

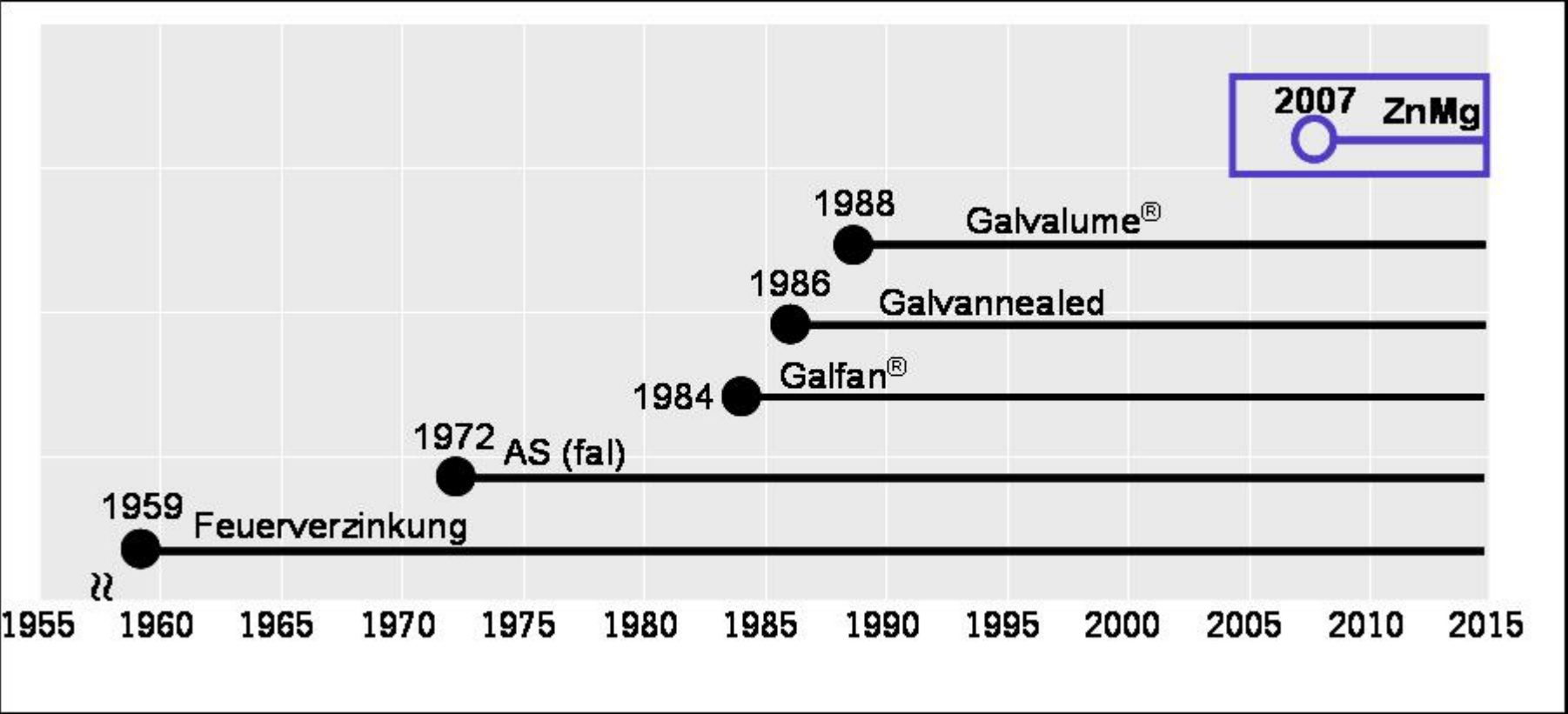
ZMg EcoProtect®

A new galvanised product for the building industry

Michael Lamprecht

Panama International, 12th november 2009, Helsinki

Development of hot-dip-galvanizing in europe

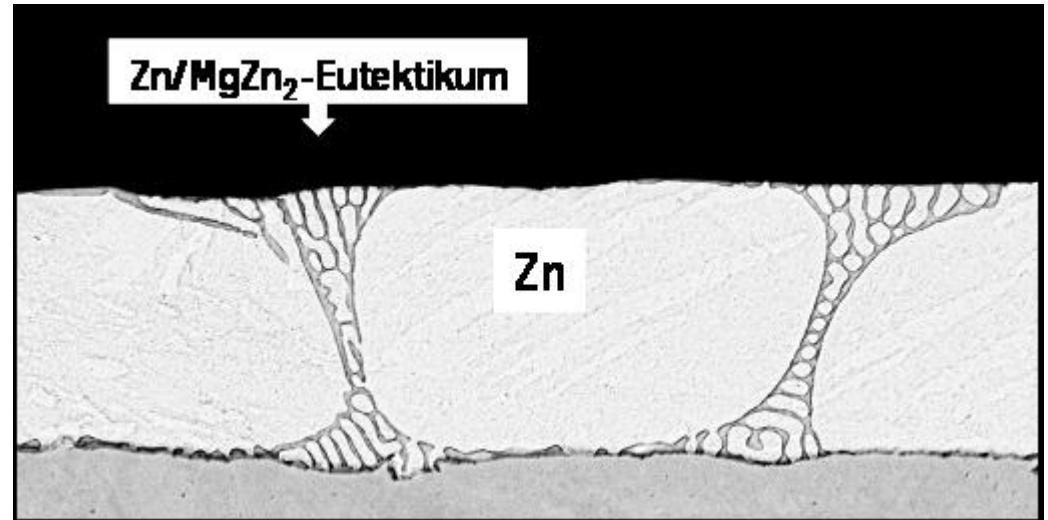


Motivation for a new metallic coating concept

1. development of a metallic coating with a higher specific corrosion resistance
2. protection of the zinc resources
3. energy saving using less zinc in the process
4. reduced dependancy on the volatile raw material prices (particularly the zinc price)

ZMg EcoProtect®

hot dip metal coated thin sheets



- **Mg – content: ca. 1% in melt and layer**
- **first production trial march 2006**
- **69.000 t produced in the FY 2007/08**

