

CALIBRE 301EP-30

Polycarbonate Resins

CALIBRE® 301EP-30 resin is designed for injection molding products. It exhibits an excellent physical property balance of heat resistance, transparency and impact strength.

Main Characteristics

- Very low viscosity
- Good mold release

Applications

- Thin components
- DVD security boxes
- Packaging applications

Properties ¹	Test Method	English		SI	
		Value	Units	Value	Units
Physical					
Melt Flow Rate (300 °C /1.2 kg)	ASTM D1238	30	g/10 min	30	g/10 min
Density	ASTM D792	1.20		1,200	Kg/m ³
Mould Shrinkage	ASTM D955	0.005~0.007	in/in	0.005~0.007	mm/mm
Water Absorption @ 24 hrs, 23°C	ASTM D570	0.15	%	0.15	%
@ equilibrium, 50%RH, 23°C	ASTM D570	0.32	%	0.32	%
Optical					
Refractive Index, n _o	ASTM D542	1.586		1.586	
Light Transmittance	ASTM D1003	89	%	89	%
Haze	ASTM D1003	0.7~1.5	%	0.7~1.5	%
Thermal					
Deflection Temperature Under Load (DTUL) @ 4 mm	ASTM D648				
@ 66 psi (0.45 Mpa), annealed		282	°F	139	°C
@ 264 psi (1.8 Mpa), annealed		277	°F	136	°C
@ 264 psi (1.8 Mpa), unannealed		252	°F	122	°C
Vicat Softening Point, 50°C /hr, 50N Load	ASTM D1525	291	°F	144	°C
Coefficient of Linear Thermal Expansion, @ -40 to 82°C	ASTM D696	38 x 10 ⁻⁶	in/in/°F	68 x 10 ⁻⁶	mm/mm/°C
Mechanical					
Tensile Yield Strength @ 50 mm/min	ASTM D638	8,700	psi	60	MPa
Ultimate Tensile Strength	ASTM D638	8,840	psi	61	MPa
Elongation at Yield	ASTM D638	6	%	6	%
Elongation at Break	ASTM D638	150	%	150	%
Tensile Modulus	ASTM D638	340,000	psi	2,340	MPa
Flexural Strength	ASTM D790	14,000	psi	96	MPa
Flexural Modulus	ASTM D790	350,000	psi	2,410	MPa
Notched Izod Impact ² @ 23 °C	ASTM D256	13	ft-lb/in	700	J/m
Unnotched Izod Impact @ 23 °C	ASTM D256	No break		No break	
Instrumented Dart Impact ³ , Total Energy @ 23 °C	ASTM D3763	-	in-lb	-	J
Rockwell Hardness	ASTM D785	-	R Scale	-	M Scale
Taber Abrasion Resistance ⁴ (Δ Haze)	ASTM D1044	-	%	-	%
Ignition Resistance⁵					
UL-94 @1.6 mm	ASTM D635	V2		V2	
UL-94 @ 3.2 mm	ASTM D635	V2		V2	
Limiting Oxygen Index	ASTM D2863	26	%	26	%
Average Extent of Burning	ASTM D635	1	in	25	mm
Electrical					
GWT 2.0 mm, 5 second	IEC 695-2-1	850	°C	850	°C
Ball Indentation Temperature	IEC 598-1	>125	°C	>125	°C
Compression Tracking Index @ 2.0 mm	IEC 112	250	V	250	V
Dielectric Strength	ASTM D149	420	V/mil	17	KV/mm
Dielectric Constant @ 60 Hz	ASTM D150	3		3	
Dissipation Factor @ 60 Hz	ASTM D150	0.001		0.001	
Volume Resistivity @ 23 °C, dry	ASTM D257	2.0 x 10 ¹⁷	Ω-cm	2.0 x 10 ¹⁷	Ω-cm

(1) Typical properties; not to be constructed as specifications.

(2) 0.125 in; 10 mil notch (3.2 mm; 0.25 mm notch)

(3) 0.125 in; 8000 ipm (3.2 mm; 203 m/min)

(4) 1,000 g; CS-10 F wheel; 500 cycles

(5) These numerical flame spread ratings are small-scale test values and are not intended to reflect hazards presented by these or any other materials under actual fire conditions. UL 94 file: E93278

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Safety and Handling Considerations

Material Safety Data (MSD) sheets for CALIBRE polycarbonate resins are available from LG DOW Polycarbonate Ltd. MSD sheets are provided to help customers satisfy their own handling, safety and disposal needs, and those that may be required by locally applicable health and safety regulations, such as OSHA (U.S.A.), MAK (Germany), or WHMIS (Canada). MSD sheets are updated regularly, therefore, please request and review the most current MSD sheet before handling or using any product. The following comments are general and apply only to CALIBRE polycarbonate resins as supplied. Various additives and processing aids used in fabrication and other materials used in finishing steps have their own safe use profile and must be investigated separately.

