ANSI/ADA Specification No. 88
Reaffirmed by ANSI: December 2006

American National Standard/
American Dental Association
Specification No. 88

# Dental Brazing Alloys

Modified adoption of ISO 9333:1990, Dental brazing materials

American Dental Association
Council on Scientific Affairs 2000

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**AMERICAN NATIONAL STANDARD/AMERICAN DENTAL ASSOCIATION SPECIFICATION NO. 88 FOR DENTAL BRAZING ALLOYS**

American Dental Association Specification No. 88 for Dental Brazing Alloys has been approved by the Council on Scientific Affairs of the American Dental Association. This and other specifications for dental materials, instruments and equipment are being formulated by working groups of the ADA Standards Committee on Dental Products (formerly Accredited Standards Committee MD 156 for Dental Materials, Instruments and Equipment. The Committee has representation from all interests in the United States in the standardization of materials, instruments and equipment in dentistry. The Council has adopted the specifications, showing professional recognition of their usefulness in dentistry, and has forwarded them to the American National Standards Institute with a recommendation that the specifications be approved as American National Standards. Approval of ADA specification No. 88 as an American National Standard was granted by the American National Standards Institute on March 23, 2000. This standard becomes effective March 23, 2001.

The Council thanks the working group members and the organizations with which they were affiliated at the time the specification was developed: Clyde Ingersoll (Co-Chairman), Ivoclar/Ardent, Tonawanda, NY; Ronald Dudek (Co-Chairman), Austenal, Inc., Chicago, IL; Thomas Cameron, Degussa-Ney Dental, Bloomfield, CT; Lawrence Gettleman, University of Louisville, KY; Abdul Khan, CMP Industries, Albany, NY; Herbert Mueller, Paffenbarger Research Center, NIST, Gaithersburg, MD; Arun Prasad, Jeneric Pentron, Inc., Wallingford, CT; Monty Reiger, Houston, TX; and Nikhil Sarkar, Louisiana State University, New Orleans, LA.

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## FOREWORD

(This foreword does not form a part of ANSI/ADA Specification No. 88 for Dental Brazing Alloys.)

The ASC MD156 Working Group on Casting and Brazing Alloys reviewed ISO 9333-1990 for possible adoption. The consensus was that ISO 9333 was not acceptable in total as an ANSI/ADA standard, but with certain changes could be made acceptable.

### Rationale

The consensus was that many of the changes were only editorial, but significant changes were needed in paragraphs and figures describing the production and preparation of test specimens.

**Clause 6.7** Flow temperature, needed revision to be more in keeping with today's technology. In addition, the paragraphs on tarnish/corrosion were changed to conform to proposed ISO10271 (Proposed ANSI/ADA Specification No. 97).

## INTRODUCTION

Specific qualitative and quantitative requirements for freedom from biological hazard are not included in this standard, but it is recommended that in assessing possible biological or toxicological hazards, reference should be made to ANSI/ADA document No. 41, Biological Evaluation of Dental Materials.

Requirements for corrosion resistance have not been established. Such necessary tests and limits will be added as they become available. Reference may be made to ANSI/ADA Specification No. 97 for Dental Metallic Materials—Corrosion Testing (ISO 10271).

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## 1. SCOPE

This standard specifies requirements and test methods for brazing filler alloys suitable for use in brazing cast dental restorations.

## 2. REFERENCES

ASTM E 8 Metals—Standard Test Methods for Tension Testing of Metallic Materials

ISO/DIS 10271 Dental Metallic Materials—Corrosion Test Methods

## 3. DEFINITIONS

For the purposes of this national standard, the following definitions apply:

### 3.1 Dental Brazing Alloy

Alloy suitable for use as a filler metal in operations in which dental alloy(s) parts are joined to form a dental restoration.

### 3.2 Flow Temperature

Lowest temperature at which the filler metal is fluid enough to flow into the gap and to wet the surface of the metallic parts.

## 4. REQUIREMENTS

### 4.1 Chemical Composition

The composition of the brazing alloy shall be within 0.5% (m/m) of the value for each component stated by the manufacturer (see Clause **7A**). If the dental brazing alloy contains more than 0.1% (m/m) of nickel and/or more than 0.02% (m/m) of beryllium, cadmium and/or lead, the manufacturer shall clearly state this (see Clause **7F**). Testing shall be in accordance with standard analytical procedures of sufficient accuracy for required values.

### 4.2 Biocompatibility

See Introduction for guidance on biocompatibility.

### 4.3 Corrosion Resistance

A comparison of the surface of an untreated and a treated specimen shall not reveal any visible evidence that a chemical reaction has occurred. Testing may be in accordance with the immersion test referred to in ISO/DIS 10271 or with another test, which should be fully reported.

### 4.4 Tarnish Resistance

A comparison of the surface of an untreated and a treated specimen shall not reveal any significant darkening or discoloration of the treated specimen surface. Testing may be in accordance with the dipping test referred to in the ISO/DIS 10271 or with another test, which should be fully reported.

### 4.5 Mechanical Strength of Brazed Joint (Tensile Strength)

The tensile strength of the brazed specimen shall exceed 350 MPa or the 0.2% offset yield strength of the weakest of the alloy parts. Testing shall be in accordance with Clause 6.5.