

KOCETAL®
Polyoxymethylene (POM)

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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

KOCETAL®

Polyoxymethylene (POM)

KOCETAL® (POM)

KOCETAL® is an engineering plastic material that is a copolymer polyacetal resin with a high degree of crystallization. It possesses low-friction and wear-resistant properties, chemical resistance, and excellent moldability.

Based on these properties, KOCETAL® is used in various industrial fields such as automobiles, OA equipment, and household appliances.

CHARACTERISTIC OF KOCETAL®

MECHANICAL PROPERTY

The biggest advantage of KOCETAL® is the balance between mechanical toughness and rigidity. Additionally, with a high degree of crystallization, the material has self-lubricating properties, as well as excellent low-friction, wear-resistant properties and resistance to fatigue and creep.

CHEMICAL RESISTANCE

Due to its high crystallinity, KOCETAL® has strong resistance to general organic solvents. It has excellent resistance to gasoline and lubricating oil, but adding acid additives for performance enhancement can reduce its resistance.

LIGHT RESISTANCE

If UV absorbers are added, KOCETAL® has high resistance to UV rays. KOLON ENP has various weather-resistant KOCETAL® materials that can be used in various conditions.

LOW FORMALDEHYDE EMISION

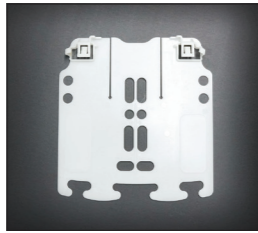
Generally, POM materials release a significant amount of formaldehyde gas during the injection process, and a small amount of gas is continuously emitted during use. KOLON ENP produces a material that dramatically reduces the release of formaldehyde gas, and this material meets all relevant specifications.

APPLICATIONS

LUMBAR SUPPORT

K300EW, K300LO, UR302LO

- ▶ Injection moldability
- ▶ Dimensional stability



SEAT BELT BUTTON

K300HRD

- ▶ Weather resistance
- ▶ Dimensional stability



FUEL PUMP ASSEMBLY

K100HS, K300EW

- ▶ Creep resistance
- ▶ Dimensional stability
- ▶ Good fuel resistance



GEAR

LF301, K300, K300EW, GF305

- ▶ Low friction
- ▶ Creep resistance
- ▶ Dimensional stability



FASTENER

UR304

- ▶ Impact modified
- ▶ Dimensional stability



BUMPER BRACKET

K300EWBBK, K300HBK

- ▶ Excellent dimensional stability
- ▶ Optimized toughness and strength



EXTRUDED ROD

K100

- ▶ Heat stability
- ▶ Control of crystallization
- ▶ Dimensional stability



SANITARY PART

K300

- ▶ Good strength
- ▶ Chemical resistance
- ▶ Hydrolysis resistance



WINDOW MOTOR GEAR

K100HS

- ▶ Friction resistance
- ▶ Creep resistance
- ▶ Dimensional stability



DOOR LATCH HOUSING

K300EWBBK

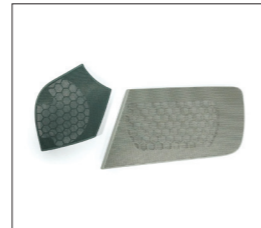
- ▶ Dimensional stability
- ▶ Wear resistance
- ▶ Good strength



SPEAKER GRILL

WR701LO

- ▶ Excellent UV-resistance
- ▶ Low Formaldehyde gas emission
- ▶ Good flowability



