Ticona
Engineering polymers for technical solutions.

Combined Data Sheet

Friday, April 13, 2007

Celcon® M90™

Ticona - *Acetal (POM) Copolymer*

Unit System: English

Actions **Legend (Open)**

General Information

Product Description

Celcon acetal copolymer grade M90™ is a medium viscosity polymer providing optimum performance in general purpose injection molding and extrusion of thin walled tubing and thin gauge film. This grade provides overall excellent performance in many applications.

General	
Material Status	• Commercial: Active
Availability	• Latin America • North America • South America
Test Standards Available	• ASTM • ISO • ISO 10350
Features	• Copolymer • General Purpose • Viscosity, Medium
Uses	• Film • General Purpose • Tubing
Forms	• Pellets
Processing Method	• Extrusion • Extrusion, Film • Extrusion, Profile • Extrusion, Sheet • Injection Molding
Multi-Point Data	• Isochronous Stress vs. Strain (ISO 11403-1) • Isothermal Stress vs. Strain (ISO 11403-1)

ASTM and ISO Properties [1]

Physical	**Nominal Value**	**Unit**	**Test Method**
Density -Specific Gravity	1.41	sp gr 23/23°C	ASTM D792
Melt Mass-Flow Rate (MFR)	9.0	g/10 min	ASTM D1238
Mold Shrink, Linear-Flow	0.022	in/in	ASTM D955
Mold Shrink, Linear-Trans	0.018	in/in	ASTM D955
Water Absorption Sat/23C	0.75	%	ISO 62
Water Absorption 23C/50RH	0.20	%	ISO 62
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Tensile Modulus [2]	400000	psi	ISO 527-1, -2
Tensile Strength @ Yield			ASTM D638
(-40 °F)	13700	psi	
(73 °F)	8800	psi	
(160 °F)	5000	psi	
Tensile Stress at Yield [3]	9570	psi	ISO 527-1, -2
Tensile Strain at Yield [3]	10	%	ISO 527-1, -2
Flexural Modulus (73 °F)	370000	psi	ISO 178
Impact	**Nominal Value**	**Unit**	**Test Method**
Notched Izod Impact Strength (73 °F) [4]	2.71	ft·lb/in²	ISO 180
Thermal	**Nominal Value**	**Unit**	**Test Method**
DTUL @264psi - Unannealed	230	°F	ASTM D648
Melting Point	329	°F	
Electrical	**Nominal Value**	**Unit**	**Test Method**
Volume Resistivity	1.0E+14	ohm·cm	ASTM D257

Additional Properties

Density of Melt, Internal Method: 1200 kg/m³
Eff. Thermal Diffusivity, Internal Method: 4.85E-8 m³/s

Ejection Temperature: 165°C
Specific Heat Capacity of Melt, Internal Method: 2210 J/(kg-K)
Thermal Conductivity of Melt, Internal Method: 0.155 W/(m-K)

ISO 10350 Properties [5]

Rheological properties	Nominal Value	Unit	Test Method
Melt volume-flow rate (190°C/2.16 kg)	0.488	in³/10min	ISO 1133
Molding shrinkage (parallel)	2.0	%	ISO 2577
Molding shrinkage (normal)	1.9	%	ISO 2577
Mechanical properties 23°C/50%r.h.	**Nominal Value**	**Unit**	**Test Method**
Tensile creep modulus (1h)	355000	psi	ISO 899-1
Tensile creep modulus (1000h)	196000	psi	ISO 899-1
Charpy impact strength (+23°C)	89.5	ft·lb/in²	ISO 179 /1eU
Charpy impact strength (-30°C)	86.1	ft·lb/in²	ISO 179 /1eU
Charpy notched impact strength (+23°C)	2.86	ft·lb/in²	ISO 179 /1eA
Charpy notched impact strength (-30°C)	2.86	ft·lb/in²	ISO 179 /1eA
Thermal properties	**Nominal Value**	**Unit**	**Test Method**
Melting temperature (10°C/min)	329	°F	ISO 11357-1, -3
Temp. of deflection under load (1.80 MPa)	214	°F	ISO 75-1, -2
Vicat softening temperature (50°C/h 50N)	322	°F	ISO 306
Coeff.of linear therm. expansion (parallel)	0.000067	in/in/°F	ISO 11359-1, -2
Coeff.of linear therm. expansion (normal)	0.000067	in/in/°F	ISO 11359-1, -2
Electrical properties 23°C/50%r.h.	**Nominal Value**	**Unit**	**Test Method**
Volume resistivity	3.1E+14	ohm·in	IEC 60093
Surface resistivity	3.0E+16	ohms	IEC 60093
Other properties	**Nominal Value**	**Unit**	**Test Method**
Density	0.0509	lb/in³	ISO 1183
Test specimen production	**Nominal Value**	**Unit**	**Test Method**
Processing conditions acc. ISO	9988-2		
Injection Molding, melt temperature	401	°F	ISO 294
Injection Molding, mold temperature	194	°F	ISO 10724
Injection Molding, injection velocity	8	in/sec	ISO 294
Injection Molding, pressure at hold	12500	psi	ISO 294

Processing Information

Injection	Nominal Value	Unit
Processing (Melt) Temp	360 to 390	°F
Mold Temperature	180 to 199	°F
Back Pressure	50.8	psi
Screw Compression Ratio	3.0:1.0 to 4.0:1.0	
Extrusion	**Nominal Value**	**Unit**
Melt Temperature	356 to 446	°F

Extrusion Notes

Extrusion Compression Ratio: 3:1 to 4:1
Extrusion L/D Screw Ratio: 20:1
Film Extrusion Melt Temperature: 160 to 220°C
Sheet Extrusion Melt Temperature: 180 to 190°C

Notes

1 Typical properties: these are not to be construed as specifications.

2 0.039 in/min

3 2.0 in/min

4 Type 1, Notch A

5 Typical properties: these are not to be construed as specifications. Additional ISO 10350 data and disclaimer information may be found on ISO 10350 Data Sheet.

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