Zinc plating is widely used to provide sacrificial corrosion protection to steel and is usually deposited in thicknesses varying from 5 to over 25 µm, zinc plated coatings are usually passivated by immersing in chromate solution to increase the resistance of the zinc to corrosion, supplementary treatments can be applied after chromating to provide specific characteristics such as;

- Sealing – to improve corrosion resistance.
- Integral lubricant – to improve torque characteristics of fasteners/threads.

With suitable pre treatment zinc can be deposited on almost any substrate, though by far the most common are ferrous substrates, however certain materials such as cast iron and carbonitrided steel require processing in specific types of zinc bath.

MP Eastern offer both rack and barrel plating services and a range of passivates and sealers including;

- Clear/Blue – Trivalent chromate ELV/RoHS compliant
- Colour/Yellow – Hexavalent chromate not ELV/RoHS compliant
- Thick film trivalent – Trivalent chromate this class of passivate developed to approximate the corrosion resistance of the Colour/Yellow passivate as an ELV/RoHS compliant alternative
- Black passivate – Hexavalent not ELV/RoHS compliant
- Torque control lubricant

The protective value of the coating is dependent upon;

- Thickness of zinc deposit, generally the thicker the zinc deposit, once the protective value of the relevant chromate film has become exhausted, then the time to base metal corrosion or "red rust" is thickness dependent.

- Chromate film, the type of chromate film applied influences the time to first corrosion products of zinc or "white rust" appearing.

- Production method, zinc coatings are produced by the rack or barrel method. Barrel plating is the most economical method for bulk processing of small parts but the protective value of the relevant chromate film is less than a chromate film produced by the rack method.
  The main cause of this is the mechanical damage to the film that is inherent in the barrel production method.

- Component, the substrate condition, shape of the part all have an influence on final protective value of the specific system applied.

High tensile components and components that have been hardened to specific levels of surface hardness may require baking treatments before plating (stress relief), and after plating for the relief of hydrogen embrittlement.

The baking times and temperatures are dependent upon the UTS and/or the surface hardness of the part.

High tensile or hardened parts that are not baked for the relief of hydrogen embrittlement can failure in service or even before service, more details are provided in ISO 9587 and ISO 9588.

When specifying zinc plating on drawings or orders it is recommended that wherever possible national, international or defence standards are used to provide the processing instructions to your supplier, typically the following information should also be provided;

- Specification reference and coating class.
- Base material grade and condition.
- Significant surfaces and areas where measurements of coating thickness are to be made.
- Any areas that must not be used as contact points for jigging/wiring
- Any special inspection requirements.
- Any special packing requirements

See also BS EN 1403:1998 Corrosion protection of metals – Electrodeposited coatings – Method of specifying general requirements.

In the table below we have summarised information from the standards we typically process to. We also hold a large library of customer specific, superseded/legacy specifications so contact us if you need any help.

Typical standards for specifying zinc plating

Standard	Notes	Comments
BS EN ISO 2081:2008	Coating requirements are specified by referencing the following codes; ISO 2081- A/B/C/D/E/F Where; A – the chemical symbol for the basis metal B – SR Stress relief heat treatment requirements followed by the minimum temperature and time C – The chemical symbol Zn followed the minimum local thickness in µm. D- ER Hydrogen embrittlement relief treatment requirements followed by the minimum temperature and time. E – Chromate conversion coating code F – Supplementary treatment code. Example: ISO 2081 – FE/SR(200)3/Zn25/ER(190)8/C Explanation: 25 µm of zinc (Zn25) on iron or steel (Fe) which is to be stress relieved before plating for 3 hours @ 200^0 C {SR(200)3}, baked after plating for hydrogen embrittlement relief for 8 hours @ 190^0 C {ER(190)8)} and yellow iridescent passivate (C). *Consult the specification for the full range of coating designation and guidance on corrosion protection (service conditions).*	Supersedes; BS EN 12329:2000 BS 1706:1990
BS 7371-12:2008	Standard for imperial fasteners, thickness is dependent upon screw thread dia and passivation called up by the appropriate code. *Screw thread dia* *Batch av thk (µm)* 0.060" to 0.125" 3.8 to 5.1 µm 0.126" to 0.250" 5.1 to 6.4 µm 0.250" to 0.500" 6.4 to 7.6 µm 0.500" to 0.750" 7.6 to 8.9 µm > 0.75" See BS EN 12329 Passivate codes: A = Clear, B = Bleached C = Colour, D = Olive drab Bk = Black	Supersedes; BS 3382 Part 2
BS EN ISO4042:2000	Standard for fasteners, plating thickness is dependent upon thread dia and passivation is called up by the appropriate code. *Screw thread dia* *Batch av thk (µm)* 1.0 to 2.0 mm 3 µm 2.5 to 8.0 mm 5 µm 10 to 16 mm 8 µm 18 to 22 mm 10 µm > 22 mm See the table in the specification Passivate codes: Class 1 : A = Clear, B = Bleached Class 2 : C = Colour, D = Olive drab Bk = Black	Replaces; BS7371-3:1993
AMS 03-20	Steels Min local thk 10 µm Min av thk 14 µm Copper base materials & corrosion resisting steels Min local thk 8 µm Min av thk 12 µm Threaded items < 20 mm dia Up to 3 mm Min av thk 4 µm 3 mm to 5 mm Min av thk 5 µm 5 mm to 13 mm Min av thk 6.5 µm 13 mm to 20 mm Min av thk 7.5 µm Washers Min av thk 5 µm Rivets, taper pins & cotters Min av thk 8 µm	Passivate to BS 6338, trivalent systems may be used provided they meet the requirements of BS 6338. Chromate classification: A = Clear, B = Bleached C = Colour, D = Olive drab