DOOR HANDLE

MC301LO2

- ▶ Surface with metallic texture
- ▶ Low VOC Emission



SIDE MIRROR ACTUATOR

LW701BK

- ▶ Low-friction & Wear-resistant
- ▶ Dimension Stability



COSMETIC DISPENSOR

K300LOCM

- ▶ Food Contact
- ▶ Low VOC Emission



OVERVIEW PRODUCT PORTFOLIO

CATEGORY	GRADE NAME	DESCRIPTION
GENERAL	K100	High Viscosity, for Extrusion (MFR : 3g/10min)
	K100SP	High Viscosity, for Injection (MFR : 4.5g/10min)
	K300	Medium Viscosity, Standard (MFR : 9g/10min)
	K300EW	Medium Viscosity, Ductile Improved (MFR : 9g/10min)
	K500	Medium Viscosity (MFR : 15g/10min)
	K700	Low Viscosity (MFR : 27g/10min)
	K800	Low Viscosity (MFR : 36g/10min)
	K900	Ultra-low Viscosity (MFR : 45g/10min)
	K900HF	Ultra-low Viscosity (MFR : 75g/10min)
HIGH STRENGTH	K100HS	High Strength, High Viscosity (MFR : 3g/10min)
	K500HS	High Strength, Medium Viscosity (MFR : 15g/10min)
MEDICAL GRADE	M100	Medical, High Viscosity (MFR : 3g/10min)
	M300	Medical, Medium Viscosity (MFR : 9g/10min)
	M500	Medical, Medium Viscosity (MFR : 15g/10min)
	M700	Medical, Low Viscosity (MFR : 24cm3/10min)
	M500HS	Medical, High Strength (MFR : 15g/10min)
	M500SW, M700SW	Medical, Low-friction & Wear-resistance
IMPACT MODIFIED	UR302	Impact Modified (TPU included)
	UR304	Impact Modified (TPU included)
	UR306	Impact Modified (TPU included)
	EL302	Impact Modified (TPEE included)
	EL304	Impact Modified (TPEE included)
REINFORCED GRADE	GF305	Glass Fiber 25% Reinforced
	GF702	Glass Fiber 10% Reinforced
	GF705	Glass Fiber 25% Reinforced
	GB705	Glass Bead 25% Reinforced
	TC704	Talcum 20% Reinforced
	WH704	Whisker 20% Reinforced

OVERVIEW PRODUCT PORTFOLIO

CATEGORY	GRADE NAME	DESCRIPTION
WEATHER RESISTANT	WR301	UV Resistance, Medium Viscosity (MFR : 9g/10min)
	WR701	UV Resistance, Low Viscosity (MFR : 27g/10min)
	WR303	Weather Resistance
LOW-FRICTION & WEAR-RESISTANCE	SL201HS	Low-friction & Wear-resistance, High Strength
	TF302	PTFE powder 10% Reinforced
	TF304	PTFE powder 20% Reinforced
	MS301	Molybdenum Reinforced
	LF301	Low-friction & Wear-resistance
	LF302	Low-friction & Wear-resistance, Low warpage
	LW301	Low-friction & Wear-resistance
	LW701	Low-friction & Wear-resistance
	LW302	Low-friction & Wear-resistance
	SO301	Silicon Reinforced
	SW501HS	Silicon Reinforced
CONDUCTIVE GRADE	VT100	Conductive Grade, for Extrusion
	CB301	Conductive Grade
	CF702	Carbon Fiber Reinforced
LOW VOC EMISSION	K100LO2	Low VOC, High Viscosity (MFR : 3g/10min)
	K300LO2	Low VOC, Medium Viscosity (MFR : 9g/10min)
	K500LO2	Low VOC, Medium Viscosity (MFR : 15g/10min)
	K700LO2	Low VOC, Low Viscosity (MFR : 27g/10min)
	K100HSLO2	Low VOC, High Strength (MFR : 3g/10min)
	K500HSLO2	Low VOC, High Strength (MFR : 15g/10min)
	UR302LO2	Low VOC, Impact Modified
	UR304LO2	Low VOC, Impact Modified
	UR309LO2	Low VOC, Impact Modified
	WL303LO2	Low VOC, Weather Resistance
	WR301LO2	Low VOC, Weather Resistance
	WR701LO2	Low VOC, Weather Resistance
	LF301LO2	Low VOC, Low-friction & Wear-resistance
	LW301LO2	Low VOC, Low-friction & Wear-resistance
	MS301LO2	Low VOC, Low-friction & Wear-resistance
SO301LO2	Low VOC, Low-friction & Wear-resistance	
SPECIAL MATERIALS	MC301LO2	Metallic Color
	LM301	Laser markable

NOMENCLATURE

The name of KOCETAL® commercial products generally follows the scheme below:

