
**Vitreous and porcelain enamels —
Terminology —**

**Part 1:
Terms and definitions**

Emaux vitrifiés — Terminologie —

Partie 1: Termes et définitions

Sample Document

get full document from standards.iteh.ai



Sample Document

get full document from standards.iteh.ai



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
Annex A (normative) Cross reference index of alternative terms	26

Sample Document

get full document from standards.iteh.ai

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*.

A list of all parts in the ISO 19496 series can be found on the ISO website.

Vitreous and porcelain enamels — Terminology —

Part 1: Terms and definitions

1 Scope

This document defines a number of terms relating to vitreous and porcelain enamels and their technology. This list is not complete and only comprises those terms for which the definition is considered necessary for correct and adequate understanding in order to clarify these processes.

The interpretations given are those corresponding to the practical usage in this field and they do not necessarily coincide with those used in other fields.

For purposes of clarification, the term “vitreous enamel”, used throughout this document, is synonymous with “porcelain enamel”, the term favoured in the United States and some other countries.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

NOTE [Annex A](#) lists alternative terms and cross refers to primary terms used below.

3.1

abrasive blasting

process for *cleaning* ([3.44](#)) or finishing by means of an abrasive directed at high velocity against the work piece

3.2

abrasion resistance

degree of resistance of *vitreous enamel* ([3.255](#)) to be abraded by solid materials

3.3

acid resistance

degree of resistance of *vitreous enamel* ([3.255](#)) to attack by acidic corrosive chemicals

3.4

adherence

adhesion

<enamel-metallic substrate> degree of bonding between the fused *vitreous enamel* ([3.255](#)) and the metallic substrate

3.5

adherence of powder

ability of a vitreous enamel powder to remain attached by static attraction to a grounded *substrate* ([3.242](#)) before *firing* ([3.111](#))

3.6

ageing

change in properties of vitreous enamel slips, powders, reagents, or steel with the lapse of time

3.7

air seal

air curtain

flow of pressurized air across the entrance and exit of a *continuous furnace* (3.53) that prevents heat escaping from the furnace but allows ware to pass through

3.8

alkali degreasing

removal of oil, grease, lubricants, and loose debris from the surface of the metallic substrate by immersion or spraying with an aqueous alkali degreaser in preparation for *vitreous enamelling* (3.256)

3.9

alkali resistance

degree of resistance of *vitreous enamel* (3.255) to attack by alkaline corrosive mediums

3.10

aluminium enamel

vitreous enamel (3.255) specifically formulated for application on aluminium substrates

3.11

anneal

annealing

thermal treatment of metals generally made by controlled heating and subsequent cooling

Note 1 to entry: Raw castings are heated in the range from 650 °C to 950 °C to relieve stresses and strains, burn off grease and in some cases to change the structure of the iron and in so doing improve the castings condition prior to coating with vitreous enamel.

3.12

anti-scale compound

agent that is applied to furnace tooling and other items to protect them from *scaling* (3.210) during *firing* (3.111)

3.13

back emission

back ionization

<electrostatic powder> defect often with the appearance of localized, very heavy *orange peel* (3.160), due to excessive charge build-up in the powder film resulting in electrical breakdown of air (i.e. back emission)

Note 1 to entry: The effect of the self-limiting characteristics of the electrostatic powder during application.

3.14

ball mill

ceramic or ceramic-lined rotating cylinder in which vitreous enamel materials are either wet or dry ground, generally using alumina, porcelain or steatite balls as grinding media

3.15

batch smelter

discontinuous smelter

smelter which is charged, fired, and discharged according to a predetermined periodic cycle

3.16

bead

defect resulting from accumulation of *vitreous enamel* (3.255) usually at the point where the enamel drains off the ware in *dipping* (3.78) (3.79)

3.17**beading****rim enamelling**

application of ridge of *vitreous enamel* (3.255) along the edge or rim of ware

3.18**beading enamel****rim enamel**

vitreous enamel (3.255) specifically formulated for *beading* (3.17)

3.19**biocide**

anti-bacterial agent used to inhibit fermentation of organic *mill additions* (3.150) such as gums

3.20**bisque**

dry unfired vitreous enamel coating

3.21**black specks**

defect that appears as black particles at the surface of vitreous enamel coating

Note 1 to entry: See *boiling* (3.26) and *carbon boil* (3.34).

Note 2 to entry: This can be the result of reaction with the substrate or with contamination on the substrate surface.

