Straumann[®] PURE Ceramic Implant





Strong and reliable Esthetic Clinically proven Metal-free Nowadays, patients are more esthetic and health conscious than ever before (Montero et al., 2014). Healthy-looking oral soft tissues and bright teeth are considered a prerequisite for a beautiful smile and self-esteem, adding directly to health-related quality of life (Bennadi and Reddy, 2013; Klages et al., 2004; Pithon et al., 2014). The Straumann[®] PURE Ceramic Implant is ivory-colored like a natural tooth root and provides a highly esthetic and metal-free alternative to implants made out of titanium.

DID YOU KNOW?

Zirconium ≠ Zircon ≠ Zirconia

- · Zirconium is a grayish white metal
- Zircon is a mineral
- Zirconia (Zirconium dioxide, ZrO₂) is a ceramic powder

stabilized Zirconia.

STRONG AND RELIABLE

Ceramic components have been used successfully in orthopedic surgery for over 35 years (Bhandari et al., 2011) and are also valued by the aerospace industry for their enhanced toughness and dimensional stability even in high temperatures. However, the stability of ceramic dental implants has long been questioned. To overcome these objections, Straumann[®] has established an innovative manufacturing process followed by a rigorous 100% proof test in which every single Straumann[®] PURE Ceramic Implant is tested mechanically before leaving the production site. Here, forces that exceed the maximum human bite capability are applied, and only implants that

pass the test are delivered to the dentist. The outstanding quality becomes evident when comparing the Straumann[®] PURE Ceramic Implants with other commercially available ceramic implants. The Straumann® PURE Ceramic Implant (Ø4.1mm and \emptyset 3.3 mm) shows significantly higher resistance to forced rupture (Fig. 1). Forced rupture is the most frequent cause of ceramic implant failure. The reliability of the Straumann[®] PURE Ceramic Implant has been clinically verified in a multicenter study, where zero implant fractures were reported during a follow-up period of 24 months (Gahlert et al., 2015).





Z-Systems Z-Look3 Evo Rapide 3.6mm/4.0mm Straumann PURE Ceramic Implant ND 3.3mm Implant RD 4.1mm

Fig. 1: Static fracture strength tests according to ISO14801 show that Straumann® PURE Ceramic Implants have significantly higher resistance to forced rupture than competitor implants in reduced and regular diameter (data on file).

DID YOU KNOW?

- FATIGUE STRENGTH: is the long-term capability of the implant to withstand nor-

ESTHETIC

Most patients perceive a treatment as successful when they are satisfied with the overall dentofacial appearance after treatment. Unlike other white ceramics, Straumann® PURE Ceramic Implants are ivory-colored, which most closely resembles natural tooth roots - an advantage in patients with a thinner mucosal biotype or a high lip line smile (Bidra and Rungruanganunt, 2013; Gahlert et al., 2015; Jung et al., 2008).

Favorable soft tissue formation

Zirconia shows a favorable formation of the epithelial attachments, as well as lower bacterial accumulation compared to titanium surfaces (Degidi et al., 2006; Institut Straumann AG, 2014b; Welander et al., 2008). This is an important observation since bacterial adhesion to implant surfaces can lead to bone loss in the tissues surrounding the implants (Lindquist et al., 1996). Studies were able to show lesser gingival recession after placement of zirconia implants (Tete et al., 2009), as well as excellent esthetic outcomes and papilla formation around the implant after one year follow-up (Fig. 2) (Gahlert et al., 2015; Kniha, 2014).

DID YOU KNOW?

Zirconia shows favorable formation of the epithelial attachments, as well as lower plaque adhesion compared to titanium surfaces.





Fig. 2: In this 29-year-old female patient, a vertical fracture of tooth 21 led to marginal inflammation, which was particularly noticeable due to the high smile line (A). Situation after implant at loading at 1 year (B). The use of a one-piece Straumann[®] PURE Ceramic Implant satisfies not only treatment success but also the desire of the patient for a completely metal-free solution in an otherwise caries-free set of teeth. Courtesy of Dr. Michael Gahlert and Prof. Heinz Kniha.

CLINICALLY PROVEN

Surface modifications play an important role in the osseointegration process and thereby influence implant strength as well as aging resistance (Buser et al., 1991; Shalabi et al., 2006). The surface of the Straumann[®] PURE ceramic implant, Straumann[®] ZLA®, features a topography characterized by macro- and micro-roughness similar to the proven Straumann[®] SLA[®] surface (Fig. 3) (Bormann et al., 2012; Gahlert et al., 2012; Institut Straumann AG, 2011). With over 20 years of experience and more than 100 clinical and preclinical studies, the Straumann SLA[®] surface is one of the most successful and best clinically documented surfaces in dental implantology, with proven osseointegration properties (Buser et al., 2012; Fischer and Stenberg, 2011; Roccuzzo et al., 2008). In preclinical studies, the ZLA® surface demonstrated similar healing patterns, healing times and osseointegration in terms of peri-implant bone density and bone-toimplant contact (BIC) as seen for the SLA® surface (Gahlert et al., 2012; Gahlert et al., 2010). Other studies observed even higher BIC with ceramic implants compared to titanium (Dubruille et al., 1999; Schultze-Mosgau et al., 2000). A recent multicenter clinical trial reported survival and success rates of 97.6% for the Straumann® PURE Ceramic Implant after one year (Gahlert et al., 2015), which is a value within the range of reported one-year survival and success rates for titanium or titanium alloy implants (den Hartog L. et al., 2008).



97.6% implant survival and success rate



Fig. 3: The ZLA® surface combines the micro- and macro-roughness of the SLA® surface with reliable osseointegrative properties. The torque-out value of the Straumann® PURE Ceramic Implant is equivalent to SLA® implants from titanium.

