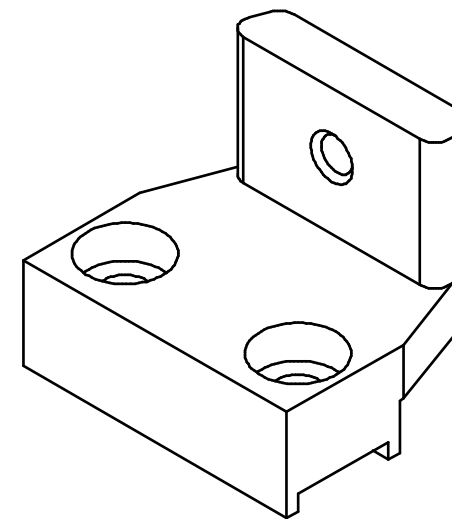


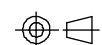
A-A (2 : 1)



2023-06-21

Sharp edges removed
Rotofinished

RKI, / JKI 2023-03-01, R1
Material: 1.0038; S235JR; EN 10025-2; (St37-2)
Treatment: Zn 5 +/1 µm(ISO 2081 - Fe/Zn5/A)

Material: S 235 JR (1.0037)		ISO 1101, ISO 1302, ISO 16792 GENERAL TOLERANCES according to ISO 2768 m						
Treatment: Zn 5µm acc. to UN-D 1481		Dimension:	0.5 thru 3	3 thru 6	6 thru 30	30 thru 120	120 thru 400	400 thru 1000
		Tolerance:	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8
		General Roughness:	3.2 ✓				Scale: 2:1	
							Unit: mm	
		Drawn:					Date:	25-02-13
Description: SPRING BLOCK		Approved:					Date:	13-03-13
		Drawing nr:	00430-02-173					Rev.: A-R1
File: 00430-02-173.ipt	Project nr: 00430	Sheet: 1	Of: 1		Size: A3			

Corporate
Standardization
Department

METALLIC COATING
ELECTRODEPOSITED COATINGS OF ZINC

UN-D 1481
page 1/4 EN
1998-06-30

Keywords: Metallic coatings; electrodeposited coatings;
zinc coatings.

Supersedes UN-D 1481 dated 1994-12-31
Modification: editorially adapted

1 Scope

This standard specifies the requirements for electrodeposited coatings of zinc for the protection against corrosion of iron castings and products of steel, low-alloyed steel, copper and copper alloys.

This standard shows some resemblance to ISO 2081.

Coatings applied to sheet, strip, wire or tube in the unfabricated form are excluded.

No consideration has been given in this standard to the surface condition of the base metal.

More information is given in UT-D 115.

2 Designation

The designation of the coating consists of an indication for:

- the coating material;
- the coating thickness (see 3.2);
- the type of passivation (see 3.5);
- the standard;
- any additional requirement (see 3.7).

Examples:

Zn 5 μ m yell pass UN-D 1481

This means:

Zn : zinc with a composition according to 3.1;
5 μ m : minimum local (see 3.2.1) or average (see 3.2) coating thickness of 5 μ m;
yell pass : iridescent yellow passivated;
UN-D 1481 : the coating shall meet the requirements of this standard.

Zn 12 μ m black pass UN-D 1481 no org. coating

This means:

Zn : zinc with a composition according to 3.1;
12 μ m : minimum local (see 3.2.1) or average (see 3.2) coating thickness of 12 μ m;
black pass : black passivated;
UN-D 1481 : the coating shall meet the requirements of this standard;
no org. coating : organic coating not to be applied.

3 Requirements

3.1 Composition of the coating

The coating shall consist of passivated electrolytically deposited zinc.

No impurities in the zinc are allowed which have an adverse effect on the quality and the appearance of the coating.

An organic coating shall be applied of which the quality and properties shall be subject of agreement between the interested parties unless it has been specified as an additional requirement that any organic coating shall not be present.

3.2 Thickness of the coating

Remarks:

- The coating thickness shall be stated in μm . The mentioned value of the coating thickness (in μm) is always the minimum layer thickness;
- In the thickness of the coating the thickness of the passivation layer is included;
- For the determination of the coating thickness any organic coating shall be removed.

3.2.1 Products without screw thread

The minimum thickness of the coating on products without screw thread shall be $5 \mu\text{m}$. At any point that can be touched by a ball of 20 mm in diameter, this minimum thickness shall be regarded as the minimum value of the local thickness measured by the non-destructive method given in ISO 2178 "Non-magnetic coatings on magnetic substrates - Measurement of coating thickness - Magnetic method" or in according ISO 1463 "Metallic and oxide coatings - Measurement of coating thickness - Microscopical method" or by any other method as agreed upon between the interested parties and specified in writing.

