Key Implant Design Features

Brandon Yeager, DMD Jacqueline Chow, DDS Abdullah Aldosari, BDS Fengyuan Zheng, DDS, PhD
The Ohio State University Advanced Prosthodontics

Manufacturer	Nobel Biocare™				Southern Implants	Zimmer Biomet			straumann			Dentsply + Astratech Dental	BioHorizons
Product Line	Branemark MK III/IV& III Groovy	**CONICAL CONNECTION** Replace	Parallel	Active	Replace Select TC	Inverta	TSV	Trabecular Model	OsseoTite	NanoTite	T3	Tissue Level	Bone Level	BLX	Osseospeed EV	Tapered Family
Metal and Geometry	Parallel or Tapered Cold worked CP Ti grade I Thread pitch: 0.5-0.8mm 3.5, 4.1, 5.1mm diameter Narrow, regular and wide platform	Tapered Cold worked CP Ti grade I Thread pitch: 0.64-0.75mm 3.5, 4.3, or 5mm diameter Narrow and regular platform	Straight Cold worked CP Ti grade I Thread pitch: 0.6-0.8mm 3.75, 4.3, 5.0, 5.5mm diameter Narrow, regular and wide platform	Tapered Cold worked CP Ti grade I Thread pitch: 1.0-1.2mm 3.0, 3.75, 4.3, 5.0, 5.5mm diameter Narrow, regular and wide platform	Straight Cold worked CP Ti grade I Thread pitch: 0.64-0.79mm 3.5, 4.3, 5.0, 6.0mm diameter Narrow, regular and wide platform	Body-Shift Implant Design CP Ti grade IV Thread pitch: variable 3.5, 3.6, 4.0, 4,2, 4.5, 5.0mm diameter	Tapered Screw Vent Ti-6Al-4V Thread pitch: 0.6mm 3.7, 4.1, 4.7, 6.0mm diameter	Tapered Ti-6Al-4V Thread pitch: 0.6mm 3.7, 4.1, 4.7, 6.0mm diameter	Tapered or Straight Cold worked CP Ti grade I/II—but meets grade III strength Thread pitch: 0.6-0.9 mm 3.25, 3.75, 4.0, 5.0, 6.0mm diameter	Tapered or Straight Cold worked CP Ti grade I/II—but meets grade III strength Thread pitch: 0.6-0.9 mm 3.25, 3.75, 4.0, 5.0, 6.0mm diameter	Tapered or Straight Cold worked CP Ti grade I/II—but meets grade III strength Thread pitch: 0.6-0.9 mm 3.25, 4.0, 5.0, 6.0mm diameter	Straight CP Ti grade IV Thread pitch: 1mm for 3.3mm, 1.25mm for others 2.9, 3.3, 4.1, 4.8mm diameter	Straight or Tapered CP Ti grade IV Thread pitch: 0.8mm 2.9, 3.3, 4.1, 4.8mm diameter	Tapered with aggressive threads TiZr Thread pitch: 0.85-1.4mm 3.75, 4.5, 5.5, 6.5mm diameter	Straight or Tapered and Profile platform CP Ti grade IV Thread pitch: 0.66mm 3.0, 3.6, 4.2, 4.8 , 5.4mm diameter	Tapered, Bone or Tissue level Short and wide diameter Ti-6Al-4V ELI Alloy Variable Thread 3.0, 3.8, 4.6, 5.8mm diameter
Surface Texture	Anonic Oxidation TiUnite Moderately Rough (Sa: 1-2 um)	Anonic Oxidation TiUnite/TiUltra Moderately Rough (Sa: 1-2 um)	Anonic Oxidation TiUnite/TiUltra Moderately Rough (Sa: 1-2 um)	Anonic Oxidation TiUnite/TiUltra Moderately Rough (Sa: 1-2 um)	Anonic Oxidation TiUnite Moderately Rough (Sa: 1-2 um)	Alumina Sand Blasted Moderately Rough (Sa: 1.43 um)	Microtextured MTX Minimally Rough (Sa: 0.78 um)	Microtextured with tantalum based Trabecular midsection MTX Minimally Rough (Sa: 0.78 um)	Dual Acid Etched Smooth (Sa: 0.31 um)	Dual Acid Etched + Calcium Phosphate Discrete Crystalline Deposition Minimally Rough (Sa: 0.65 um)	Dual Acid Etched + Calcium Phosphate Discrete Crystalline Deposition Moderately Rough (Sa: 1.40 um)	Sand blasted and Acid etched SLA Moderately Rough (Sa: 1.50 um)	Sand blasted and Acid etched SLA Moderately Rough (Sa: 1.50 um)	Sand blasted and Acid etched SLA Moderately Rough (Sa: 1.50 um)	Titanium oxide blasted and Acid etched Moderately Rough (Sa: 1.52 um)	Laser ablation LaserLok Moderately Rough (Sa: 1.34 um)
