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ZHONGSHAN H.R.T. PRECISION STEEL BALL CO., LTD.

TEL: 076-88991166-601 FAX: 0760-88991166-603 EMAIL: hrt2@chnsteelball.com

ADD: No. 71, Shenchong Industrial Park, Zhongshan City, Guangdong

Chrome Steel Balls

Material: Chrome Steel/AISI52100/SUJ-2/100Cr6

Size: 0.5mm~3mm

Grade: G5~G1000

Hardness: HRC60-66

Certifications: ISO9001, TS16949, ISO14001

Feature: excellent surface quality, superior wear resistance, high hardness and high load bearing capacity

Application: Bearing, ball screw, linear motion guide, automotive parts, chemical, food processing, ink and paint grinding, caster wheel, slide rail bicycle and car

Chemical Composition

CHROMIUM	CARBON	MANGANESE	SILICON	PHOSPHOROUS	SULPHUR
1.30% TO 1.60%	.98% TO 1.10%	0.25% TO 0.45%	0.15% TO 0.35%	0.025% MAX.	0.025% MAX.

Mechanical Properties

TENSILE STRENGTH	YIELD STRENGTH	ELONGATION IN TWO INCHES	REDUCTION IN AREA	MODULUS OF ELASTICITY	DENSITY
325,000 PSI	295,000 PSI	0.05	0.08	29,500,000 PSI	.283 LBS./CU.IN.

Physical Characteristics

CORROSION RESISTANCE	NO CORROSION RESISTANCE
MAGNETIC	YES



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Stainless Steel Ball AISI 302

Material: AISI 302 Stainless Steel

Size: 0.5mm ~ 50.8mm

Grade: G100/G200

Hardness: HRC25-39

Certificates: ISO9001, ISO14001, ISO/TS16949

Feature: good corrosion resistance

Applications: dispenser valves, aerosol valves, lotion pumps, locks, agitators, animal feeders, trigger sprayers, finger pumps, food processing, medical applications

Chemical Composition

CHROMIUM	CARBON	NICKEL	MANGANESE	SILICON	PHOSPHOROUS	SULPHUR
17%-19%	.15% MAX.	8%-10%	2% MAX.	1% MAX.	.045% MAX.	.03% MAX.

Mechanical Properties

TENSILE STRENGTH	YIELD STRENGTH	ELONGATION IN TWO INCHES	REDUCTION IN AREA	MODULUS IN ELASTICITY	DENSITY
80,000-180,000 PSI	50,000-150,000 PSI	55%-60%	55%-60%	29,000,000 PSI	0.286 LBS./CU. IN.

Physical Characteristics

CORROSION RESISTANCE	GOOD
MAGNETIC	SLIGHTLY (DEMAG PROCESS AVAILABLE)



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Stainless Steel Ball AISI 304

Material: AISI 304 Stainless Steel

Size: 0.5mm-50.8mm

Grade: G100/G200

Hardness: HRC25-39

Certificate: ISO9001, TS16949, ISO14001

Feature: good corrosion resistance

Application: couplings, valves and pumps, aerosol and dispenser valves, medical applications, animal feeders, trigger sprayers, finger pumps and food processing

Application: Iatrical instrument, chemical industry, aviation, plastic hardware, scent bottle, sprayer, valve, nail polish, switch, washing machine, fridge, air condition, medicinal materials, automotive fittings, bearing

Chemical Composition

CHROMIUM	CARBON	NICKEL	MANGANESE	SILICON	PHOSPHOROUS	SULPHUR
18%-20%	.08% MAX.	8%-10.5%	2% MAX.	1% MAX.	.045% MAX.	.03% MAX.

Mechanical Properties

TENSILE STRENGTH	YIELD STRENGTH	ELONGATION IN TWO INCHES	REDUCTION IN AREA	MODULUS OF ELASTICITY	DENSITY
80,000-180,000 PSI	50,000-150,000 PSI	55%-60%	55%-70%	29,000,000 PSI	.285 LBS./CU.IN.

Physical Characteristics

CORROSION RESISTANCE	GOOD
MAGNETIC	SLIGHTLY(DEMAG PROCESS AVAILABLE)



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Stainless Steel Ball AISI 316

Material: AISI 316 Stainless Steel

Size: 0.5mm-50.8mm

Grade: G100/G200

Hardness: HRC20-28

Certificate: ISO9001, TS16949, ISO14001

Feature: excellent corrosion resistance and resistance to sulphuric acid compounds

Application: trigger sprayers, bearings, dispenser valves, body jewelry, lotion pumps, quick-disconnect couplings and aerospace applications

Chemical Composition

CHROMIUM	CARBON	NICKEL	MANGANESE	SILICON	PHOSPHOROUS	SULPHUR	MOLYBDENUM
16%-18%	.08% MAX.	10%-14%	2% MAX.	1% MAX.	.045 % MAX.	.03% MAX.	2%-3%

Mechanical Properties

TENSILE STRENGTH	YIELD STRENGTH	ELONGATION IN TWO INCHES	REDUCTION IN AREA	MODULUS OF ELASTICITY	DENSITY
80,000 TO 120,000 PSI	45,000 PSI	10%-15.0%	55.0%-65.0%	28,000,000 PSI	.288 LBS./CU.IN.