3.22**blank**

sized piece of untreated metal sheet that will be used in forming the finished article

3.23**blasting**

process whereby solid metallic, mineral, synthetic resin, vegetable particles or water are projected at high velocity against a work piece for the purpose of *cleaning* (3.44), abrading or shot peening the surface

3.24**blister**

defect that appears as a localized bubble under the surface of the fired *vitreous enamel* (3.255)

3.25**bloom**

visual exudation or efflorescence on the vitreous enamel surface

Note 1 to entry: See *scumming* (3.212).

3.26**boiling**

defect resembling areas of *ground-coat* (3.135) pull-through, *blisters* (3.24) and *pinholes* (3.169), visible after first cover-coat fire

Note 1 to entry: See *carbon boil* (3.34) and *black specks* (3.21).

Note 2 to entry: This can be the result of excessive ground-coat activity during cover-coat fire, as the ground-coat boils up through the cover-coat it may be accompanied by a release of gases.

3.27**bolt-hole brush**

specially-designed round brush used to remove vitreous enamel bisque from in and around small openings in the ware

3.28

box furnace

furnace in which ware is fired according to a predetermined periodic cycle

3.29

break out

defect characterized by areas of *blisters* ([3.24](#)) having well-defined boundaries

3.30

bubble structure

size and spatial distribution of voids within the fired vitreous enamel layer

3.31

burn-off

defect that appears as a localized area of rough oxides erupting through the enamel coating

Note 1 to entry: This can be caused by too thin an application of enamel, allowing excessive oxidation of the metal substrate during firing, leading to super saturation of the enamel coating with metal oxides.

3.32

burning bar

burning point

burning tool

tool used to suspend or support ware during firing operations

3.33

button test

fusion button test

control test to determine the relative fusibility of vitreous enamel frit or powder

Note 1 to entry: See *fusion flow test* ([3.126](#)).

Note 2 to entry: The completed test specimen resembles a button.

3.34

carbon boil

defect resembling areas of *blisters* ([3.24](#)), *pinholes* ([3.169](#)), or *black specks* ([3.21](#)), visible in fired *vitreous enamel* ([3.255](#))

Note 1 to entry: See *boiling* ([3.26](#)) and *black specks* ([3.21](#)).

Note 2 to entry: Result of the oxidation of carbides and free carbon at or near the surface of the steel substrate during firing, resulting in evolution of gasses.

3.35

cascading

<electrostatic powder> defect that starts with a few particles of powder detaching themselves after application and as they cascade down the ware they gather more and more powder leaving a trail of thinner and thinner coating

Note 1 to entry: Excess powder, inadequate powder adhesion and vibration contribute to this defect.

3.36

cast iron enamel

vitreous enamel ([3.255](#)) specifically formulated for application on cast iron substrate

3.37

cermet

ceramic-metal coating

mixture of one or more ceramic materials in combination with a metallic phase applied to a metallic substrate

3.38**chalkboard enamel
blackboard enamel**

special type of matt vitreous enamel used to provide a writing surface for chalk

3.39**chalky surface**

surface defect where the vitreous enamel surface has lost its *gloss* ([3.131](#)) and taken on a powdery appearance

Note 1 to entry: See *scumming* ([3.212](#)).

3.40**chemical resistance**

degree of resistance of *vitreous enamel* ([3.255](#)) to attack by corrosive chemicals

3.41**chipping**

defect characterized by fracturing and detachment of irregular enamel particles from the vitreous enamel surface

3.42**cleanability**

relative ease with which soils or stains can be removed from a fused vitreous enamel surface

3.43**cleaner**

pre-treatment solution, usually alkaline, used to remove oil, grease, lubricants, and loose debris from the surface of metal substrate in preparation for *vitreous enamelling* ([3.256](#))

3.44**cleaning
degreasing**

removal of foreign materials, such as abraded metallic particles from pressing or *blasting* ([3.23](#)), grease, oil, oxides, *scale* ([3.209](#)), rust, swarf, etc., from the surface

Note 1 to entry: See *vapour degreasing* ([3.252](#)).

3.45**clear frit
transparent frit**

vitreous enamelling ([3.256](#)) frit that remains essentially transparent or non-opaque when fused

3.46**coefficient of expansion**

rate at which a material will expand under the influence of increasing temperature

3.47**cold-rolled steel**

low-carbon, cold-reduced and annealed sheet steel, not necessarily enamelling quality

3.48**colour matching**

comparison of two or more samples of products that are notionally the same colour

3.49**colouring oxide**

calcined mixture of inorganic material used as a *mill addition* ([3.150](#)) to impart colour to a *vitreous enamel* ([3.255](#))