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Technical Report No. 146

CAD/CAM Abutments in Dentistry

ADA American Dental Association®

Standards Committee on Dental Products

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AMERICAN DENTAL ASSOCIATION TECHNICAL REPORT NO. 146 FOR CAD/CAM ABUTMENTS IN DENTISTRY

The ADA Standards Committee on Dental Products (SCDP) has approved ADA Technical Report No. 146 for CAD/CAM Abutments in Dentistry. This and other standards and technical reports for dental materials, instruments and equipment are being formulated by working groups of the ADA SCDP. The Committee has representation from all interests in the United States in the standardization of materials, instruments and equipment in dentistry. The ADA SCDP confirmed approval of ADA Technical Report No. 146 on January 1, 2018.

The ADA Standards Committee on Dental Products thanks the members of Working Group 9.71 and the organizations with which they were affiliated at the time the specification was developed:

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FOREWORD

(This Foreword does not form a part of ADA Technical Report No. 146 for CAD/CAM Abutments in Dentistry).

There are many CAD/CAM abutments in metal and ceramic materials (including combinations of both) currently available. CAD/CAM abutments differ from standardized abutments in that they require data acquisition of the implant(s) axis, position relative to surrounding dentition and anti-rotation feature to design a patient-specific restorative solution. The subgingival contours and emergence profile of the abutments need to achieve acceptable esthetic results without causing harm to the hard or soft tissue of the patient. Adverse surgical placement of the implant relative to the definitive restoration should be corrected to the extent possible. The purpose of this document is to provide a listing of these issues along with specific variables that should be assessed.

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1 SCOPE

CAD/CAM abutments have an anatomically correct emergence profile and restoration substructure specific to the patient (i.e. patient specific). This technical report provides references for test methods that can be used for assessing reliability, accuracy and reproducibility of patient specific CAD/CAM abutments designed for use with a manufacturer's own implants or for use with implants from other manufacturers; as well as guidelines for standardization of future products.

The abutment is individually designed by a laboratory or doctor to be attached to an implant by means of an abutment screw, dental cement or friction fit. This document provides on abutments where milling is done at a central milling facility, a dental lab, or by an in-office milling machine.

Specific qualitative and quantitative requirements for freedom from biological hazard are not included in this document, but it is recommended that, in assessing possible biological or toxicological hazards, reference be made to ISO 10993-1 and ISO 7405.

2 DEFINITIONS

For the purposes of this document, the terms and definitions given in ISO 1942 and the following apply.

2.1 abutment, implant – premanufactured prosthetic component directly connected to the endosseous dental implant and is intended for use as an aid in prosthetic rehabilitation by replicating a prepared tooth.

2.2 abutment screw (implant) – component used to attach an implant abutment component to a dental implant.

2.3 anti-rotation feature – interface geometry of implant components that prevents relative rotation of fastened components.

2.4 CAD/CAM – acronym for computer aided design/computer aided manufacture. CAD/CAM procedures to manufacture a dental restoration, prosthesis, or abutment normally include all or some of the following stages: 1) Digital scanning procedure of the oral cavity, laboratory model or wax/plastic pattern; 2) Software that can display and manipulate the scan data, and can be used to design the abutment; and, 3) Software to control machinery used to manufacture the abutment.

2.5 central milling facility – remote site that receives and/or transmits digital files that can produce and/or design dental prosthetic devices.

2.6 endosseous implant – device made of a material such as titanium intended to be surgically placed in the bone of the upper or lower jaw arches to provide support for prosthetic devices, such as artificial teeth, and to restore the patient's chewing function.)

2.7 3rd party abutment or implant body – abutment or implant body for which the interface, dimensions and materials are marketed by a company other than the original equipment manufacturer (OEM) of the respective compatible implant body or abutment.

3 MATERIALS