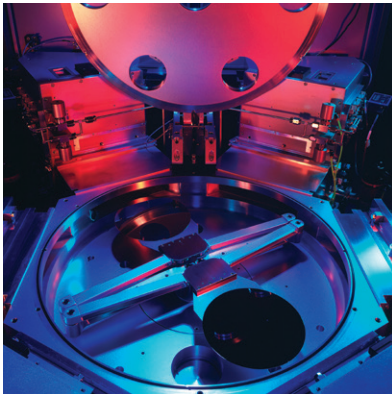




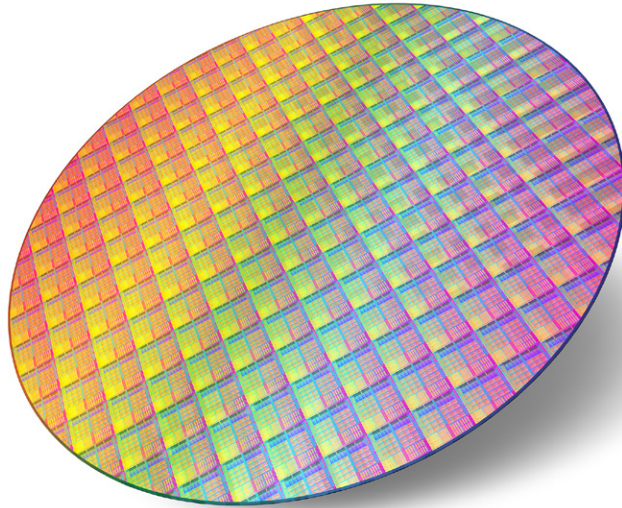
an SKF Group brand

Kaydon **infinite**[®]
bearing solutions

for Semiconductor Fabrication



Precision, purity and productivity



In semiconductor fabs and foundries, where tolerances are tight and contamination can be disastrous, Reali-Slim® bearings help keep your productivity high. From robots to mechanical polishers to photolithography equipment, they make rotating devices smaller, lighter and simpler.

Reali-Slim bearings are the world's most-specified thin section bearings, known for saving space and weight in demanding applications. Pioneered by Kaydon Bearings in the 1950s, they have a cross-section that stays the same as the bore size increases, providing the dynamic capacity of bigger bearings without the bulk.

Kaydon's advanced manufacturing processes and proprietary lubricants are two more reasons why Reali-Slim bearings are so popular for robot hubs, motors, elbows, wrists, and pivot positions. In OEM designs or as aftermarket replacements, they deliver

significant benefits for fabricators:

- Smoother operation
- Longer service life
- Less robot downtime
- Greater positional accuracy
- Reduced particle contamination
- Fewer broken wafers

Kaydon **AMR (AfterMarket Replacement)** bearings are dimensionally-equivalent "drop-in" bearings that give you OEM-or-better performance. They usually provide a cost advantage, as well as a 12-month warranty on materials and workmanship.

SME (Semiconductor Manufacturing Equipment) bearings are custom-engineered to solve specific problems. They come with a 24-to-36-month guarantee... the best in the industry.

SME and AMR bearings feature all the specialized attributes that are so critical in semiconductor applications:

- Special cleaning
- Low particle generation

Reali-Slim bearings make a difference in...

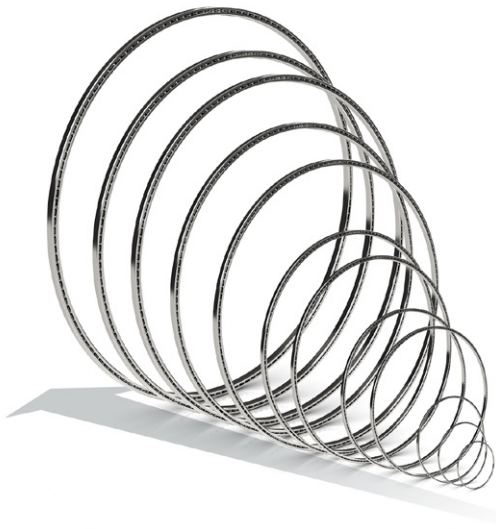
- Atmospheric & Vacuum Robots
- Chemical Mechanical Polishers (CMP)
- Lappers
- Wafer Probers
- Ion Implantation
- Sputtering Equipment
- Test heads/Manipulators
- Rapid Thermal Processing (RTP)
- Megasonic Cleaning Systems
- Spin Dryers
- Photolithography Lens & Counter Balance
- Die Bonders
- Wafer Steppers
- Transfer Systems (SMIF)
- Multi-Wire Saws

