

## 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>. Incorporation of small amounts of fluoride ions in the oxide layer, a slight increase on the micrometer scale in surface roughness and the appearance of a nanoscale topography have been reported for the OsseoSpeed surface<sup>3-8</sup>.

*In vitro* and animal experiments indicate that the OsseoSpeed surface leads to increased bone formation and stronger bone-to-implant bonding<sup>2,5,9-22</sup> at shorter healing times than TiOblast or machined titanium surfaces<sup>2,15,23</sup>. This has also been confirmed in a human histological study<sup>24</sup>. The mechanisms for the faster osseointegration have been thoroughly investigated with emphasizes on the molecular level. Enhanced osteoblast differentiation<sup>3,14,25-29</sup>, platelet activation and thrombogenic properties of the fluoride-treated surface have been reported<sup>26,30,31</sup>.

The OsseoSpeed surface characteristics and properties have been reviewed in numerous published articles revealing positive bone response<sup>32-35</sup>. Results from the extensive OsseoSpeed clinical study program show good functionality<sup>36-39</sup>, and predictable and maintained marginal bone levels with a mean marginal bone level reduction of 0.3 mm<sup>40-44</sup>. The maintained marginal bone levels are also confirmed in prospective studies with three and five year results<sup>41,42,44</sup>. There is no significant dip in Implant Stability Quotient values<sup>37,39</sup> traditionally seen at implants 2-6 weeks after installation. This is interpreted as a continuous gain in osseointegration and stability. Published data shows that the OsseoSpeed implant can be safely used with a range reported for survival rate from 94.5% to 100%, including the use of immediate loading protocol<sup>43,45</sup> even in the atrophic edentulous maxilla<sup>46,47</sup>, in sinus lifted maxillary posterior jaw sites<sup>37,48</sup>, immediate installation in extraction sockets<sup>36,45,49</sup> and implants placed in atrophied mandibles close to the nerve<sup>50</sup>.

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Reprints can be ordered from references marked with ID No.

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