Physical Characteristics

CORROSION RESISTANCE	EXCELLENT
MAGNETIC	NO



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Stainless Steel Ball AISI 316L

Material: AISI 316L Stainless Steel

Size: 0.5mm-50.8mm

Grade: G100/G200

Hardness: HRC20-28

Certificate: ISO9001, TS16949, ISO14001

Feature: excellent corrosion resistance and resistance to sulphuric acid compounds (AISI type 316L stainless steel has a lower carbon content than 316 stainless, which gives it even higher corrosion resistance than the excellent resistance of type 316.)

Application: Spray pump, detergent pump, cosmetic, ocean pump, aviation, jewelry, medical applications

Chemical Composition

CHROMIUM	CARBON	NICKEL	MANGANESE	SILICON	PHOSPHOROUS	SULPHUR	MOLYBDENUM
16%-18%	.03% MAX.	10%-14%	2% MAX.	1% MAX.	.045 % MAX.	.03% MAX.	2%-3%

Mechanical Properties

TENSILE STRENGTH	YIELD STRENGTH	ELONGATION IN TWO INCHES	REDUCTION IN AREA	MODULUS OF ELASTICITY	DENSITY
80,000 TO 120,000 PSI	45,000 PSI	10%-15.0%	55.0%-65.0%	28,000,000 PSI	.287 LBS./CU.IN.

Physical Characteristics

CORROSION RESISTANCE	EXCELLENT
MAGNETIC	NO



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Stainless Steel Ball AISI 440C

Material: AISI 440C Stainless Steel

Size: 0.5mm-50.8mm

Grade: G5-G1000

Hardness:HRC58-65.

Certificate:ISO9001, TS16949, ISO14001

Feature: Good wear-resisting property and corrosion resistance, with higher rust resistance and hardness than AISI420.

Application: Bearing which require corrosion resistance, such as hydraulic parts, grinding machines, petrochemical industry, and etc.

Chemical Composition

CHROMIUM	CARBON	NICKEL	MANGANESE	SILICON	PHOSPHOROUS	SULPHUR	MOLYBDENUM
16%-18%	.95%-1.2%		1% MAX.	1% MAX.	.040 % MAX.	.03% MAX.	.75% MAX.

Mechanical Properties

HARDNESS	TENSILE STRENGTH	ELONGATION IN TWO INCHES	REDUCTION IN AREA	MODULUS OF ELASTICITY	DENSITY
RC-58 MIN.	285,000 PSI	0.02	55%-70%	29,000,000 PSI	.277 LBS./CU.IN.

Physical Characteristics

CORROSION RESISTANCE	FAIR
MAGNETIC	YES



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Stainless Steel Ball AISI 420

Material: AISI 420 Stainless Steel

Size: 0.5mm-50.8mm

Grade: G10-G1000

Hardness:HRC48-52

Certificate:ISO9001, TS16949, ISO14001

Feature: fair-to-good corrosion resistance and good material strength

Application: bearings, valves, lighters and writing instruments

Chemical Composition

CHROMIUM	CARBON	NICKEL	MANGANESE	SILICON	PHOSPHOROUS	SULPHUR
12%-14%	.15% MAX.		1% MAX.	1% MAX.	.040% MAX.	.03% MAX.

Mechanical Properties

HARDNESS ROCKWELL	TENSILE STRENGTH	ELONGATION IN TWO INCHES	REDUCTION IN AREA	MODULUS IN ELASTICITY	DENSITY
48 MIN.	95,000-250,000 PSI	8%-25%	25%-50%	29,000,000 PSI	0.279 LBS./CU. IN.

Physical Characteristics

CORROSION RESISTANCE	FAIR
MAGNETIC	YES



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Brass Ball

Material: brass

Size: 1.0mm-12.7mm

Grade: G100-G1000

Hardness: HRB 75-87

Certificate: ISO9001, TS16949, ISO14001

Feature: excellent corrosion resistance, excellent electrical conductivity, low friction

Application: valves, electronics, automotive security, appliance, petrochemical industry operations,

Physical Characteristics

CORROSION RESISTANCE	YES
ELECTRICAL CONDUCTIVITY	YES



Ceramic Balls

Size: 0.5mm-20mm

Grade: G3/G5/G10

Certificate:ISO9001, TS16949, ISO14001

Feature: spherical, rolling elements that provide higher stiffness, lower thermal expansion, lighter weight, increased corrosion resistance, and higher electrical resistance than steel balls

Applications for Ceramic Balls

The GlobalSpec SpecSearch database contains information about applications for ceramic balls, many of which are used as bearings. The following list provides some examples.