Hazards and Handling Precautions

CALIBRE polycarbonate resins have a very low degree of toxicity and under normal conditions of use should pose no unusual problems from ingestion, eye or skin contact. However, caution is advised when handling, storing, using, or disposing of these resins and good housekeeping and controlling of dusts are necessary for safe handling of product. Workers should be protected from the possibility of contact with molten resin during fabrication. Handling and fabrication of plastic resins can result in the generation of vapors and dusts. Dusts resulting from sawing, filing, and sanding of plastic parts in post-molding operations may cause irritation to eyes and the upper respiratory tract. In dusty atmospheres, use an approved dust respirator. Pellets or beads may present a slipping hazard. Good general ventilation of the polymer processing area is recommended. Processing may release fumes that may include polymer fragments and other decomposition products. Fumes can be irritating. At temperatures exceeding melt temperature, polymer fragments can occur. Processing improperly dried resin can result in the production of bisphenol A. Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations. Use safety glasses. If there is a potential for exposure to particles, which could cause mechanical injury to the eye, wear

chemical goggles. If vapor exposure causes eye discomfort, use a full-face respirator. No other precautions other than clean body covering clothing should be needed for handling CALIBRE polycarbonate resins. Use gloves with insulation for thermal protection, when needed.

Combustibility

Although CALIBRE polycarbonate resins may contain ignition resistant chemical additives, these resins will burn and, once ignited, may burn rapidly under the right conditions of heat and oxygen supply. Do not permit dust to accumulate. Dust layers can be ignited by spontaneous combustion or by other ignition sources. When suspended in air, dust can pose an explosion hazard. Dense black smoke is produced when product burns. Toxic fumes are released in fire situations. Fire fighters should wear positive-pressure, self-contained breathing apparatus and full protective equipment. Water or water fog is the preferred extinguishing media. Foam, alcohol resistant foam, carbon dioxide, or dry chemicals may also be used. Soak thoroughly with water to cool and prevent re-ignition.

Disposal

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. For unused or uncontaminated material, the preferred options include sending to a licensed recycler, reclaimer, incinerator or other thermal destruction device. LG DOW POLYCARBONATE LTD. HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN THE MSD SHEET COMPOSITION SECTION. For used or contaminated material, the disposal options remain the same, although additional evaluation is required (see, for example, in the U.S.A., 40 CFR, Part 261, "Identification and Listing of Hazardous Waste"). All disposal methods must be in compliance with Federal, State/Provincial, and local laws and regulations. As a service to its customers, LG-DOW can

provide lists of companies, which recycle, reprocess, or manage chemicals or plastics, and companies that manage used drums. Contact your LG-DOW representative for further details.

Environment

Generally speaking, in the environment, lost pellets are not a problem except under unusual circumstances - when they enter the marine environment. They are inert and benign in terms of their physical environmental impact, but if ingested by waterfowl or aquatic life, they may mechanically cause adverse effects. Spills should be minimized and they should be cleaned up when they happen. Plastics should not be discarded into the ocean or any other body of water.

Product Stewardship

LG DOW Polycarbonate Ltd. has a fundamental concern for all, who make, distribute and use its products, and for the environment in which we live. This concern is the basis of our Product Stewardship philosophy, by which we assess the health and environmental information on our products and then take appropriate steps to protect employee and public health and the environment. Our Product Stewardship program rests with every individual involved with LG-DOW products from initial concept and research to the manufacture, sale, distribution, and disposal of each product.

Customer Notice

LG-DOW encourages its customers and potential users of LG-DOW products to review their applications for such products from the standpoint of human health and environmental quality. To help ensure that LG-DOW products are not used in ways for which they are not intended or tested, LG-DOW personnel will assist customers in dealing with ecological and product safety considerations. Your LG-DOW sales representative can arrange the proper contacts. LG-DOW literature, including Material Safety Data sheets, should be consulted prior to the use of LG-DOW products. These are available from your LG-DOW representative.

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- Long-term contact with internal body fluids or internal body tissues (long-term is a use which exceeds 72 continuous hours);
- Use in cardiac prosthetic devices regardless of the length of time involved (cardiac prosthetic devices include, but are not limited to: pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass assisted devices);
- Use as a critical component in medical devices that support or sustain human life; or
- Use specifically by pregnant women or in applications designed specifically to promote or interfere with human reproduction.

In addition, for LG-DOW products, new business opportunities require a business assessment prior to sale or sampling of LG-DOW products. Authorized distributors and resellers will adhere to the LG-DOW medical policy.

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If products are described as "experimental" or "developmental": 1) product specifications may not be fully determined; 2) analysis of hazards and caution in handling and use are required; and 3) there is greater potential for LG-DOW to change specifications and/or discontinue production.



LG DOW Polycarbonate Ltd.
www.lgdow.com

Hana Securities Building, 9th Floor, 23-3 Yoido-dong, Youngdeungpo-Ku, Seoul 150-010, Korea
Tel: (82-2) 3771-2625 Fax: (82-2) 3771-2627