

## LUSTRAN<sup>®</sup> SAN 31

### SAN

Specialty Grade

#### Description

Lustran SAN 31 resin is an injection molding grade of transparent SAN (styrene acrylonitrile) thermoplastic. The base resin used in the Lustran SAN 31 product is in chemical compliance with 21 CFR 181.32 (acrylonitrile copolymers and resins) for use in the manufacture of repeated-use houseware articles as well as FDA modified ISO 10993-1\*\*. It also meets U.S. Pharmacopeia 23 Class 6 test requirements. Lustran SAN 31 has a large molding window and is easy to process. The resin is available in natural (000000) color, crystal (552160) tint, and transparent and opaque custom colors (upon request).

#### Applications

Lustran SAN 31 resin is a general-purpose grade with a unique balance of cost/performance properties among thermoplastic resins. It is used in a wide variety of applications requiring clarity, heat and chemical resistance, strength and rigidity. Typical applications include beverage tumblers and mugs, blender jars, tableware, dinnerware, cosmetic packaging, instrument lenses, and medical devices.

Lustran SAN 31 performs exceptionally well in applications that are subject to demanding environments. Finished products are resistant to heat deformation, scratching, and chemicals, such as foodstuffs, oils, greases, acids, alkalies, and petroleum products. Common solvents, such as MEK and THF, can be used for bonding Lustran SAN 31. Parts molded out of Lustran 31 resin also accept various methods of printing. As with any product, use of Lustran 31 resin in a given application must be tested (including field testing, etc.) in advance by the user to determine suitability.

#### Drying

Drying prior to processing in a desiccant dehumidifying hopper dryer is recommended. An inlet air dew point of -20°F (-29°C) or below is recommended to achieve a moisture content of ≤0.2%. Typical drying conditions are 2 hours at 180°-190°F (82°-88°C). Drying for 4 hours at 160°-170°F (71°-77°C) is also adequate.

#### Processing

A reciprocating screw injection molding machine is preferred. A general-purpose screw with a 2.5:1 compression ratio is suggested. A minimum L/D ratio of 20:1 will ensure melt homogeneity.

Use minimum melt temperature with minimum barrel residence time, consistent with good part quality. To avoid excessive residence time, volume and weight of the shot should be balanced against barrel capacity and injection stroke. A shot weight-to-machine ratio capacity of 0.5–0.7 is recommended. A mold temperature of 120-180°F (50-80°C) is recommended for development of maximum gloss and strength.

Undercuts must be avoided when processing SAN. To avoid mold release problems, a minimum draft of 1° should be specified.

Typical processing parameters are noted below. Actual processing conditions will depend on machine size, mold design, material residence time, and shot size.

Typical Injection Molding Conditions*	
Barrel Temperatures:	
Rear.....	340°– 365°F (170°– 185°C)
Middle.....	365°– 390°F (185°– 200°C)
Front.....	395°– 420°F (200°– 215°C)
Nozzle.....	395°– 420°F (200°– 215°C)
Melt Temperature.....	425°– 500°F (220°– 260°C)
Mold Temperature.....	100°– 180°F (40°– 80 °C)
Injection Pressure.....	10,000 – 20,000 psi
Hold Pressure.....	40 – 80% of Injection Pressure
Back Pressure.....	0 – 25 psi
Screw Speed.....	Moderate
Injection Speed.....	Moderate to High
Cushion .....	1/8 in max
Clamp.....	.2 – 4 ton/in <sup>2</sup>

\*Extended barrel soak time at start-up or short-term shutdown (up to 6 hours) will change color of material in barrel.

Additional information on processing may be obtained by contacting a INEOS ABS technical service representative.

Typical Properties* for Standard Tint (552160) Resin	ASTM Test Method (Other)	Lustran® SAN 31 Resin	
		U.S. Conventional	SI Metric
<b>General</b>			
Specific Gravity	D 792		1.07
Density	D 792	0.039 lb/in <sup>3</sup>	1.07 g/cm <sup>3</sup>
Specific Volume	D 792	25.9 in <sup>3</sup> /lb	0.93 cm <sup>3</sup> /g
Mold Shrinkage	D 955	0.003 - 0.004 in/in (mm/mm)	
Melt Flow Rate at 230°C/3.8-kg Load	D 1238	7.5 g/10 min	
<b>Optical</b>			
Transmittance at 0.125-in (3.2-mm) Thickness	D 1003	87 - 88%	
Haze at 0.125-in (3.2-mm) Thickness	D 1003	0.7%	
Refractive Index	D 542	1.57	
<b>Mechanical</b>			
Tensile Stress at Break	D 638	10,500 lb/in <sup>2</sup>	72 MPa
Tensile Modulus	D 638	475,000 lb/in <sup>2</sup>	3.3 GPa
Flexural Stress at Yield	D 790	16,700 lb/in <sup>2</sup>	115 MPa
Flexural Modulus	D 790	500,000 lb/in <sup>2</sup>	3.4 GPa
Impact Strength:	D 256		
0.125-in (3.2-mm) Thickness			
Notched Izod		0.4 ft-lbs/in	21 J/m
Unnotched		3.8 ft-lbs/in	201 J/m
Deformation Under Load:	D 621		
4,000 psi (28 MPa), 122°F (50°C), 24 Hr		1.5%	
Rockwell Hardness	D 785	83 (M Scale)	
<b>Thermal</b>			
Deflection Temperature Under Load:	D 648		
0.5-in (12.7-mm) Thickness			
Unannealed			
264 psi (1.82 MPa)		205°F	96°C
Annealed			
264 psi (1.82 MPa)		218°F	103°C
Coefficient of Linear Thermal Expansion	D 696	3.8 E-05 in/in/°F	6.8 E-05 mm/mm/°C
Vicat Softening Temperature, Rate B	D 1525	230°F	110°C
<b>Flammability**</b>			
UL94 Flame Class:	(UL94)		
1.6-mm Thickness			HB
3.05-mm Thickness			HB

\* These items are provided as general information only. They are approximate values and are not part of the product specifications.

\*\* Flammability results are based on small-scale laboratory tests for purposes of relative comparison and are not intended to reflect the hazards presented by this or any other material under actual fire conditions.

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