- Ceramic aerospace bearings are used in airframes as well as gyroscopes (gyros), navigation systems, flow meters, avionic instruments, and other aerospace parts.
- Agitator balls have suitable corrosion and density (weight) for agitation or mixing applications, such as the balls used in aerosol paint cans.
- Ceramic automotive bearings are used with seating tracks and seat slides, safety restraints and seatbelt locking mechanisms, airbags, constant velocity (CV) joints, double offset joints, tripod joints, cross groove joints, spindle bearings, and many other systems.
- Conveyors balls are used in conveyors, ball transfer units, roller table, casters, roller or lazy Susan applications.
- Spring loaded balls are used in quick disconnect couplings or snap on fasteners and fastening systems. Socket wrenches often use this type of fastening mechanism to hold onto the socket.

Ceramic balls are also used in float or level sensing, flow metering, gaging or alignment, valves, sprayers and pumps, and pollution or vapor control systems.



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Glass Balls

Size: 0.5mm-20mm

Grade: G3/G5/G10

Certificate: ISO9001, TS16949, ISO14001

Feature: high corrosion resistance, light weight (1/3 of stainless steel), low coefficient of friction, high dimensional stability, tight tolerances, non-magnetic, zero porosity, stable material cost

	Soda Lime Precision Glass Balls	Borosilicate Precision Glass Balls
Characteristics	Soda lime precision glass balls will not stand thermal shock; can mechanically give continual service at 230°F.; stands limited static and torque load; good electric and corrosion resistant properties.	Borosilicate glass balls withstand high thermal shock; can mechanically give continual service at 450°F with extreme temperature limit at 900°F; very high electrical resistivity and dielectric strength; high chemical stability, withstands high applied torque loads.
Density	2.4 gm/cm continuous operating temp. 230°F	2.2 gm/cm
Continuous Operating Temperature	230°F	450°F
Surface Finish	Ground - 20-30 RMS Polished - 10-20 RMS	Ground - 20-30 RMS Polished - 10-20 RMS



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Carbon Steel Ball

Material: Carbon Steel

Size: 0.5mm-50.8mm

Grade: G100-G1000

Hardness: HRC \geq 60

Certificate: ISO9001, TS16949, ISO14001

Feature: High hardness, and excellent wear resistance

Application: anti-friction bearings, steering columns, casters, conveyors and trolleys, roller skates, toys, drawer slides

Chemical Composition

CARBON	MANGANESE	PHOSPHOROUS	SULPHUR
.15% - .20%	.6% - .9%	.03% MAX.	.05% MAX.

Physical Characteristics

CORROSION RESISTANCE	NOT CORROSION RESISTANCE
MAGNETIC	YES



Plastic Ball

Material: Plastic

Size: 1.0mm-30mm

Grade: G1~G3

Certificate: ISO9001, TS16949, ISO14001

Feature: excellent fatigue and corrosion resistance, impact strength and in many cases natural lubricity

Application: For crafts, accessories, household tools

Polyamide (Nylon) Balls (PA)

Profile

Nylon balls are insoluble in diluted mineral acids and most organic acids, and common solvents. Nylon balls are exceptionally resistant to alkalis, petroleum oil and greases at temperatures up to 300°F. Acids such as lactic acid, photographic solutions, etc., have little or no effect.

Nylon balls are an excellent choice for applications that require a lightweight, resilient and abrasion-resistant material that performs well in hot, chemically aggressive and humid environments. Used without lubrication, nylon balls provide greater toughness and ductility than most plastics.

Nylon balls are also an environmentally favorable choice, because of the way they are made, and can be reused.

Specific Gravity

1.12 -1.14

Hardness

R119

Polypropylene Balls (PP)

Profile

Polypropylene balls have excellent chemical resistance and low density, as well as the highest melting point of the volume thermoplastics. Polypropylene balls also have high tensile strength. They are an excellent electrical insulator, with low dielectric constant and loss factors. Polypropylene balls are highly resistant to acids, alkalis, alcohols and many inorganic chemicals, and are non-toxic.

Specific Gravity

.90

Rockwell Hardness

R80-102



Polyoxymethylene (POM) Balls

Profile

Polyoxymethylene (POM) balls offer predictable mechanical, chemical and electrical properties over a broad temperature range for extended periods of time. Polyoxymethylene (POM) balls exhibit good fatigue resistance, impact resistance, tensile and shear strength and dimensional stability. They have very low moisture absorption characteristics.

Polyoxymethylene (POM) balls maintain a natural lubricity, giving them a low coefficient of friction against metals. Because of this, polyoxymethylene (POM) are used in pump, valve, slide and rolling applications. Most resins used for polyoxymethylene (POM) balls meet FDA, USDA and UL requirements.

Specific Gravity

1.41-1.42 gm/cc

Hardness

R119-122