- Tolerant of temperatures over 250° C
- Low outgassing
- Low torque
- Zero maintenance

They also withstand environmental conditions not found in typical industrial settings and perform with distinction, cycle after cycle. The result? Higher chip yield that contributes to a healthier bottom line.

Kaydon AMR and SME bearings are available globally from qualified distributors who provide local customer support. These distributors also offer a variety of other products, presenting fabs and foundries with opportunities to consolidate their supply bases.

Superior performance in OEM and aftermarket applications



Kaydon AMR (aftermarket replacement) bearings

AMR bearings are the high-performance, cost-effective choice to replace OEM bearings. They are not exact copies, but equivalent or better. While similar to OEM designs, AMR bearings are engineered and manufactured by the world's leading producer of thin section bearings. And they often sell for less than OEM-supplied components. (Note: "Copy Exact" limitations may apply.)

All AMR bearings come with a standard 12-month warranty on materials and workmanship. They are always packaged with graphic assembly instructions, to ensure proper orientation during assembly.

Kaydon SME (semiconductor manufacturing equipment) bearings

SME bearings are not simply OEM equivalents, but specialized solutions — solutions that OEMs are usually unable (or unwilling) to provide. Using their many years of experience solving problems for fabs, Kaydon engineers recommend design improvements, material upgrades and lubricant changes to meet each fabricator's special challenge.

SME bearings typically offer better performance than OEM parts and are backed by a 24-36 month performance guarantee (some conditions apply; see graph). They have integral shields to keep contamination out and lubricant in. Non-metallic load balls, spacers and separators reduce particle generation while enhancing corrosion resistance. They also produce a smoother rotation and are not affected by magnetic fields.

The advantages don't stop there. SME bearings feature vacuum-compatible lubricants (see next page) that do not degrade like conventional lubricants, reducing the chances of contamination and bearing failure. Whatever the challenge, you can count on Kaydon SME bearings to provide long life with very little downtime.

SME & AMR Bearing Materials

Races

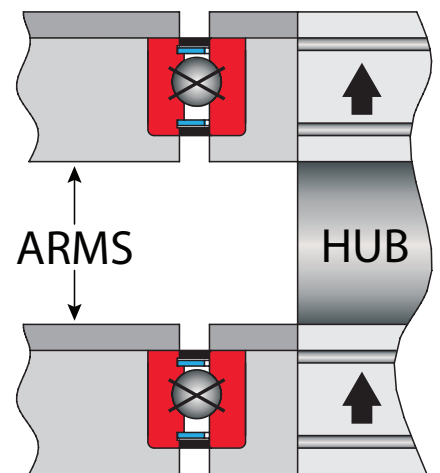
- AISI 52100 Steel
- AISI 440C Stainless Steel
- 17-4 PH Stainless Steel

Balls

- 52100 Steel
- 440C Stainless Steel
- Borosilicate glass
- Ceramic

Separators

- Brass
- Nylon/Acetyl
- 440C stainless steel spacer balls
- 52100 steel spacer balls
- PEEK
- Torlon® spacer balls
- Teflon® or Vespel® toroids



