

# MEDICAL

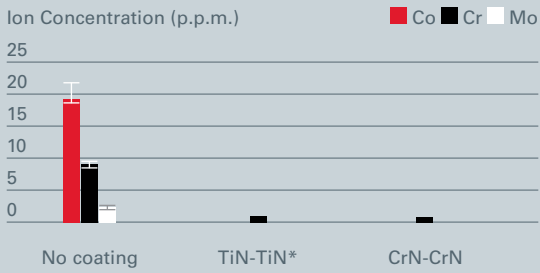


**IHI** GROUP

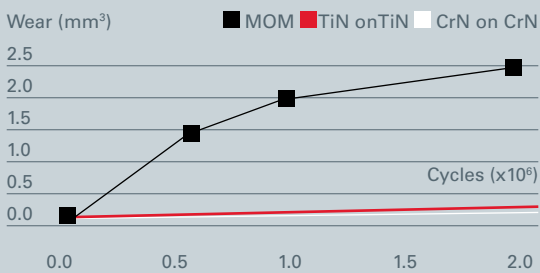
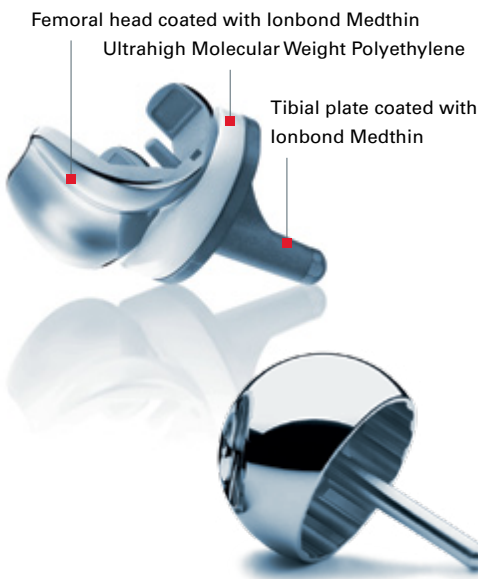
THE SURFACE ENGINEERS™

**ionbond**

## Ionbond Coatings for Medical Implants...



Corrosion Resistance



Wear Resistance

### Low wear anti-allergy solutions

There are two primary types of artificial joint designs, those that use polyethylene separators and those that employ metal-on-metal designs. In both cases Medthin™ coatings significantly improve the performance of these systems.

### Polyethylene-based Designs

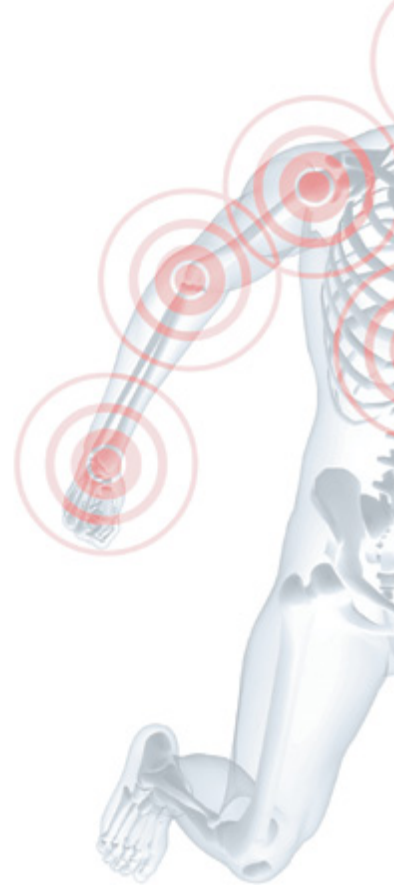
The established design of articulating systems experiencing heavy loads, as for example in the case of a full knee replacement, is to use a polyethylene separator to avoid metal-on-metal (MOM) contact. Here Ionbond nanoscale coatings are essential in three ways:

- Prevents corrosion caused by contact with body fluids
- Minimizes the creation of polyethylene wear debris
- Reduction of the metallic ion concentration by a factor of 1000x over uncoated implants