CHARACTERISTICS 1		VISCOSITY		CONTENT	CHARACTERISTICS 2		COLOR	
K	-	3	0	0	L	O	B	K

CHARACTERISTICS 1

K	Standard grade
CB	Conductive grade with special carbon black
CF	Conductive grade with carbon fiber
DS	Hot diesel resistance improved grade
EL	Impact modified grade
GB	Glass bead filled grade
GF	Highly stiff grade with glass fiber
LF	Low friction grade with special polymer
LW	Low wear grade with special polymer
MS	Low friction grade with MoS2
SO	Low friction grade with Silicon Oil
TC	Talcum filled grade for dimensional stability
TF	Low friction grade with PTFE
UR	Impact modified grade
VT	Anti-static grade
WH	Whisker filled grade for low friction and high stiffness
WR	Weather/Light resistant grade
LM	Laser marking

CONTENT

1	5%
2	10%
3	15%
4	20%
5	25%
6	30%
8	40%

CHARACTERISTICS 2

EW	Improved ductile grade than standard
HS	High strength grade
LO	Low odor and VOC's grade
HF	High flowability

COLOR

BE	Beige
BK	Pre colored black
BBK	Blend type black
BL	Blue
BN	Brown
DG	Dark gray
GR, GY	Gray
RD	Red
WT	White
YE	Yellow
None	Natural

VISCOSITY

10	MFR=3g/min (High Viscosity)
30	MFR=9g/min (Medium Viscosity)
50	MFR=15g/min (Medium Viscosity)
70	MFR=27g/min (Low Viscosity)
80	MFR=36g/min (Low Viscosity)
90	MFR=45g/min (Ultra-low Viscosity)

THE PROPERTIES OF KOCETAL®

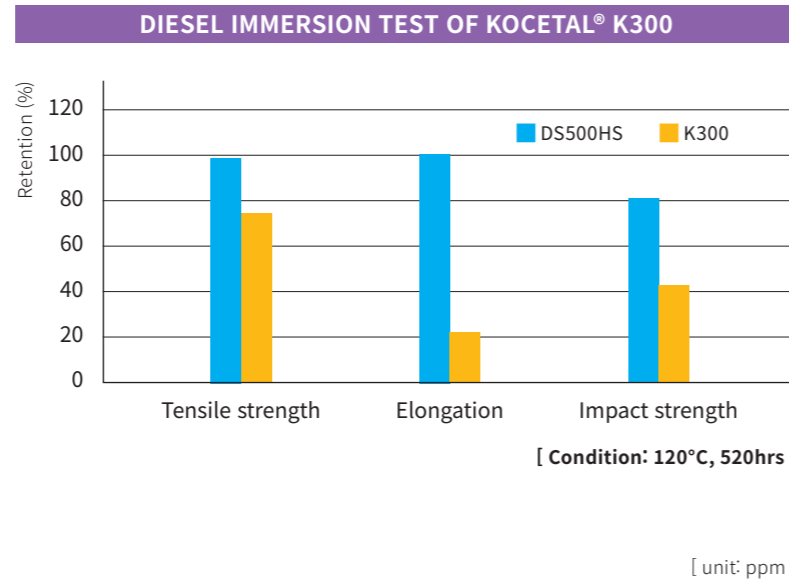
KOCETAL® FOR AUTOMOTIVE

KOCETAL® is stable in a wide temperature range from -40°C to 100°C.

KOCETAL® is suitable for automotive interiors since it has excellent chemical resistance to washers, antifreeze, gasoline, diesel and so on.

CHEMICAL RESISTANCE OF KOCETAL® K300			
CHEMICALS	WEIGHT LOSS	DIMENSION CHANGE	CHANGE OF TENSILE STRENGTH
GASOLINE	0.45	0.15	1.54
KEROSENE	0.19	0.02	4.62
LIGHT OIL	0.10	0.01	3.08
ENGINE OIL	- 0.50	- 0.06	4.62
BREAK OIL	0.87	0.27	0.00
GLASS WASHING ANENT	0.74	0.20	3.08

[Condition: 23°C, 1 year-immersion, unit %]



KOCETAL® is suitable for automotive interiors since it has superior color stability and light resistance.

It also has low formaldehyde emission over a wide range of molding temperature.

