

Ceramic ball heads

BIOLOX®*forte*
BIOLOX®*delta*



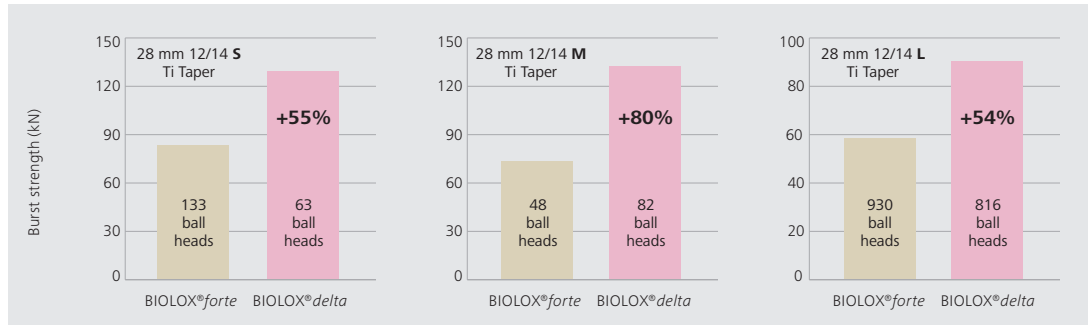
Facts & Figures	BIOLOX® <i>forte</i>	BIOLOX® <i>delta</i>
BIOLOX® ceramics	<ul style="list-style-type: none"> Market introduction 1994 3,63 million sold ball heads (2016) Over 2 decades of proven clinical history worldwide 	<ul style="list-style-type: none"> Leading ceramic technology in THA Market introduction 2003 4,99 million sold ball heads (2016) 14 years of proven clinical history worldwide^{3,4}
Material performance	<ul style="list-style-type: none"> Extremely hard, high fracture resistant and wear resistant aluminum oxide ceramic 	<ul style="list-style-type: none"> Extremely hard, very high fracture resistant and wear resistant composite ceramic material based on aluminum and zirconium oxide² Clearly demonstrates greater resistance to stripe wear phenomenon compared to BIOLOX®<i>forte</i>⁶ Higher in vivo wear resistance⁸ Less volumetric wear with BIOLOX®<i>delta</i> heads⁹

Features	BIOLOX® <i>forte</i>	BIOLOX® <i>delta</i>	
Bending Strength	650 MPa	1360 MPa	A higher bending strength equates to a higher burst strength
Toughness	3.5 MPa √m	5.9 MPa √m	High toughness contributes to lower wear and fracture rate
Scratch Resistance	10 N	20 N	High scratch resistance results in higher stripe wear resistance ⁷

Burst strength comparison BIOLOX®*forte* / BIOLOX®*delta*

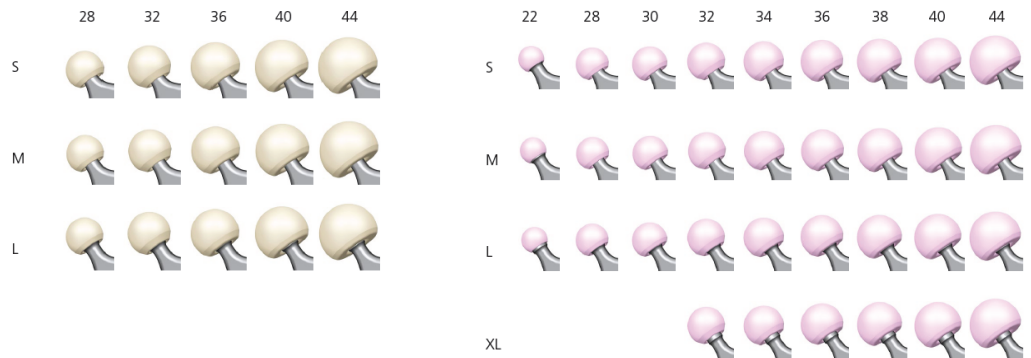
Depending on ball head size, BIOLOX®*delta* heads show a much higher burst strength that results in reduced fracture rate.

For 28 mm ball heads which generally have the lowest burst strength there is a burst strength increase from 54% to 80% for BIOLOX®*delta*.



Size range BIOLOX®*forte* / BIOLOX®*delta*

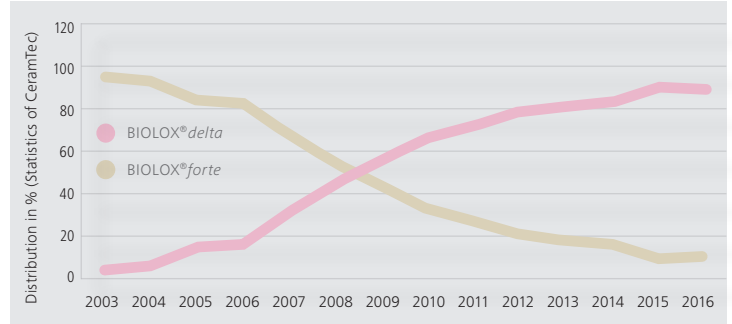
With BIOLOX®*delta* heads you have additional neck lengths and ball head sizes.



Facts & Figures: BIOLOX®forte / BIOLOX®delta

Ball heads: Distribution in % BIOLOX®forte / BIOLOX®delta

Based on CeramTec's current statistics, BIOLOX®delta ball heads are used in more than 85% of implantations. The trend is also confirmed by registries. AOANJRR Report 2016 shows that in 2015, 97.4% of ceramic femoral heads used were mixed ceramic.¹



Clinical complaints statistics of CeramTec

With BIOLOX®delta, fracture rate is one order of magnitude less than with BIOLOX®forte.

Ball heads	BIOLOX®forte	BIOLOX®delta
Components sold (total)	3.63 Mio	4.99 Mio
Post-operative clinical complaints	22 of 100.000	1 of 100.000
Fracture rate	0.022%	0.001%

BIOLOX®OPTION – First choice for hip revision⁵

- Significantly reduces the rate of wear related osteolysis following revision
- Revision option for a case in which the acetabular cup and a firmly fixed stem are to remain in situ
- Solution after the rare case of ceramic component fracture
- Option for neck length correction in primary surgery



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