



## BUSINESS AREA

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### Contact for further information

If you want to inquire more detail information on product of KOLONPLASTIC, INC. follow the process written below.

1. Access the Internet homepage of KOLONPLASTIC, INC. [www.kolonplastics.com/enghome](http://www.kolonplastics.com/enghome)
2. 'SALES CONTACT' category.
3. Then you can see contact number on E-mail, Tel or Fax according to regional groups.



# About Kolon Plastics

## Kolon Plastics-Growing with our customers as a POM Global Leader

Kolon Plastics was established in March 1996 as a joint venture between Kolon Industries Inc. in Korea and Toray Industries Inc. in Japan. Production began in 1998 with capacity and sales of 25,000MT/year. After the 2nd factory line was completed, we produce 57,000MT of POM and 50,000MT of the other compounding materials a year. As a specialist POM manufacturer with the engineering plastics technology. Our priority is to create customer solutions and to grow with our customers as a POM global leader.

Our management philosophy, which has been inherited from our parent company, emphasizes the role and social responsibility of the enterprise as well as an enlightened attitude toward each member of our organization.

## Be an unflinching industrialist

Kolon Plastics has an unflinching spirit as a member of industry and constantly tries to contribute to industrial development.

## With efficiency and originality

Kolon Plastics management standard attaches great importance to efficiency and originality.

## A place to realize each individual's potential

We help our members to improve their ability and try to make the organization a fruitful workplace.

## Contribution to affluent human life and development of mankind

This is our ultimate goal.



# Introduction of KOCETAL®

## What is KOCETAL® - POM ?

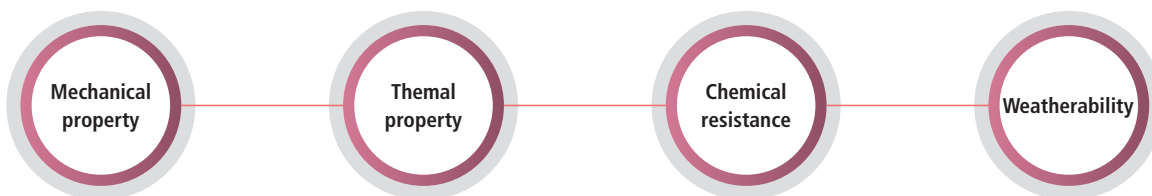
KOCETAL refers to polyacetal resin of a copolymer type, And is a material of an excellent quality with features of excellent anti-friction/anti-wear,

chemical-resistance, heat-resisting stability, precise dimensions and molding abilities. It is mainly applied in gear or roller, and is used for various

purposes over the fields of cars, office equipment and living materials.

**KOCETAL®**  
**POLYOXYMETHYLENE**  
Engineering Plastic

## Properties of KOCETAL® - POM?



### Mechanical property

The resin is highly crystalline, and has a great combination of toughness and rigidity. It is also resistant to fatigue, creep, and to abrasion thanks to its property of self-lubrication.

### Thermal property

Heat deflection temperature under load and deterioration are other properties to be considered with polymer.

Amorphous resin deflects over the heat deflection temperature, but polyacetal that is crystalline, doesn't deflect a lot even over the heat deflection temperature. Thus, the limit of temperature should be considered after calculating the amount of creep deflection, depending on the design requirement.

The estimated life of resin can be extrapolated by temperature with polymer.

Amorphous resin deflects over the heat deflection temperature, but polyacetal that is crystalline, doesn't deflect a lot even over the heat deflection temperature. Thus, the limit of temperature should be considered after calculating the amount of creep deflection, depending on the design requirement.

The estimated life of resin can be extrapolated by measuring the change of property by temperature and using Arrhenius Plot.

Because thermal stability of acetal copolymer resin can be improved by addition of stabilizer, each grade shows different thermal stability. Homopolymer is more easily deteriorated than copolymer.

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# Introduction of KOCETAL<sup>®</sup>

## Properties of KOCETAL<sup>®</sup> - POM?

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### Chemical resistance

The chemical resistance of a resin can be judged by examining the solubility to chemicals, the increase of weight through absorption, and the influence of chemicals on creep fracture.

Polyacetal isn't penetrated by organic solvents due to its crystalline property, but gains its weight slightly to aromatic, chlorine, ketonic, and ester solvents, which can change its mechanical property and size. Exceptionally, hexafluoroacetone dissolves polyacetal. Polyacetal is resistant to gasoline and lubricant, but if acid additive is used to improve the performance, it may become less resistant.

Copolymer is resistant to alkali, but homopolymer is not resistant to alkali chemicals. Polyacetal is generally resistant to inorganic chemicals, but can be penetrated by  $ZnCl_2$  depending on temperature and concentration.

The life of resin should be decided by considering the concentration of chemicals and temperature. In case of resistance to hot water, homopolymer has fairly shorter life than copolymer.

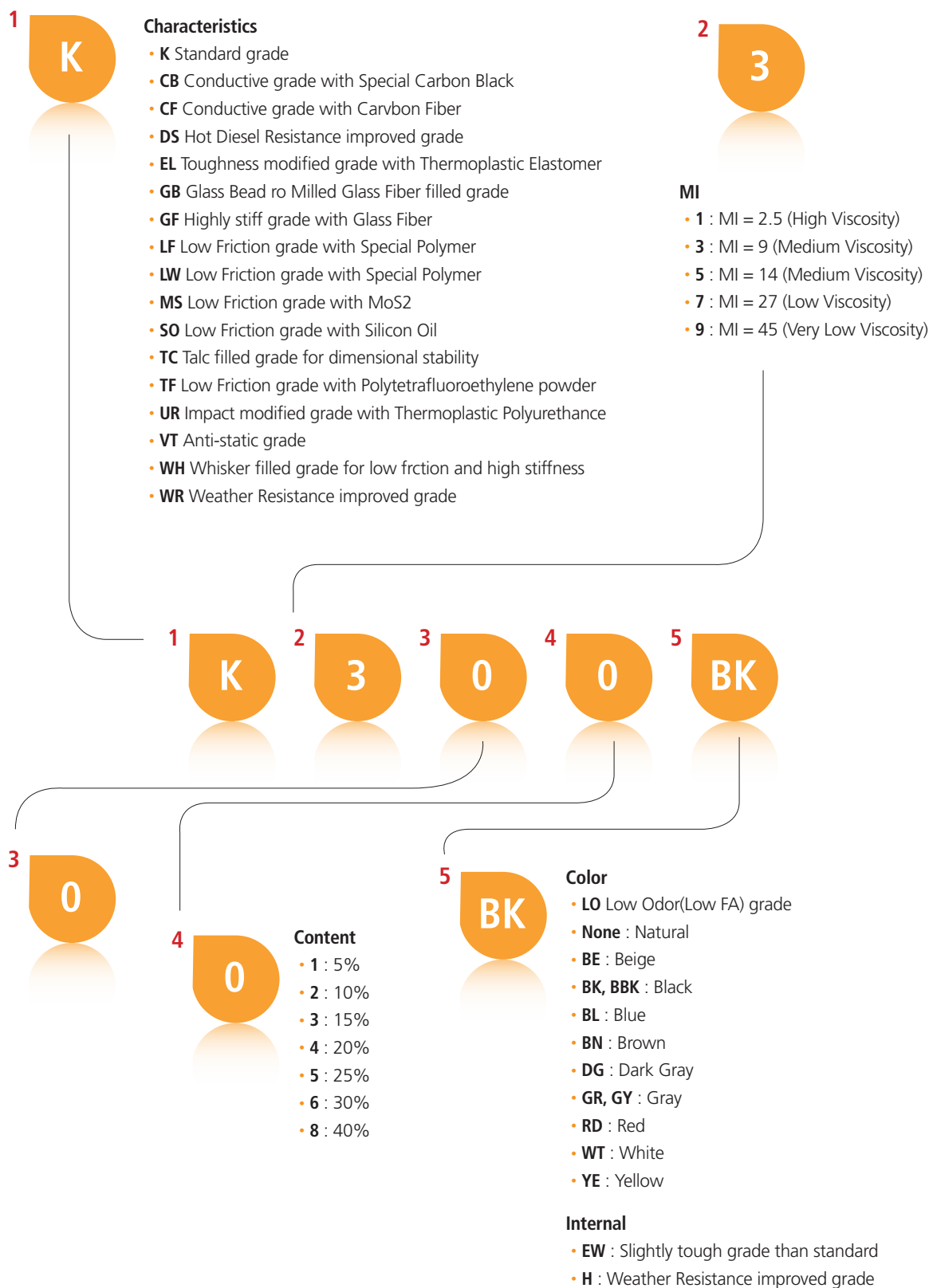
The life of resin should be decided by concentration of chemicals and temperature. In case of resistance to hot water, if used for one year, the limit of temperature for copolymer is 90°C, and is 65°C if used for ten years. Due to its chemical structure, homopolymer has fairly shorter life than copolymer.