TEST CONDITION	K300	LOW ODOR MATERIAL	
		K300LO	WR301LO
65°C x 2 hours	< 1.45	< 0.04	No detection
80°C x 2 hours	< 1.45	< 0.07	< 0.04
100°C x 2 hours	< 1.45	< 0.18	< 0.18
240°C x 15 minutes	-	< 60.0	< 90.0
VDA 275 (60°C x 3 hours)	< 8.70	< 0.70	< 0.50
REMARK	STD	STD	UV resistance

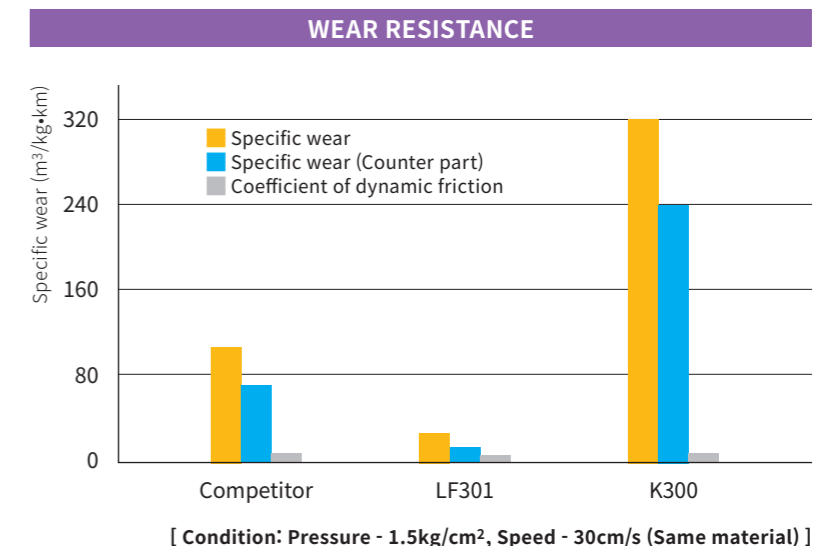
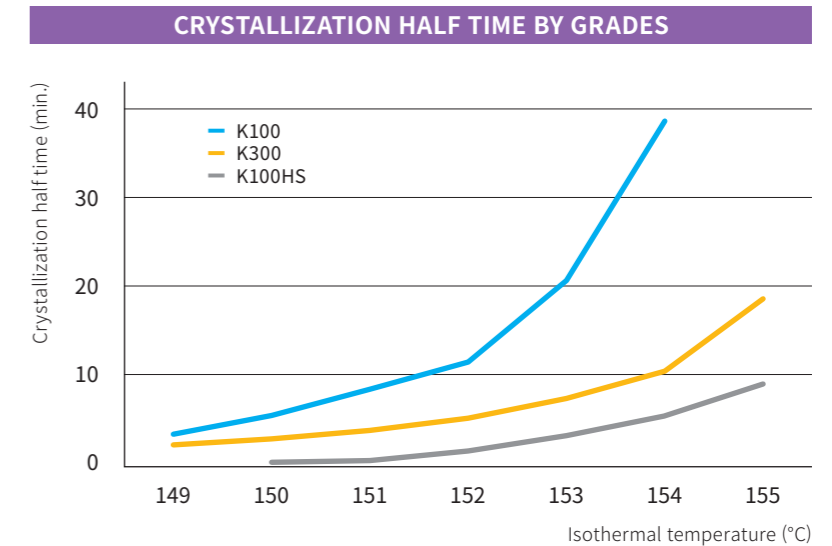
KOCETAL® FOR E&E, INDUSTRIAL APPLICATIONS

KOCETAL® is widely used for high-performance parts for electric / electronic applications requiring high precision and functionality.

KOCETAL®, produced by crystallization control technology, has fast crystallization, dense and uniform crystal structure. It implements excellent abrasion resistance and high mechanical strength suitable for various office equipment and electric / electronic parts

For extrusion applications, K100, which has a slower crystallization rate, is widely used and K300 is the most commonly used for general injection molding.

K100HS is crystallized quickly and at the same time it produces small and constant crystals which show excellent wear resistance and high mechanical strength. It is a material suitable for high-load gears and driven parts.



THE PROPERTIES OF KOCETAL®

MECHANICAL PROPERTIES

KOCETAL® is a material that has better mechanical strength and durability than PA and PBT. In addition, it has excellent impact resistance, heat resistance and weather resistance.