ZMg EcoProtect®

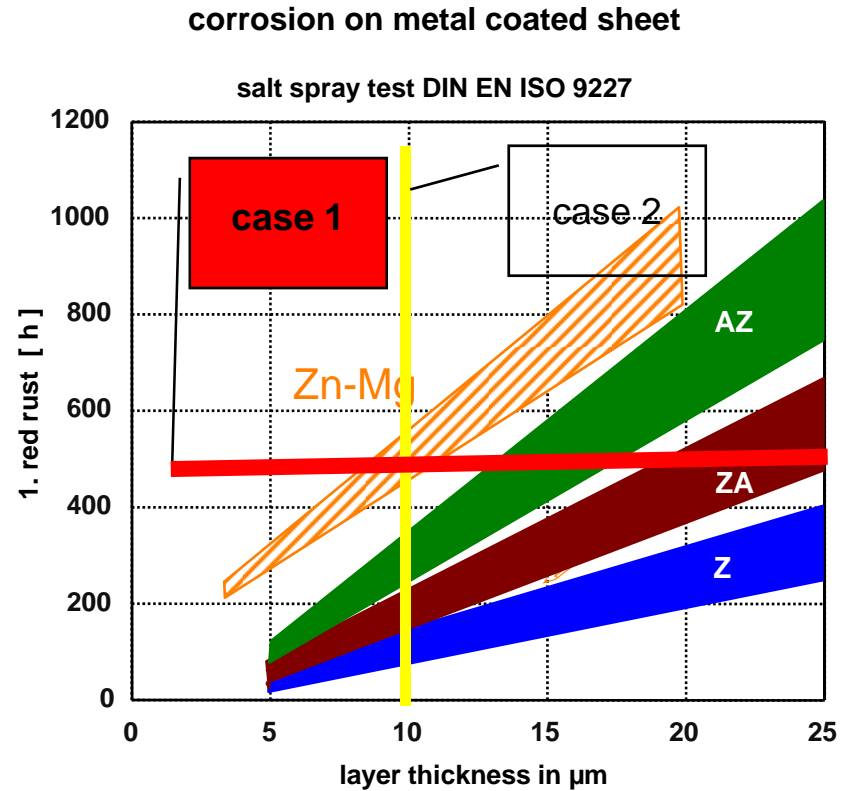
improved specific corrosion resistance

case 1

- equivalent corrosion resistance

case 2

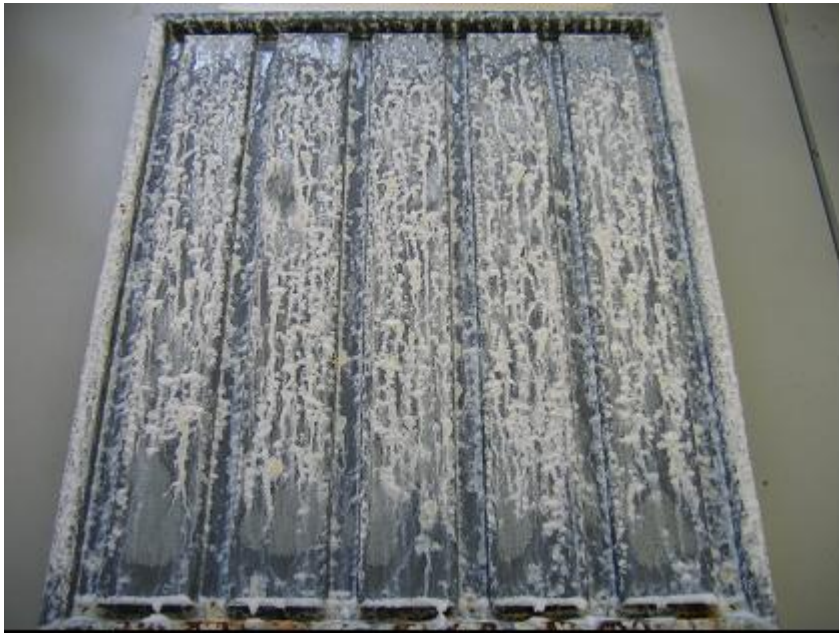
- improved corrosion resistance



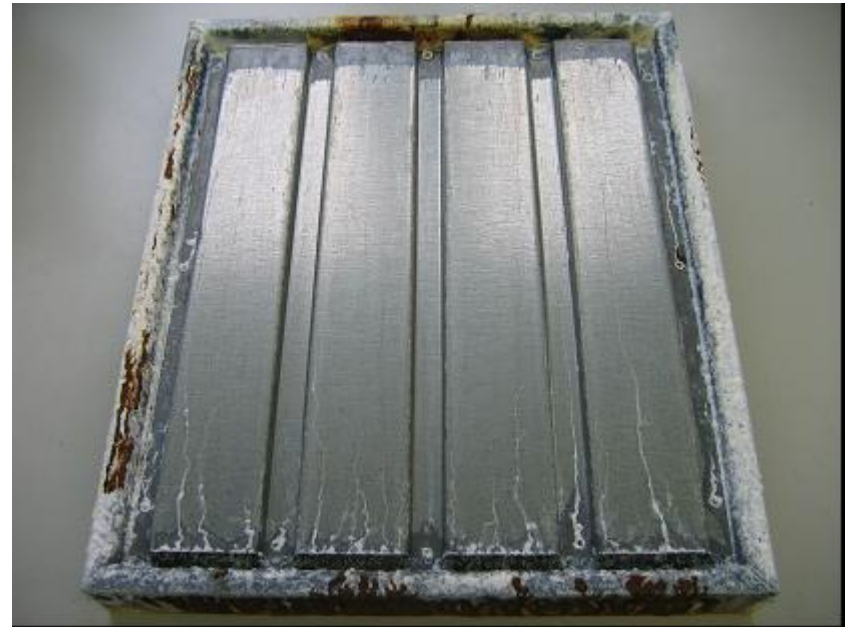
hot-dip-galvanized (Z), Galfan (ZA), Galvalume (AZ) and Zink Magnesium (ZMg)