### Weatherability

Polyacetal resin is not resistant to ultraviolet, but can be improved by adding light stabilizer and ultraviolet absorber. The resistance to ultraviolet can be enhanced by staining carbon black and using proper pigment. However, in case of exterior use, the resin can be deteriorated by ultraviolet and influenced by  $SO_x$ ,  $NO_x$ , ozone, etc. Therefore, serious consideration is needed for weatherability.

The accelerated weather resistance test is carried out by using Weather-O-Meter, Xenon arc, Fade-O-Meter. Good result doesn't guarantee any crack or discoloration caused by exterior conditions.

## Nomenclature of KOCETAL® - POM?



# LOW-VOCs POM

## Why on earth should this be KOCTAL®?

### Requirements of Auto makers

1. VDA 275 : 60°C, 3h [Formaldehyde gas emission measurements for molded products]
2. VDA 270 : 80°C, 2h [Sensory odor, Grades 1(no odor) ~ 6(unbearable odor)]
3. VDA 277 : Total Organics Emission

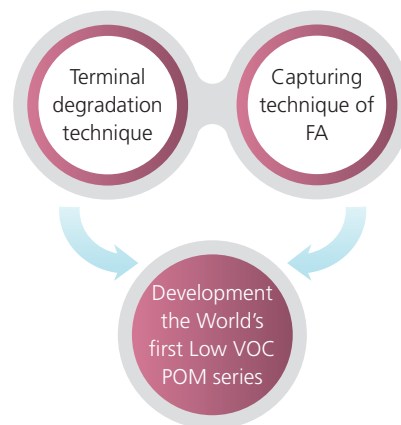
Company	VDA275 [mg formaldehyde/kg sample]	VDA 270 [-]	VDA 277 [µg/cm]
Volks Wagen	10	3	50
Audi	10	3	10
Daimler/Chrysler	5(natural) / 20(colored)	3	-
Volvo	10	3	20
HMC	-	3	-

### Core Technique of Low VOCs POM

#### Minimizing FA gas Emission

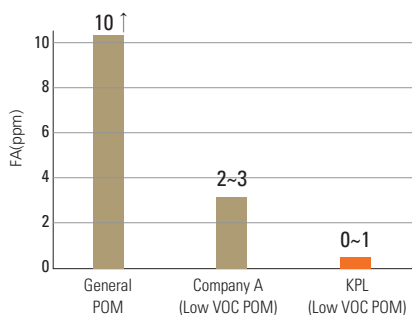
- 1) Terminal degradation technique : Minimizing Semi, Unstable Ends
- 2) Minimizing VOCs ( Controlling VOCs of Hydrocarbons )  
: Using porous nano reaction and absorption additives
- 3) German Automobile Association Standards (PV3900)  
: 2~2.5 Rank(General POM : 5 Rank)

► VOCs : Volatile Organic Compounds

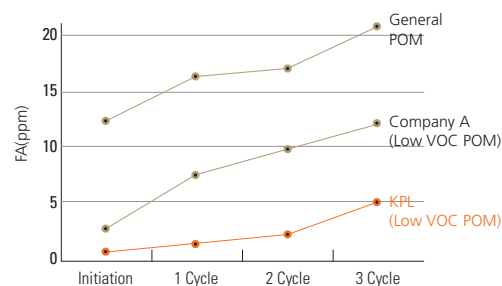


### FA Properties of Low VOCs POM

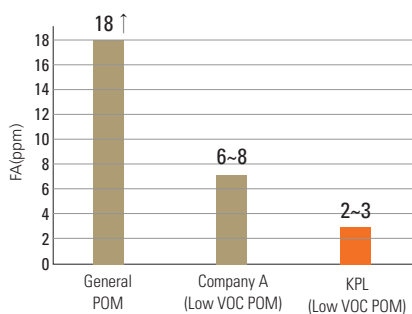
#### Standard Garde FA test result



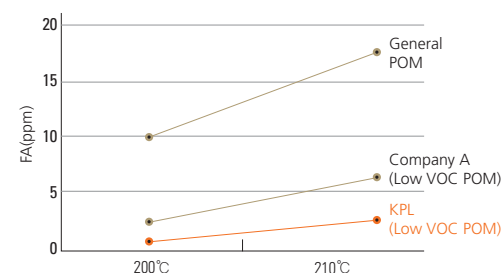
#### 100% Recycle FA test result



#### Compound Garde FA Test result



#### Test results of Injection Temperature



► Measurement Methode : VDA275

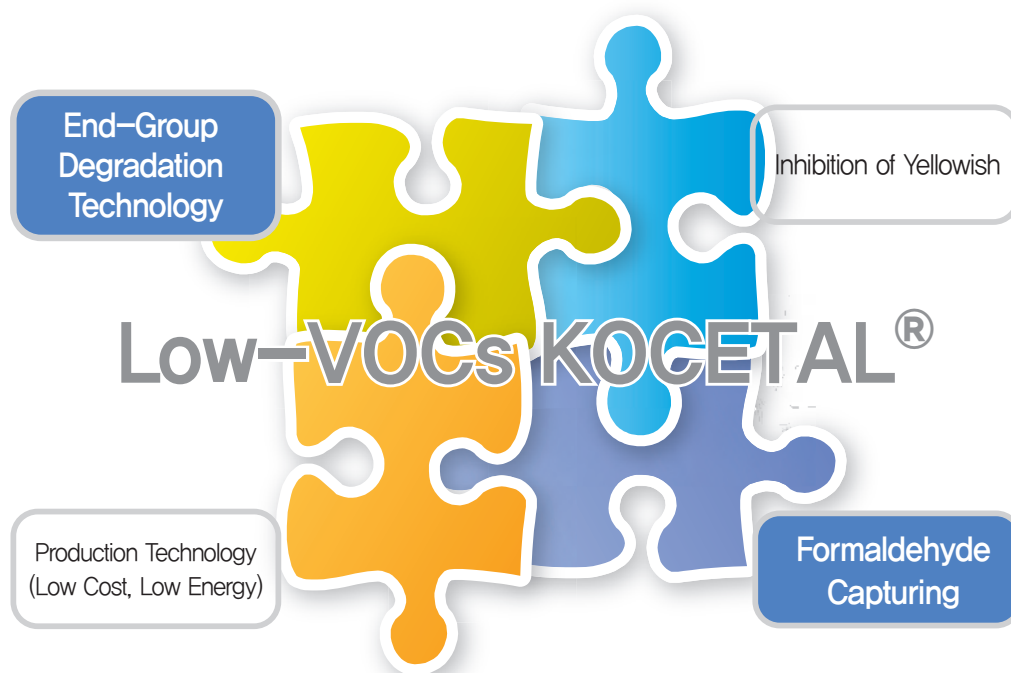
FA : Formaldehyde

VOC : Volatile Organic Compounds



**Product Summary**

	Grade	Formaldehyde gas(ppm)
Standard	K300LO	1 ↓
	K700LO	1 ↓
Weather Resistance	WR301LO	1 ↓
	WR701LO	
Impact Resistance	UR302LO(PU 10%)	1 ↓
	UR304LO(PU 20%)	
Wear resistance	LF301LO	3 ↓
Glass fiber reinforced	GF302LO(GF 10%)	3 ↓
	GF304LO(GF 20%)	
	GF705LO(GF 25%)	

