



DLC COATINGS

Ultimate abrasive wear resistance

Overview

Entegris' DLC (diamond-like carbon) coatings are ultra-hard, extremely smooth, highly lubricious coatings that are ideal for plastic injection mold components. UltraC™ Diamond and Ultra-HT™ will substantially enhance the durability of mold components, reduce friction, increase mold productivity, and reduce corrosion. The coatings are deposited using a low-temperature (<150°C) proprietary Plasma Enhanced Chemical Vapor Deposition (PECVD) process and can be uniformly deposited over large areas, on virtually all vacuum compatible substrates, including polymers, and is very conformal to the surface features.

The DLC coatings can be applied to existing tool designs without the need for design changes and modifications. Entegris can also refurbish DLC coated parts, lowering the Cost of Ownership (CoO) while maximizing the life of these high value critical components.

Ultra-HT is an innovative, multi-layer, fully dense coating based on our UltraC hard carbon coating technology. This mono-dimensionally modulated (MDM) coating system, consisting of individual layers of the two materials differing in elastic modulus, has high strength, toughness and excellent resistance to erosion and wear.



Applications

- Ejector pins
- Cores and sleeves
- Slides
- Thread cores
- Blow molds
- Aluminum metal forming tools and dies
- Cavity surfaces
- Wear plates

Features

- Extremely wear resistant
- Super hard
- Ultra low friction
- Corrosion resistant
- Eliminates the formation of macro and submicroscopic wear debris
- Highly conformal to surface features
- Thickness of 1-50 µm
- Deposited at low temperature
- Can be deposited on most substrates

Specifications

| | | ULTRAC DIAMOND | ULTRAC-HT |
|--------------------------|---------------|---|--|
| Substrate: | Compatibility | Metals, ceramics (AlN, Al ₂ O ₃ , quartz, YSZ, Si, graphite, etc.), many polymers and anodized metals | |
| | Size | Up to 91 cm (36") | Up to 91 cm (36") |
| Structure: | | Dense, amorphous, micro-conformal DLC | Dense, amorphous, mono-dimensionally modulated (MDM), multilayered |
| Temperature: | Deposition | <150°C (302°F) | <150°C (302°F) |
| | Use | 400°C (752°F) | -50 to 400°C (-58 to 752°F) |
| Coating thickness: | | 1-10 µm | 1-50 µm |
| Electrical resistivity: | | 10 ⁵ -10 ⁷ Ω-cm | 10 ⁸ Ω-cm |
| Coefficient of friction: | | 0.04-0.08 | 0.04-0.08 |
| Hardness: | | 2000 – 4000 DPHN | 2000 DPHN |
| Wear resistance: | | Excellent | Excellent |
| Corrosion resistance: | | Resistant to most acids and alkalis, including HF environments | |



For More Information

To learn more about how Entegris' high-purity specialty coatings help customers enhance yields, improve productivity and meet future technological needs, call Entegris at +1 781-359-3700.

To review Entegris' specialty coatings offering, visit Entegris' Web site at www.entegrisspecialtycoatings.com.

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