Base	LE1G30BLW	Active Air Flap Housing
		LN1G30BL	
		LN1G40BL	
	COMPOSITE	GF Reinforced	LN1G50BL
UE1G50BL			
UE1G60BL			FEM Carrier Panel
Flame Retardance		UE1G72BL	Rear Back Beam
		UE1G58BLFR	BMA Bottom Cover
Polyamide Base		UE1G58BLWFR	BMA Bottom Cover
		UN1G50BL	
		UN1G60BLW	AGV Battery Cover
		UN1G67BL	
		UN1C50	
		UN1C60	
		UN3G50BL	
Flame Retardance, PA		UN3G60BL	
		UN1G55BLFR	
Polycarbonate Base		UO1G50BL	
		UO1G60BL	
Flame Retardance, PC	UO1G50BLFR		

KompoGTe® LFT Material

RESIN			REINFORCEMENT	CONTENT	CHARACTERISTIC	COLOR			
L	E	1	G	4	0	H	I	B	L

RESIN		REINFORCEMENT		CHARACTERISTICS	
LN1	PA6	C	Carbon fiber	B	Blending
LN3	PA66	G	Glass fiber	F	High flow
LN9	PA alloy	A	Aramid fiber	H	Heat resistant
LA1	POM	S	Steel fiber	HI	High Impact
LE1	PP	H	Hybrid fiber	R	Water resistant
		W		W	Weather resistant

COLOR		CONTENT	
BL	Black	20	20%
WH	White	30	30%
GR	Gray	40	40%

KompoGTe® Composite Material

TYPE	RESIN	REIN'	CONTENT	COLOR	LAYUP	CHARACTERISTIC				
U	E	1	G	6	0	B	L	W	F	R

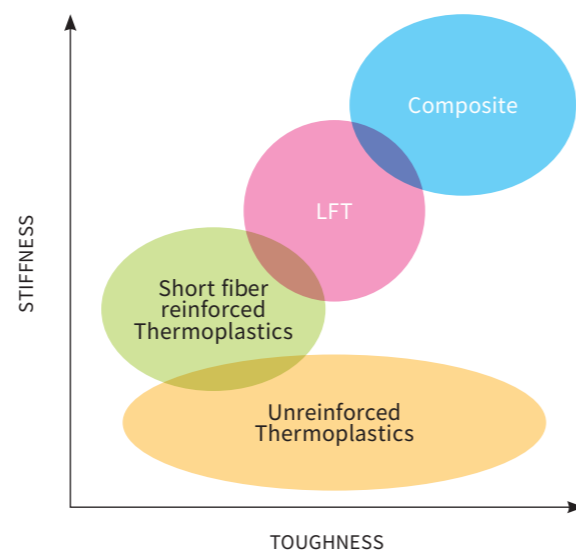
TYPE		REINFORCEMENT		LAYUP TYPE	
U	UD Tape	C	Carbon fiber	P	Ply
RESIN	N1	PA6	G	W	Woven
	N3	PA66	A	H	Ply + Woven
	S1	PPS	S		
	O1	PC	H		
E1	PP				