**Technology of Low-VOCs POM**

# GRADE

Typical Property data of KOCETAL®



Properties	Item	Method (ASTM)	Unit	General purpose grade					
				K100	K200	K300	K300EW	K500	K700
Physical properties	Specific gravity	D792	-	1.41	1.41	1.41	1.41	1.41	1.41
	Water absorption (23°C, water, 24hr.)	D570	%	0.22	0.22	0.22	0.22	0.22	0.22
	Mold shrinkage	D955	%	2.2	2.0	2.0	2.0	2.0	2.0
Thermal properties	Melt index(190°C, 2,160g)	D1238	g/10 min	2.5	6.0	9.0	9.0	14.0	27.0
	Melting point	DSC	°C	166	166	166	166	166	166
	Heat distortion Temperature	D648	°C	158	158	158	158	158	158
				110	110	110	110	110	110
	Linear thermal expansion	D696	X10 <sup>-5</sup> /°C	13	13	13	13	13	13
	Flammability	UL-94	-	HB	HB	HB	HB	HB	HB
Mechanical properties	Tensile strength	D638	MPa	57	60	64	62	65	65
	Elongation at break	D638	%	80	75	60	70	50	45
	Flexural strength	D790	MPa	80	90	94	91	96	97
	Flexural modulus	D790	GPa	2.2	2.35	2.5	2.5	2.6	2.7
	Impact strength(Izod Notched)	D256	J/m	87	76	67	75	61	55
	Rockwell hardness	D785	M Scale	78	80	80	80	80	80
Electrical properties	Dielectric strength	D149	KV/mm	19	19	19	19	19	19
	Surface resistivity	D257	Ω	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>
	Volume resistivity	D257	Ω . cm	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>
	Dielectric constant (10 <sup>6</sup> Hz)	D150	-	3.7	3.7	3.7	3.7	3.7	3.7
	Dielectric dissipation factor (10 <sup>6</sup> Hz)	D150	-	0.006	0.006	0.006	0.006	0.006	0.006

1. The above properties are estimated by Kolon Plastics, not guaranteed fully.
2. The above grades are representatives. In addition, user required grades of various properties and colors can be developed and sold.
3. Please inquire of Kolon Plastics in case that the applications are needed for any certificate such as FDA, KTW, WRAS. etc..



General purpose grade			Toughened grade				Reinforced grade			
K900	K300BK	K700BK	UR302	UR304	EL302	EL304	GF305	GF702	GF705	GB705
1.41	1.41	1.41	1.38	1.36	1.38	1.36	1.59	1.49	1.59	1.59
0.22	0.22	0.22	0.24	0.25	0.24	0.25	0.20	0.20	0.20	0.2
2.0	2.0	2.0	1.8	1.7	1.8	1.7	0.5	0.9	0.5	1.7
42.0	10.0	27.0	9.0	12	9.0	9.0	7.0	19.0	10.0	23.0
166	166	166	166	166	166	166	166	166	166	166
158	158	159	152	145	152	144	164	164	164	163
110	110	110	90	82	92	82	163	160	163	120
13	13	13	13	13	13	13	2.5	6	2.5	8
HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB
64	64	65	53	45	50	43	128	93	147	43
45	50	40	90	140	80	85	6	7	7	25
96	93	97	75	60	72	60	190	140	220	85
2.7	2.5	2.7	2.1	1.8	2.0	1.7	8.0	4.5	7.8	3.5
50	65	53	97	130	87	110	50	45	70	30
80	80	80	78	76	78	76	90	85	90	82
19	19	19	19	19	19	19	19	19	19	19
1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>
1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>
3.7	3.7	3.7	-	-	-	-	-	-	-	-
0.006	0.006	0.006	-	-	-	-	-	-	-	-

# GRADE

Typical Property data of KOCETAL®



Properties	Item	Method (ASTM)	Unit	Reinforced Grade		Low friction grade				
				TC704	WH704	MS301	SO301	TF302	TF304	LF301
Physical properties	Specific gravity	D792	-	1.56	1.59	1.41	1.40	1.46	1.51	1.40
	Water absorption (23°C, water, 24hr.)	D570	%	0.2	0.23	0.21	0.22	0.19	0.18	0.21
	Mold shrinkage	D955	%	1.6	0.9	2.0	2.0	2.0	2.1	2.0
Thermal properties	Melt index(190°C, 2,160g)	D1238	g/10 min	20.0	17.0	9.0	10.5	9.0	6.5	10.0
	Melting point	DSC	°C	166	166	166	166	166	166	166
	Heat distortion Temperature	D648	°C	163	163	158	150	158	156	158
				145	158	100	100	107	106	110
	Linear thermal expansion	D696	X10 <sup>-5</sup> /°C	6	3.5	13	13	13	13	13
	Flammability	UL-94	-	HB	HB	HB	HB	HB	HB	HB
Mechanical properties	Tensile strength	D638	MPa	60	85	61	55	53	45	60
	Elongation at break	D638	%	7.5	7.5	50	70	40	30	60
	Flexural strength	D790	MPa	105	140	87	82	78	67	90
	Flexural modulus	D790	GPa	5.3	6.5	2.5	2.4	2.3	2.1	2.5
	Impact strength(Izod Notched)	D256	J/m	33	40	50	55	40	35	60
	Rockwell hardness	D785	M Scale	84	96	80	80	75	70	80
Electrical properties	Dielectric strength	D149	KV/mm	-	-	-	-	16	16	-
	Surface resistivity	D257	Ω	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>
	Volume resistivity	D257	Ω . cm	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>
	Dielectric constant (10 <sup>6</sup> Hz)	D150	-	-	-	-	-	3.1	3.1	-
	Dielectric dissipation factor (10 <sup>6</sup> Hz)	D150	-	-	-	-	-	0.009	0.009	-

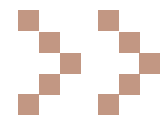
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2. The above grades are representatives. In addition, user required grades of various properties and colors can be developed and sold.
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Low friction grade				Special Grade								
LF302	LF701	LW701	VT702	DS500	CB301	K300 HRD	WR301	K300 LO	WR301 LO	WR701 LO	K300 PW	K300 FC
1.43	1.40	1.39	1.41	1.41	1.40	1.41	1.41	1.41	1.40	1.40	1.41	1.41
0.21	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8.0	27.0	26.0	27.0	16.0	5.0	11.0	9.0	10.0	10.0	31.0	9.0	9.0
166	166	166	166	166	166	166	166	166	166	166	166	166
160	158	158	158	158	152	158	158	158	158	158	158	158
120	110	110	110	110	106	110	110	110	110	110	110	110
13	13	13	13	13	13	13	13	13	13	13	13	13
HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB
55	62	58	64	58	55	62	62	62	57	63	64	64
50	40	40	60	55	20	50	65	50	65	45	60	60
85	87	87	93	92	83	85	90	85	85	87	94	94
2.7	2.8	2.5	2.6	2.4	2.4	2.4	2.3	2.4	2.3	2.5	2.5	2.5
45	45	40	56	62	48	65	62	65	65	60	67	67
82	80	80	80	80	75	80	80	80	80	80	80	80
-	-	-	19	-	-	19	-	19	19	19	19	19
1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>12</sup>	1X10 <sup>16</sup>	1X10 <sup>3</sup>	1X10 <sup>13</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>	1X10 <sup>16</sup>
1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>10</sup>	1X10 <sup>14</sup>	1X10 <sup>2</sup>	1X10 <sup>11</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>	1X10 <sup>14</sup>
-	-	-	3.7	-	-	3.7	-	3.7	3.7	3.7	3.7	3.7
-	-	-	0.06	-	-	0.06	-	0.06	0.06	0.06	0.006	0.006

