INTERNATIONAL STANDARD 1459

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Metallic coatings — Protection against corrosion by hot dip galvanizing — Guiding principles

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, International Standard ISO 1459 replaces ISO Recommendation R 1459-1970 drawn up by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings.*

The Member Bodies of the following countries approved the Recommendation :

Australia	India	South Africa, Rep. of
Belgium	Iran	Spain
Chile	Israel	Sweden
Czechoslovakia	Italy	Switzerland
Egypt, Arab Rep. of	Netherlands	Thailand
Finland	New Zealand	Turkey
France	Norway	United Kingdom
Germany	Poland	
Hungary	Portugal	

No Member Body expressed disapproval of the Recommendation.

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Metallic coatings — Protection against corrosion by hot dip galvanizing — Guiding principles

1 SCOPE AND FIELD OF APPLICATION

This International Standard gives general guidance relating to zinc coatings applied by hot dip galvanizing to steel and cast iron articles to provide protection against corrosion.

2 REFERENCES

ISO 752, *Zinc ingots.*

ISO 1460, *Metallic coatings — Hot dip galvanized coatings on ferrous materials — Determination of the mass per unit area — Gravimetric method.*

3 DEFINITION

hot dip galvanizing : The application of a zinc coating by dipping prepared objects in molten zinc, by which process alloy layers may be formed between the basis metal and the outer zinc layer. Under some circumstances the whole coating may consist of alloy layers and in such cases the appearance may be grey and dull.

4 MASS PER UNIT AREA AND THICKNESS OF THE COATING

4.1 The coating mass per unit area of the surface is given in terms of grams per square metre of surface. If the coating thickness is required, the equation

$$e = \frac{m_A}{7}$$

gives the approximate relationship between the coating thickness e, in micrometres, and the mass per unit area m_A, in grams per square metre, assuming the density of the coating to be 7 g/cm^3.

4.2 The coating mass per unit area of the surface is determined according to ISO 1460.

5 GENERAL GUIDANCE

5.1 Basis metal

Unalloyed steel and cast iron are particularly suitable for hot dip galvanizing but other ferrous materials may also be hot dip galvanized. The purchaser shall provide the hot dip galvanizer with as much information as required about the composition and nature of the steel or cast iron. In cases of doubt the purchaser shall consult the galvanizer and, if necessary, submit samples of the materials to be used.

5.2 Material condition

Surface contaminants which cannot be removed by pickling, for example oil, fat, paint, welding slag and similar impurities, shall be removed prior to pickling.

Surface unevenness — such as seams or rolling slags, laps, grooves and scars — may affect hot dip galvanizing and give a visible effect on the surface of the coating.

Surface roughness and internal stresses of the basis metal will affect the thickness and the appearance of the coating. Rough surfaces may result in coatings of higher mass per unit area.

5.3 Hot dip galvanizing bath

The zinc added to the hot dip galvanizing bath shall contain not less than 98,5 % by mass of zinc according to ISO 752.

5.4 Requirements to be met by the hot dip galvanized coating

5.4.1 *Mass per unit area*

See section 4.

5.4.2 *Appearance*

The coating shall be continuous, as even as possible and free from anything that is detrimental to the stated use of the coated object.[1] In job hot dip galvanizing, a thicker, less smooth coating is obtained in comparison with mechanically wiped sheet or wire.

1) White marks on the surface of the coating (popularly known as "wet storage stain" or "white rust") are unattractive but are not usually detrimental to the other properties of the coating. If it is desired to retain the initial bright appearance on hot dip galvanized products, special storage conditions are necessary. Surface treatments applied immediately after hot dip galvanizing can avoid or reduce the formation of these white marks.

In some cases of hot dip galvanizing, particularly on high tensile steel, the finish of the coated object may be of a uniform grey. Provided that such a coating has adequate adhesion, the grey finish is not detrimental.

5.4.3 *Adhesion*

Requirements regarding adhesion of the zinc coating and methods of testing shall be agreed between the interested parties if necessary.

5.5 After-treatment

Hot dip galvanized objects may be left untreated after withdrawal from the hot dip galvanizing bath or may be treated to assist subsequent painting. The most important treatments are phosphating and chromating.

The purchaser shall state if the product is to be painted eventually and shall indicate whether an after-treatment is to be applied or omitted.