



National Standards Authority of Ireland

IRISH STANDARD

I.S. EN 13858:2006

ICS 25.220.40

**CORROSION PROTECTION OF METALS -  
NON-ELECTROLYTICALLY APPLIED ZINC  
FLAKE COATINGS ON IRON OR STEEL  
COMPONENTS**

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English Version

## Corrosion protection of metals - Non-electrolytically applied zinc flake coatings on iron or steel components

Protection des métaux contre la corrosion - Revêtements non électrolytiques de lamelles de zinc sur des composants en fer ou en acier

Korrosionsschutz von Metallen - Nicht elektrolytisch aufgetragene schuppenförmige Zinküberzüge auf Werkstücken aus Eisen oder Stahl

This European Standard was approved by CEN on 6 October 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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## **Foreword**

This document (EN 13858:2006) has been prepared 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of an identical text or by endorsement, at the latest by May 2007, and conflicting national standards shall be withdrawn at the latest by May 2007.

This document supersedes EN 13858:2003.

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

## EN 13858:2006 (E)

### Introduction

The purpose of non-electrolytically applied zinc flake coatings, which may contain a small proportion of aluminium flakes, is for corrosion protection of steel components. If needed, these coatings may also incorporate an integral lubricant, for improving lubricity. Variations in colour or lubricity are obtained by applying a suitable supplementary coating to zinc flake-based coatings.

The non-electrolytically applied zinc flake coatings for iron and steel components are obtained by cold immersion or by pneumatic or electrostatic gun-spraying of the coating liquid, followed by curing. Coating processes by cold immersion ensure complete coverage of components, even with complex shapes. These coatings are not suitable for components that are used at temperatures higher than the curing temperature.

Mechanical cleaning methods of the metal surfaces are preferred for steel parts having a tensile strength of 1 000 MPa and greater ( $R_m \geq 1\,000$  MPa) to avoid the risk of hydrogen embrittlement. If acid chemical cleaning methods are used, stress relief heat treatment is required for high strength steels ( $R_m \geq 1\,000$  MPa) if they contain tensile stresses (see Clause 6.1.2).

Zinc protects steel by galvanic action, i.e. sacrificial action takes place to protect steel when it is in close contact with the steel, and after weathering, zinc oxides are formed on the coating surface. These oxides are voluminous and plug the pores in the coating to provide barrier protection. Apart from cathodic corrosion protection, the zinc flakes also provide barrier properties due to the platelet structures.

Artificial atmosphere corrosion tests of these coatings can provide some measure of guidance for corrosion protection. However, the duration and results of accelerated corrosion tests, such as the neutral salt spray test, have no direct relation to the corrosion protection in other environments.

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