Excellent protection against corrosion for ZMg EcoProtect® on profiles

salt spray test DIN EN ISO 9227



frame : Z275
profile : Z130



frame : Z275
profile : ZMg130

Excellent protection against corrosion for ZMg EcoProtect® on threedimensional pieces for the automobile industry

trailer mudwing (salt spray test: DIN EN ISO 9227 / 264 h)



standard galvanisation Z 280
with Cr(VI)-containing primer



ZMg EcoProtect® ZMg 130
free from Cr(VI)-primer

Corrosion protection – an outstanding characteristic of ZinkMagnesium

redrust significantly reduced with ZMg

Y-flange after 10 cycles in corrosion test VDA 621-415



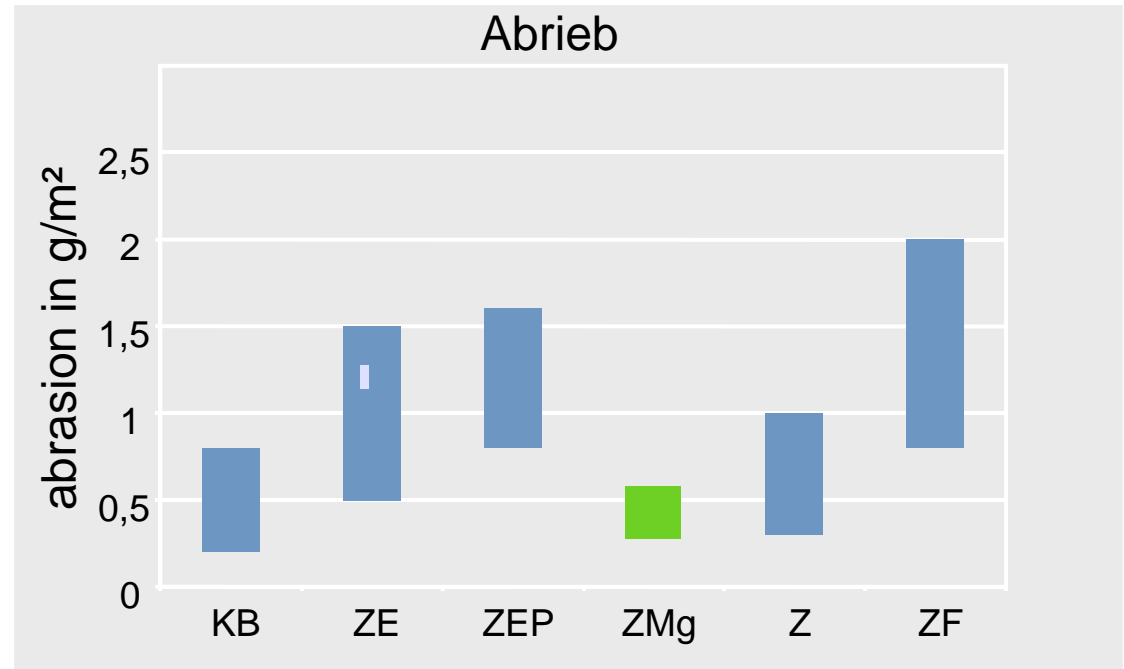
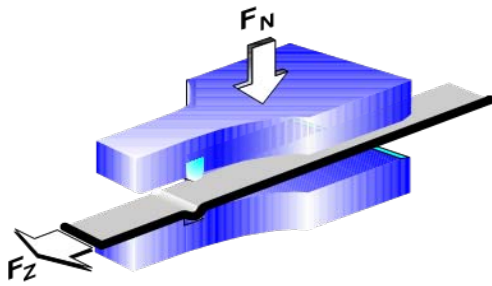
ZMg100 (7 μm)



Z140 (10 μm)

