

# CORRPASSIV™ Corrosion Prevention Systems

Based on Organic Nanometal®  
Technology

## CORRPASSIV™ Description

- The Organic Nanometal® behaves like a noble metal with a potential that differs only slightly from silver; i.e. more stable than copper, iron, etc.
- As soon as a direct conductive contact is established between the Organic Nanometal and the metal to be protected, a dual protective mechanism starts to take effect
- CORRPASSIV ennobles the surface of conventional metals such as iron, steel, copper, aluminum or zinc and passivates it
- For the variety of applications we offer several CORRPASSIV systems

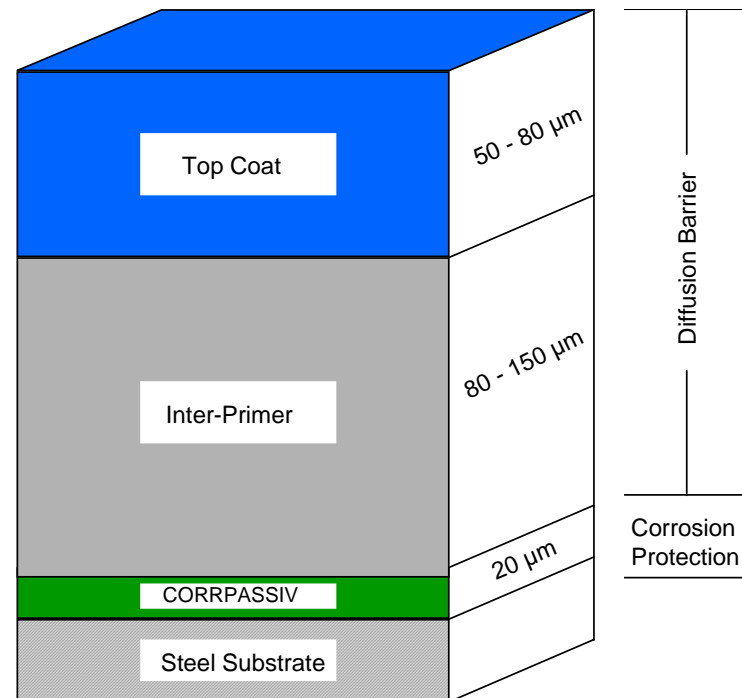
*Main areas are industrial coatings, seawater and offshore applications*

# CORRPASSIV™ Classic Set Up

2-C-PU or EP Topcoat

2-C-EP Interprimer

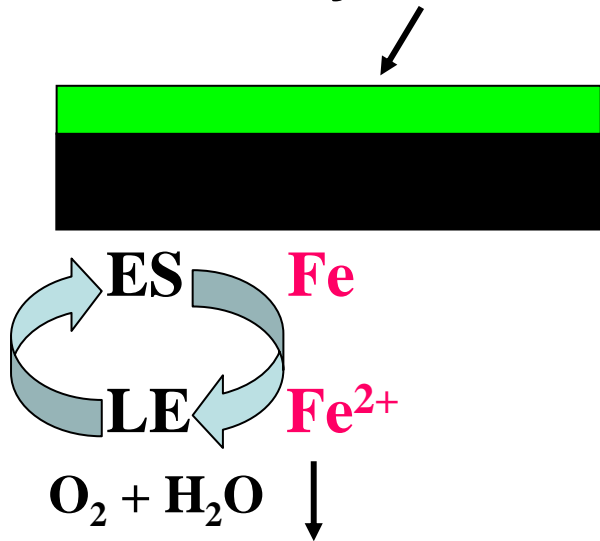
CORRPASSIV Primer  
(approx. 1.5% PAni)