# PRODUCT

Kocetal, the first choice for...  
...Automotive Applications



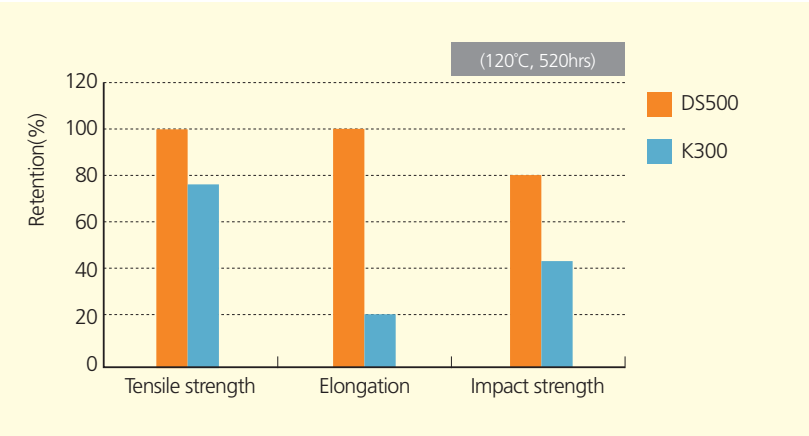
Kocetal is stable over a wide temperature range (-40 to 100°C) and has superior chemical resistance against window washing agent, anti-freeze, gasoline and diesel oil. It is being widely used for parts such as various types of clips which require wear and creep resistance.

## Chemical resistance of Kocetal K300

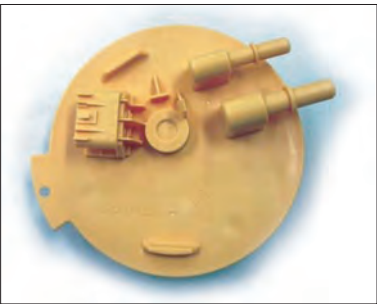
(condition 23°C, 1 year-immersion, unit %)

Chemical	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
Windows washer fluid	0.74	0.20	3.08

## Diesel immersion test



Fuel Pump



Fuel tank cap



Ball Joint



Fuel Neck

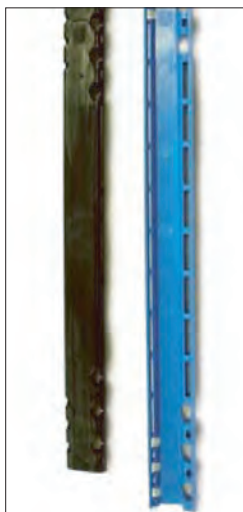
## Automotive

Kocetal is strongly recommended for the car interior parts as its surface is not glossy and has superior color stability and weatherability (light fastness). It also has low odor due to low formaldehyde content in the formed product and has superior thermal stability.

### Generation of formaldehyde by conditions

(unit: ppm)

Test condition	K300	Low odor material	
		K300LO	WR301LO
65°C X 2 hours	1.45 <	< 0.04	No detect
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 resistant



Seat slide guide



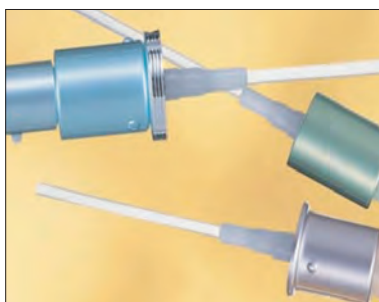
Low Insertion Force



Clip



Seat Belt Button



Dispenser pump



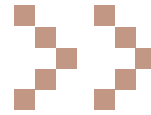
Speaker Grill



Seat Belt Part

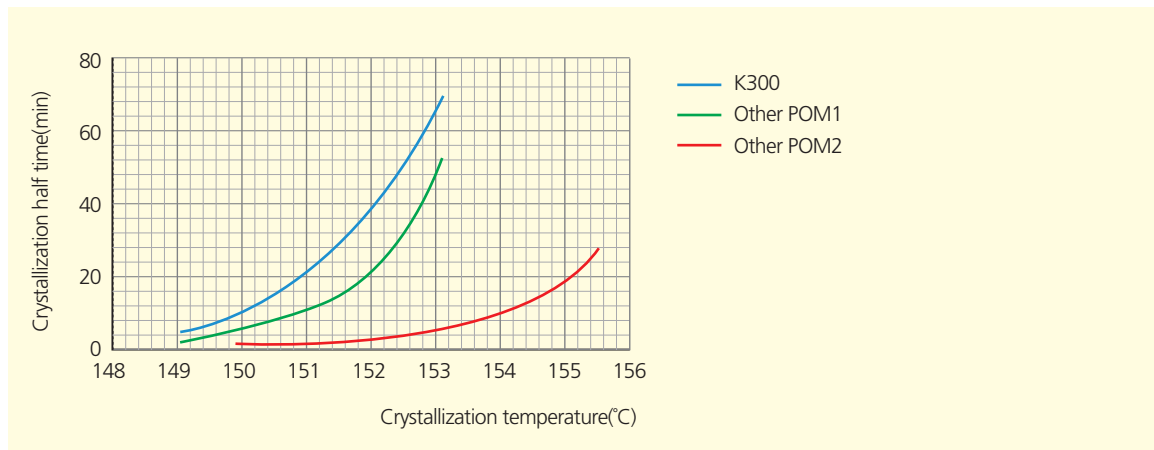
# PRODUCT

Kocetal, the Most Optimal for...  
...Electric & Electronic Applications



Kocetal is high quality material and is recommended for high-tech machine parts which require high precision and functionality.

## Crystallization rate of Kocetal



Laundry Leg



Laundry Fitting



CD Changer Part



Gear

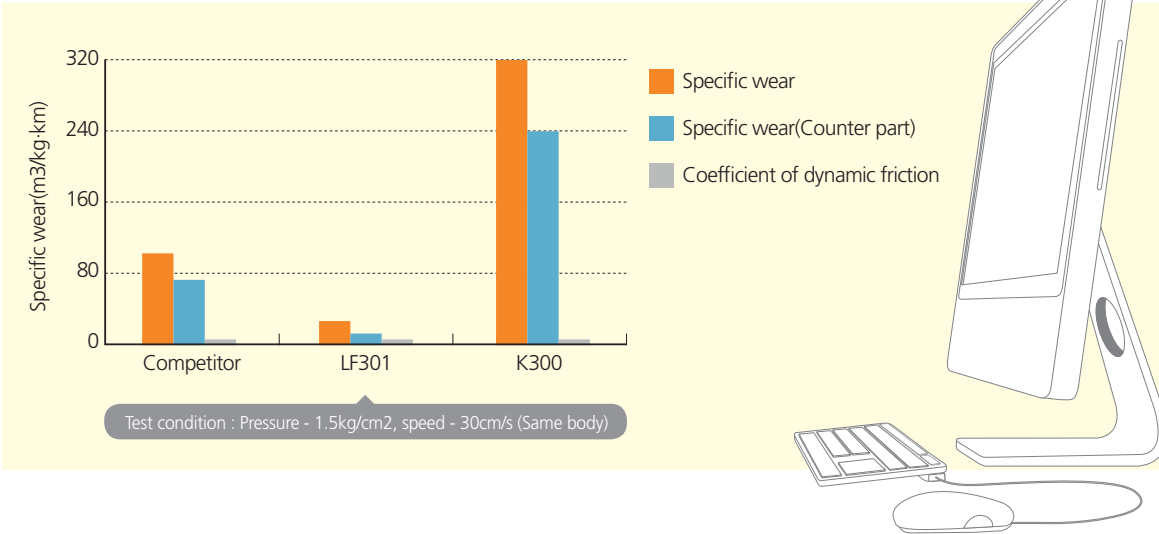


OA Gears



Kocetal is manufactured with crystallization-regulating technology, with enables fast crystallization and the formation of small, homogenous crystals. This creates a material of excellent wear resistance and mechanical strength, marking it suitable for OA equipment and consumer electronic parts.

