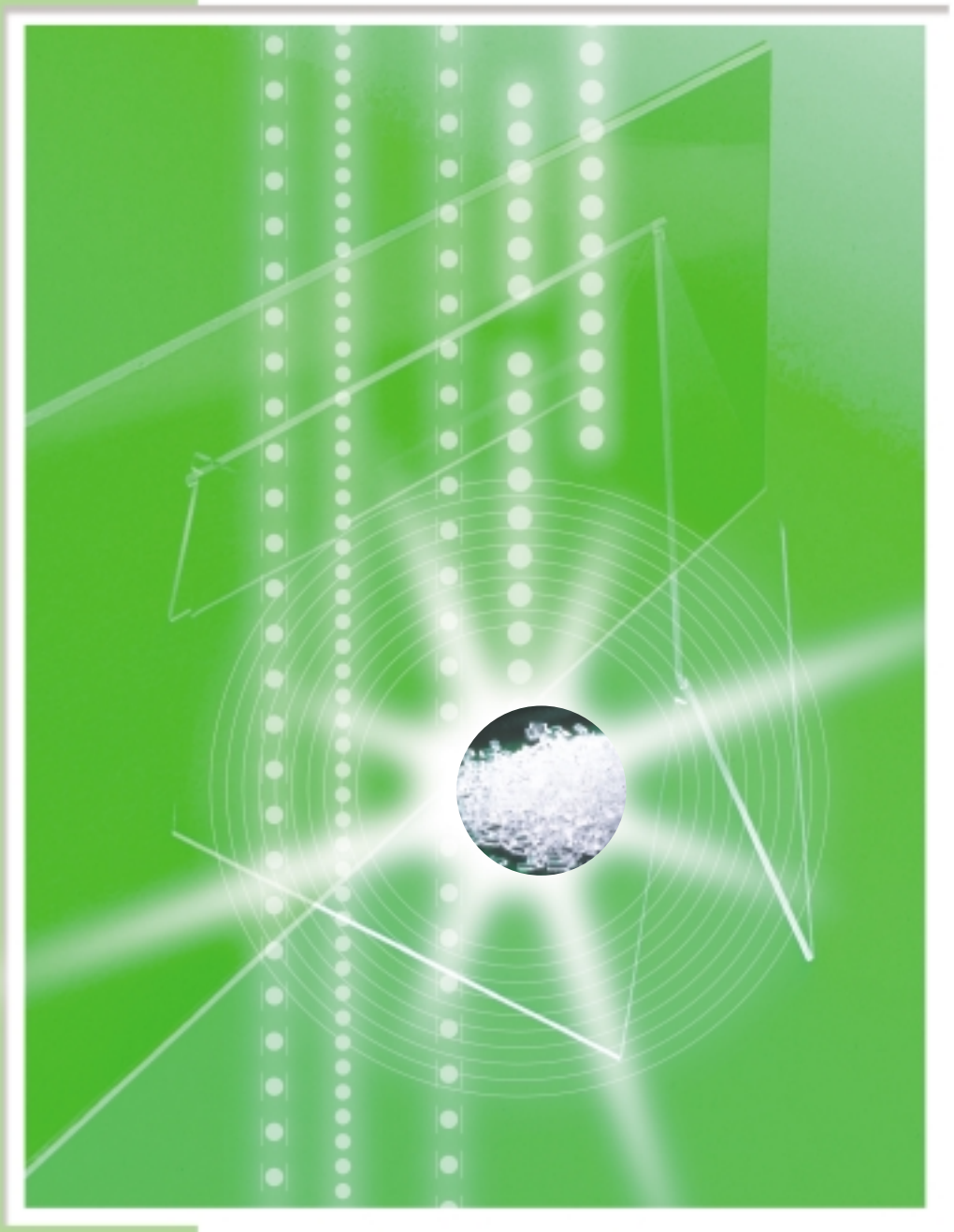
Cyclo Olefin Polymer (COP)

ZEONOR®



ZEON CORPORATION

ZEONOR®

ZEONOR®—high-performance Thermoplastics from ZEON CORPORATION

ZEONOR® is a new line of thermoplastic polyolefin resin with an excellent combination of optical and electronic properties.
These unique Cyclo Olefin Polymer (COP) was developed by ZEON CORPORATION using proprietary technology for a wide range of electronic, automotive and packaging applications.
ZEONOR® can easily be processed for any of these applications via injection molding, blow molding or extrusion.

