

UNCD® Faces — Advanced Materials for Dry Running

PRODUCT DESCRIPTION

UNCD is a patented form of diamond that features exceptionally low friction, superior wear resistance, and chemical inertness. UNCD Faces have a thin film of UNCD securely integrated on the seal face of a silicon carbide ring (alpha-phase self-sintered), enhancing mechanical seal performance and service life. Unlike commercially available diamond-like-carbons (DLC), UNCD is a phase-pure (sp3) diamond-bonded carbon.

BENEFITS

- Minimizes friction resulting in less heat generation
- Reduces wear for longer service life
- Enables dry running of hard-on-hard surfaces
- Performs exceptionally well against conventional soft or hard counterfaces
- Suitable for a wide range of media
- Affordable for mainstream use

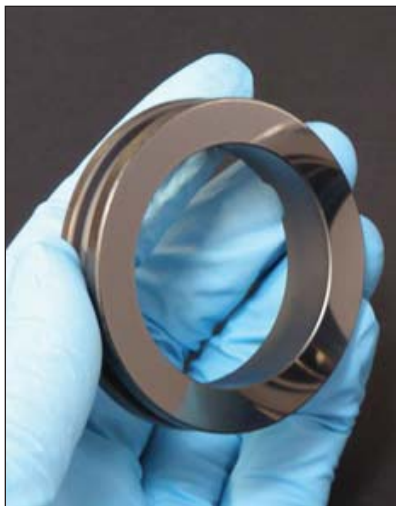
APPLICATIONS

- chemical/ refining
- pharmaceutical
- power generation
- food processing
- pipeline
- pulp & paper
- water/ waste water

UNCD Faces opens wider opportunities for the use of hard seal faces in demanding applications and are particularly suitable for abrasive slurries, poor lubricating environments including hot water and applications that include temperature sensitive media. UNCD faced silicon carbide has lower friction running against silicon carbide that does the current industry practice for low friction of carbon running against silicon carbide. UNCD offers silicon carbide users a means to take advantage of both low friction and high wear resistance. UNCD Faces are so smooth that the faces can run directly against conventional seal face materials such as blister resistant carbons and silicon carbide.

PROPERTIES

UNCD Faces are manufactured using seal ring substrates of high purity, alpha-phase self-sintered silicon carbide made in the USA. The thin film UNCD maintains surface smoothness and flatness of the substrate material that existed before applying the UNCD. UNCD Faces for shaft diameter sizes smaller than 4 inches have face flatness within 2 helium light bands (23 microinches). Silicon carbide typical properties are shown below:



| PROPERTY | UNITS | TEST | VALUE |
|--|------------------------------|---------------|------------|
| Density | gm/cc | ASTM-C 20 | 3.10 |
| Flexural Strength, 20C | MPa (psi X 10 ³) | ASTM-F417 | 462 (67) |
| Elastic Modulus, 20C | GPa (psi X 10 ⁹) | ASTM-C848 | 393 (57) |
| Poisson's Ratio, 20C | N/A | ASTM-C848 | 0.20 |
| Compressive Strength, 20C | MPa (psi X 10 ³) | ASTM-C773 | 2700 (363) |
| Hardness | GPa (kg/mm ²) | KNOOP 1000 gm | 26 (2500) |
| Tensile Strength, 25C | MPa (psi X 10 ³) | ACMA TEST #4 | 307 (44.5) |
| Thermal Conductivity, 20C | W/m K | ASTM-C408 | 125 |
| Specific Heat, 100C | J/kg*K | ASTM-E1269 | 820 |
| Thermal Shock Resistance (delta temp. c) | C | N/A | 400 |
| Maximum Use Temperature | C | NO-LOAD COND. | 1000 |

Actual property values may vary. This data is not warranted.

OFFERINGS

UNCD Faces are available to OEM and seal manufacturers to enhance the performance of their mechanical seals. We can supply UNCD Faces for practically any seal ring design to meet your requirements in sizes up to 12 inches diameter, and we welcome small quantity orders. To request a quote for UNCD Faces, simply provide us your seal ring dimensions and quantity requirements. Engineering and technical support, including extensive surface characterization and dynamic seal test capabilities, are available to help ensure that OEMs and seal manufacturers can quickly incorporate UNCD Faces into existing products and develop new products using UNCD. As a convenience to customers looking to evaluate UNCD Faces, we offer multi-spring pusher seals (Type A05) and bellows seals (Type A06) which already come with UNCD Faces stationary seats (Type M05, o-ring mount) for use with ANSI pumps.