### Metal-on-Metal Designs

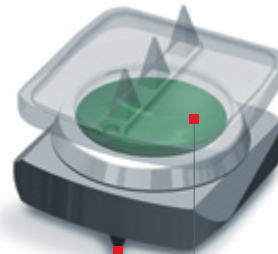
In some systems metal-on-metal contact is the preferred solution. These ball-socket type of joints are common in hips, wrists, ankles, and fingers. Ionbond over the last 15 years has developed special coatings for these ball-socket systems. With the loads bearing directly on the metallic joints the wear resistance in such systems is of primary importance. Medthin™ coatings provide:

- Reduced wear by a factor of 10 over uncoated joints
- Low friction coefficients of less than 0.2
- Consistently high film cohesion





## ...in the Most Demanding Applications



Rough surface prepared for osseointegration

Tribological solutions  
PVD/PACVD thin films

### Tribology

#### Ionbond's Tribological PVD/PACVD films

Spinal discs can be coated with our industry-leading Medthin™ 43 ADLC (Diamolith) that provides:

- ▶ Hydrophobic surfaces
- ▶ Higher contact angle when compared with other thin films such as PVD nitrides
- ▶ High hardness
- ▶ Low friction coefficient
- ▶ Approved for low load applications (<300 N)



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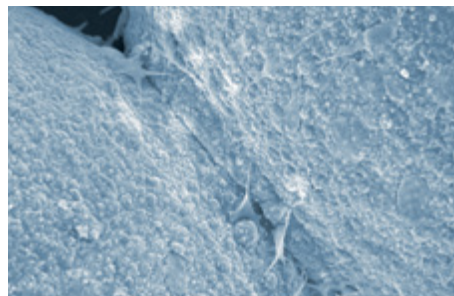
Poly-Ether-Ether-Ketone

### Cell attachment

**Poly-Ether-Ether-Ketone (PEEK) substrates coated with thick PVD Medthin™ 65 Ti for cell attachment (Hydrophilic surfaces – low contact angle):**

Ionbond recently developed a unique industrial scale technique for application of Medthin™ 65Ti onto implants made of PEEK and Carbon Fiber re-inforced PEEK. Ionbond «Metal on PEEK» coating has the following properties:

- ▶ Adhesion >20 MPa.
- ▶ Coating thickness up to 20µm.
- ▶ Coating possible on smooth plastic injected molded surfaces as well as on blasted surfaces
- ▶ Medthin™ 65Ti is a coating suitable for cell attachment



Cell attachment to Medthin™ 65Ti



# Ionbond Coatings for Medical Instruments

## Anti-reflection

**Ionbond Nanocrystalline anti-reflection coatings for surgical instruments:**

- ▶ Nanocrystalline coating structure of Medthin™ 20 coatings allow long life time through improved corrosion resistance
- ▶ Light reflection reduced by 70%
- ▶ Deposition temperature below 200 °C
- ▶ PVD-process preserves properties of thin instruments tips

**Ionbond has extended capacity for coating large volumes at our medical device coating locations worldwide.**



## Thread coating

**Ionbond tailored coatings for screw and spindle systems:**

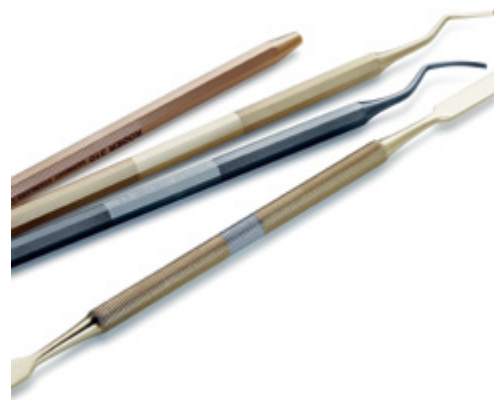
- ▶ Reduction of Friction
- ▶ Reduction of Galling