CONTENT		CHARACTERISTIC
50	50%	FR
60	60%	
67	67%	
72	72%	

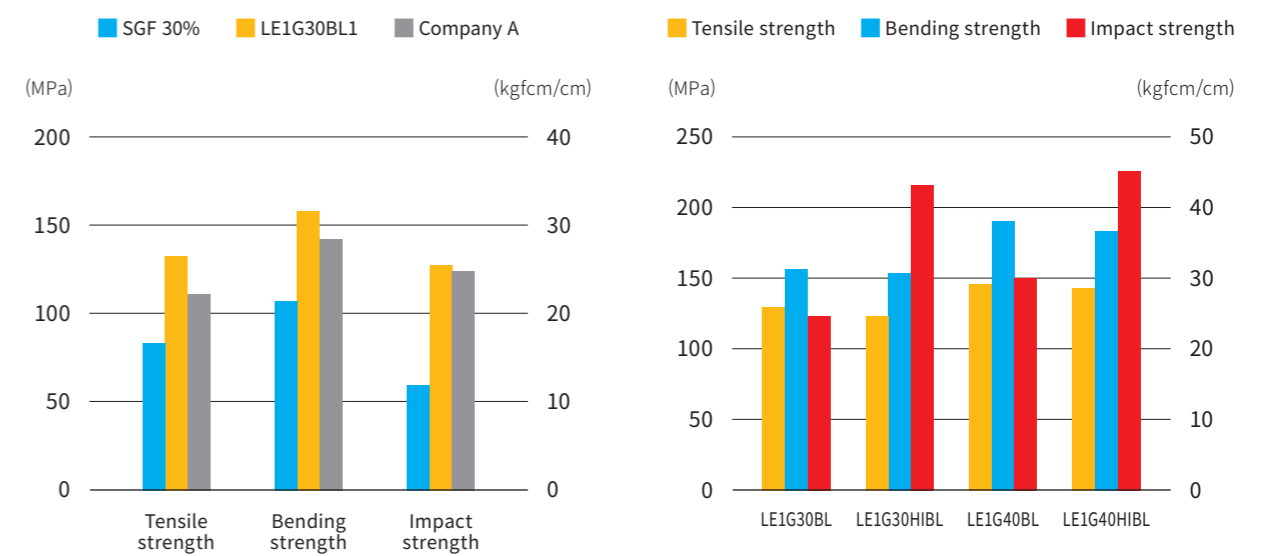
COLOR	
BL	Black
NA	Natural

HIGH STIFFNESS & IMPACT RESISTANCE

KompoGTe® LFT is superior in stiffness and impact resistance compared to short fiber reinforced materials. In addition, our impregnation technology provides property compared to competitors.