ZMg EcoProtect®

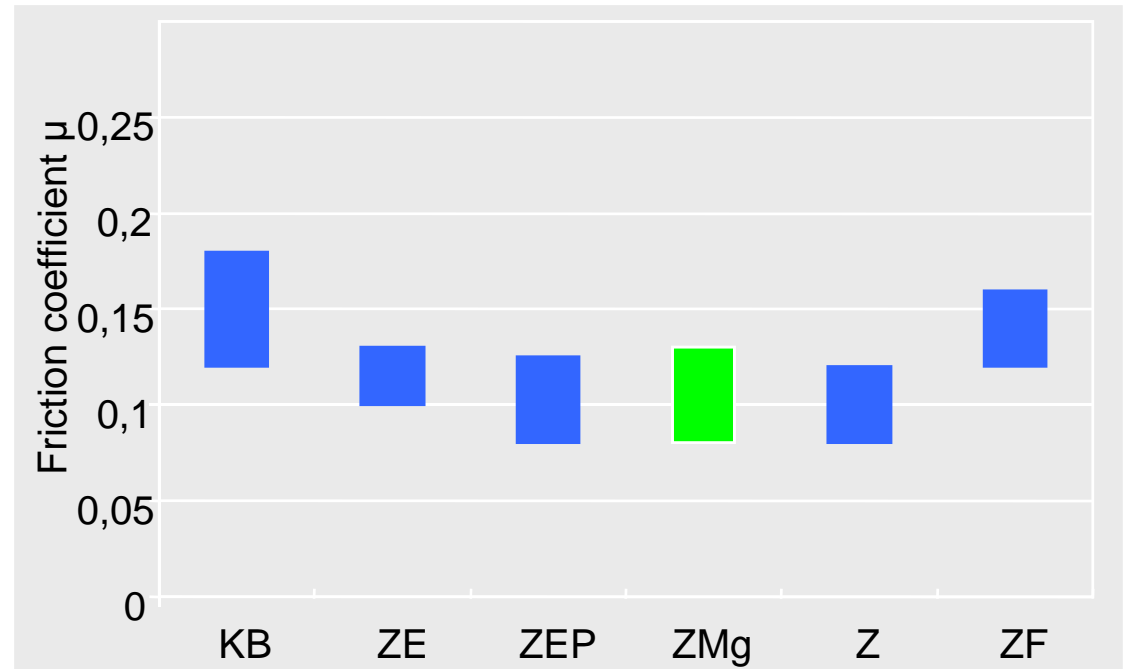
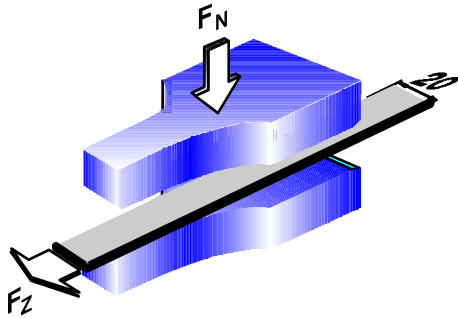
sound formability properties approved by testing abrasion resistance



KB = unverzinktes Feinblech, ZE= elektrolytisch verzinktes Feinblech
ZEP = elektrolytisch verzinktes + vorphosphatiertes Feinblech
ZMg = feuerbeschichtetes Zink-Magnesium-Feinblech ,
Z = feuerverzinktes Feinblech, ZF = Galvannealed Feinblech

ZMg EcoProtect®

sound formability properties approved by testing the friction coefficient



KB = unverzinktes Feinblech, ZE= elektrolytisch verzinktes Feinblech
ZEP = elektrolytisch verzinktes + vorphosphatiertes Feinblech
ZMg = feuerbeschichtetes Zink-Magnesium-Feinblech ,
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Sound Formability of ZMg approved in praxis



ZMg EcoProtect with finish

ZMg EcoProtect® as a basis for color coating (PLADUR®)

Polyester 25µm similar RAL 9002 /
salt spray test acc. DIN EN ISO 9227
Z-275g/m² ZA-255g/m² ZMg-130g/m²