Key Properties-ZEONOR®

1 HIGH TRANSPARENCY

Light transmittance 92%

2 LOW SPECIFIC GRAVITY

Specific Gravity : 1.01

lighter than many other plastics

3 LOW WATER ABSORPTION

Less than 0.01%

Offer excellent dimensional stability under high humidity

4 HIGH THERMAL STABILITY

Tg:100-163℃

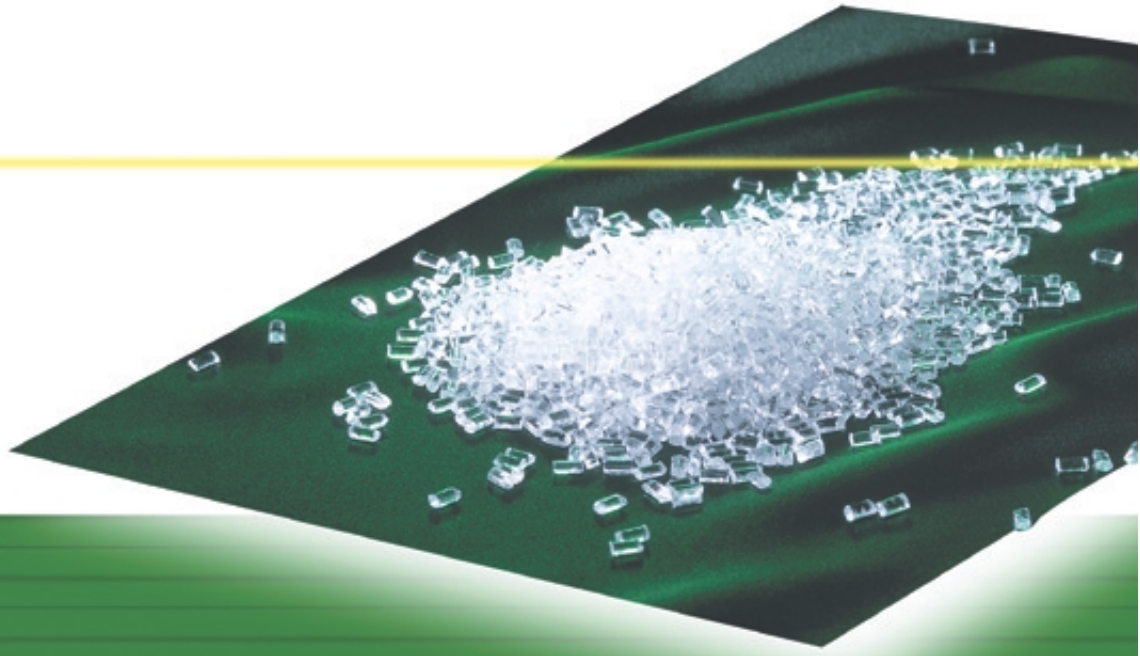
5 HIGH FLOW

MFR : 10-60g/10 minutes at 280℃

Ideal for high precision molding

6 High Chemical Resistance

Is highly resistant to acid, alkaline, alcohol, and ketone.

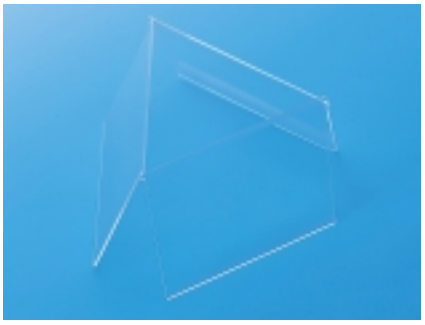


Typical Properties of ZEONOR®

Propeties	Unit	Measurement method	Conditions	ZEONOR®	
				1020R	1060R
Specific gravity	-	ASTM D792	-	1.01	1.01
Water absorption	%	ASTM D570	-	＜0.01	＜0.01
Light transmittance	%	ASTM D1003	Thickness 3mm	92	92
Glass transition temperature	℃	JIS K7121	-	102	100
Deflection temperature under load(With annealing)	℃	ASTM D648	1.80MPa	101	99
Linear expansion coefficient	cm/cm℃	ASTM E831	-	7×10^{-5}	7×10^{-5}
MFR	g/10min	ISO1133	280℃,21.18N	20	60
			230℃,21.18N	-	14
Flexural modulus	MPa	ISO 178	-	2100	2100
Flexural strength	MPa	ISO 178	-	80	76
Tensile strength	MPa	ISO 527	-	53	53
Modulus of elasticity in tension	MPa	ISO 527	-	2200	2100
Tensile elongation	%	ISO 527	-	90	60
Izod impact strength	J/m	ASTM D256	With notch	60	18
Dupont impact strength	J	-	-	36	26
Rockwell hardness	-	ASTM D785	M scale	20	20
Volume resistivity	Ω cm	IEC93	-	$>10^{16}$	$>10^{16}$
Dielectric breakdown strength	KV/mm	ASTM D149	-	70	70
Dielectric constant	-	IEC250	1MHz	2.3	2.3
Dielectric tangent	-	IEC250	1MHz	0.0002	0.0002
Flammability	-	UL-94	-	94HB	94HB
Characteristics	-	-	-	High strengh	High fluidity

