

Australian Standard™

AS 2219.3.3

Method of test for vitreous enamel coatings**Method 3.3: Miscellaneous tests—Determination of the adhesion of enamels on aluminium under the action of electrolytic solution (spall test)**

PREFACE

This Standard was prepared by the Standards Australia Committee CH-007, Vitreous Enamel Finishes.

This Standard is identical with and has been reproduced from ISO 13805:1999, *Vitreous and porcelain enamels for aluminium—Determination of the adhesion of enamels on aluminium under the action of electrolytic solution (spall test)*.

This Standard is Method 3.3 of a series of Standards covering the miscellaneous testing of vitreous enamel coatings.

The series comprises the following Parts:

AS

2219	Method of test for vitreous enamel coatings
2219.3.1	Method 3.1: Miscellaneous tests—Method of test of self-cleaning properties
2219.3.2	Method 3.2: Miscellaneous tests—Production of specimens for testing
2219.3.3	Method 3.3: Miscellaneous tests—Determination of the adhesion of enamels on aluminium under the action of electrolytic solution (spall test)

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title pages.
- (b) In the source text, 'this international Standard' should read 'this Australian Standard'.
- (c) A full point substitutes for a comma when referring to a decimal marker.
- (d) In Clause 2, 'ISO 13805' should read 'ISO 13804'.

References to International Standards should be replaced by references to Australian Standards, as follows:

<i>References to International Standards</i>		<i>Australian Standard</i>	
ISO		AS	
3819	Laboratory glassware—Beakers	2234	Beakers
4788	Laboratory glassware—Graduated measuring cylinders	2163	Laboratory glassware—Measuring cylinders
10141	Vitreous and porcelain enamels—Vocabulary	1914	Glossary of terms relating to vitreous enamel coatings
13804	Vitreous and porcelain enamels on aluminium—Production of specimens for testing	2219	Methods of test for vitreous enamel coatings
		2219.3.2	Method 3.2: Miscellaneous tests—Production of specimens for testing

INTRODUCTION

The spalling of porcelain enamelled aluminium, a defect characterized by separation of the porcelain enamel from the aluminium base material, is caused by poor adhesion. The spall test is therefore capable of controlling the quality of the enamelling process including the enamel formulation, the preparation of the base metal prior to enamelling, the application and firing procedures, and the aluminium alloy selected for enamelling.

1 Scope

This International Standard specifies a test method for the accelerated determination of the resistance of porcelain enamel coatings on aluminium and aluminium alloys to spalling as a result of exposure to moisture or weathering. Because spalling is caused by the lack of adhesion between the coating and the base metal, the spall test is a test of adhesion. The greater the extent of spalling in this test, the greater the likelihood that the article will spall in service.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative document indicated below. For undated references, the latest edition of normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3819, *Laboratory glassware — Beakers*.

ISO 4788, *Laboratory glassware — Graduated measuring cylinders*.

ISO 10141, *Vitreous and porcelain enamels — Vocabulary*.

ISO 13805, *Vitreous and porcelain enamels on aluminium — Production of specimens for testing*.

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 10141 apply.

4 Principle

A scored enamelled aluminium specimen is exposed to an aqueous test solution consisting of antimony trichloride, SbCl_3 , having a concentration of 10 g/l, at an ambient temperature of 18 °C to 28 °C for 20 h.

5 Designation

The test method for the determination of the adhesion of enamel coatings on aluminium and aluminium alloys by means of the spall test described in this International Standard shall be designated as follows:

Test ISO 13805