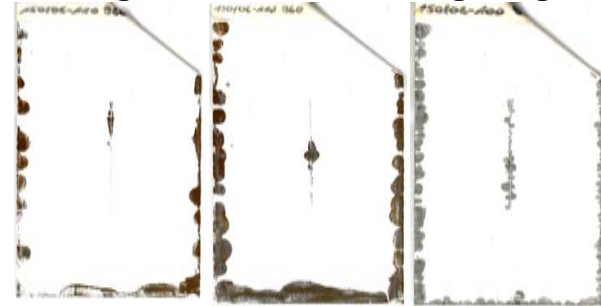
ZMg persuades by good corrosion performance

Excellent corrosion resistance

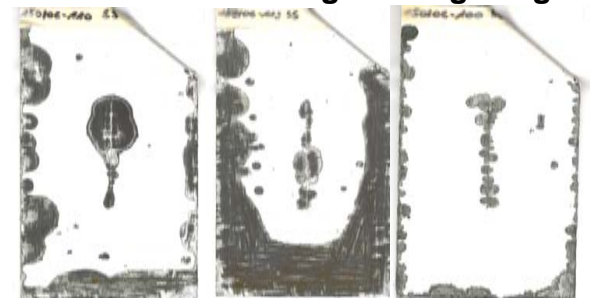
- beating the standard
- increasing the advantages under high corrosion loads and/or long exposition times
- well performing in the bending area
- good performance with Cr(VI)-free primer and finish
- minor sensitivity to corrosion creep/disbonding
- minor sensitivity to cutting edge corrosion
- can be used with all kinds of color coatings



Z-275g/m² ZA-255g/m² ZMg-130g/m²



Z-275g/m² ZA-255g/m² ZMg-130g/m²

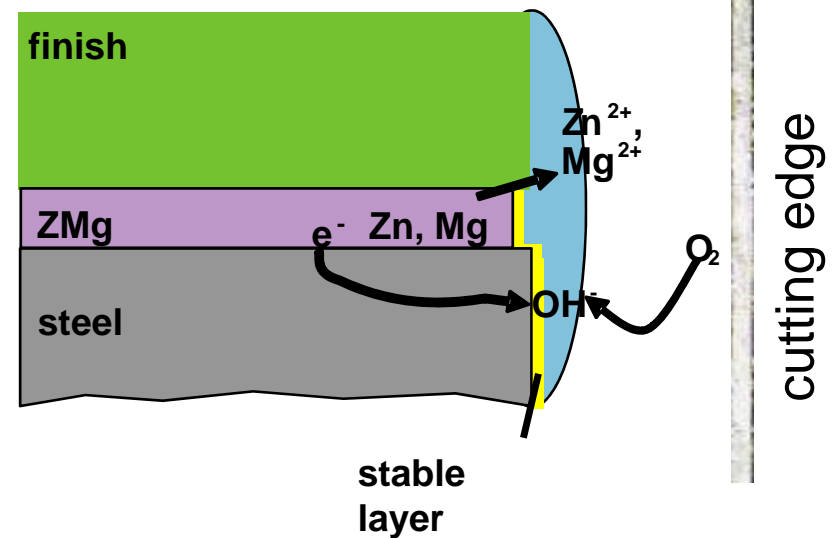
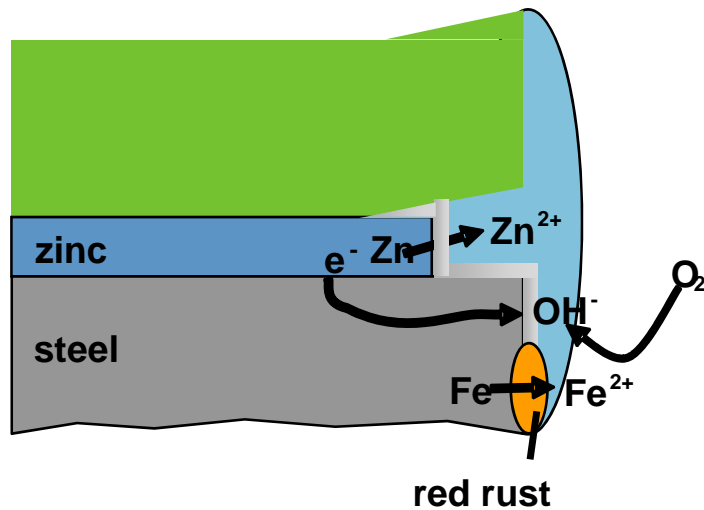
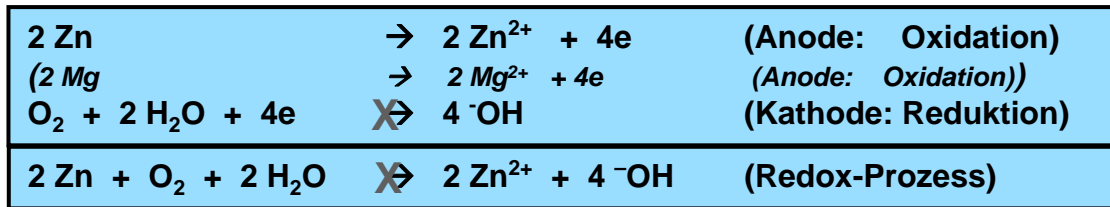


