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Application Note

# ISO 14801 – Dental Implant Fatigue



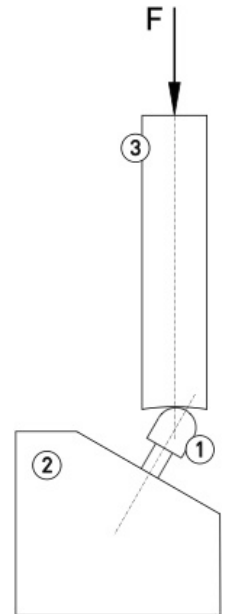
## Background

The endurance properties of endosseous dental implants have to be mechanically tested during implant development and for market approval. This test can be performed according to ISO 14801, which specifies a test method applied for determining the endurance properties under specified laboratory conditions.

## Test Setup and Environment

The end endosseous dental implants (1) is mounted into a specimen holder (2) at an angle of 30° to produce a clinically relevant worst-case scenario. The implant is then loaded using an applicator (3) that is free to move horizontally to avoid any side loads.

A cyclic, sinusoidal load (F) is applied to the end of the load applicator until the specimen exhibits failure or until the chosen number of cycles has been attained. Load and displacement values (deflection of the test specimen) shall be recorded throughout the test.



## Equipment

Fatigue testing according to ISO 14801 can be easily, reliably, and safely performed using the following equipment:

- [THELKIN Servo-Electric Load Frame](#) (e.g. SEL-M-010) - This system is in accordance with ISO 4965<sup>1</sup> and allows for an easy and safe sample setup, profile and data acquisition programming, and test execution.
- [Dental Implant Specimen Holder](#) - helps the quick and stable mounting of the test sample.
- [Fluid Bath](#) - implements the environmental simulation. Bath temperature can be controlled up to 50°C using the external temperature controller or connecting the heating plate directly to the THELKIN controller and user interface software.

The system can be optionally equipped with an [Uninterrupted Power Supply](#) that is connected to the THELKIN testing software. This setup allows a continuous testing in case of a power outage or if necessary, a test stop followed by a shut down in a controlled manner in order to protect the sample.

<sup>1</sup> ISO 4965: ISO 4965-1 Metallic materials - Dynamic force calibration for uniaxial fatigue testing - Part 1: Testing system.