Bare areas, however, shall not be present.

This requirement does not apply to holes with a depth of more than one quarter of the diameter of the hole; in these holes, however, bare areas shall not be present at a depth of less than the diameter of the hole.

3.2.2 Products with threaded holes and/or studs

The average thickness of the coating on items with threaded holes and/or studs shall be preferably $5 \mu\text{m}$.

The average coating thickness shall be, at least, equal to the required value with the exception of the coating thickness on screw threads in holes, having a depth of more than one quarter of the diameter of the hole; in these holes, however, bare areas shall not be present at a depth of less than the diameter of the hole.

The average coating thickness shall be determined in accordance to Annex B of ISO 2081 (dissolution of the coating) or by any other method as agreed upon between the interested parties and specified in an instruction.

3.2.3 Screws, bolts and nuts

The maximum thickness of the coating on screws, bolts and nuts is dependent on the diameter and indicated in UN-D 12.

If the layer thickness on the screws, bolts and nuts is less than $5 \mu\text{m}$ the requirements on corrosion resistance as mentioned in this standard (see 3.6) are not valid.

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3.3 Adhesion

The adhesion of the coating to the base metal shall be such that the zinc coating cannot be separated from the base metal by normal use.

The coating may be cracked after bending, but shall not flake off the base metal.

3.4 Appearance

The coating shall be free from clearly visible plating defects such as blisters, pits, roughness or cracks.

The articles shall be clean and free from damage.

The electroplating method employed shall be such that the finish is reasonably bright. Stains due to drops of passivating liquids are acceptable provided they are not too obvious.

3.5 Passivation

The passivation of the coating shall be continuous over the zinc surface.

The presence of a blue bright passivation film shall be determined in accordance with Annex D of ISO 2081 (stain test) after removal of any organic coating. The passivating film shall be adherent.

The adhesion of a passivation film shall be tested, after ageing, at room temperature in a clean environment for at least 24 hours, according to annex E (paper test) or Annex F (eraser test) of ISO 2081.

In the designation of the coating the passivation shall be indicated as follows:

Passivation		Indication
Method	Type	
chromate	blue bright	blue pass
chromate	iridescent yellow	yell pass
chromate	olive green	green pas
chromate	black	black pass

The coating shall be iridescent yellow passivated unless another type of passivation is required.

3.6 Corrosion resistance

The corrosion resistance of passivated zinc coatings shall be tested according to the methods given in IEC 68-2-11 Test Ka "Salt mist test" and IEC 68-2-30 Test D "Accelerated damp heat test".

These tests shall not be applied within 24 hours after the electroplating process.

Irrespective of the type of passivation no corrosion products of the base metal shall be visible on articles coated with 5 µm zinc after 48 hours, on articles coated with 12 µm zinc after 96 hours and on articles coated with 25 µm zinc after 192 hours conditioning in accordance with IEC 68-2-11 Test Ka.

After the blue bright, olive green and black passivated zinc coated articles have been subjected to two cycles and the iridescent yellow passivated zinc coated articles to six cycles of the test given in IEC 68-2-30 Test D, there shall be no breakdown of the passivation film or any appearance of white corrosion products. Slight staining is permitted.

After 6 hours testing according to IEC 68-2-11 Test Ka "Salt mist test" on blue passivated zinc there shall be no appearance of white (zinc) corrosion.

After 48 hours on olive green-, black- and yellow passivated zinc coated articles there shall be no appearance of white (zinc) corrosion.

On the green, but especially on black, passivated zinc coated articles there shall be a mark off more visible than on yellow passivated zinc. This staining is permitted.

3.7 Additional requirements

Additional requirements shall be met if specified. The requirements and the methods of testing shall be agreed upon between the interested parties and specified in writing.

3.7.1 Organic coating

Indication	Requirement
no org. coating	The organic coating to par. 3.1 shall not be applied.

3.7.2. Hydrogen embrittlement

Indication	Requirement
not brittle	Any brittleness as a result of the electroplating process is not permitted.

Articles made from steel having a Vickers hardness HV of at least 275 shall be tested for hydrogen embrittlement by the following method:

At least 20 specimens are taken at random from the batch concerned.

These specimens are subjected to a continuous loading stress with one to five percent of plastic deformation in a direction in accordance with the expected use of the articles.

After 7 days of this test none of the loaded articles shall be broken.