

# FalZinc - Durability

## Technical Information

TIS-MTL-FIN-058  
19 February 2009 – Issue 4

## FalZinc - Durability

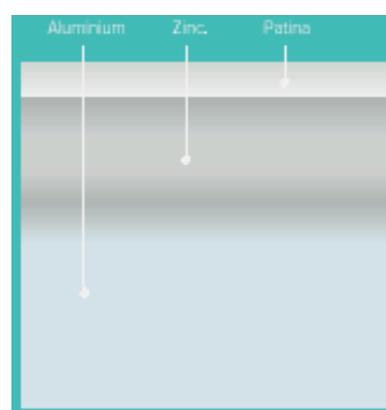
### Introduction

FalZinc, offers all the performance benefits of traditional (fully supported) aluminium standing seam roofing and cladding together with the aesthetic appeal of zinc. The combination of a zinc surface on an aluminium substrate eliminates most of the corrosion problems associated with zinc roofing and allows simpler and more cost effective roof constructions to be created.

**NB** The form of FalZinc roll-formed as Kalzip self supporting standing seam roofing and cladding sheets is known as AluPlusZinc which utilises a higher strength grade of aluminium alloy substrate.

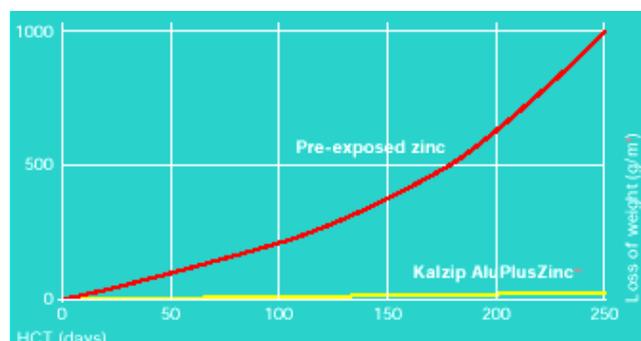
### Corrosion testing of Kalzip FalZinc (AluPlusZinc)

FalZinc (AluPlusZinc) has been proven, by testing, to be highly resistant against corrosion. The patented PEGAL process produces a highly durable fusion between the aluminium substrate and the thin zinc coating. The additional phosphate treatment creates a stable patina with high resistance to the effects of weathering.



*A diagrammatic representation of FalZinc (AluPlusZinc)*

Tests in accordance DIN 5017 KFW (cyclic condensate tests) in addition to HCT-tests have shown that FalZinc (AluPlusZinc) outperforms conventional zinc surfaces in terms of resistance to corrosion as can be seen on the following graph.



*HCT-Test showing loss of material weight due to corrosion – comparing pre-exposed zinc and Kalzip AluPlusZinc (FalZinc)*

Furthermore, the performance characteristics of the aluminium substrate, e.g. its resistance to the effects of seawater, are fully retained in FalZinc (AluPlusZinc). The HCT-tests are based on the measurement of a microclimate with a high ionic concentration with underlying relative humidity and temperature that is comparable to the prevailing conditions simulated in the field of structural engineering. The weathering characteristics of FalZinc (AluPlusZinc) have been confirmed by prolonged and controlled exposure of samples in urban, heavy industrial and maritime conditions.



**Zinc pre-exposed to weathering (micro-shot HCT-test 250 days)**



**FalZinc (AluPlusZinc), produced by the PEGAL process (micro-shot HCT-test 250 days)**

## Erosion of surface of Zinc Roof Sheets

Zinc roofing materials along with other heavy metals used in roofing applications such as Lead and Copper are prone to losing through erosion metal ions from their surface to the atmosphere and to ground water. Other metals, such as Aluminium and Titanium, do not suffer from the same problem. Typical values of annual loss for various metals are shown in the following table:

Typical values of annual loss of various roofing metals due to erosion	
Metal	Loss of material ( $\mu\text{m}/\text{annum}$ )
Copper	0.2
Zinc	0.5
Lead	0.6
Aluminium	0
Titanium	0

Values taken from article published in *Baumetall 4/2001 – Metallabtrag und Metallabschwemmung von Metall-dächern* – Dr. Markus Faller

An expertise, produced by Dr.-Ing. Werner E. Kallenberger of **Zinkberatung Ingenieurdienste GmbH, Nr. 00/135**, stated that the FalZinc (AluPlusZinc) surface does not behave like zinc but behaves like aluminium. The FalZinc (AluPlusZinc) surface would therefore not be prone to any of the erosion problems that can be encountered with zinc. The surface of FalZinc (AluPlusZinc) was found to be a mixture of phosphate, aluminium and zinc.