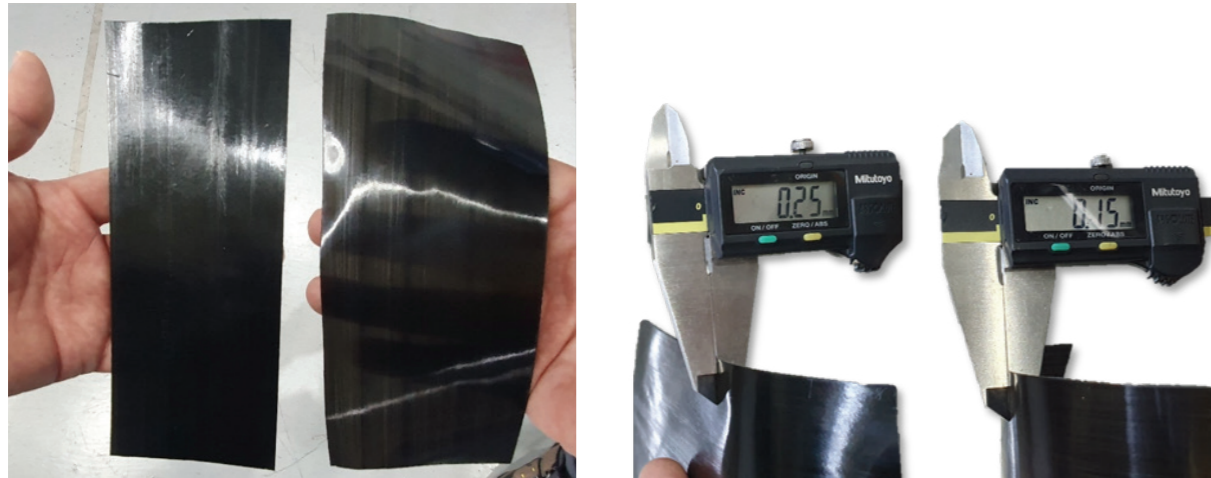


MECHANICAL PROPERTIES



PP/GF60 UD LAMINATED SHEET

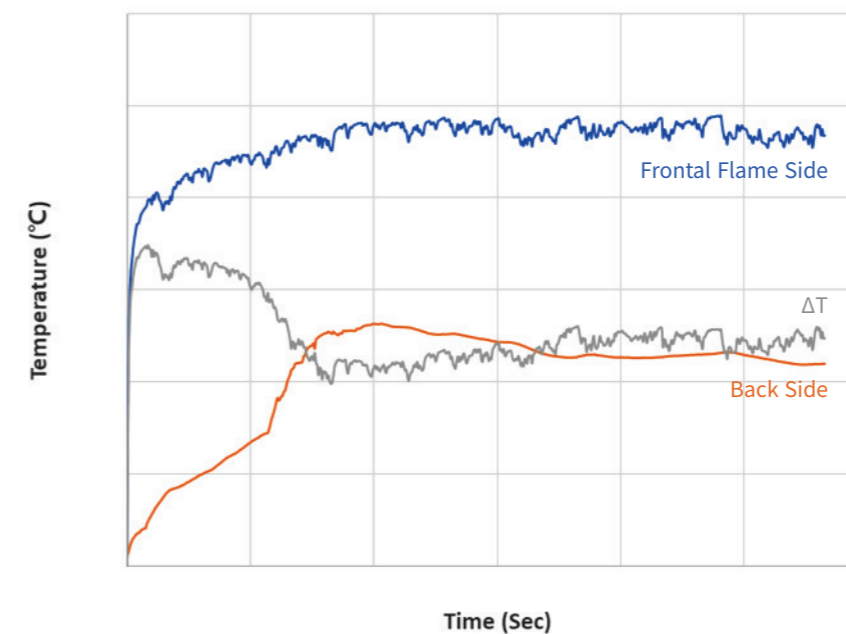
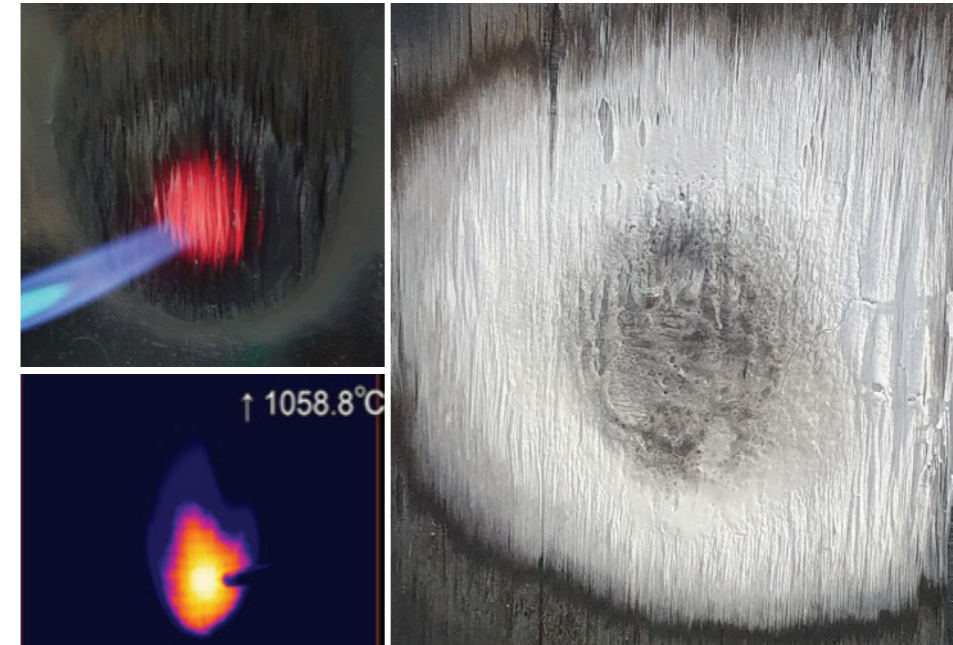
4Ply Sheet



PROPERTY	TEST STANDARD	UNIT	RESULT (THERMOFORMED)	
			PP/GF LAMINATED SHEET	PP/GF WOVEN FABRIC
Specific Gravity	ISO 1183	-	1.48	1.48
Tensile Strength (0 degree)	ISO 527	Mpa	370	360
Tensile Modulus (0 degree)	ISO 527	Gpa	15	16.5
Tensile Strength (45 degree)	ISO 527	Mpa	95	156
Tensile Modulus (45 degree)	ISO 527	Gpa	3.8	4.13
Fogging	DIN 75201	g	1.26 (µg)	1.21 (µg)
Odor	VDA 270(B3)	-	3.5	3.5
Carbon Contents	VDA 277	µg C/g	<5 (Non Detected)	<5 (Non Detected)
Burning Rate	UL 94	mm/min	39	37
Aging Resistance	400h @ 150°C	-	No Brittleness	No Brittleness
Wet Resistance	120h @ 80°C / 80% RH	-	No Drop	No Drop