Collar	Machined or Textured Straight or Tapered	Machined or Textured beveled rim Straight threaded textured collar or partially machined	Machined or Textured beveled rim Straight threaded textured collar	Straight, threaded, and textured	Machined, partially machined, or threaded and textured Straight	Machined Straight (external) or Beveled (deep conical) rim	Straight or beveled rim -- Machined or Textured Straight and Threaded or Non collar	Machined or Textured beveled rim Threaded collar	Full acid etch surface with Certain Prevail Full machined or hybrid machined collar Straight, Tapered or Extended Platform		Machined straight or beveled rim Straight collar	Machined Straight or Tapered collar	Machined beveled rim Straight and Textured collar	Machined beveled rim Straight and Microthreaded collar	Machined beveled rim Straight or Tapered Microthreaded collar	Machined or textured beveled rim Straight
Connection	External hexagonal Allows for vertical passivity stop	Internal conical hexagonal Allows for vertical passivity stop with non-engaging abutment No vertical passivity stop with engaging abutment			Internal trilobe Allows for vertical passivity stop	External hexagonal and internal conical Allows for vertical passivity stop	Internal Morse Taper with Internal hex Friction fit No vertical passivity stop	Internal Morse Taper with Internal hex Friction fit No vertical passivity stop	Internal (Certain) or External Internal "Certain" has click when seating 6/12 internal connection, 30° abutment rotation External allows for vertical passivity stop Internal allows for vertical passivity stop provided by the abutment			Internal Morse Taper One-stage SynOcta: 8° octagonal cone or CrossFit: 15° conical cylinder No vertical passivity stop	Internal Morse Taper CrossFit: 15° conical cylinder No vertical passivity stop	Internal Morse Taper TorcFit: 7° conical cylinder, six positions No vertical passivity stop, 22.5 prosthetic shoulder with "Flat Top" portion	Internal conical connection with one-position, six-position, or index free No vertical passivity stop	45 degree conical internal hex connection No vertical passivity stop
Abutment Options	-Esthetic, Esthetic 15°, Procera Esthetic -Snappy Abutment 4.0° and 5.5° -Universal Base -Multi-unit Abutment (Straight, 17°, 30°) -Locator and Ball -GoldAdapt Engaging and Non-Engaging -Gold Coping Bar	3.0 Platform Narrow Platform Regular Platform Wide Platform Single Unit: Screw retained: Universal base, On1 Universal engaging Cement retained: Esthetic 15°, On1 Esthetic, Narrow Profile Multiple-unit: Multi-unit Abutment plus Cement retained: Esthetic and Esthetic 15°, On1 Esthetic Procera customized single implant crowns, implant bridge restorations, fixed and fixed-removable bar overdenture restorations Edentulous: Multi-unit Abutment plus (Straight, 17°, 30°), Locator R-Tx, Gold Coping Bar GoldAdapt Engaging and Non-Engaging			Narrow Platform Regular Platform Wide Platform -Esthetic, Esthetic 15°, Procera Esthetic -Snappy Abutment 