## Color-coding

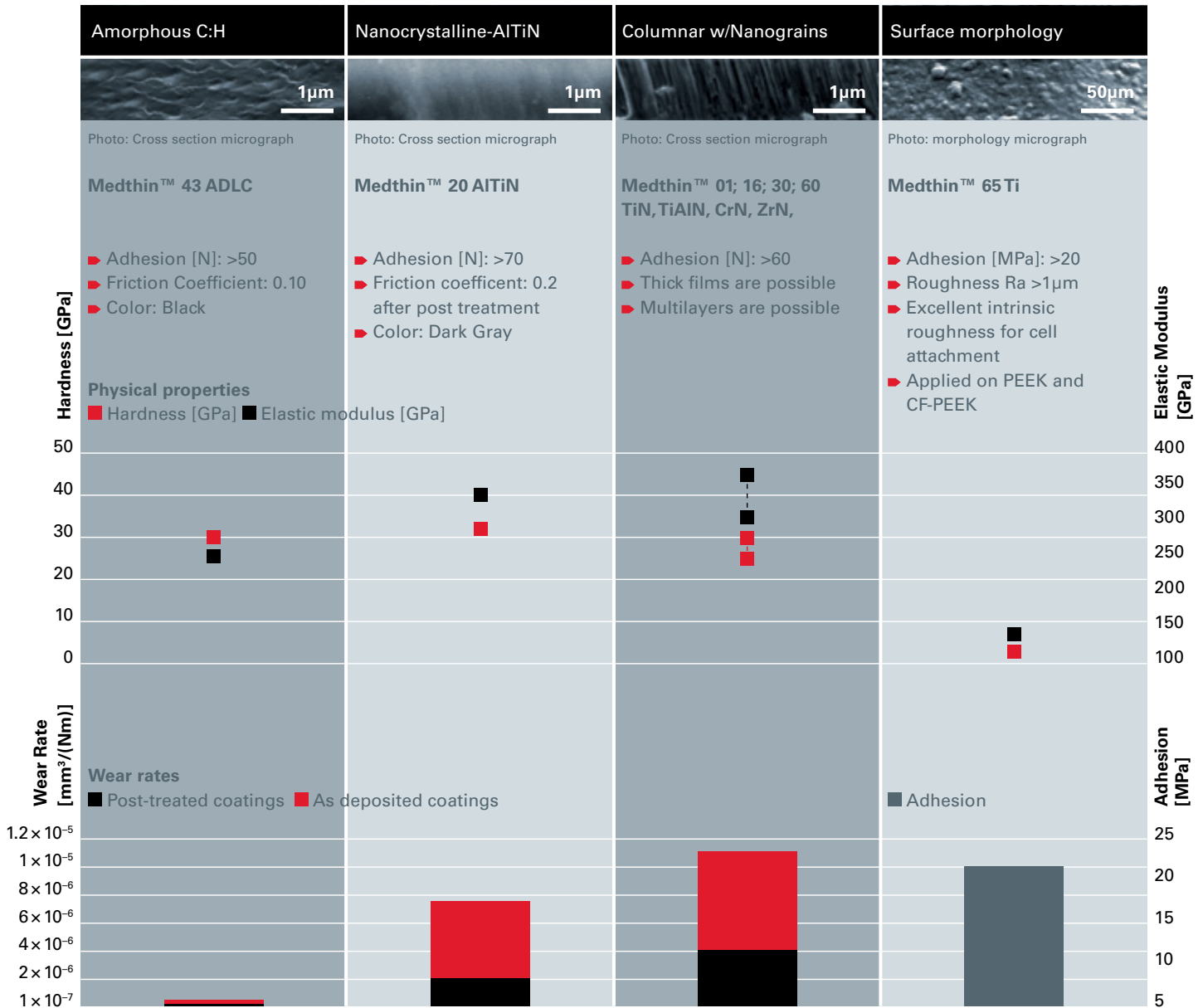
**Instruments made from stainless steel and CrCoMo can be color coded.**

- ▶ Excellent chemical inertness
- ▶ Amorphous or dense nanostructured thin films
- ▶ High resistance to sterilization processes



You make it first, we make it last

## The Medthin™ Family of Biocompatible Coatings



For a complete list of coatings see [www.ionbond.com](http://www.ionbond.com)



# Competence and Innovation – Worldwide

Ionbond is a leader in surface enhancement technology and provides advanced coating solutions featuring a broad range of hard, low friction, wear resistant coatings based on PVD, PACVD and CVD technologies for a wide range of applications. It has a global presence with coating centers in strategic locations across Europe, Asia, and North America and has one of the largest coating networks in the world.

Ionbond is part of the IHI group, a Japanese industrial group with significant R&D resources that operates through multiple business fields including: Energy and Resources, Social Infrastructure, Industrial Machinery and Aero Engines.



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See our website for a full list of all coating centers and local equipment sales offices. [www.ionbond.com](http://www.ionbond.com)

