



# Grilamid® TR 90 NZZ nat

## EMS-GRIVORY - Polyamide 12

Monday, November 4, 2019

### General Information

General				
Material Status	• Commercial: Active			
Availability	• Africa & Middle East • Asia Pacific	• Europe • Latin America	• North America	
Features	• High Impact Resistance	• Hydrolysis Resistant	• UV Resistant	
Uses	• Appliance Components • Automotive Applications • Automotive Exterior Parts • Automotive Interior Parts • Cell Phones • Connectors	• Electrical/Electronic Applications • Engineering Parts • Eyeglass Frames • Household Goods • Hydraulic Applications • Lighting Applications	• Medical/Healthcare Applications • Optical Applications • Outdoor Applications • Pneumatic Applications	
	• Natural Color			
Appearance	• Natural Color			
Forms	• Granules			
Processing Method	• Extrusion	• Injection Molding		

### ASTM & ISO Properties <sup>1</sup>

Physical	Dry	Conditioned	Unit	Test Method
Density	0.990	--	g/cm <sup>3</sup>	ISO 1183
Molding Shrinkage				ISO 294-4
Across Flow	0.90	--	%	
Flow	0.80	--	%	
Water Absorption				ISO 62
Saturation, 73°F	3.0	--	%	
Water Absorption				ISO 62
Equilibrium, 73°F, 50% RH	1.5	--	%	
Mechanical	Dry	Conditioned	Unit	Test Method
Tensile Modulus	--	189000	psi	ISO 527-2
Tensile Stress (Yield)	--	7250	psi	ISO 527-2
Tensile Stress (Break)	--	6530	psi	ISO 527-2
Tensile Strain (Yield)	--	7.0	%	ISO 527-2
Tensile Strain (Break)	--	> 50	%	ISO 527-2
Impact	Dry	Conditioned	Unit	Test Method
Charpy Notched Impact Strength				ISO 179/1eA
-22°F	--	12	ft·lb/in <sup>2</sup>	
73°F	--	29	ft·lb/in <sup>2</sup>	
Charpy Unnotched Impact Strength				ISO 179/1eU
-22°F	--	No Break		
73°F	--	No Break		
Hardness	Dry	Conditioned	Unit	Test Method
Ball Indentation Hardness	--	11600	psi	ISO 2039-1

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Thermal	Dry	Conditioned	Unit	Test Method
Heat Deflection Temperature 66 psi, Unannealed	266	--	°F	ISO 75-2/B
Heat Deflection Temperature 264 psi, Unannealed	230	--	°F	ISO 75-2/A
Continuous Use Temperature -- <sup>2</sup>	158 to 194	--	°F	ISO 2578
-- <sup>3</sup>	239	--	°F	Internal Method
Glass Transition Temperature <sup>4</sup>	311	--	°F	ISO 11357-2
CLTE - Flow	6.7E-5	--	in/in/°F	ISO 11359-2
CLTE - Transverse	6.7E-5	--	in/in/°F	ISO 11359-2
Electrical	Dry	Conditioned	Unit	Test Method
Surface Resistivity	--	1.0E+12	ohms	IEC 60093
Volume Resistivity	--	1.0E+13	ohms·cm	IEC 60093
Electric Strength	--	1100	V/mil	IEC 60243-1
Comparative Tracking Index	--	600	V	IEC 60112
Flammability	Dry	Conditioned	Unit	Test Method
Flammability Classification 0.03 in	HB	--		IEC 60695-11-10, -20
Additional Information	Dry	Conditioned	Unit	Test Method
ISO Type	PA MACM12 to HI, GHL, 14-020	--		ISO 1874

### Notes

<sup>1</sup> Typical properties: these are not to be construed as specifications.

<sup>2</sup> Long Term

<sup>3</sup> Short Term

<sup>4</sup> 10°C/min