

Thermal spraying - Zinc, aluminium and their alloys
- Part 1: Design considerations and quality
requirements for corrosion protection systems (ISO
2063-1:2019)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Thermal spraying - Zinc, aluminium and their alloys -
Part 1: Design considerations and quality requirements for
corrosion protection systems (ISO 2063-1:2019)

Projection thermique - Zinc, aluminium et alliages de
ces métaux - Partie 1: Considérations de conception et
exigences de qualité pour les systèmes de protection
contre la corrosion (ISO 2063-1:2019)

Thermisches Spritzen - Zink, Aluminium und ihre
Legierungen - Teil 1: Bauteilgestaltung und
Qualitätsanforderungen für Korrosionsschutzsysteme
(ISO 2063-1:2019)

This European Standard was approved by CEN on 8 February 2019.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 2063-1:2019) has been prepared by Technical Committee ISO/TC 107 "Metallic and other inorganic coatings" in collaboration with Technical Committee CEN/TC 240 "Thermal spraying and thermally sprayed coatings" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by September 2019, and conflicting national standards shall be withdrawn at the latest by September 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 2063-1:2017.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 2063-1:2019 has been approved by CEN as EN ISO 2063-1:2019 without any modification.

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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).

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

For an explanation of 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 www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO 2063-1:2017), of which it constitutes a minor revision.

The changes compared to the previous edition are as follows:

- [Table C.1](#) has been corrected;
- citations for [Annex E](#), [Annex F](#) and [Annex G](#) have been added in the text.

A list of all the parts in the ISO 2063 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In order to protect iron- and steel-based structures (e.g. for steel construction, bridge construction, steel structures for water construction, onshore and offshore wind energy constructions, petrol and natural gas industry) against corrosion, protective coatings are usually deposited. Corresponding to type, shape and required functionality of the part, numerous procedures are available. The deposition of corrosion protection coatings or coating systems can be done by applying hot-dip galvanizing, organic coatings or thermal spraying of zinc, aluminium and their alloys. Using combinations of metallic and organic coatings, duplex corrosion protection coating systems can be produced.

Thermal-sprayed corrosion protection coatings made of zinc, aluminium and their alloys can be sprayed onto all steels which make up the components used in the relevant industrial application. This may be carried out on-site, as well as in the workshop, regardless of the article's size. Due to the usually low heat input into the surface of the part, only a slight thermal loading of the substrate occurs, so that changes in steel properties and deformation of the part do not occur.

Corrosion protection coatings can be used as repairs or rework of defects of other coatings (e.g. uncoated hot-dip zinc galvanized areas) or worn coatings where thermal spraying can be applied on the spot. Due to relative low investment costs, thermal spraying can also be economically applied for single parts.

The ISO 2063 series applies to thermal-sprayed metallic coatings to protect iron and steel against corrosion by deposition of zinc, aluminium or their alloys onto the uncoated surface to be protected.

This document targets designers of components. It covers the planning engineering of the corrosion protection system and deals with the basic rules for planning of corrosion protection systems and for the constructive design of the components to be protected, if the protection system is based upon a thermal-sprayed metallic coating.

ISO 2063-2 targets manufacturers of corrosion protection systems. It deals with the requirements for the execution of the corrosion protection works by thermal spraying in the workshop and on-site.

Thermal spraying — Zinc, aluminium and their alloys —

Part 1:

Design considerations and quality requirements for corrosion protection systems

1 Scope

This document specifies requirements for the protection of iron and steel surfaces against corrosion by applying thermal-sprayed metallic coatings of zinc, aluminium or their alloys.

In this document, requirements for the planning of the corrosion protection system and for the constructive design of the component to be protected are specified, where thermal spraying is intended to be the process for the deposition of the metallic corrosion protection.

Some field-related basic terms are defined and instructions for corrosion behaviour of the zinc and aluminium materials under different environment conditions are provided.

Characteristic properties of the coating, e.g. coating thickness, minimum adhesive strength and surface appearance, are specified and test procedures for thermal-sprayed corrosion protection coatings of zinc, aluminium or their alloys are determined.

This document is valid for applying thermal-sprayed zinc and aluminium protection coatings against corrosion in the temperature range between $-50\text{ }^{\circ}\text{C}$ to $+200\text{ }^{\circ}\text{C}$, taking into consideration the service conditions of any sealants used. Heat-resistant protective coatings of aluminium are covered by ISO 17834 and are not in the scope of this document.

Other corrosion protection processes, e.g. hot-dip galvanizing (galvanic coating), sherardizing, electroplating or selection and deposition of organic coatings/paints are not in the scope of this document.

Requirements for the manufacturing of thermal-sprayed coatings are specified in ISO 2063-2.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 2063-2:2017, *Thermal spraying — Zinc, aluminium and their alloys — Part 2: Execution of corrosion protection systems*

ISO 2178, *Non-magnetic coatings on magnetic substrates — Measurement of coating thickness — Magnetic method*

ISO 4624, *Paints and varnishes — Pull-off test for adhesion*

ISO 8044, *Corrosion of metals and alloys — Basic terms and definitions*

ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

ISO 8501-3, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 3: Preparation grades of welds, edges and other areas with surface imperfections*

ISO 12671, *Thermal spraying - Thermally sprayed coatings - Symbolic representation on drawings*

ISO 14232-1, *Thermal spraying — Powders — Part 1: Characterization and technical supply conditions*

ISO 14916, *Thermal spraying — Determination of tensile adhesive strength*

ISO 14917, *Thermal spraying — Terminology, classification*

ISO 14919, *Thermal spraying — Wires, rods and cords for flame and arc spraying — Classification — Technical supply conditions*

ISO 14923, *Thermal spraying — Characterization and testing of thermally sprayed coatings*

EN 10163-2, *Delivery requirements for surface conditions of hot-rolled steel plates, wide flats and sections — Part 2: Plate and wide flats*

EN 10163-3, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections — Part 3: Sections*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14917, ISO 8044 and the following apply.

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

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

3.1

service life

expected lifetime of a product (e.g. a structure, component or part) or the acceptable period of use in service

Note 1 to entry: It is also the time that any manufactured item can be expected to be serviceable.

3.2

design life

period of time during which the item (e.g. a structure, component, part or product) is expected by its designers to work within its specified parameters

Note 1 to entry: In the case of series production, it is the period of time between the putting into service of a single item and that item's onset of wearing out.

3.3

life to first maintenance

durability

expected life of a coating system until first maintenance

Note 1 to entry: It is also the time interval that elapses after the initial coating before coating deterioration reaches the point that maintenance is necessary to restore protection of the base metal in accordance with ISO 12944-1.