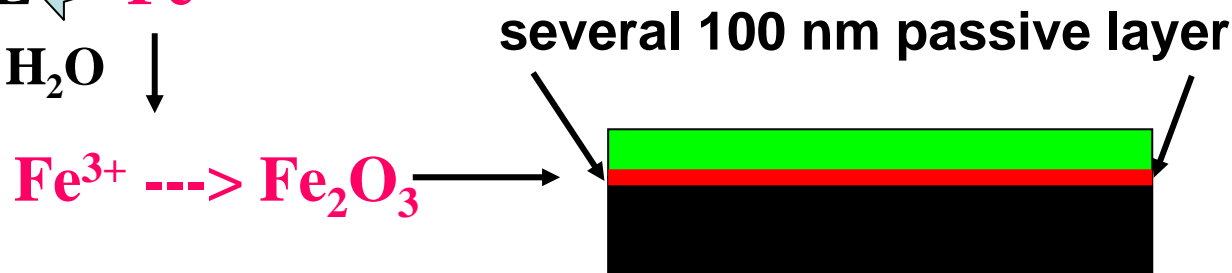
# CORRPASSIV™

## Passivation Principle of the Organic Nanometal®

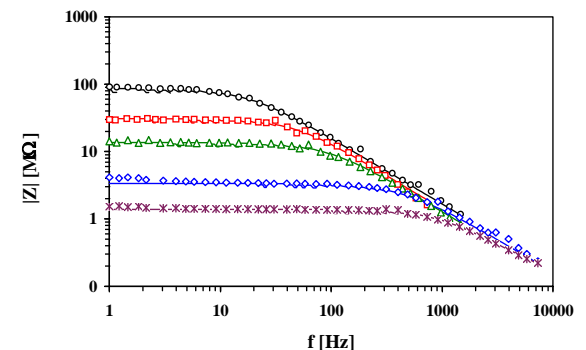
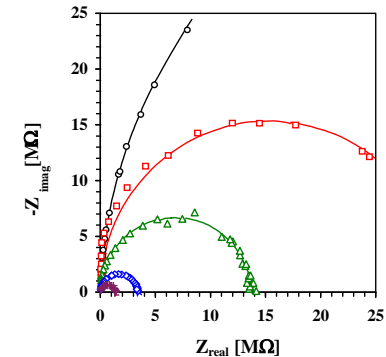
very fine dispersion (less than 1.5% in the primer)



1. Potential shift of 400 - 800 mV
2. Oxidation to Fe<sup>2+</sup>, Cu<sup>+</sup> etc..;  
PAni in the reduced state („LE“)
3. Formation of defined oxides



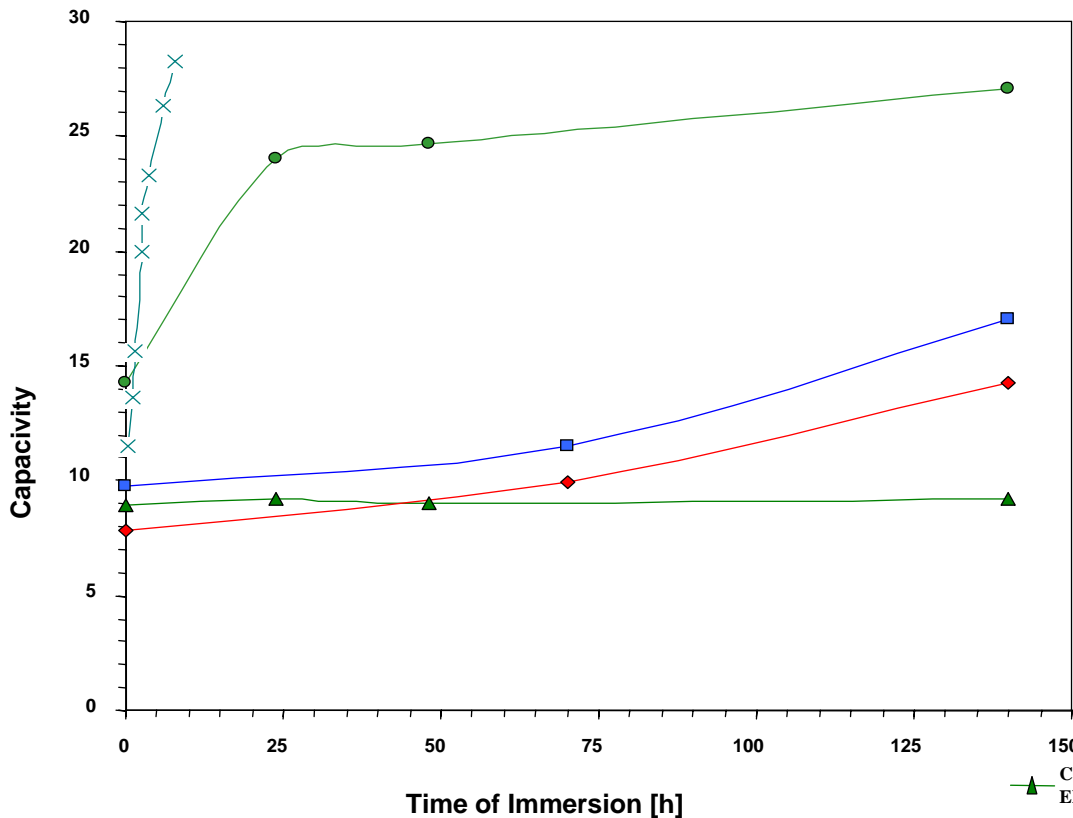
# CORRPASSIV™ Research Methods for Analyzing the Coating Properties



