

## OsseoSpeed™ – more bone more rapidly

OsseoSpeed™ was launched in the fall 2004 and is a further development of the moderately roughened (grit blasted with titanium dioxide particles) titanium surface TiOblast™. OsseoSpeed gains its additional surface characteristics via a chemical (fluoride) treatment and a slight topographic modification of the TiOblast surface<sup>1,2</sup>. Scientific documentation on the OsseoSpeed surface reports on an incorporation of a small amount of fluoride ions, a slight increase on the micrometer scale in surface roughness and the appearance of nanometer sized peaks<sup>3,4</sup>.

*In vitro* and animal experiments indicate that the OsseoSpeed surface leads to increased bone formation and stronger bone-to-implant bonding (measured by push out, removal torque, shear strength, histomorphometry, SEM)<sup>2,5-11</sup> at shorter healing times than TiOblast or machined Titanium surfaces<sup>2,12</sup>. The exact mechanisms for the faster osseointegration observed is not fully understood, but enhanced osteoblast differentiation<sup>3,5,13,14</sup> and thrombogenic properties of the fluoride treated surface is reported<sup>10,15</sup>. From the extensive OsseoSpeed program of clinical trials initiated on human patients, results show osseointegration and good functionality<sup>16-20</sup>. And, it has been shown that there is no dip in Implant Stability Quotient values, which is traditionally seen with implants<sup>19,20</sup> 2-4 weeks after installation. This is interpreted as continuous increase gain in osseointegration and stability. Predictable and maintained marginal bone levels are reported for the OsseoSpeed implant when applying early loading protocols<sup>17,18</sup>.

The feature OsseoSpeed is added to the design features of the Astra Tech implant system. Therefore, benefits from the extensively clinically documented implant system in terms of mechanical and biomechanical properties are *per se* applicable for the OsseoSpeed implant as well. OsseoSpeed is suitable for all implant patients. However, Astra Tech has received FDA clearance for stating that OsseoSpeed is especially indicated for use in soft bone applications where implants with other implant surface treatments may be less effective.

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# Scientific Review

*Documentation on OsseoSpeed™*

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*Page: 3/3*

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