CREEP RESISTANCE

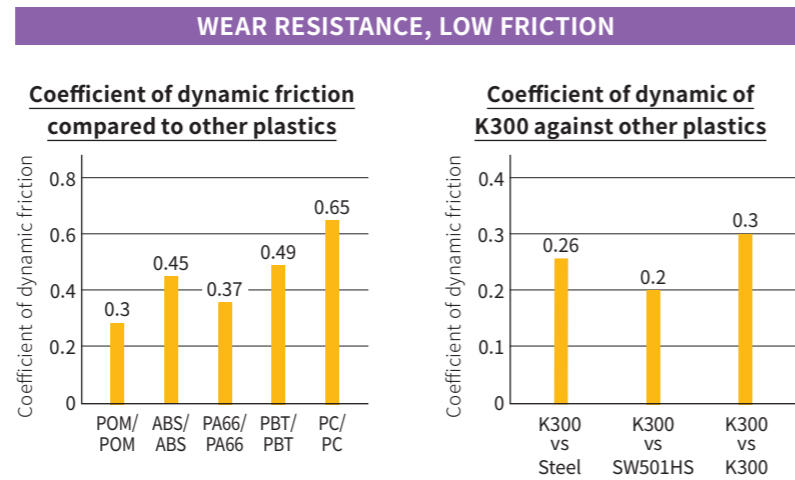
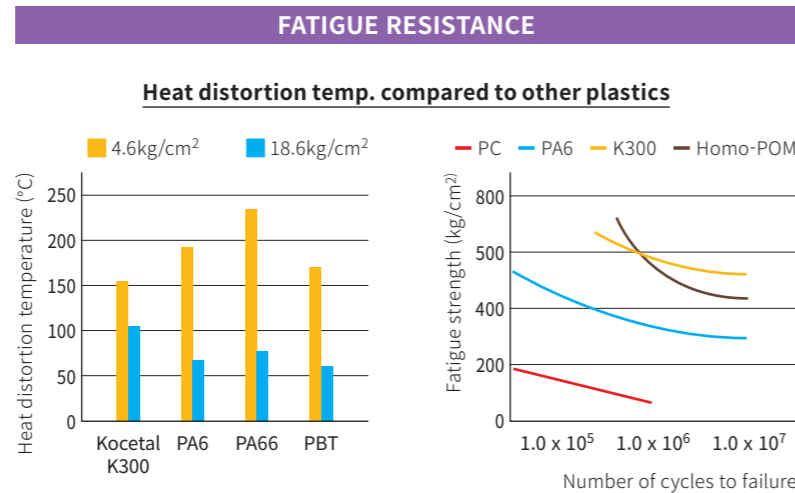
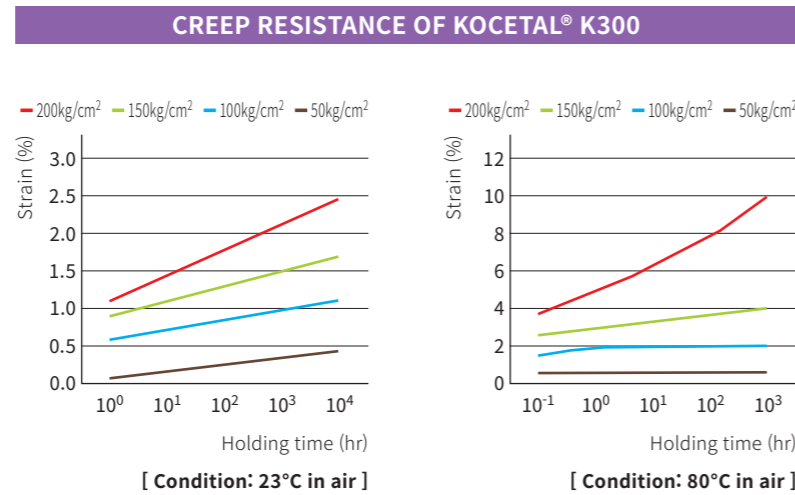
KOCETAL® is an excellent creep resistant material. It is widely used for various types of valves, including buckles.

FATIGUE RESISTANCE

KOCETAL® has excellent elastic recovery and fatigue resistant properties. These properties are used in materials such as zippers and tape reels.