360h test time

960h test time

2000 h test time

Protection mechanisms of zinc-alloy-layers



PLADUR® on basis of ZMg EcoProtect® performs extremely well at the cutting edge

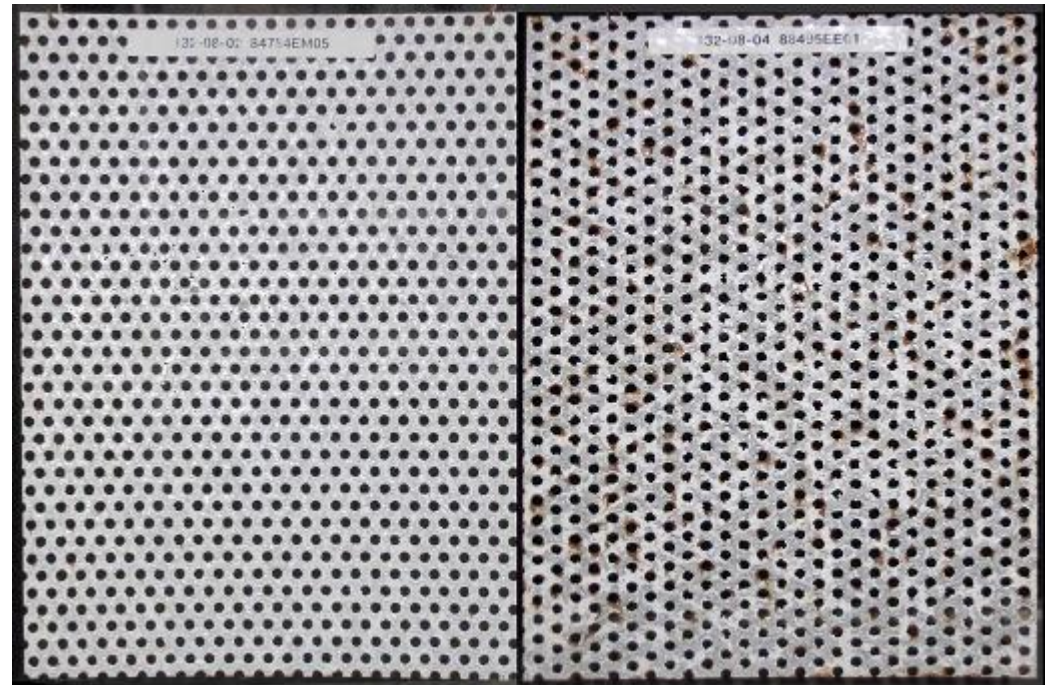
salt spray test DIN EN ISO 9227

sample:

PLADUR® Polyester 25 µm

perforated sheet

- hole diameter 5 mm
- hole distance 8 mm
- hole percentage 35 %



ZMg 130 + Polyester 25µm

Z 275 + Polyester 25µm

Significant cutback in layer thickness possible with ZMg+ PLADUR® for the construction industry

- at least same corrosion properties with half the layer thickness (ZMg 130 + CC vs. Z 275 + CC)
- approved by DIBT (Allgemeine bauaufsichtliche Zulassung für die Korrosionsschutzklasse III, PLADUR® with ZMg EcoProtect®)
- european approval applied, expected for Q1/2010
- other national approvals applied