Wear resistant properties of Kocetal



Key Board Frame



Fan Neck Part



Printer Gears



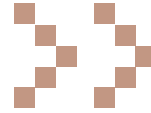
Laundry Machine Gear



CD-ROM

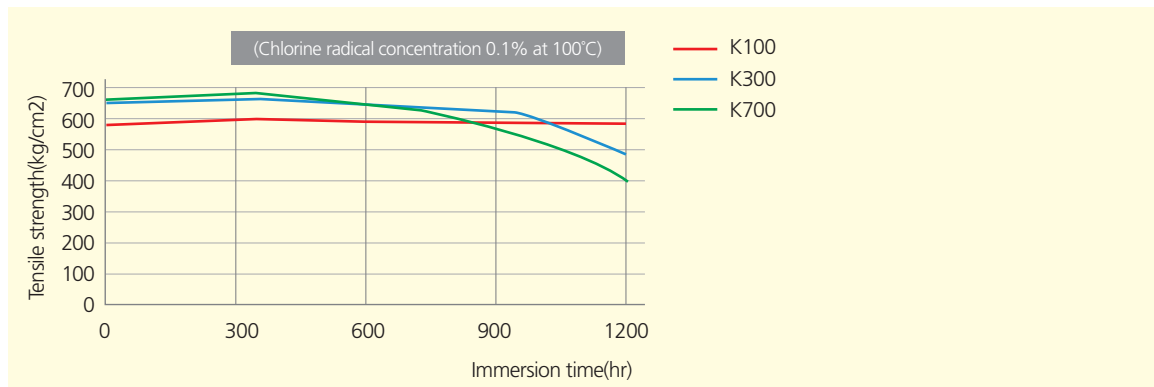
# PRODUCT

Kocetal, the Excellent for...  
...Industrial Applications

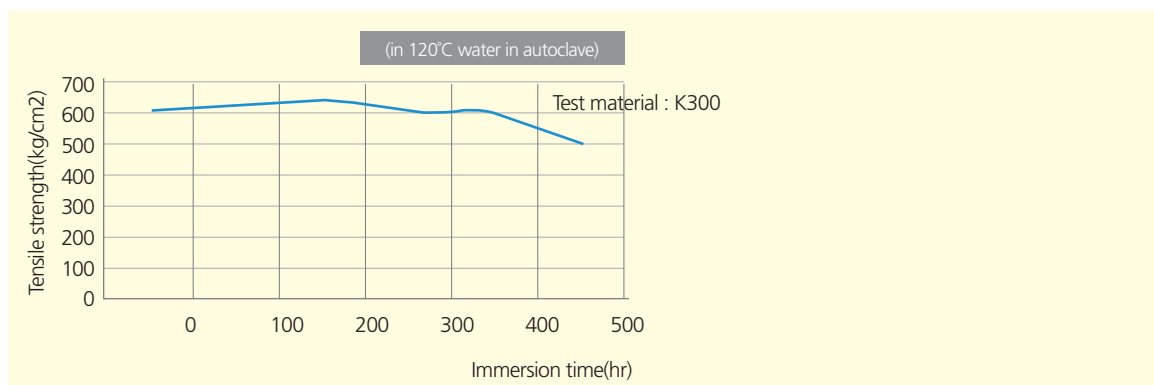


Kocetal is being widely used for industrial equipments, agricultural machinery, construction machinery among other applications due to its balanced properties such as mechanical strength, friction/wear resistance, light weight, corrosion resistance, chemical resistance and weatherability.

## Property in chlorine water



## Hydrolysis resistance of Kocetal



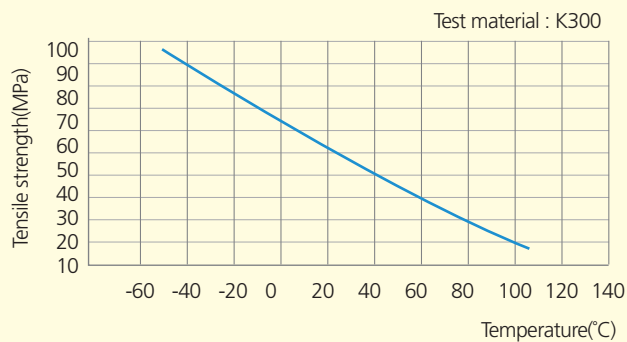
Laundry Machine Neck Part



Toilet bowl

Kocetal has excellent resistance to chemicals and hydrolysis, and is used for various types of containers, piping and pipe-connectors.

### Tensile strength of Kocetal according to temperature variation



Cable Protector



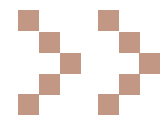
Pipe Fitting



Printer Gears

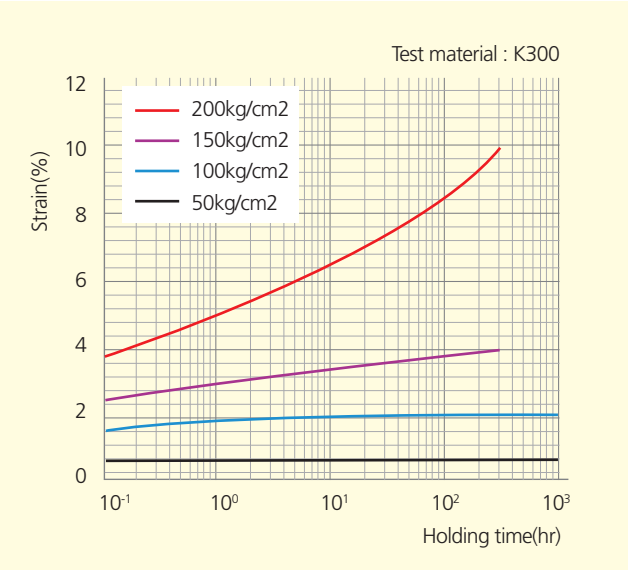
# PRODUCT

Kocetal, the Most Preferable for...  
... Consumer Articles



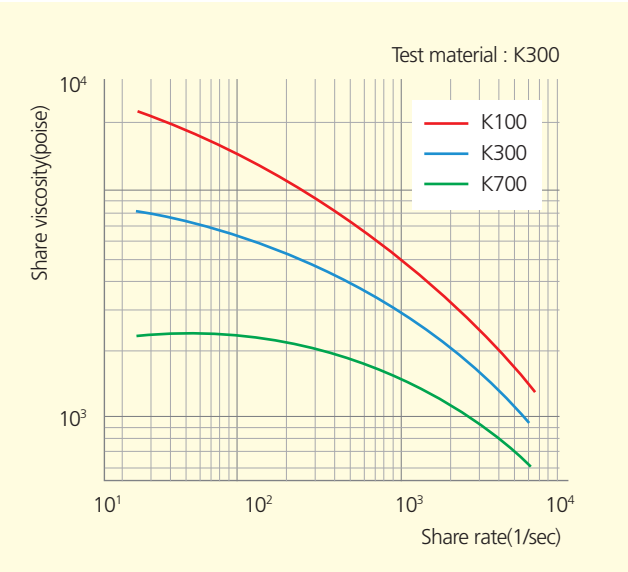
Kocetal has exceptional fatigue resistance and is the optimum material for parts that are subjected to repeated bending, stress, impact or vibration.

## Creep resistance on several loads at 80°C



Camera Lens Cap

## Melt viscosity at 230°C



Correction Tape



Zippers

Kocetal displays a well-balanced spectrum of mechanical and physical properties over a wide temperature range. It also offers excellent moldability and is used in a diverse variety of parts. Our reinforced grades are suitable for application that require higher strength.