DID YOU KNOW?

- The new Straumann[®] PURE Ceramic Implant is the result of
- > 9 years of research and development
- with an investment of over 100,000 man hours

METAL-FREE

The prevalence of allergic diseases has increased worldwide in recent years (Lotvall et al., 2012), with a growing number of patients suffering from multiple allergies (Simpson et al., 2008). Although hypersensitization to titanium is quite uncommon (Sicilia et al., 2008), many people are generally aware of allergic reactions to metals such as nickel and cobalt (Thyssen and Menne, 2010). In this light, health-conscious patients or patients with susceptibility to allergic reactions may request a metal-free alternative to titanium implants. Straumann® PURE Ceramic Implants are made out of zirconia (yttria-stabilized tetragonal zirconia polycrystal, Y-TZP), which is biocompatible and guaranteed 100% metal-free.

DID YOU KNOW?

A recent patient survey in Germany and Switzerland involving more than 250 participants revealed that:

 Patients would prefer a light-colored ceramic implant over a grayish colored titanium implant, even if it involves higher treatment costs (Institut Straumann AG, 2014c). Bennadi D, Reddy CV (2013). J Int Soc Prev Community Dent 3(1):1-6.

Bhandari M, Lewis PM, Waddell JP (2011). Evidence-Based Orthopedics . Oxford, UK: Wiley-Blackwell.

Bidra AS, Rungruanganunt P (2013). J Esthet Restor Dent 25(3):159-176.

Bormann KH, Gellrich NC, Kniha H, Dard M, Wieland M, Gahlert M (2012). Clin Oral Implants Res 23(10):1210-1216.

Buser D, Janner SF, Wittneben JG, Bragger U, Ramseier CA, Salvi GE (2012). Clin Implant Dent Relat Res 14(6):839-851.

Buser D, Schenk RK, Steinemann S, Fiorellini JP, Fox CH, Stich H (1991). J Biomed Mater Res 25(7):889-902.

Degidi M, Artese L, Scarano A, Perrotti V, Gehrke P, Piattelli A (2006). J Periodontol 77(1):73-80.

den Hartog L., Slater JJ, Vissink A, Meijer HJ, Raghoebar GM (2008). J Clin Periodontol 35(12):1073-1086.

Dubruille JH, Viguier E, Le NG, Dubruille MT, Auriol M, Le CY (1999). Int J Oral Maxillofac Implants 14(2):271-277.

Fischer K, Stenberg T (2012). Clin Implant Dent Relat Res.;14(6):808-15.

Gahlert M, Kniha H, Weingart D, Schild S, Gellrich NC, Bormann KH (2015). submitted.

Gahlert M, Roehling S, Sprecher CM, Kniha H, Milz S, Bormann K (2012). Clin Oral Implants Res 23(3):281-286.

Gahlert M, Rohling S, Wieland M, Eichhorn S, Kuchenhoff H, Kniha H (2010). Clin Implant Dent Relat Res 12(4):297-305.

Institut Straumann AG (2011). Preclinical evaluation report. Data on file.

Institut Straumann AG (2014b). Data on File.

Institut Straumann AG (2014c). Patient Survey. Data on File.

Jung RE, Holderegger C, Sailer I, Khraisat A, Suter A, Hammerle CH (2008). Int J Periodontics Restorative Dent 28(4):357-365. Klages U, Bruckner A, Zentner A (2004). Eur J Orthod 26(5):507-514.

Kniha K (2014). ITI World Symposium, Geneva.

Lindquist LW, Carlsson GE, Jemt T (1996). Clin Oral Implants Res 7(4):329-336.

Lotvall J, et al. (2012). Allergy 67(4):449-450.

Montero J, Gomez-Polo C, Santos JA, Portillo M, Lorenzo MC, Albaladejo A (2014). J Oral Rehabil 41(10):768-782.

Pithon MM, Nascimento CC, Barbosa GC, Coqueiro RS (2014). Am J Orthod Dentofacial Orthop 146(4):423-429.

Roccuzzo M, Aglietta M, Bunino M, Bonino L (2008). Clin Oral Implants Res 19(2):148-152.

Schultze-Mosgau S, Schliephake H, Radespiel-Troger M, Neukam FW (2000). Oral Surg Oral Med Oral Pathol Oral Radiol Endod 89(1):91-98.

Shalabi MM, Wolke JG, Jansen JA (2006). Clin Oral Implants Res 17(2):172-178.

Sicilia A, Cuesta S, Coma G, Arregui I, Guisasola C, Ruiz E et al. (2008). Clin Oral Implants Res 19(8):823-835.

Simpson CR, Newton J, Hippisley-Cox J, Sheikh A (2008). J R Soc Med 101(11):558-563.

Tete S, Mastrangelo F, Bianchi A, Zizzari V, Scarano A (2009). Int J Oral Maxillofac Implants 24(1):52-58.

Thyssen JP, Menne T (2010). Chem Res Toxicol 23(2):309-318.

Welander M, Abrahamsson I, Berglundh T (2008). Clin Oral Implants Res 19(7):635-641.

International Headquarters

Institut Straumann AG Peter Merian-Weg 12 CH-4002 Basel, Switzerland Phone +41 (0)61 965 11 11 Fax +41 (0)61 965 11 01 www.straumann.com

© Institut Straumann AG, 2015. All rights reserved.

Straumann[®] and/or other trademarks and logos from Straumann[®] mentioned herein are the trademarks or registered trademarks of Straumann Holding AG and/or its affiliates. All rights reserved.