

Coating and Surface Treatment Services (Orthopedic)

Service		Brand name	Thickness	Roughness (R _a)	Porosity	Adhesive strength	Fatigue strength	Ca/P ratio	Hardness	Key features
PVD * coatings	TiN Golden yellow	N/A	0.5-7 µm	≤ 0.05 µm on polished surface	N/A	at least HF 1 (DIN EN ISO 26443)	No impact	N/A	~2,300 HV	<ul style="list-style-type: none"> Minimizing wear Reduction of ion release Increase of wet-tability Aesthetic appearance Antireflex properties (not applicable to all PVD coatings)
	TiNbN Brass yellow	N/A	0.5-6 µm	≤ 0.05 µm on polished surface	N/A	at least HF 1 (DIN EN ISO 26443)	No impact	N/A	~2,500 HV	
	ZrN Light yellow	N/A	0.5-6 µm	≤ 0.05 µm on polished surface	N/A	at least HF 1 (DIN EN ISO 26443)	No impact	N/A	~2,500 HV	
	TiAlN Gray black	N/A	0,5-6 µm	≤ 0.05 µm on polished surface	N/A	at least HF 1 (DIN EN ISO 26443)	No impact	N/A	~2,700 HV	
	CrN Metallic silver	N/A	0.5-6 µm	≤ 0.05 µm on polished surface	N/A	at least HF 1 (DIN EN ISO 26443)	No impact	N/A	~2,000 HV	
	DLC Black	N/A	0.5-2.5 µm	≤ 0.05 µm on polished surface	N/A	HF 1-3 (DIN 4856)	No impact	N/A	~700 HV	
Porous Titanium ** coatings	TPS metal	N/A	30-800 µm	3.5-80 µm	20-40 %	≥ 22 MPa	Max loss ~15 %	N/A	N/A	Enhancement of primary and secondary implant fixation
	TPS peek	N/A	50-250 µm	20-40 µm	20-60 %	≥ 22 MPa	Flexural modulus (static): Natural 3.7 GPa Coated 3.8±0.2 GPa	N/A	N/A	
	TPS ceramic	N/A	50-300 µm	30-60 µm	20-40 %	≥ 22 MPa	No impact	N/A	N/A	
Calcium- Phosphate ** coatings	Electro-chemical deposition	BONIT®	20±10 µm	N/A	60 %	≥ 15 MPa	No impact	1.1±0.1	N/A	Enhancement of secondary implant fixation (rapid bone ingrowth)
	Sprayed HA	N/A	20-200 µm	5-13 µm	10-20 %	≥ 15 MPa	Max loss ~15 %	1.61-1.76	N/A	
Titanium Anodizing	Type II	DOTIZE®	1-2 µm	≤ 3 µm (R _z)	N/A	≥ 22 MPa	~10 % increase	N/A	~25 % increase	Increase in fatigue strength, reduction of fretting corrosion, suppression of bone adhesion
	Type III (Coloring)	N/A	20-200 nm	≤ 0.05 µm on polished surface	N/A	≥ 22 MPa	No impact	N/A	N/A	Improvement of implant and instrumentation identification and handling

* Additional PVD coatings and **combined porous titanium and calcium-phosphate coatings upon customer request.
The indicated values reflect the range of capabilities. The coating specification is defined in accordance with the customer's requirements.