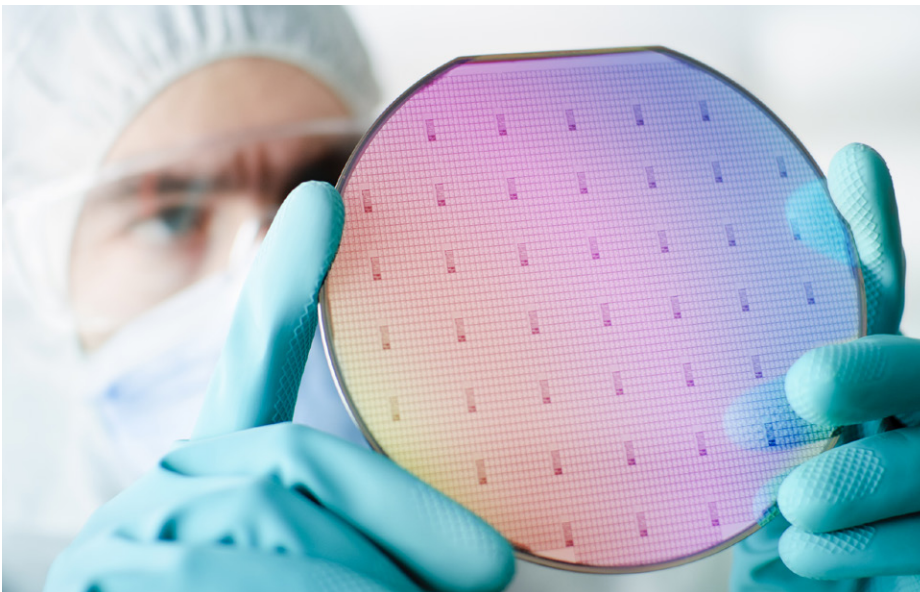
Torlon is a registered trademark of Solvay Specialty Polymers.
 Teflon is a registered trademark of The Chemours Company.
 Vespel is a registered trademark of E. I. DuPont de Nemours and Company.

Endura-Vac® Lubricants: low outgassing and particle generation

Kaydon SME and AMR bearings are cleanroom-cleaned and lubricated with specialized, low-outgassing lubricants suitable for the rated vapor pressure and temperature range.

Endura-Vac® lubricants are available in a variety of formulations to meet specific needs and process conditions. Developed in conjunction with premier lubricant manufacturers, they have

been field-tested and validated in semicon fabs around the world. Two primary types are available: perfluorinated polyether (PFPE) and multiply alkylated cyclopentane (MAC).



Linear PFPE's

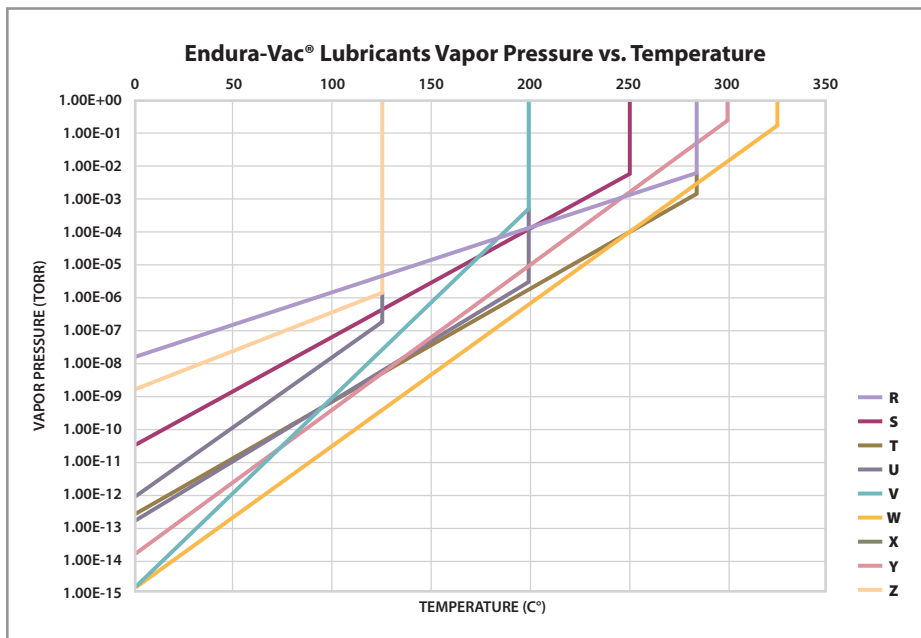
- Good low temperature properties, including better torque at low temperature
- Good outgassing properties
- Poor load carrying properties, typically around 100,000 psi contact stress
- Poor resistance to Lewis Acids at temperatures that are normally considered safe for PFPE's