Data represents experimental results and does not guarantee specific performance levels under actual usage.
＊Please inquire conceming heat-resistant grades.

Applications



Large and Small Light Guide Plate

ZEONOR® can contribute to thinner and lightweight liquid crystal panel through its low specific gravity and high fluidity. Additionally, it excels in micro pattern transfers and can make contributions to high luminosity and therefore may offer power savings in the future.

Containers and Tableware

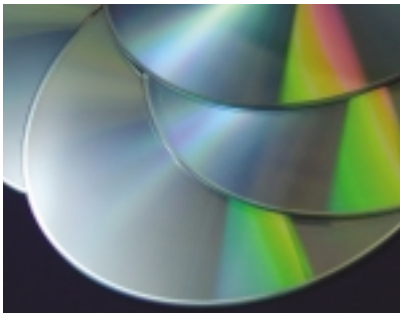
ZEONOR® can be used to make contains with crystal-like textures. In addition to being used for containers when waterproofing is required, it is also suitable for containers that need to be chemically resistant to acid and alkaline.

Automobile Parts

ZEONOR® can contribute to reduced total part weight. It has good molding properties and can be used for molding large-scale products and complex shaped products. Inaddition, it can accommodate a wide range of heat resistant levels.

Semiconductor Containers

Very little metal, ion, and excess gas impurities are present and therefore it is suitable for uses requiring highly pure materials.
Moreover, its low moisture diffusion properties reduce contamination therefore making it suitable for applications suchas wafer processing equipment and transport containers.



Disc

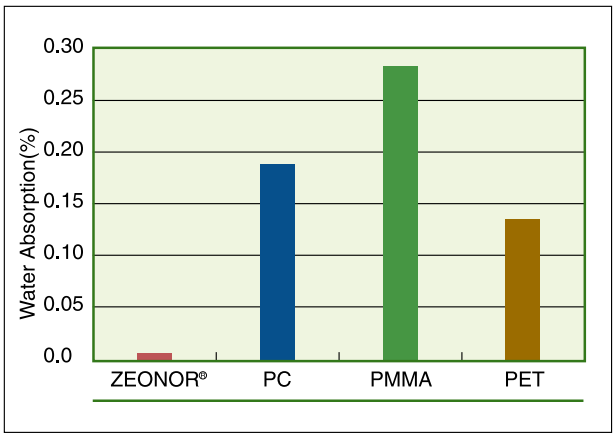
Disk substrates based on ZEONOR® have very low birefringence as well as high transmission, therefore can provide excellent signal performance, especially in the Blue Ray Laser range. Very good transcription performance provides material for next generation disks such as High Data Density optical disks. ZEONOR's low moisture absorption property can be used to realize a disc resistant to warping.

Push Through Packaging

ZEONOR® excels in high transparency and high moisture barrier resistance. With ZEONOR's low shrinkage properties, it is easily and accurately shaped through the thermoforming process.