Evaluation Result of Flame retardant Grade

- Grade: UN1G55BLFR
- Thickness: 2mm

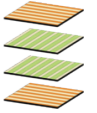


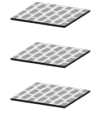
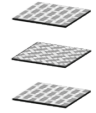
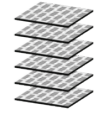
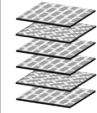


MECHANICAL PROPERTIES of KompoGTe® (LFT)

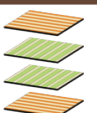
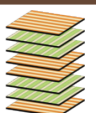

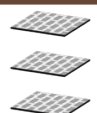
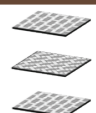
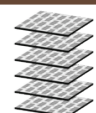
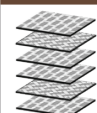
Property	Specific Gravity	Ash	Tensile Strength	Flexural Strength	Flexural Modulus	Impact Strength (Notched IZOD)	Heat Deflection Temperature
TEST METHOD	ISO 1183	ISO 3451	ISO 527	ISO 178	ISO 178	ISO 180	ISO 75
UNIT		%	MPa	MPa	MPa	KJ/m2	°C
LE1G20BL1	1.02	20	110	135	4,450	16.8	157
LE1G30BL1	1.10	30	135	170	6,150	23.8	160
LE1G30HI	1.10	30	135	170	6,000	26.8	159
LE1G30HIBL	1.10	30	125	160	5,950	24.4	159
LE1G40	1.18	40	145	200	8,100	28.0	163
LE1G40BL1	1.18	40	140	185	7,750	25.9	163
LE1G40HIBL2	1.20	40	145	190	7,500	29.4	163
LE1G50BL1	1.29	50	160	210	9,800	31.5	163
LE1G502	1.29	50	160	225	10,400	32.7	163
LE1G60	1.41	60	150	190	11,500	29.2	163
LE1G60BL	1.41	60	150	220	14,500	34.0	163
LN1G30BL	1.36	30	165	240	8,300	24.3	220

MECHANICAL PROPERTIES of KompoGTe® (Lamination Pattern Configuration)

PP/GF 72wt%

PROPERTY	ORIENTATION	UNIT	UE1G72BL			UE1G72BLW				
			Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	
Stacking Lay-up	-	-								
			[0/902/0]	[0/902/0]s	[0/±45/90]s	[0]3	[0/45/0]	[0]6	[0/45/0]s	
Specific gravity(ISO 1183)	-	-	1.69							
Tensile (ISO 527)	Modulus	GPa	0	20.3	20.2	15	21.5	15.6	21.6	16.1
			90	20.4	20.3	15	21.1	15.5	21.2	16
			45	4.3	4.3	15.1	4.4	10.8	4.4	10.9
	Strength	MPa	0	406	405	365	445	365	450	370
			90	403	408	370	440	363	435	365
			45	100	100	357	140	265	140	250
Flexural (ISO 14125)	Modulus	GPa	0	20.8	23.5	20.1	18.6	16.5	19	16.4
			90	10.8	12.3	6.5	18.4	16.4	18.8	16.2
			45	4.1	4.5	8.9	5.3	6.3	5.4	10
	Strength	MPa	0	600	625	457	435	415	450	410
			90	52	380	128	430	410	435	405
			45	64	68	200	78	230	80	310

PA6/GF 67wt%

PROPERTY	ORIENTATION	UNIT	UE1G72BL			UE1G72BLW				
			Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	
Stacking Lay-up	-	-								
			[0/902/0]	[0/902/0]s	[0/±45/90]s	[0]3	[0/45/0]	[0]6	[0/45/0]s	
Specific gravity(ISO 1183)	-	-	1.69							
Tensile (ISO 527)	Modulus	GPa	0	23.2	23	17.5	22.3	17.9	22.4	18
			90	23.1	23.1	17.5	22.2	17.8	22.3	17.9
			45	9	9	17.6	9	13.4	9.1	13.7
	Strength	MPa	0	420	414	343	435	355	434	360
			90	422	419	345	432	352	435	363
			45	160	160	342	150	270	165	273
Flexural (ISO 14125)	Modulus	GPa	0	23.5	27.8	26.3	18.7	18.9	19.7	18.9
			90	7.9	17.4	6.4	18.6	18.7	19.5	18.9
			45	8.4	9	9.1	9	7.1	9	11.4
	Strength	MPa	0	720	775	605	541	554	540	540
			90	205	505	115	538	552	539	540
			45	138	144	320	198	247	201	387