Branched PFPE's

- Good high temperature properties, including better torque at high temperature
- Outgassing properties depend on viscosity grade
- Good load carrying properties
- Better resistance to Lewis Acids than Linear PFPE's

MAC's

- Superior lubricity and much higher load-carrying properties than PFPE's
- Extremely low outgassing
- The additive solubility of hydrocarbon



From a wide range of Endura-Vac lubricants, Kaydon engineers choose one to suit each application's vapor pressure, temperature, and process gases.

Semiconductor Application Information Sheet



Contact Name _____

Company _____

Phone _____ Email _____

1. In what semiconductor process will this bearing be used?

2. Which robot platform? _____
3. What position on the robot? _____
4. Which part number is being replaced? (please specify aftermarket, OEM or Kaydon P/N) _____
5. Describe the bearing performance issues that have been experienced to-date. Examples could include: lubricant turned black, robot positioning error, outgassing, particle generation, noise, corrosion, etc.

6. What is the current bearing service life? _____ years _____ months or _____ wafer cycles
7. What is the operating temperature of the process? _____
8. If the operating temperature at or near the bearings is known, please report that value as well. _____
9. What is the vacuum pressure of the process? _____ Torr (if atmospheric, please indicate this)
10. What process gasses are used in the process? (essential to recommend bearing materials and lubricant type)

Visit our website: www.kaydonbearings.com for latest releases, newest features, and downloads of catalogs, white papers, videos, software, and CAD drawings.

Premium Products Real-Slim® Thin Section Bearings



Kaydon Thinfinite bearings solutions


How Real-Slim® bearings outperform other thin section bearings




Real-Slim® bearings outperform other thin section bearings in terms of weight reduction and space saving. The chart shows that Real-Slim bearings can reduce weight by up to 99.9% and save up to 97% of space compared to other thin section bearings.

www.kaydonbearings.com

White Paper



4-point bearings do triple duty while saving space



A diagram showing a 4-point bearing with labels A, B, C, and D. The bearing is shown in a cross-section, highlighting its compact design and how it can be used in multiple ways to save space.

The Advantages of Thin Section Bearings – Kaydo...




Ultra-Slim
99.9% weight reduction
97% space reduction

Application testing - Kaydon Bearings



0:00 / 0:22

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Kaydon infinite bearing solutions


At Kaydon, we apply **infinite** engineering to solve the world's most demanding **infinite** solutions meet the most aerospace and defense, commercial, industrial machinery, medical systems, mining, oil and gas, renewable energy, and semiconductor manufacturing markets.

Thinfinite solutions in thin section bearings
Kaydon.Thinfinite@thin section bearing solutions save weight, create

Engineering
Research, development, and testing
Bearing selector
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SKF secures long-term agreement for Kaydon bearings with major wind turbine manufacturer
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Four-point bearings do triple duty while saving space
Kaydon earns Gold Boeing award

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Kaydon infinite bearing solutions

Videos

Thin section bearings

At Kaydon, we apply **Thinfinite**® engineering experience and expertise to solve the world's most unique bearing challenges. The Kaydon Real-Slim® inch-standard, thin section bearing is one of the most widely used thin section bearings in the world. Learn more about how Kaydon **Thinfinite**® bearing solutions save weight, create space, reduce friction, increase design flexibility, and provide excellent running accuracy.

Advantages of thin section bearings (1:32)

Research, development, and testing

Kaydon's **infinite**® engineering expertise and experience extends to the Kaydon Bearings research, development, and testing labs. Kaydon engineers use advanced analytical tools and calculations to understand, test, and recommend the best possible bearing solution for each customer.

Thin section bearings
Research, development, and testing



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