



## ADVANTAGES

Performances beyond regular steel bearings  
High temperature resistance (from 400 °c up to 800°c)  
Self-lubricant / dry running conditions High wear  
resistance / High hardness  
High corrosion resistance  
Good electrical insulation  
Low thermal conductivity  
Lower weight  
Low friction coefficient  
FDA compatible  
Longer lifetime

## APPLICATIONS

Nuclear  
Electronics  
Aerospace  
Semi-conductors  
Performance racing vehicles  
Laboratory equipment  
Under water applications  
Cryogenic applications  
Saline atmosphere  
Food processing  
Medical devices  
Chemical industry  
Robotics  
General industry

## BEARING LOAD DIRECTIONS

Radial bearing // Angular contact bearings // Thrusting bearings (axial) // UC TYPE (with curved outer ring for automatic centering) // 2 Rows bearings // Deep groove bearings

## BEARING STANDARD TOLERANCES

ABEC	ISO	DIN
ABEC 1	Normal	P0
ABEC 3	Class 6	P6
ABEC 5	Class 5	P5
ABEC 7	Class 4	P4
ABEC 9	Class 2	P2

ABEC = ABMA system for rating ball bearing tolerances  
 ISO = International Standards Organization  
 DIN = German National Standards Organization

## MATERIALS

ITEM	UNIT	TYPICAL STEEL	Si <sub>3</sub> N <sub>4</sub>	ZrO <sub>2</sub> (Yttria)
Density	g/cc	7,60	3,20 - 3,30	6,00
Hardness	HV	700	1500 - 1800	1200
	HRC	62	75 - 80	70
Elastic modulus	GPa	208	300 - 320	210
Thermal expansion coefficient	10 <sup>-6</sup> K	10,0	3,20	10,50
Thermal conductivity (20°)	W/M°K	30 - 40	13	2
Max usage temperature	°C	120	800	500
Poisson's ratio		0,30	0,26	0,30
Flexural strength (800°)	MPa	2400	200	300
Crushing strength (800°)	MPa	-	1400	2100
Electrical resistance (600°)	Ohms.m	0,1 - 1	10 <sup>15</sup>	10 <sup>15</sup>
Tenacity	MPam ½	25	18	10
Corrosion-resistant		Common	Excellent	Excellent
Centrifugal force		Large	Low	Common
Non lubrication friction		Large	Low	Low
Self-lubricating		-	Excellent	Common
Magnetism		Common	None	None
Fatigue type		Scale off	Spalling	Smash

## **BEARING CONFIGURATIONS**

### **Silicon Nitride (Si3N4)**

- Full complement: Si3N4 races and balls (no retainer).  
Max use temp 600°C.
- With retainer: Peek®, Teflon (PTFE), Stainless, or Chrome steel.  
Max use temp 200-250°C.

### **Zirconia Oxide (ZrO2)**

- Full complement: ZrO2 races and balls (no retainer).  
Max use temp 400-450°C.
- With retainer: Peek®, Teflon (PTFE), Stainless, or Chrome steel.  
Max use temp 200-250°C.

### **Hybrid**

- Stainless steel races and Si3N4 balls.  
Max use temp 120°C.
- With retainer: Peek®, Teflon (PTFE), Stainless, or Chrome steel.  
Max use temp 120°C.

### **Hybrid ceramics**

- Full complement Si3N4 races / ZrO2 balls.  
Max use temp 400-450°C
- Full complement ZrO2 races / Si3N4 balls.  
Max use temp 400-450°C
- With retainer: Peek®, Teflon (PTFE), Stainless, or Chrome steel.  
Max use temp 200-250°C.

SCERAM can provide specific configurations, on demand.  
Please contact us for more information.