Spray Nozzle



Buckles

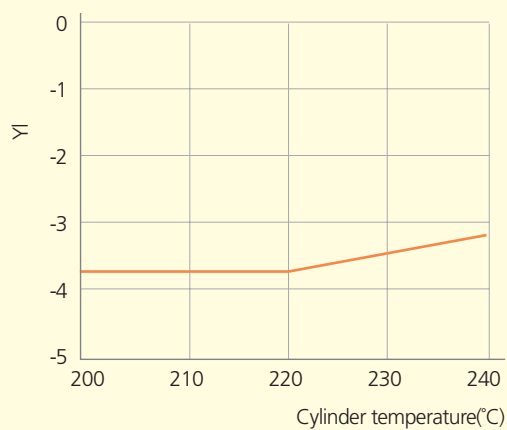


Ball Point Pen Part

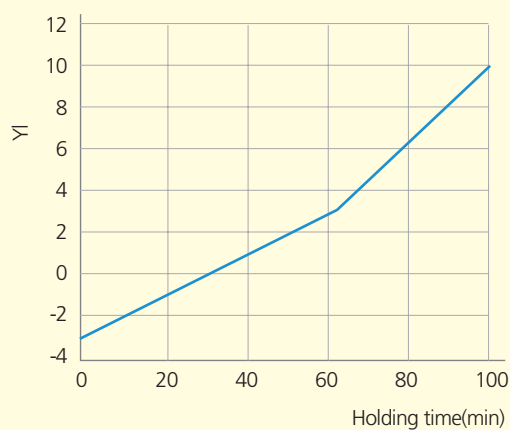


Stoppers

### Color change as molding temperature

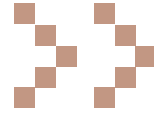


### Color change as molding time



# PRODUCT

## Characteristic Property...



### Mechanical property

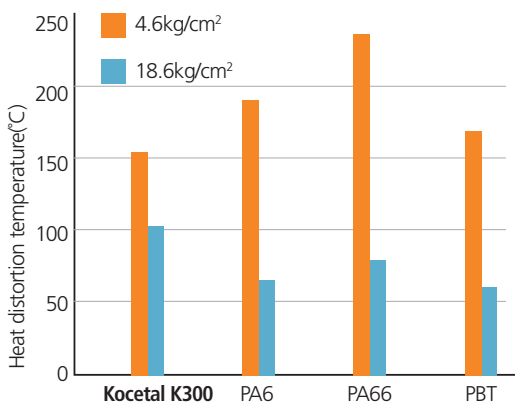
Kocetal is a plastic material with excellent mechanical strength, durability, and a well-balanced range of properties. Compared to Nylon and PBT, it shows little change in mechanical properties over a wide temperature range (-50~80°C). Kocetal has lower Mechanical Stiffness than homo polymers, but it is more flexible and has superior impact resistance, thermal property and weatherability. It also has high intensity and heat resistance.

### Creep resistance

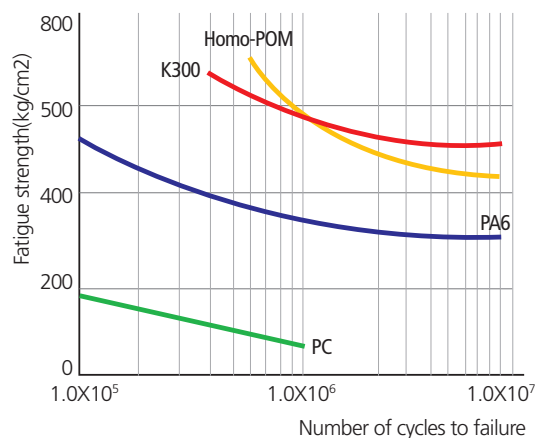
Kocetal has excellent creep resistant, its properties remain stable even under load for an extended period. Buckles and various types of valves are good examples of making use of this property.

### Fatigue resistance

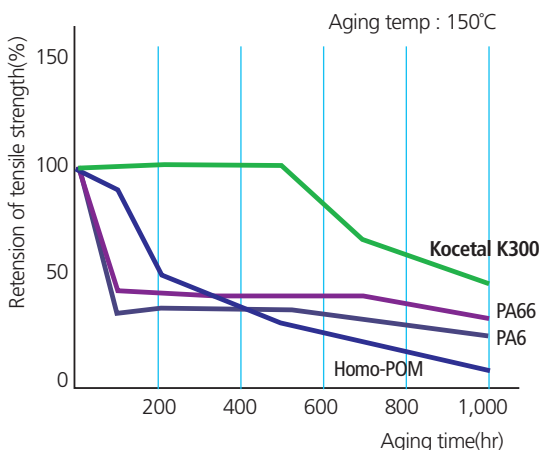
Kocetal has excellent elasticity recovery and fatigue resistant properties and is used extensively in applications such as zippers and tape reels. Polycarbonate and m-PPO have weak resistance to organic solvent and oils, but Kocetal has no such limitations.



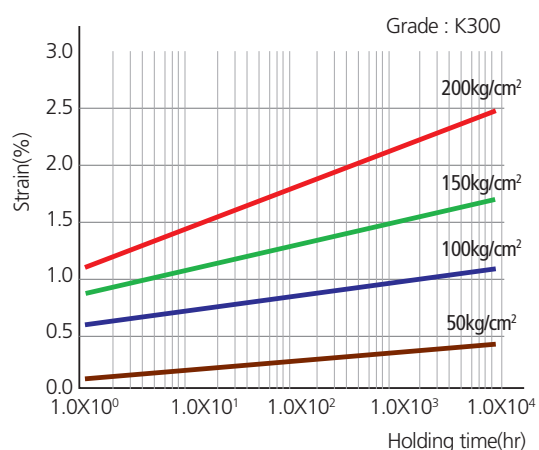
Heat distortion temp. compared to other plastics



Heat distortion temp. compared to other plastics



Retention of tensile strength by oven aging test



Creep resistance

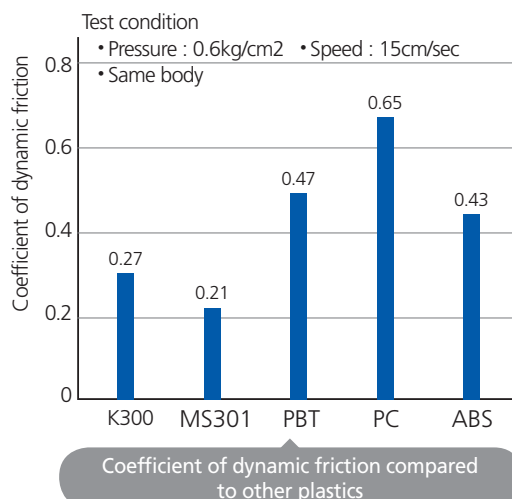
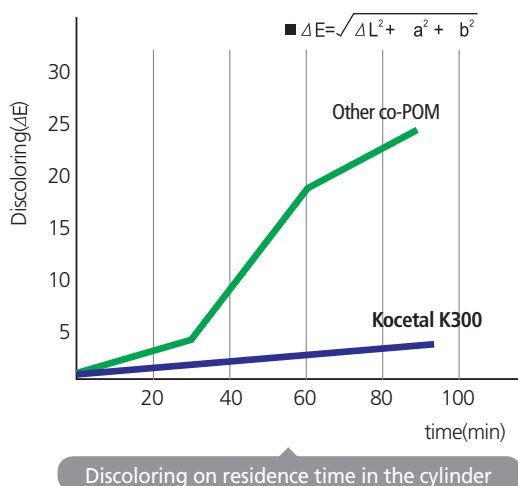
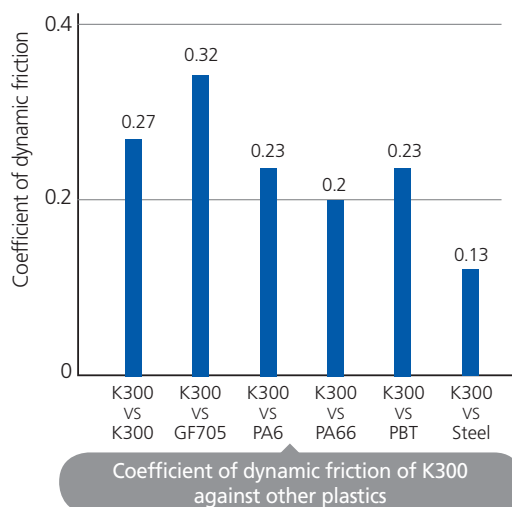
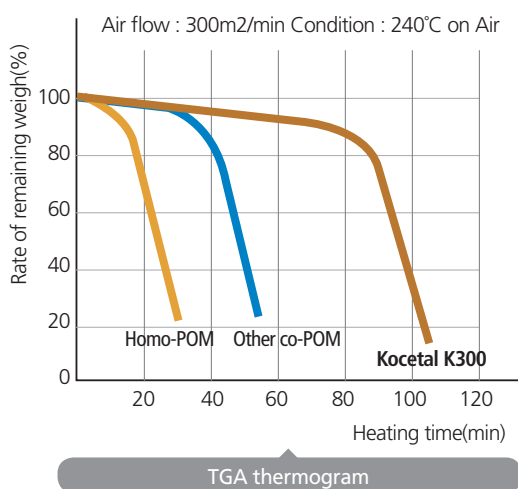
## Wear and friction resistance

Kocetal is self-lubricating and has superior friction and wear resistance compared to other resins. Kocetal has less 'creak' noise than metals and is the optimum material for machine parts such as gears, cams, bearings and gate rollers.

