



Materials & Specifications :

AISI 52100 Chrome Steel

HARDNESS

AISI 52100 Chrome Steel Balls are made with a through hardness of RC 60 to 67.

MATERIAL ANALYSIS

Carbon	0.98 to 1.10%
Manganese	0.25 to 0.45%
Silicon	0.15 to 0.35%
Phosphorus	Maximum of 0.025%
Sulfur	Maximum of 0.025%
Chromium	1.30 to 1.60%
Molybdenum	Maximum of 0.10%
Nickel	Maximum of 0.25%
Copper	Maximum of 0.35%

Note: Trace elements not shown

MECHANICAL PROPERTIES

Tensile strength	325,000 psi
Yield strength	295,000 psi
Elongation in two inches	5%
Reduction in area	8%
Modulus of elasticity	29,500,000 psi
Density	0.283 lb./cu. in.

52100 steel is a high-carbon chromium alloy steel, which, because of its versatility, is used in a variety of mechanical applications, notably in ball & roller bearings. In the annealed condition this steel is comparatively easy to machine, yet very high hardness and abrasion resistance can be developed by heat treatment to make the steel particularly suitable for applications requiring extreme wear resistance. In addition, 52100 steel can be heat treated to high levels of tensile strength and fatigue strength.



Quality Assurance

Materials & Specifications :
poly (butylene terephthalate)

(PBT)

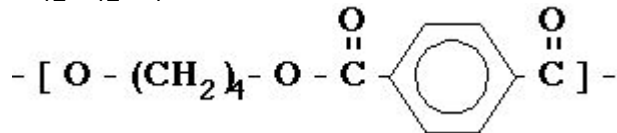
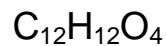
Properties

Glass transition temperature: 66°C.

Melting temperature: 227°C.

Molecular weight of repeat unit: 220.23
g/mol.

Repeat Unit



Description

Poly(butylene terephthalate) (PBT) is semicrystalline polyester engineering polymer commonly used in injection molding, composite, and blend applications, having a high degree and rate of crystallization, good chemical resistance, thermal stability, and excellent flow properties. PBT is used in various high volume automotive, electrical, and other engineering applications because it possess good tensile strength, flexural modulus, and dimensional stability especially in water and high resistance to hydrocarbons (1, 2). It is a good material for the very demanding automobile industry. With its' high durability, acid resistant, it is used for bearing housings.

Material Data

PBT polyesters are semi-crystalline. They are versatile materials with a good balance of mechanical and electrical properties. They have excellent electrical properties and are abrasion resistant. Dimensional stability is significantly better than nylon, especially in humid environments. PBT performs much like nylon but can handle higher temperatures and does not absorb moisture. PBT has excellent impact strength but is very notch sensitive.

POLYESTER 30% GLASS (POLYBUTYLENE TEREPHTHALATE) (PBT)

APPLICATIONS; Automotive, appliance, electrical, bearing housings, conveyors and electronics

Properties

Physical	Units	Test Method	Data
Specific Gravity		ASTM D792	1.66
Water Absorption @ 24 Hour Immersion	%	ASTM D570	0.07
Water Absorption @ Equilibrium	%	ASTM D570	0.25
Mold Shrinkage, Flow Direction, 1/8 in thick	in/in x 10 ⁻³		3-5
Mechanical @ 73F	Units	Test Method	Data
Tensile Strength @ Break	psi	ASTM D638	19,500
Tensile Modulus	10 ⁶ psi	ASTM D638	1.7
Elongation @ Break	%	ASTM D638	1.5
Flexural Strength	psi	ASTM D790	28,000
Flexural Modulus	10 ⁶ psi	ASTM D790	1.5
Compressive Strength	psi	ASTM D695	18,000
Shear Strength	psi	ASTM D732	8,900
Tensile Impact Strength	ft-lb/in ²	ASTM D1822	48
Taber Abrasion	mg/1000 cycles	ASTM D1044	40
Rockwell Hardness	M Scale	ASTM D785	90
Coefficient of Friction Against Metals, Dynamic			0.10-0.13
Thermal	Units	Test Method	Data
Heat Deflection Temperature (66 psi)	F	ASTM D648	442
Heat Deflection Temperature (264 psi)	F	ASTM D648	406
Coefficient of Linear Thermal Expansion 32F-284F	in/in/F x 10 ⁻⁵	ASTM D696	0.8
Deformation Under Load @ 122F, 24 Hours, 2,000psi	%	ASTM D621	0.3
Deformation Under Load @ 122F, 24 Hours, 4,000psi	%	ASTM D621	0.4
Electrical	Units	Test Method	Data
Volume Resistivity	ohm-cm	ASTM D257	5 x 10 ¹⁵
Dielectric Strength	volt/mil	ASTM D149	
1/8 in Thickness, 73F, 50% RH			490
1/8 in Thickness, 73F, 90% RH			460
1/8 in Thickness, 73F, 6 Weeks in 73F Water			450
1/8 in Thickness, 150F, 50% RH			470
1/8 in Thickness, 250F, 50% RH			460
Dielectric Constant, 100 Hz		ASTM D150	3.9
Dissipation Factor, 100 Hz		ASTM D150	0.006
Rating or Property (Underwriters Laboratories Ratings)	Units	Test Method	Data
Temperature Indices			
Electrical	C		140
Mechanical w/Impact	C		130
Mechanical w/o Impact	C		140
Arc Resistance	seconds		123
Comparative Tracking Index	volts		280
Hot Wire Ignition	seconds		73
High Amp Arc Ignition	arcs		200 +
High Voltage Track Rate	in/min		8.2
Flammability @ 1/32"		UL 94	V-0
UL 94-5V, Min. Thickness , In.			0.058