WEAR RESISTANCE, LOW FRICTION

KOCETAL® is a self-lubricating material with exceptional anti-friction / wear characteristics compared to other plastic materials.



DIMENSIONAL STABILITY

KOCETAL® reaches a stable condition after 24 hours at room temperature after injection, without further deformation.

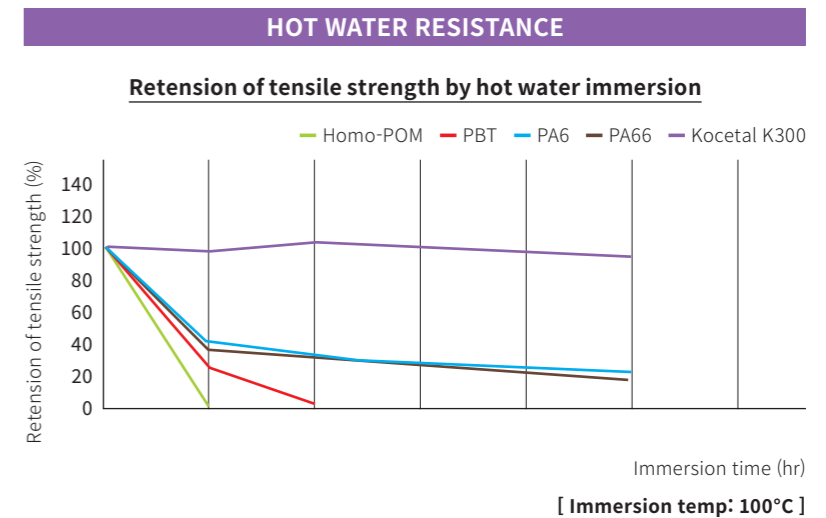
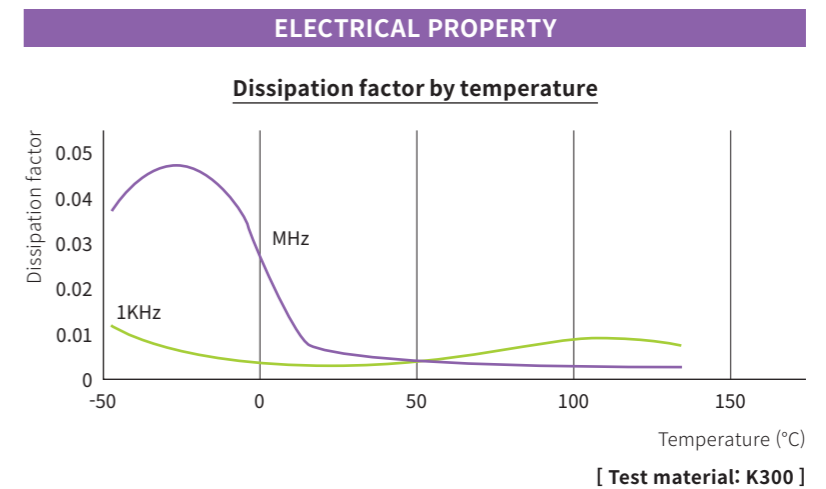
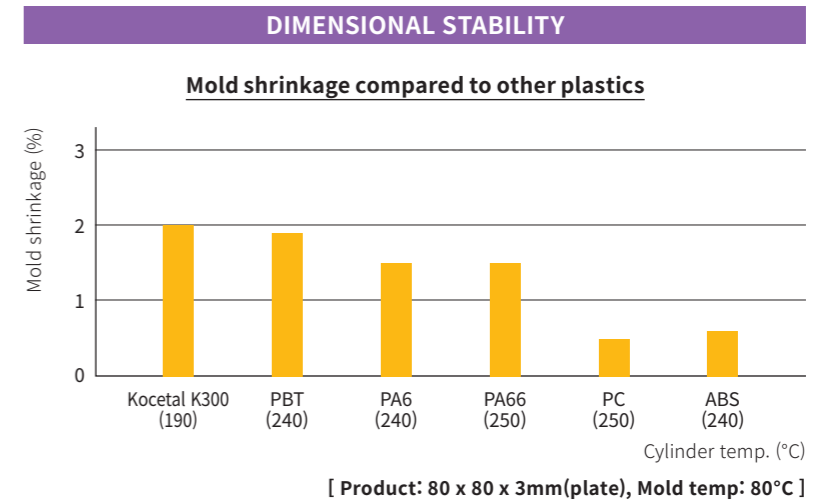
Due to low water absorption and dimensional stability, it is suitable as a material for high-precision parts due to small change in dimensions.

