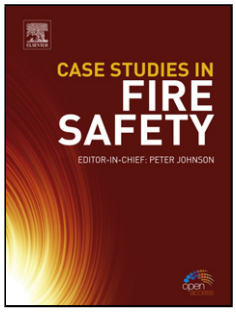


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# Corrosion and corrosion products of hot dipped galvanized steel during long term atmospheric exposure at different sites world-wide.

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**Research highlights**

- Atmospheric corrosion of zinc coated steel.after world wide exposure
- Localised corrosion attack with pitting of zinc coating
- Sulfate and chloride containing corrosion products in corrosion pits
- Zinc hydroxy carbonate at cathodic areas outside the pits.

## Abstract

The atmospheric corrosion of hot dipped galvanised steel was studied in a wide-world exposure in Europe, East Asia and USA. The corrosion product composition, morphology and surface distribution was investigated after 0.5, 1 and 2 years exposure. The corrosion was localised for all exposure conditions with sulfate and chloride containing corrosion products$(Zn(OH)_2)_3 \cdot ZnSO_4 \cdot nH_2O$,$NaZn_4(SO_4)(OH)_6Cl \cdot 6H_2O$ and $Zn_5(OH)_8Cl_2 \cdot H_2O$ formed at the anodic sites in corrosion pits and $Zn_5(OH)_6(CO_3)_2$ mainly in the outer parts of the corrosion products and cathodic areas outside the pits. The content of the sulfate containing corrosion products increased in the order marine <marine/urban, marine / industrial< industrial / urban.

## 1. Introduction

Zinc coatings have greatly contributed to improve the corrosion resistance of steel products exposed to corrosive environments and zinc coated steel can reach lifetimes of several decades. Continuous hot dipped galvanized steel sheet for building or automotive applications are coated with zinc containing a small amount of aluminum to suppress the formation a layer of Zn-Fe phases which are formed during galvanizing steel from pure