

3M Advanced Materials Division

3M™ Silicon Carbide Standard Modular Sliding Bearing Systems

Introduction

The 3M™ Silicon Carbide Standard System is based on the 3M™ Silicon Carbide family of materials, which have proven their reliability in millions of bearings. It provides a series of carefully matched, ready-to-install components.

Why 3M™ Silicon Carbide Standard?

- Standardized machine element
- Optimally matched bearing components
- A set consists of sleeve-bushing – thrust washer
- Nominal diameter from 16 to 63 mm
- 12 different bearing sizes available
- Components are available separately
- Can be used universally for many fluids
- Attractive pricing due to volume production
- Easy order processing



3M™ Silicon Carbide Standard Modular Sliding Bearing Sizes

No.	Nominal Diameter (mm)	Sleeve (mm)	Bushing (mm)	Thrust Bearing (mm)
1	16	16 × 10 × 16	25 × 16 × 16	25 × 10 × 4
2	16	16 × 10 × 16	32 × 16 × 16	32 × 10 × 5
3	20	20 × 10 × 20	32 × 20 × 20	32 × 10 × 5
4	25	25 × 16 × 25	32 × 25 × 25	32 × 16 × 5
5	25	25 × 16 × 25	45 × 25 × 25	45 × 16 × 6
6	32	32 × 16 × 32	45 × 32 × 32	45 × 16 × 6
7	32	32 × 20 × 32	45 × 32 × 32	45 × 20 × 6
8	32	32 × 25 × 32	45 × 32 × 32	45 × 25 × 6
9	45	45 × 25 × 45	63 × 45 × 45	63 × 25 × 8
10	45	45 × 32 × 45	63 × 45 × 45	63 × 32 × 8
11	50	50 × 32 × 50	63 × 50 × 50	63 × 32 × 8
12	63	63 × 45 × 63	80 × 63 × 63	80 × 45 × 10

Applications

3M™ Silicon Carbide Sliding Bearings are typically used in process fluid lubricated applications such as magnetically coupled pumps, canned motor pumps, support bearings for immersion pumps, and agitator and magnetic drives for stirrers.

3M silicon carbide sliding bearings are suitable for applications which depend on process fluids for lubrication, rather than oil or grease.

They can be used with a wide variety of process fluids, including:

- Aggressive acids and alkalis
- Aqueous solutions
- Hot water
- Effluent
- Abrasive suspensions
- Organic liquids

3M silicon carbide sliding bearings can operate in mixed lubrication conditions for long periods without seizing and with extremely low wear rates.

Technical Data

(Not for specification purposes)

- Relative bearing clearance of 2.2% (based on the nominal diameter)
- Load capacity radial/axial 3.5/1.5 MPa
- Width/nominal diameter = 1/1
- Cylindrical dimensions tolerance class IT 7
- All functional surfaces machined
- Thermal expansion 3M™ Silicon Carbide Grade F $\alpha_{SiC} = 2.8 \times 10^{-6} 1/K (20 - 200^{\circ}C)$
- Ceramic material 3M silicon carbide grade F
- Twist lock through grooves
- The journal bearings can be bonded, shrink fit or clamped
- Centering of the shaft sleeve with O-rings or tolerance sleeves
- Lubrication groove included as standard feature

Sliding Bearings Have Enjoyed Worldwide Success for 35 Years

The load bearing strength of the bearings depends on parameters such as the type of lubricant (viscosity), the temperature and mode of operation (continuous running or frequent starts/stops). Higher loads should be verified with tests under realistic lubrication and operating conditions.

3M™ Silicon Carbide makes it easy to choose the bearing size according to the loads. It is based on the tried and tested 3M silicon carbide grade F material – a single-phase, non-porous sintered silicon carbide, with unrivaled corrosion resistance, hardness and reliability.

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