

Metallic and other inorganic coatings - Phosphate conversion coating of metals (ISO 9717:2010)

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NATIONAL FOREWORD

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English Version

Metallic and other inorganic coatings - Phosphate conversion coating of metals (ISO 9717:2010)

Revêtements métalliques et autres revêtements inorganiques - Couches de conversion au phosphate sur métaux (ISO 9717:2010)

Metallische und andere anorganische Überzüge - Phosphatüberzüge auf Metallen (ISO 9717:2010)

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Foreword

The text of ISO 9717:2010 has been prepared by Technical Committee ISO/TC 107 “Metallic and other inorganic coatings” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 9717:2013 by Technical Committee CEN/TC 262 “Metallic and other inorganic coatings” the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2013, and conflicting national standards shall be withdrawn at the latest by October 2013.

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Endorsement notice

The text of ISO 9717:2010 has been approved by CEN as EN ISO 9717:2013 without any modification.

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Introduction

Phosphate conversion coatings are applied to ferrous metals, aluminium, zinc and their alloys (including zinc- and zinc-alloy-plated steel, cadmium and their alloys) either as an end finish or as an intermediate layer for other coatings. They are intended to

- a) impart corrosion resistance,
- b) improve adhesion to paints and other organic finishes,
- c) facilitate cold-forming operations, such as wire drawing, tube drawing and extrusion, and
- d) modify surface frictional properties so as to facilitate sliding.

Phosphate conversion coatings are produced by treatment with solutions, the main constituents of which are the appropriate dihydrogen orthophosphates. These coatings are applied principally to ferrous materials, aluminium, zinc and cadmium and differ in coating mass per unit area and apparent density, depending on

- a) the construction material and surface condition of the components,
- b) previous mechanical and chemical treatment of the components, and
- c) processing conditions for phosphating.

All phosphate conversion coatings are more or less porous but can be sealed substantially by subsequent sealing processes.

Metallic and other inorganic coatings — Phosphate conversion coating of metals

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1 Scope

This International Standard specifies requirements for the processing of ferrous metals, aluminium, zinc, cadmium and their alloys to produce coatings consisting essentially of inorganic phosphates, which are intended to be used in conjunction with supplementary treatments for the protection of the basis metal against corrosion and to provide anti-wear properties to sliding surfaces, adhesion to organic finishes and ease of cold-forming operations.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1463, *Metallic and oxide coatings — Measurement of coating thickness — Microscopical method*

ISO 2064, *Metallic and other inorganic coatings — Definitions and conventions concerning the measurement of thickness*

ISO 2080, *Metallic and other inorganic coatings — Surface treatment, metallic and other inorganic coatings — Vocabulary*

ISO 2819, *Metallic coatings on metallic substrates — Electrodeposited and chemically deposited coatings — Review of methods available for testing adhesion*

ISO 2859 (all parts), *Sampling procedures for inspection by attributes*

ISO 3892, *Conversion coatings on metallic materials — Determination of coating mass per unit area — Gravimetric methods*

ISO 4519, *Electrodeposited metallic coatings and related finishes — Sampling procedures for inspection by attributes*

ISO 9587, *Metallic and other inorganic coatings — Pretreatment of iron or steel to reduce the risk of hydrogen embrittlement*

ISO 9588, *Metallic and other inorganic coatings — Post-coating treatments of iron or steel to reduce the risk of hydrogen embrittlement*

ISO 15724, *Metallic and other inorganic coatings — Electrochemical measurement of diffusible hydrogen in steels — Barnacle electrode method*

ISO 27831-1, *Metallic and other inorganic coatings — Cleaning and preparation of metal surfaces — Part 1: Ferrous metals and alloys*

ISO 27831-2, *Metallic and other inorganic coatings — Cleaning and preparation of metal surfaces — Part 2: Non-ferrous metals and alloys*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1463, ISO 2064, ISO 2080, ISO 2819, ISO 9587 and ISO 9588 and the following apply.

**3.1
free acid of a phosphating solution**
number of millilitres of 0,4 % mass fraction of sodium hydroxide solution required to neutralize 10 ml of the phosphating solution to pH 4, using methyl orange or an equivalent indicator system

**3.2
pointage**
measure of the total acidity of a phosphating solution, i.e. the number of millilitres of 0,4 % mass fraction of sodium hydroxide solution required to neutralize 10 ml of the phosphating solution to pH 10 using phenolphthalein as an indicator

**3.3
accelerated process**
process where the processing solution is of the metal phosphate/phosphoric acid type containing additions such as oxidizing agents, e.g. nitroguanidine, nitrate, nitrite, or chlorate, which accelerate the coating formation

**3.4
unaccelerated process**
process where the processing solution is of the plain metal phosphate/phosphoric acid type and no accelerating agents are employed

**3.5
sealing**
application of a supplementary coating to the phosphate surface immediately after phosphating, rinsing and drying, to form a complete protective or lubrication system

**3.6
supplementary coating**
covering material, usually of an organic nature

EXAMPLES oil, grease, lacquer, varnish, paint or dry lubricant