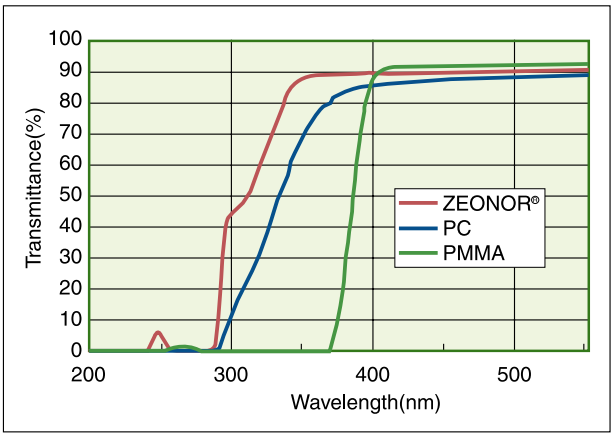
Properties

Water Absorption

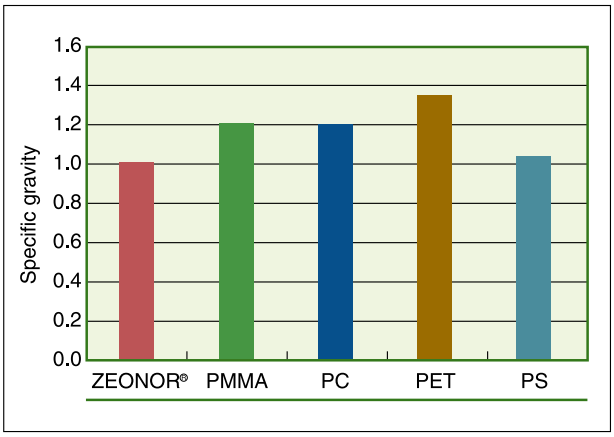


ZEONOR's low water absorption can provide high quality molded parts with very low warping and high dimensional stability.

