

ISO/TS 17988:2020-03 (E)

Dentistry - Corrosion test methods for dental amalgam

Contents		Page
Foreword		v
Introduction		vii
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Sampling	3
5	Preparation of dental amalgam test-pieces	4
5.1	General	4
5.1.1	Temperature	4
5.1.2	Mixing	4
5.2	Cylindrical test-pieces for use in the immersion and potentiostatic corrosion test procedures	4
5.2.1	Mass of dental amalgam to be mixed	4
5.2.2	Apparatus for the preparation of dental amalgam cylindrical test-pieces	4
5.2.3	Packing	8
5.3	Disc-shaped test-pieces for use in the Hertzian-loading strength-reduction test	9
5.3.1	Apparatus for the preparation of dental amalgam disc-shaped test-pieces	9
5.3.2	Materials and tolerances for construction of the mould	9
5.3.3	Packing the mould, removal of test-piece and inspection for surface defects	10
6	Determination of the resistance to corrosion by the immersion procedure	10
6.1	Principle	10
6.2	Reagents for the test solution and cleaning the apparatus	10
6.3	Apparatus	13
6.4	Mercury vapour analyser requirements	14
6.5	Cleaning the glassware	15
6.6	Assembly of the immersion corrosion test apparatus	15
6.7	Test-piece production	15
6.8	Preparation of the 0,1 mol/l lactic acid solution	16
6.9	Finishing the dental amalgam test-piece	16
6.10	Test procedure	16
6.10.1	First determination	16
6.10.2	Second determination	17
6.11	Analysis to determine the metal ion and mercury vapour release	18
6.12	Test report	18
7	Determination of the corrosion by the potentiostatic procedure	19
7.1	Principle	19
7.2	Test-piece preparation	19
7.3	Corrosion test cell requirements	20
7.3.1	Corrosion cell	20
7.3.2	Temperature control	20
7.3.3	Volume of the electrolyte	20
7.4	Reference electrode probe requirements	20
7.4.1	Reference electrode and its control	20
7.4.2	Temperature of the reference electrode	20

7.4.3	Positioning of the reference electrode	20
7.5	Potentiostat requirements	21
7.6	Reagents	21
7.7	Preparation of the electrolyte	21
7.8	Test procedure	21
7.9	Data acquisition and processing	21
7.9.1	General	21
7.9.2	Computer-controlled potentiostat	22
7.9.3	Coulometer	22
7.9.4	Data-logging and integration	22
7.10	Calculation of the total charge transported	22
7.10.1	Test-pieces embedded by casting without masking	22
7.10.2	Test-pieces embedded by casting with masking	22
7.11	Test report	22
8	Determination of the resistance to corrosion by the Hertzian-loading strength- reduction test	23
8.1	Principle	23
8.2	Test solution (artificial saliva)	23
8.2.1	Reagents	23
8.2.2	Stock solutions	24
8.2.3	Test solution (artificial saliva)	24
8.3	Test-piece production and procedure for test-piece conditioning	24
8.3.1	Apparatus	24
8.3.2	Control test-pieces	25
8.3.3	Corrosion test-pieces	25
8.3.4	Replacement test-pieces	26
8.4	Mechanical testing	26
8.4.1	Apparatus for mechanical testing	26
8.4.2	Procedure	26
8.5	Treatment of data	28
8.6	Test report	28
	Bibliography	30