## Electrochemical Impedance Spectroscopy (EIS)

# CORRPASSIV™

## Capacity Change of Coatings (EIS)



**The lower the capacity (DE),  
the less the ion diffusion.**

**Less rise means less  
corrosion**

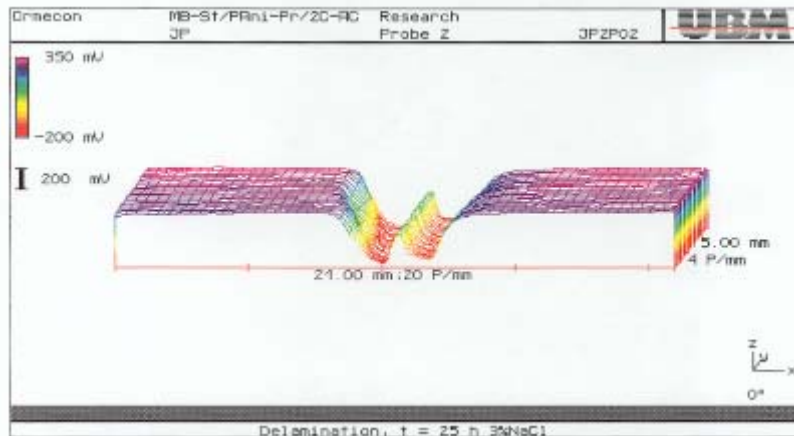
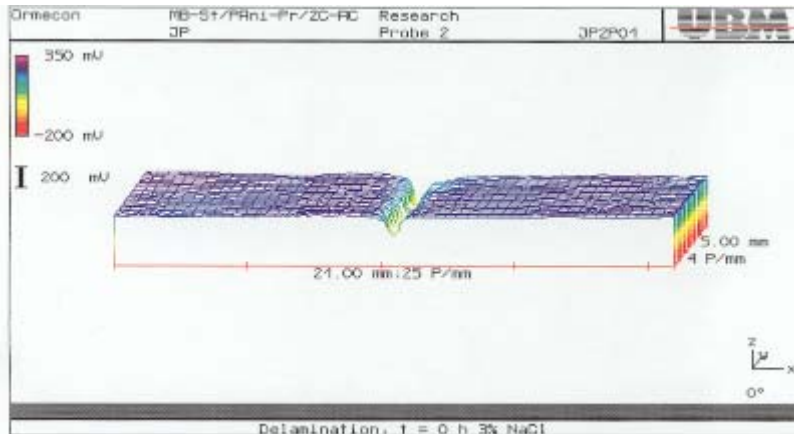
**➔ Less ions diffuse**

# CORRPASSIV™ Research Methods for Analyzing the Coating Properties



## Scanning Kelvin Probe (RKS)

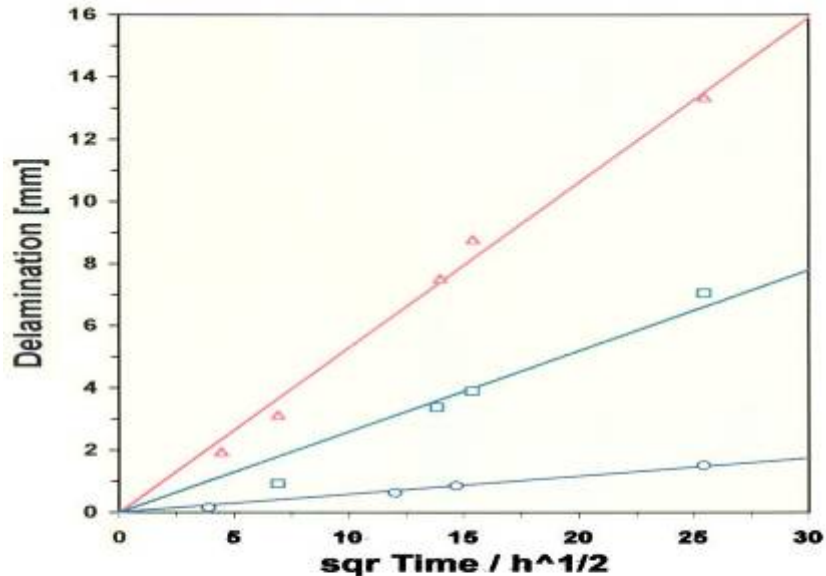
# CORRPASSIV<sup>TM</sup> Analysis by SKP