4.0° and 5.5° -Universal Base -Narrow Profile -Multi-unit Abutment (Straight, 17°, 30°) -Locator and Ball -GoldAdapt Engaging and Non-Engaging -Gold Coping Bar	Single unit: - Gold, Ti, PEEK engaging and non-engaging - Scannable abutments Multiple unit: - 0°, 20°, 30° abutments - Gold, Ti, and PEEK abutment Passive abutment system - Component kit for accurate cementing Ti bases to final prosthesis	3.5mm Platform, 4.5mm Platform, 5.7mm Platform Single Unit: -Hex-Lock and Hex-Lock Short Abutments -Angled Abutment 20° for 6 and 20 positions -Gold Abutment Engaging Multiple Unit: -Tapered Abutment (Straight, 15°, 30°) -Gold Abutment Non-Engaging -Tapered Abutment Gold coping Edentulous: -Tapered Abutment (Straight, 15°, 30°) -Tapered Abutment Bar Coping, -Locator, Ball		3.4 mm implant Diameter /4.1 mm platform, 4.1 mm implant diameter/ 5 mm platform. 5 mm implant diameter/ 6 mm platform. Non-Platform Switching 3.4 mm platform, 4.1 mm platform, 5 mm platform, 6mm platform Screw retained: - Low profile abutments : Straight (non-Hexed and hexed), Pre-angled (17° (hexed), 30°(hexed) - Minimum tissue height 1mm Cement retained : GingiHue Posts (straight and pre-angled 15°) Edentulous: - Locator			Narrow Neck CrossFit/Regular and Wide Neck synOcya -Cementable Straight, 15° and 20°, Solid -Variobase -Castable -CARES CADCAM: Zirconia and Titanium -Screw-retained -	Small, Narrow, and Regular CrossFit -CARES CADCAM: Zirconia and Titanium -Anatomic IPS emax Anatomic Straight and 15° -Cementable -Meso -Variobase -Castable -Multibase (Straight, 17°, 3°0) -Gold and Titanium abutment for bars	Regular or Wide Base -Anatomic Straight and 17 -Castable -Variobase -Multibase (Straight, 17°, 3°0)	3.0mm Platform 3.6mm Platform 4.2mm Platform 4.8mm Platform 5.4mm Platform -TiDesign Straight, 15° or 20° -ZirDesign Straight or 20° -CastDesign -Direct -Uni -Angled -SmartFix	3.0mm Platform 3.5mm Platform 4.5mm Platform 5.7mm Platform Tissue Level Abutments -Custom Cast Abutment -CAD/CAM -Esthetic (Straight, 15°, 20°, ceramic, 3in1) -Simple Solution -External -Screw Retained -Multiunit (Straight, 17°, 3°0) -Locator, Ball, OD secure
Screw Design	Unigrip Final Torque: 35Ncm	Unigrip Final Torque: 35Ncm	Unigrip Final Torque: 35Ncm	Unigrip Final Torque: 35Ncm (Active 3.0 15Ncm)	Unigrip Final Torque: 35Ncm	Unigrip/0.048" Hex Final Torque: 32-40Ncm (external hex) 15-20Ncm (conical)	0.050" (1.25mm) Hex Final Torque: 30Ncm	.050" (1.25mm) Hex Final Torque: 30Ncm	0.048" Hex Final Torque: 20Ncm			Titanium SCS Star Final Torque: 30Ncm	Titanium SCS Star Final Torque: 35Ncm	Titanium SCS Star Final Torque: 35Ncm	Titanium Alloy 0.050" Hex Final Torque: 25Ncm	Titanium Alloy .050" (1.25mm) Hex Final Torque: 30Ncm
Angled Screw Channel	No	Yes, up to 25 Zirconia abutment retained to Ti base Allows for 360° screw direction design			No	CoAxis: built in 12° angle correction	Yes, via Bella Tek Flex Abutments		No			Yes, up to 25° Cobalt-Chromium allow abutment Burnout copings allow fabrication of full cast gold, PFM, eMax or Zr Allows for some screw channel correction (+/- 45°)			Yes, up to 30° Ti or gold-shaded Ti abutment Screw is not removable after crown is cemented	Yes, up to 15° Ti base abutment