DEUTSCHES INSTITUT FÜR BAUTECHNIK
Anstalt des öffentlichen Rechts

10829 Berlin, 18. Februar 2008
Kolonnenstraße 30 L
Telefon: 030 78730-258
Telefax: 030 78730-320
GeschZ.: 136-1.30.11-8/06

Allgemeine bauaufsichtliche Zulassung

Zulassungsnummer:

Z-30.11-30

Antragsteller:

ThyssenKrupp Steel AG
Hammerstraße 11
57223 Kreuztal

Zulassungsgegenstand:

Mit dem Beschichtungssystem PLADUR ZMg
korrosiongeschützte Stahlbänder (Coils) für die
Herstellung dünnwandiger kaltgeformter Bauteile

Geltungsdauer bis:

28. Februar 2013

Der oben genannte Zulassungsgegenstand wird hiermit allgemein bauaufsichtlich zugelassen.
Diese allgemeine bauaufsichtliche Zulassung umfasst fünf Seiten.



87542/08

References: ZMg EcoProtect®



**commercial building Siegen,
Germany**

References: ZMg EcoProtect®



**commercial building Siegen,
Germany**

References: ZMg EcoProtect®



**commercial building Köln,
Germany**

References: ZMg EcoProtect®



**brown coal power plant Boxberg,
Germany**

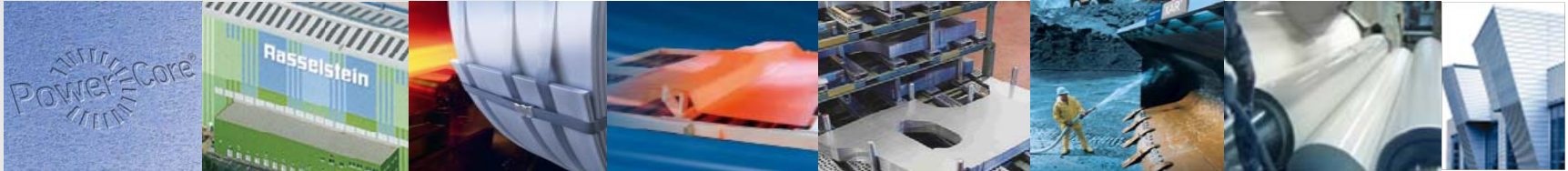
Outlook on further development of ZMg EcoProtect®

- further increase on production figures of ZMg EcoProtect®
- development of additional color coating PLADUR® systems on basis of ZMg EcoProtect®
- further increase on production capacity
- extension of the number of international approvals
- substitution of classic metallic layer systems



Summarisation

- ZMg EcoProtect® owns improved corrosion protection
- it is possible to decrease the layer thickness or to get better corrosion resistance with the original layer thickness
- ZMg-metal coatings are comparable with Z-metal coatings in all other properties
- more than 200.000 t of production experience
- further development in progress

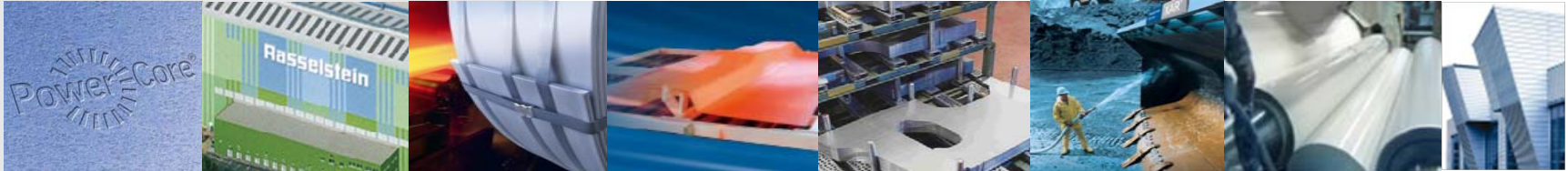


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**Thank you very much for
your attention 😊**