

NAS® 21

Styrene Methyl Methacrylate Acrylic Copolymer
Styrolution

Message:

NAS 21 is a styrene acrylic copolymer that can be used in a variety of applications demanding a strong, stiff water-clear plastic resin with excellent thermal stability.

General Information			
UL YellowCard	E55776-245676		
Features	Copolymer		
	Ethylene Oxide Sterilizable		
	Good Processability		
	Good Stiffness		
	Good Thermal Stability		
	High Clarity		
	Low Density		
	Radiation Sterilizable		
Uses	Cups		
	Displays		
	Medical Devices		
	Toys		
Agency Ratings	USP XXIII, Class VI		
Appearance	Clear/Transparent		
Processing Method	Injection Molding		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.08	g/cm ³	ASTM D792, ISO 1183
Melt Mass-Flow Rate (MFR) (200°C/5.0 kg)	1.9	g/10 min	ASTM D1238
Melt Volume-Flow Rate (MVR) (220°C/10.0 kg)	24.0	cm ³ /10min	ISO 1133
Molding Shrinkage			
Flow	0.20 to 0.60	%	ASTM D955
--	0.20 to 0.60	%	ISO 294-4
Water Absorption			
Saturation, 23°C	0.10	%	ASTM D570
Equilibrium, 23°C, 50% RH	0.10	%	ISO 62
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (M-Scale)	70		ASTM D785
Ball Indentation Hardness	168	MPa	ISO 2039-1
Mechanical	Nominal Value	Unit	Test Method

Tensile Modulus			
--	3240	MPa	ASTM D638
--	3300	MPa	ISO 527-2
Tensile Strength			
Yield, 23°C	57.9	MPa	ASTM D638
Yield, 23°C	60.0	MPa	ISO 527-2
Tensile Elongation			
Break	2.1	%	ASTM D638
Break, 23°C	2.5	%	ISO 527-2
Flexural Modulus			
--	3100	MPa	ASTM D790
--	3400	MPa	ISO 178
Flexural Strength			
--	97.2	MPa	ASTM D790
--	100	MPa	ISO 178
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength (23°C)	1.5	kJ/m ²	ISO 179
Charpy Unnotched Impact Strength (23°C)	12	kJ/m ²	ISO 179
Notched Izod Impact			
23°C	21	J/m	ASTM D256
23°C	2.5	kJ/m ²	ISO 180/A
Unnotched Izod Impact Strength	12	kJ/m ²	ISO 180
Thermal	Nominal Value	Unit	Test Method
Heat Deflection Temperature			
0.45 MPa, Unannealed	90.0	°C	ISO 75-2/B
1.8 MPa, Annealed	80.0	°C	ISO 75-2/A
Vicat Softening Temperature			
--	106	°C	ASTM D1525 ¹
--	98.0	°C	ISO 306/B50
Maximum Service Temperature	260	°C	
Optical	Nominal Value	Unit	Test Method
Refractive Index ²	1.570		ASTM D542, ISO 489
Transmittance (550 nm)	91.3	%	ASTM D1003
Haze	0.30	%	ASTM D1003
Injection	Nominal Value	Unit	
Drying Temperature	80.0	°C	
Drying Time	2.0	hr	
Rear Temperature	180 to 210	°C	
Middle Temperature	200 to 230	°C	
Front Temperature	210 to 240	°C	
Processing (Melt) Temp	200 to 240	°C	
Mold Temperature	30.0 to 60.0	°C	

Injection Rate	Slow-Moderate
NOTE	
1.	Rate B (120°C/h), Loading 1 (10 N)
2.	Sodium D Line

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