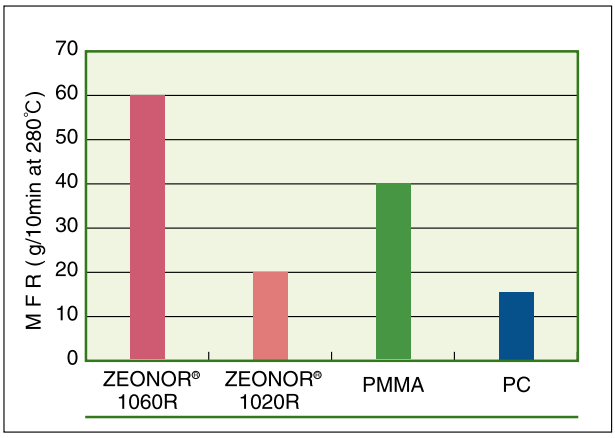
Light Transmittance



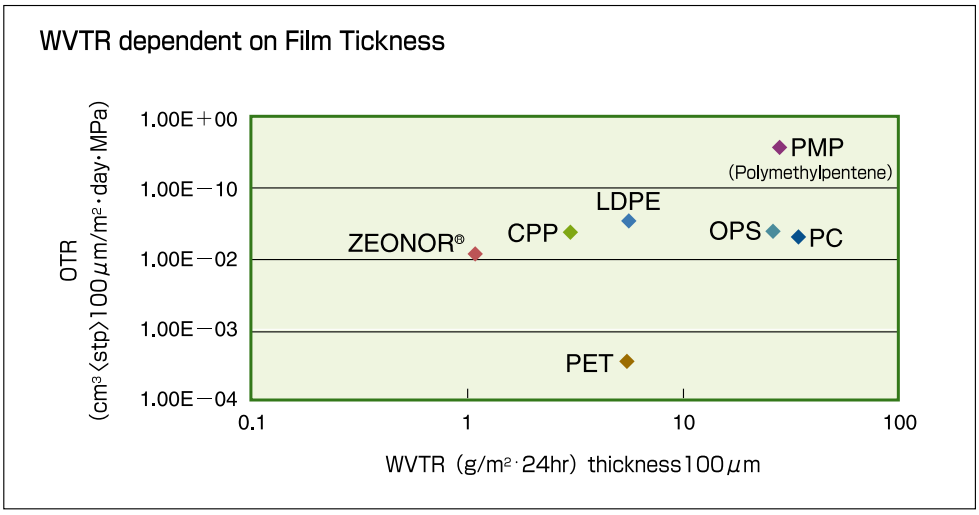
Specific gravity



M F R

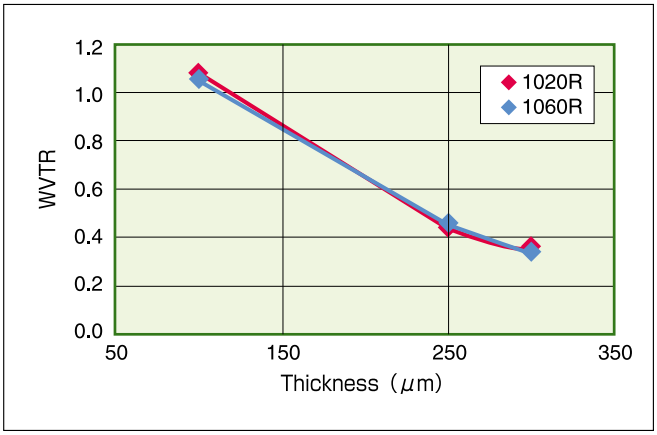


Oxygen and Moisture Permeability



Properties

Moisture Permeabillity dependent on Film Thickness



conditions:40℃ 90%RH
Test Law:JIS K7129 A Law

Impurities

Concentration of impurities in ZEONOR

Impurity	Detectable limit(ppm)	Concentration
Ca^{2+}	0.02	Less than detectable limit
Na^{+}	0.02	
Cl^{-}	0.20	
SO_4^{2-}	1.10	
SO_3^{-}	2.70	
PO_4^{2-}	3.30	

Chemical resistance

Marginal stress

140kgf/cm² or more○(usable)
100 to 140 kgf/cm²△(exercise caution in use)
100kgf/cm² or less×(unusable)

Test results

Alcohol	Methanol	○
	Ethanol	○
	IPA(isopropyl alcohol)	○
Ketone	Acetone	○
	MEK(methyl ethyl ketone)	○
	Cyclohexanone	×
	MIBK	×
Ether	Ethyl ether	×
	THF(tetrahydrofuran)	×
Aromatic	Xylene	×
Hydrocarbon	n-Pentane	×
	n-Hexane	×
	n-	×
Chlorohydrocarbon	1,2-Dichloroethane	×
Other solvents	Methyl	×
	DOP(dioctylphthalate)	×
	DMF(dimethylformamide)	○
	Methyl cellosolve	○
	Limonene	×
Acid	Hydrochloric acid(10%)	○
	Concentrated hydrochloric acid	○
	Sulfuric acid(10%)	○
	Concentrated sulfuric acid	×
	Acetic acid(10%)	○
	Formic acid(10%)	○
	Nitric acid	○
	Phosphoric acid	○
	Hydrofluoric acid(7%), nitric acid(42%),pure water(51%)	○
Base	Caustic soda(50%)	○
	Aqueous ammonia(10%)	○
Other chemicals	Formaldehyde(40%)	○
	Hydrogen peroxide water(30%)	○
Foods	Salad oil	×
	Lemon juice	○
	Orange juice	○
Cosmetics	Hair liquid	○
	Hair tonic	○
Detergent	Hair shampoo	△
	Hair rinse	○

PL (Product Liability) Notes

1. Please observe the following precautions for the storage and use of the product and items molded from the product.

(1) Keep away from fire, since ZEONOR® is combustible.
(2) Avoid exposure to direct sunlight, which can discolor ZEONOR®.
(3) Do not use or allow exposure to temperatures over the heat distortion temperature of ZEONOR®, since ZEONOR® may discolor, deform or melt.
(4) Improper molding conditions or use with a poorly designed mold may induce solvent cracking through residual stress.
(5) Do not use for parts that are subject to continuing load (snapfit insert molded products, screw stops, etc.), since the material may crack.
(6) Do not expose to the following solvents and liquids which may cause ZEONOR® to liquefy or swell.
Aromatic solvents such as benzene, toluene, etc.
Chlorinated hydrocarbon solvents, including dichloromethane, carbon tetrachloride, etc.
Vegetable and mineral oils and greases
Hydrocarbon solvents such as n-Hexane, cyclohexane and ligroin, etc.
Ethers such as diethylether, etc.
Ketones such as cyclohexanone, etc.
Prior to use test other materials and liquids containing long-chain alkyl groups in their structure.
(7) Test ZEONOR® for chemical resistance prior to use.

2.Contact ZEON CORPORATION before utilizing ZEONOR® in medical care products, foods or toys.

3.Please refer to the Material Safety Data Sheet for specific details.

Related laws and standards
1. TSCA : TSCA Inventory
2. EINECS : EINECS Inventory

Other disclaimers and warnings
(1) Specifications listed in the catalog are typical measurements using standard test methods, but arenot intended to imply guaranteed values forall possible applications. Consequently, listed values may not be applicable to products used under differing conditions.
(2) Catalog descriptions and specifications are subject to change without notice.
(3) Applicable industrial patents and copyrights should be observed when adopting applications introduced in this catalog.
(4) Physical properties cited for other resins are drawn from related catalogs and documents.
(5) Contact ZEON CORPORATION for detailed technical information.

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