Diamor® is a superhard, amorphous carbon film, which is deposited using laser controlled pulsed arc technology.

This coating is the hardest and most wear resistant variant of diamond-like carbon films. The material is purely composed of carbon atoms of which a large fraction is forming tough tetrahedrally oriented diamond sp³ bonds. The coating is smooth, hard and dense. Its properties can be engineered to meet the demands of specific applications. For example, in addition to hardness and wear resistance, properties such as hydrophobicity can be achieved by doping the film.

Diamor® proves beneficial to numerous industrial applications where low friction, wear resistance and corrosion protection are essential such as cutting and forming of metals.

Diamor® is deposited at room temperature, which is important when coating temperature sensitive materials.

Diamor® is biocompatible and suitable for applications requiring environmentally safe surfaces such as food, beverage, pharmaceutical packaging, medical etc.
FEATURES

- Extraordinary hardness exceeding 60 GPa, compared to other conventional coatings such as TiN (20 – 25 GPa)
- High stiffness
- Extreme wear resistance
- Low residual stress
- Superb adhesion to the substrate
- Low chemical wear due to inertness of carbon material
- Low coefficient of friction, therefore excellent for sliding and rolling components in contact situations. The need for lubricants and coolants is greatly reduced or even eliminated
- Possible thicknesses range from nanometers to tens of microns
- Low temperature deposition process, which allows lightweight and temperature sensitive materials such as plastics, polymers and alloys to be coated with Diamor®
- Carbon is a biocompatible material and therefore suitable for applications which demand environmentally friendly materials

APPLICATIONS AND ADVANTAGES

Tools

- Enables dry cutting and forming
- Increases tool life
- Offers time and cost savings on lubricants and downtime
- Shortens machine time for cutting and forming operations

Machine components

- Increases life due to excellent sliding properties of Diamor®
- Improved sliding behavior, wear and corrosion resistance of highly stressed surfaces of machine parts. This includes those made of a variety of materials such as steel, ceramic, plastics, aluminum alloys etc.

Packaging

- Environmentally friendly material, which does not react with food or beverage products
- Reduction or elimination of lubricants

Automotive

- Application of Diamor® allows the use of lightweight materials such as plastics and aluminum
- Reduces friction and wear of powertrain parts enabling greater fuel mileage and longer engine life

Data Storage

- Ensures a protective, scratch resistant coating yet measures only a few nanometers

Medical devices and implants

- Thanks to its properties of wear resistance and biocompatibility, Diamor® can enhance the performance and lifetime of biomedical products such as implantable devices and surgical instruments.

HOW TO ACQUIRE THE TECHNOLOGY TO DEPOSIT DIAMOR®

The Laser-Arc® technology is conveniently available as a modular system. The technology can be retrofitted to an existing batch coater. The Laser-Arc® module is scaleable in length to accommodate common chamber sizes enabling Diamor® deposition without investing in a completely new system.

It is possible to purchase the Laser-Arc® Module to integrate it into a conventional coating system from Fraunhofer CCL in the U.S. We will work with you to develop and implement the system and to optimize your coatings if required.