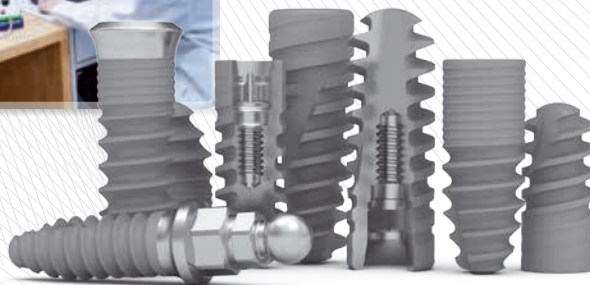


ICX

The FAIR Implant-System

DYNAMIC FATIGUE TESTS according to DIN EN ISO 14801



**Secure use of „state of the art“ technologies
the high quality standard of the ICX-PREMIUM implants.**

DYNAMIC FATIGUE TESTS

according to DIN EN ISO 14801

During their lifetime, dental implants are exposed to a multitude of different forces. These are essentially the repetitive pressure load during mastication. Ideally, the patient will use his implants 20, 30 years or more and during this time, massive forces will act on the implants through numerous chewing movements while grinding food.

Although the in-vivo load values for chewing forces and the numbers of chewing cycles found in literature vary, mean occlusal forces from 222 N in the front teeth area to 470 N in the posterior teeth area of young male adults can be assumed depending on different factors such as individual anatomy of the denture, age, gender, dentition, mastication muscles and physique [Eichner K. 1963, Blamphin et al. 1990, A. Balzer et al. 2002 and Duyck J. 2000].



To analyse the material and construction behavior of the implants towards these forces and to determine the maximum load, the mastication cycles are simulated. The international standard DIN EN ISO 14801 describes materials and methods for the conduction of standardized dynamic fatigue tests for endosseous dental implants.

For the ICX-Premium implant, dynamic fatigue tests according to DIN EN ISO 14801 were conducted in internal experiments. Implants with shoulder widths of 3.45 mm, 3.75 mm, 4.1 mm and 4.8 mm were tested with straight abutments respectively. In a dynamic fatigue test conducted by the Fraunhofer Institute for Mechanics of Materials (Dipl. phys. Roland Schäfer, Freiburg 2009) according to DIN EN ISO 14801 with an ICX-Premium implant (shoulder width 4.1) and an ICX-Premium abutment (15° angled), fatigue strength of 800 N was found. For better comparability between literature data and our test results only tests conducted with straight abutments were considered, see figure 1. Original data are held by medentis medical GmbH.

DYNAMIC FATIGUE TESTS

according to DIN EN ISO 14801

fatigue measurements on dental implants according to ISO 14801

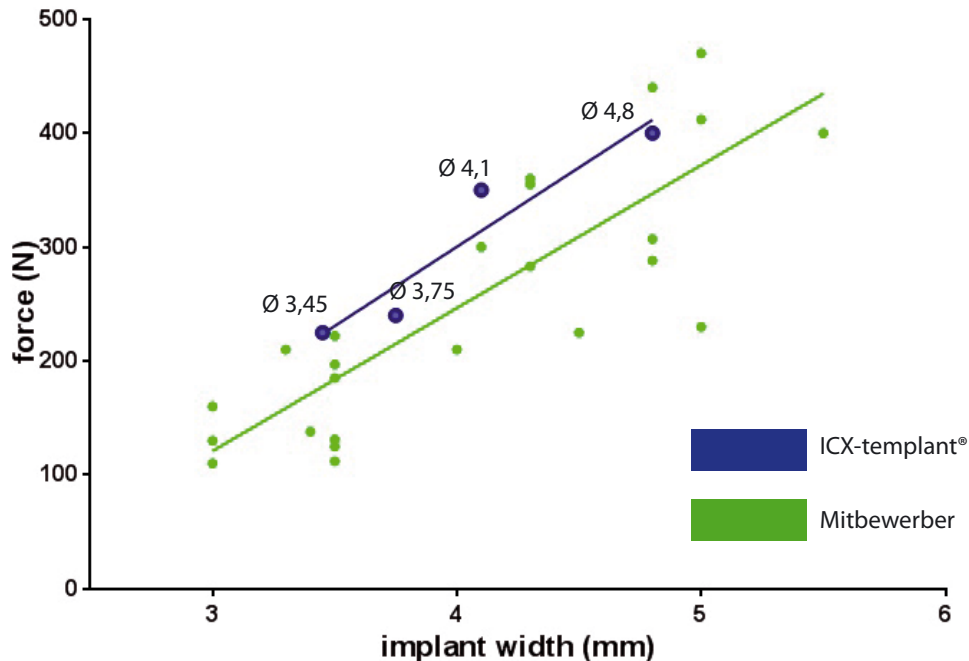


Fig.1

Figure 1: Results of fatigue tests using ICX-Premium implants with different shoulder widths (blue)¹ compared to literature data (green)²

References:

Gubbi, P. et al. (2010). An evaluation of strengths of various dental implant systems from standardized fatigue testing (poster). Palm Beach Gardens, FL: Biomet3i

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Al-Nawas, Bilal. Small diameter implants - where advanced materials make a difference. Oral presentation held at the EAO 18th annual scientific meeting Sept. 30 - Oct. 3 2009

1) Tests conducted by Jörn Ockenfels (certified mechanical engineering technician) and Jürgen Köb (certified mechanical engineering technician), medentis medical evidence center, Dernau, Germany (2014).

2) See references.

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