ELECTRICAL PROPERTY

With its superior electrical properties including high insulation, Kocetal is featured with low temperature dependency on resistivity, electric permittivity, dissipation factor and the Dielectric Strength.

HOT WATER RESISTANCE

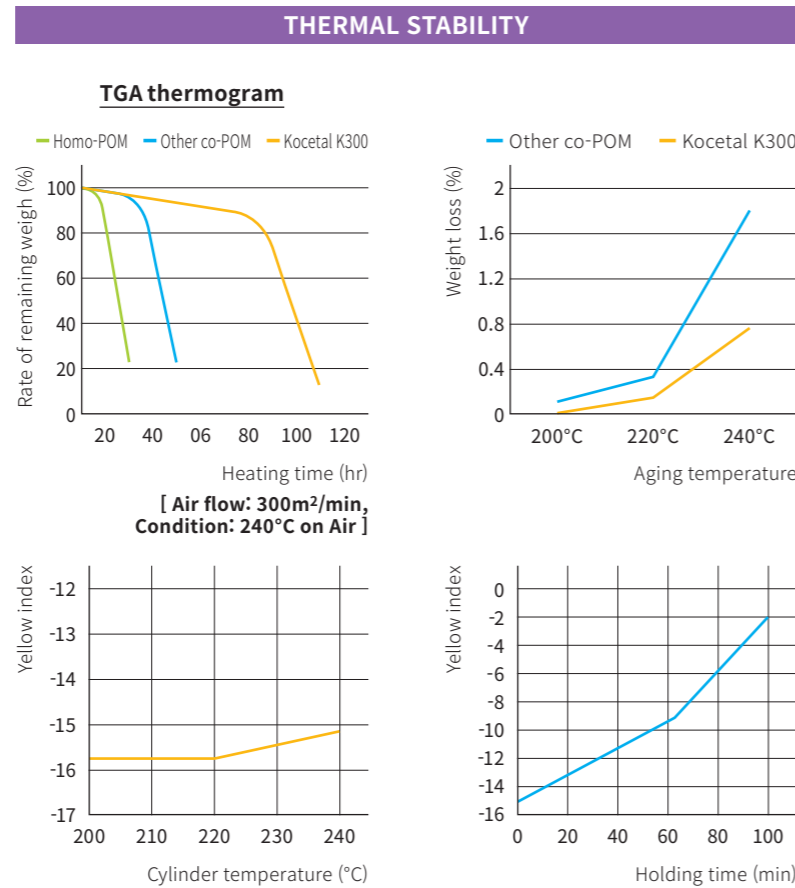
KOCETAL® can be adopted for the products used in high temperature/humidity environments as there is less dimensional and material property change in hot water immersion tests, compared to acetal homopolymer, nylon or PBT resin.



THERMAL STABILITY

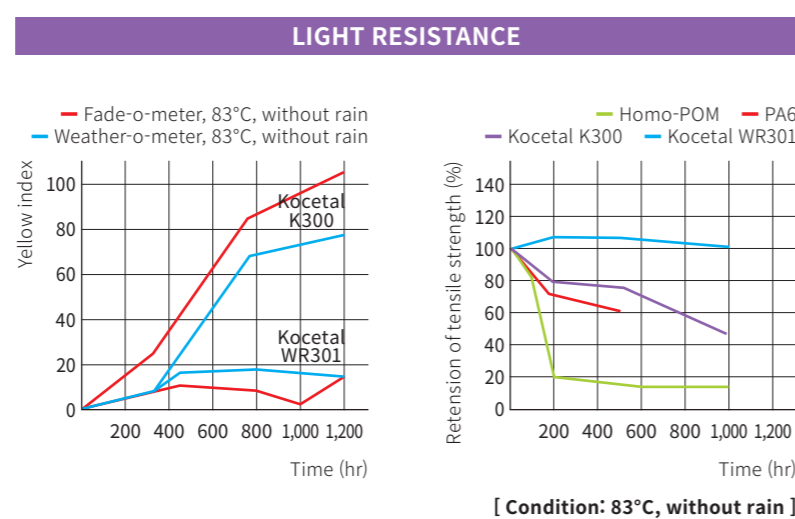
KOCETAL® has improved thermal stability, which is the weakness of most POM materials. As a result, it brings the following features