## Thermal stability

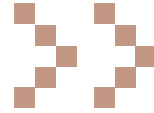
Kocetal has developed thermal stability, a weakness in most polyacetal resins, and this brings about the following effects.

1. Improved workplace environment due to less formaldehyde emission
2. Reduction in mold deposits, lowering mold maintenance costs and improving quality stability of formed product.
3. Property degradation and discoloration is minimal even when the resin is left inside the molding machine or if regrind material is used on it.
4. Because of improved weatherability and UV resistance, it is possible to use in applications which are left outdoors for extended periods.



# PRODUCT

## Characteristic Property...



### Hot water resistance

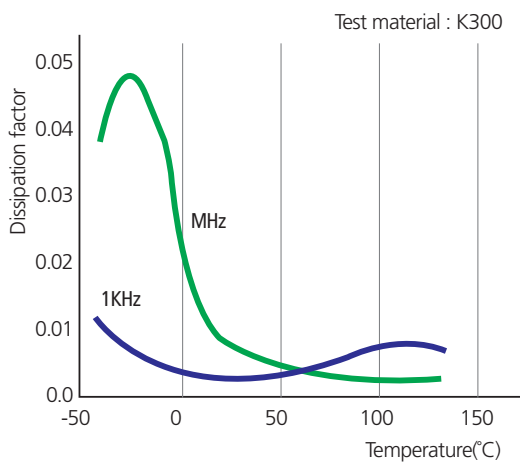
Kocetal can be adopted for the products used in high temperature/humidity environments as there is less dimensional and material property change in hot water immersion tests, compared to acetal homopolymer, nylon or PBT resin.

### Electrical property

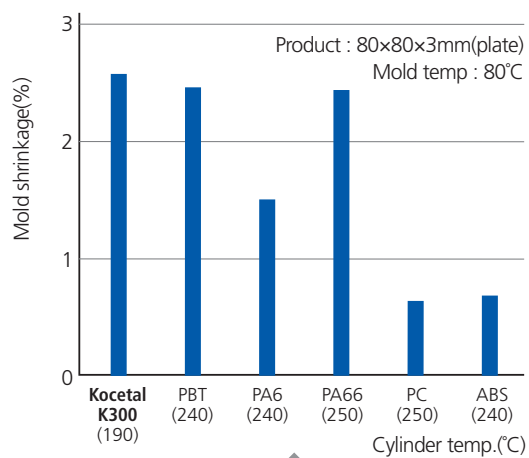
With its superior electrical properties including high insulation, Kocetal is featured with low temperature dependency on resistivity, electric permittivity, dissipation factor and the Dielectric Strength.

### Dimension stability

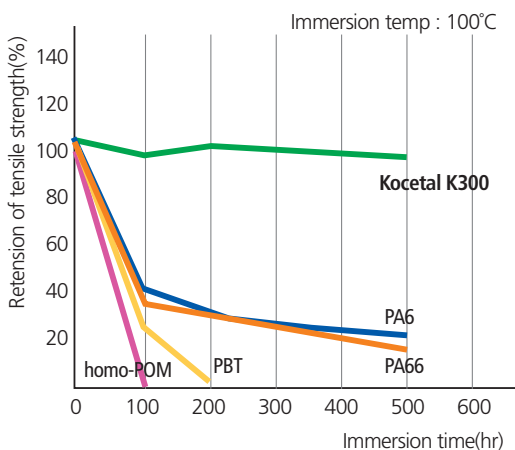
Kocetal molded products become dimensionally stable within a short period of time (24hours) at room temperature. It can be used for high precision products because it shows only minor dimensional change according to the environment due to its low water absorption and shows long-term dimensional stability.



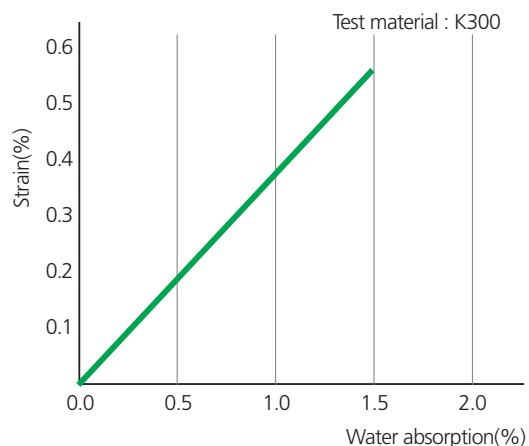
Dissipation factor by temperature



Mold shrinkage compared to other plastics



Retention of tensile strength by hot water immersion



Change of dimension by water absorption



## Weatherability

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 has an excellent tolerance to organic chemicals, oils, fats and synthetic detergents.

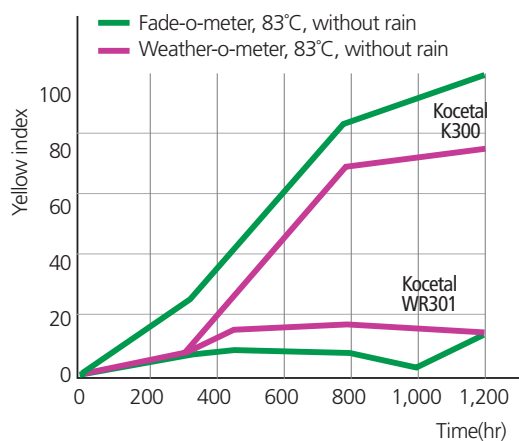
	Soft acid	Strong acid	Soft alkali	Strong alkali	Aromatic	Halogen	Alcohol	Ester	Ketone	Oil
<b>Kocetal</b>	△	×	○	○	○	◎	◎	○	○	○
Homo-POM	△	×	△	×	○	◎	◎	○	○	○
PBT	◎	△	○	×	○	◎	◎	○	○	◎
PA	○	×	○	○	◎	○	△	◎	○	○
PPO	○	○	○	○	×	×	○	×	○	○
PC	◎	△	○	×	×	×	△	×	×	△

◎ : Excellent

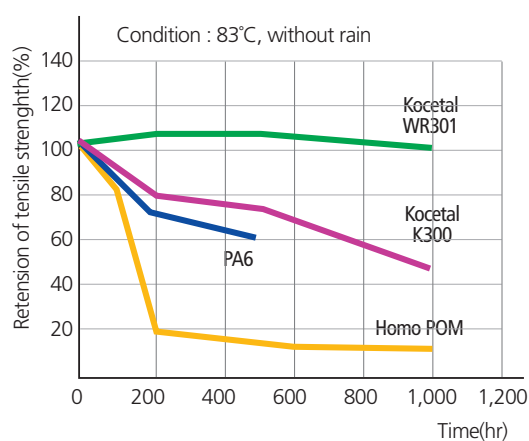
○ : Usable

△ : Usable with caution

× : Not usable

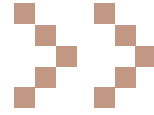


Discoloration by weather resistance test



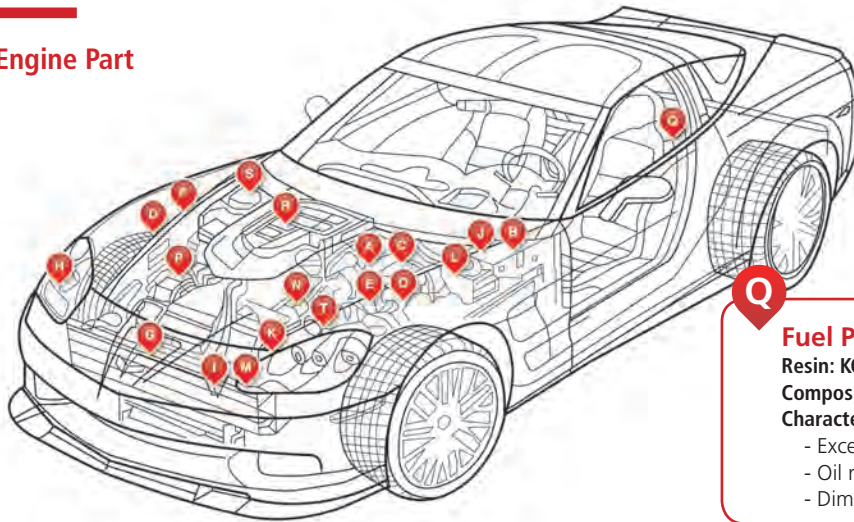
Retention of tensile strength by weather resistance test