INJECTION CONDITIONS & HANDLING PRECAUTIONS of KompoGTe®(LFT)

PRE DRYING

KompoGTe® is a reinforced polypropylene product with low water absorption, but it is recommended to dry it before use after opening. If exposed to high humidity environments or not used immediately after opening, it may result in cosmetic defects such as Silver Streak.

DRYING CONDITION

Heating or dehumidification drying at 80~90°C, in 2~4 hours

INJECTION CONDITIONS

To determine the optimal molding conditions for KompoGTe®, resin flow characteristics, molding shrinkage, dimensional precision, quality stability, uniformity, and economy should be considered. These considerations require a pre-production review before mold making. KompoGTe® has differences in shrinkage rate depending on the fiber orientation, so pre-production review is essential before mold making

The screw of the injection molding machine should have a compression ratio of 2.4-3.4 or higher, and it is advantageous to use a screw-type injection molding machine with improved wear resistance and chrome plating. We recommend using an injection molding machine designed specifically for long fibers, but a general-purpose injection molding machine can also be used. However, in the case of a general-purpose injection molding machine, the residual length of glass fibers may be reduced.

Generally, the injection temperature for KompoGTe® is set 20°C higher than its melting point of 165°C, but it is recommended to set it below 270°C to prevent thermal decomposition and discoloration. If the melt temperature is too high, the resin can degrade, causing an increase in volatile content, which can lead to the formation of bubbles or silver streaks on the product surface, and increase the likelihood of shrinkage or warpage. In addition, if the injection pressure is too high, the fiber residual length may decrease, which can degrade the material properties, so it is recommended to set the maximum pressure below 15% of the highest back pressure.

INJECTION CONDITIONS & HANDLING PRECAUTIONS of KompoGTe®(LFT)

THERMAL DECOMPOSITION

When KompoGTe® is molded at temperatures above 270°C or left in the cylinder at temperatures above 240°C for a long time (more than 20 minutes), it may cause thermal decomposition gas and discoloration of the resin.

PREVENTION OF DECOMPOSITION

- Try to keep the injection temperature setting below 260°C if possible.
- When the operation is stopped for a long time, purge the resin inside the cylinder and stop the operation.
- When the operation is stopped and delayed, set the cylinder temperature to around 170°C.
- Keep the resin and recycled material away from moisture and contamination.

MATERIAL RECYCLE

KompoGTe® does not recommend the use of recycled materials to obtain high-quality molded products. If using recycled materials, please manage the proportion of recycled materials to be 10% or less.

CAUTION FOR MATERIAL RECYCLE

- Repeated use of recycled material may cause deterioration of properties.
- If the particles of recycled material are not uniform, molding defects may occur due to differences in degradation and gas generation.
- If the amount of recycled material is high, dimensional differences may occur in the molded product.
- Avoid moisture absorption and contamination of recycled material.

CONDITIONS FOR INJECTION MOLDING

MOLDING PARAMETERS	Reinforced 20% KompoGTe® LFT	Reinforced 30% KompoGTe® LFT	Reinforced 40% KompoGTe® LFT	Reinforced 50% KompoGTe® LFT	Reinforced 60% KompoGTe® LFT
Recommended Moisture Contents(%)	≤ 0.1				
Melting Temperature (°C)	165 ± 5				
Cylinder Temperature (°C)	Nozzle	225 ~ 245	230 ~ 250	235 ~ 255	235 ~ 255
	Front	225 ~ 245	230 ~ 250	235 ~ 255	235 ~ 255
	Middle	220 ~ 240	220 ~ 240	220 ~ 240	220 ~ 240
	Rear	200 ~ 220	200 ~ 220	200 ~ 220	200 ~ 220
Mold Temperature (°C)	40 ~ 80				
Holding Pressure (%)	35 ~ 65 of maximum injection pressure				
Cushion (mm)	5 ~ 10				



For more detailed information regarding injection molding conditions, please contact the technical support representative at KOLON ENP.



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