- Improvement of working environment due to less formaldehyde emission
- Reduction of mold management cost due to mold contaminant reduction and quality improvement of molding products
- Increased of residence time in injection equipment or decrease in physical properties and discoloration even in the case of the use of pulverizing agent.
- Improvement of durability and applications of parts exposed to external environment by improvement of weather resistance and ultraviolet resistance.



LIGHT RESISTANCE

When products made from conventional acetal resins are left outdoor for 6 months, aging will cause discoloration, surface cracking and degradation. In environments where there is prolonged exposure to sunlight and ultraviolet rays, we recommend the use of UV resistant grades. However if exposure is not excessive it is possible to use standard grades.



CHEMICAL RESISTANCE

KOCETAL® is highly resistant to organic compounds, oils, fats and synthetic detergents.

◎ : Excellent ○ : Usable △ : Usable with caution X : Not usable

	KOCETAL	Homo-POM	PBT	PA	PPO	PC
SOFT ACID	△	△	◎	○	○	◎
STRONG ACID	X	X	△	X	○	△
SOFT ALKALI	○	△	○	○	○	○
STRONG ALKALI	○	X	X	○	○	X
AROMATIC	○	○	○	◎	X	X
HALOGEN	◎	◎	◎	○	X	X
ALCOHOL	◎	◎	◎	△	○	△
ESTER	○	○	○	◎	X	X
KETONE	○	○	○	○	○	X
OIL	○	○	◎	○	○	△



Note: KOLON ENP has prepared this report based on the data obtained up to the time of writing. The figures in all tables are representative values, not quality assurance values. The figures in the table can not be used as basic data for semi-finished products and finished product designs. As product quality improves, figures in the table may change without notice.

INJECTION CONDITIONS & HANDLING PRECAUTIONS

PRE-DRYING

KOCETAL® has low moisture absorption, so it can be molded immediately after opening the package. However, if the package is left open for a long time, defects in the appearance of the molded product may occur, so pre-drying is necessary. The recommended moisture content after pre-drying is below 0.1%

CAUTION for thermal decomposition at high temperatures.

If KOCETAL® material is heated to a temperature of 250°C or higher, or is kept in a cylinder above 230°C for more than 30 minutes, formaldehyde gas emission and discoloration may occur due to thermal decomposition of the material.

PREVENTION GUIDE

- The melt resin temperature should be controlled below 230°C.
- When the operation is stopped for a long time, the melt resin inside the cylinder should be purged.
- When the operation is delayed, the cylinder temperature should be adjusted to around 165°C.

USE OF RECYCLED MATERIALS

KOCETAL® does not recommend the use of recycled materials mixed with virgin materials for molding products, as this may affect the quality and appearance of the molded products. However, if mixing with recycled materials is necessary, the amount of recycled materials should generally not exceed 30%. For more detailed information on the mixing ratio and management conditions, please contact the technical support representative at KOLON ENP.

MATERIAL CHANGING

When replacing with other materials, the inside of the cylinder must be cleaned using polystyrene (PS) or polyethylene (PE) material. Especially when using a material with a different molding temperature, it is essential to clean the inside of the cylinder. If PVC material was used before working with POM, it is necessary to prevent POM decomposition caused by residual PVC through sufficient purging.

CONDITIONS OF INJECTION MOLDING

INJECTION MOLDING PARAMETERS		GENERAL POM	LOW VOC POM	REINFORCED POM
Recommended Moisture Contents (%)		≤ 0.1		
Melting Temperature (°C)		165 ± 5	←	←
Cylinder Temperature (°C)	Nozzle	180 ~ 200	180 ~ 190	180 ~ 200
	Front	180 ~ 200	180 ~ 195	180 ~ 200
	Middle	170 ~ 190	170 ~ 190	170 ~ 190
	Rear	160 ~ 180	160 ~ 180	160 ~ 180
Mold Temperature (°C)		60 ~ 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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