## Automobiles

### Engine Part



Q

#### Fuel Pump

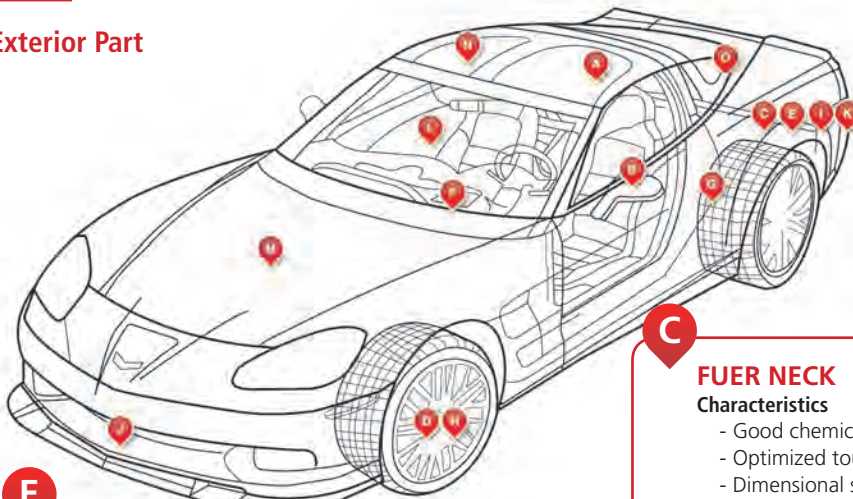
Resin: KOCETAL® K300

Composition : POM

##### Characteristics

- Excellent processability
- Oil resistance
- Dimensional stability

### Exterior Part



E

#### FUEL CAP

##### Characteristics

- Excellent chemical-resistance
- High-toughness
- Dimensional stability

Grade: K300

C

#### FUER NECK

##### Characteristics

- Good chemical-resistance
- Optimized toughness & strength
- Dimensional stability

Grade: K300BK, DS500

I

#### FUEL FILLER CAP RING

Resin: KOCETAL® EL304

Composition : POM, Modifier

##### Characteristics

- Excellent Chemical-resistance
- High-toughness
- Dimensional stability

J

#### BUMPER BRACKET

Resin: KOCETAL® K300HBK

Composition : POM, Modifier

##### Characteristics

- Excellent Dimensional stability
- Optimized toughness & strength
- Good chemical-resistance

## Interior Part

L

**SAFTY BELT****Characteristics**

- Color stability
- Excellent wear resistance
- Good dimensional stability
- Low odor

**Grade: K300HRD**

O

**DOOR LATCH HOUSING****Resin: KOCETAL® K300EW BBK****Composition : POM black****Characteristics**

- Dimensional stability
- Wear resistance
- Good strength

P

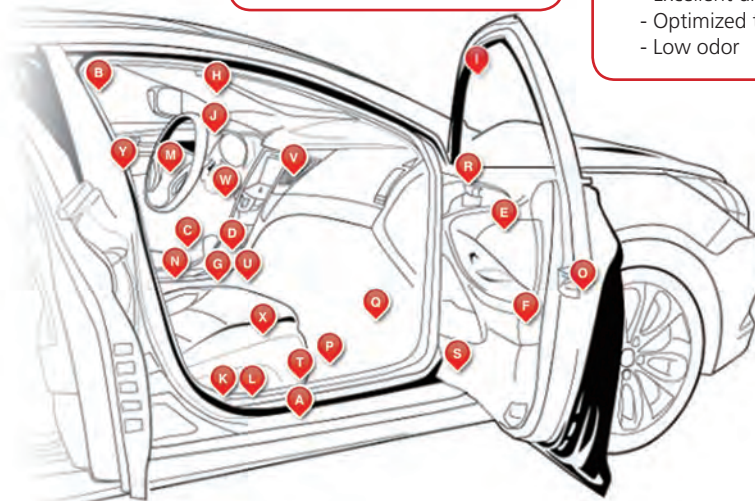
**SLIDE GUIDE****Resin: UR302, K300****Composition : POM****Characteristics**

- Impact-resistance
- Good processability
- Dimensional stability

Q

**HAVC SWITCH SHAFT & CAM****Resin: KOCETAL® K300LO, K300****Composition : POM****Characteristics**

- Excellent dimensional stability
- Optimized toughness & strength
- Low odor



R

**ACTUATOR GEAR****Resin: KOCETAL® LW702****Composition : POM Wear Modifier****Characteristics**

- Excellent wear resistance
- Balanced toughness & strength
- Good dimensional stability

S

**SPEAKER GRILLE****Resin: KOCETAL® WR701LO, WR901LO****Composition : POM, UV-additive****Characteristics**

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

T

**TRIM CLIP****Resin: KOCETAL® UR304****Composition : POM, Modifier****Characteristics**

- Optimized toughness & strength
- Excellent color stability

U

**CUP HOLER****Resin: KOCETAL® LF302****Composition : POM, Modifier****Characteristics**

- Good dimensional stability
- Excellent color stability
- Low odor

V

**AIR CONDITIONER VENT GRILLE & KNOB****Resin: KOCETAL® WR301LO****Composition : POM, Weather Resistance****Characteristics**

- No color changes under UV
- Low Formaldehyde gas emission at high Temperature
- Excellent surface

W

**STEERING ROLL CONNECTOR****Characteristics**

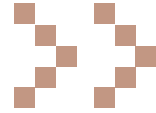
- Excellent wear resistance
- Good flowability
- Good dimensional stability

X

**LUMBER SUPPORT****Resin: KOCETAL® K300LO****Characteristics**

- Low odor
- Dimensional stability
- Excellent creep-resistance

# PROCESSING GUIDE



The chart shows the general condition of injection molding for Kocetal resin.

Classification		Units	Standard resin	Reinforced resin
Cylinder temperature		°C	160~180	170~190
		°C	180~190	190~210
		°C	190~200	190~210
		°C	190~200	190~210
Mold temperature		°C	60~80	70~120
Injection pressure	First pressure	kg/cm2	500~800	700~1,200
	Second pressure	kg/cm2	300~500	1,000
Back pressure		kg/cm2	10~30	20~50

To set the best condition for injection molding of Kocetal, Melt flow rate, shrinkage, dimensional stability, uniformity, and economic efficiency should be considered before manufacturing a mold.

- Set the injection temperature a bit higher than 165°C, the melting temperature of Kocetal.  
Stay below 220°C to restrain formaldehyde gas generation caused by thermal decomposition.
- Generally, Increase injection velocity for thin, multi-cavity mold, or dimension of product is important but, decrease injection velocity for thick product to avoid problem.
- Set the cooling time to the point that the product may not deform or have plate mark when extracting it with ejector pin.

$$\text{Cooling time} = \text{Measuring time} + \alpha$$

## Drying condition

**General case** : Heated-air drying at 80°C × 3 hours or more

**If period of mold cleaning is short** : Heated-air drying at 100°C × 3 hours or more