Examination of the  
Delamination of  
Coatings by Scanning  
Kelvin Probe  
Measurements

# CORRPASSIV™ Analysis by SKP

**Delamination as Function of Immersion Time**



Evaluation of  
Creep Corrosion

- ▲ Steel|Primer without PAni|2C-EP — 0.53 mm/h<sup>1/2</sup>
- Steel| PAni-Primer|2C-EP — 0.26 mm/h<sup>1/2</sup>
- Steel|Zn|PAni-Primer|2C-EP — 0.06 mm/h<sup>1/2</sup>

# CORRPASSIV™ Summary of Results

#	sample	µm/h	potential E (mV)		DE
			under coating	in scratch	
1	CORRPASSIV/ 2-C EP	0 (-3)	300	150 (no rust)	9 / stable
2	CORRPASSIV primer matrix without polyaniline/ 2-C EP	20-40	-200	-200 (rust)	12→15
3	EP primer / 2-C EP	50-60	-200	150 (rust)	8→14
4	Zn-EP primer / 2-C EP	30-35	-150	-700	10→17

- CORRPASSIV: < 3µm/h, > 250 mV, DE < 12 / stable
- Very good corrosion protection, if the layers are compatible
- Zinc coatings provide inferior results
- RKS and EIS together with cycling testings and outdoor exposure

# CORRPASSIV<sup>TM</sup> **Technical Expertise**

**The Organic Nanometal<sup>®</sup> will provide extremely good corrosion prevention, when the following is observed:**

- **Optimal dispersion of the Organic Nanometal**
- **Catalytic effect has to be assured**
- **Good adhesion to the metal to be protected (surface pretreatment, primer formulation)**
- **Compatibility to further layer assembly (bonding to primer, special barrier properties)**

# CORRPASSIV™ Reference Objects



Pipe coating for  
waste water  
treatment plant,  
Poland

= no corrosion  
attack after nine  
years. For  
extending the plant  
new CORRPASSIV  
material already  
has been delivered

# CORRPASSIV™ Reference Objects



Pipe coating for  
deep sea oil  
production, Brazil

this pipe was  
installed in 2000m  
water depth,  
Atlantic Ocean,  
Recife

= no claim even  
after three years  
(still assembled)

# CORRPASSIV™ Reference Objects



Test winner at the  
Honshu-Shikoku  
Bridge, Japan

# CORRPASSIV™ Reference Objects



Tokyo Oota  
Ward Haneda -  
floodgate coating  
in very  
aggressive,  
seaside  
environment

= no corrosion  
effect after four  
years

# CORRPASSIV™ Reference Objects



Coating of a  
Passenger ferry  
(aluminum), Lake  
Constance,  
Germany

= six years - still  
no corrosion  
products can be  
discovered

# CORRPASSIV™ Reference Objects



- double sided -

Page 1

Coating of steel constructions of a Tofu manufacturing company in Nagano, Japan

# CORRPASSIV™ Reference Objects

Page 2



-> after six months  
with conventional  
system



after CORRPASSIV  
coating

CORRPASSIV shows outstanding corrosion protection properties. In comparison to the conventional system which needed to be completely refurbished every six months, the CORRPASSIV system doesn't show any corrosion effect – not even after two years.

# CORRPASSIV™ Reference Objects



Tank top coating  
at a  
petrochemical  
company, Tianjin,  
China

Jan-09

# CORRPASSIV™ Reference Objects



Coating of parts  
of the Managawa  
Dam in Japan,  
2007

Jan-09

# CORRPASSIV™ Reference Objects



Coating of steel boxes for sea oil exploring measurement equipment protection, Tianjin, China