Welcome to the presentation of

The first true *high solids*
Moisture Cured PolyUrea coating

INDUSTRIES
ADVANCED & FUTUREPROOF

Owners
experiences too often
"premature failures"

Corrosion
Peeling
Cracking
Color failure

Paint Contractors
Are too often
restricted by:

"Too narrow paint applying recommendations and weather conditions"

Humidity (application delay / rust bloom)
Temperature (application delay)
Surface preparation
Complex paint systems
Slow curing

Pre-mature failures … 2-3 x the cost and time loss

While these failures can be avoided…

BE… DECIDE… ACT…

Responsible !!!

Use the “right” “innovative” paint technology…

INDUSTRIES
ADVANCED & FUTUREPROOF

Overcome all restrictions of application

Give a better solution to all corrosion problems

Easier surface preparation and paint work

Long term durability and excellent performance

Reduce total project Cost

Reduce total project Time

Prevent failures

What is
The technology?

INDUSTRIES
ADVANCED & FUTUREPROOF

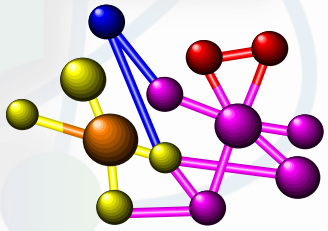
One component
Moisture Cured Poly-Urea

One component
MCU-Coatings
Liquid paint

+

Humidity

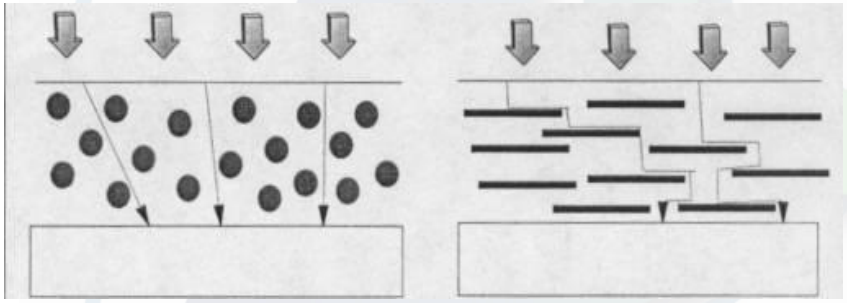
=



Poly-urea

Different than the traditional coatings systems!
A combination of
Durability & Flexibility

Micaceous Iron Oxide Pigments (MIO)



The parallel alignments of the MIO flakes in a coating on a substrate produces a shield of overlapping plates

MCU-Coatings contains Micaceous Iron Oxide Pigments (MIO)

INDUSTRIES
ADVANCED & FUTUREPROOF

MIO enhances the protection by its properties:

- Barrier protection

  Prevents the ingress of water, oxygen, and ions and thus prevents the corrosion of the steel and degradation of the binder.

- Ultraviolet light block

  Protect the surface of the binder system from the degrading action of UV and other weathering elements. Erosion rates and chalking are greatly reduced.

- Film reinforcement

  Improved resistance to blistering and corner build.

- Increases the surface & inter-coat adhesion.

  MIO produces a surface with an excellent physical profile for subsequent coats and increase substrate adhesion

Harsh durable

INDUSTRIES
ADVANCED & FUTUREPROOF

Taber Abrasion Test
ASTM 4060 1000 cycles, two CS-17 1 kg load
Result: < 30.10 mg weight loss

Extended Salt Spray Exposure:
ASTM B-117: 20.680 hours

Impact resistant:
ASTM D-2794-90: 150 inches/Lbs

Flexibility:
for many years

Temperature resistant:
150 ° C (dry) continuous

Immersion
Within 45 minutes

All weathers

6 – 99% RH

No dew point restrictions

Resistant to fog, rain and dew after minutes

Immersion after 45 minutes

Cures even at -15 ° C

All year round and night application possible

Shut downs not necessary

Surface Tolerant 1

Best adhesion on *minimal* prepared surfaces

Low steel roughness required: 25µm or hand and power tool prepared

Flash rust tolerant (L)

Adhesion direct to green concrete

Best for over-coating old coatings as lead based, alkyds, etc (adhesion & flexibility)

Surface Tolerant 2

INDUSTRIES
ADVANCED & FUTUREPROOF

Our primers are superior for over-coating old coatings:

Drying-stress in our coatings is less:

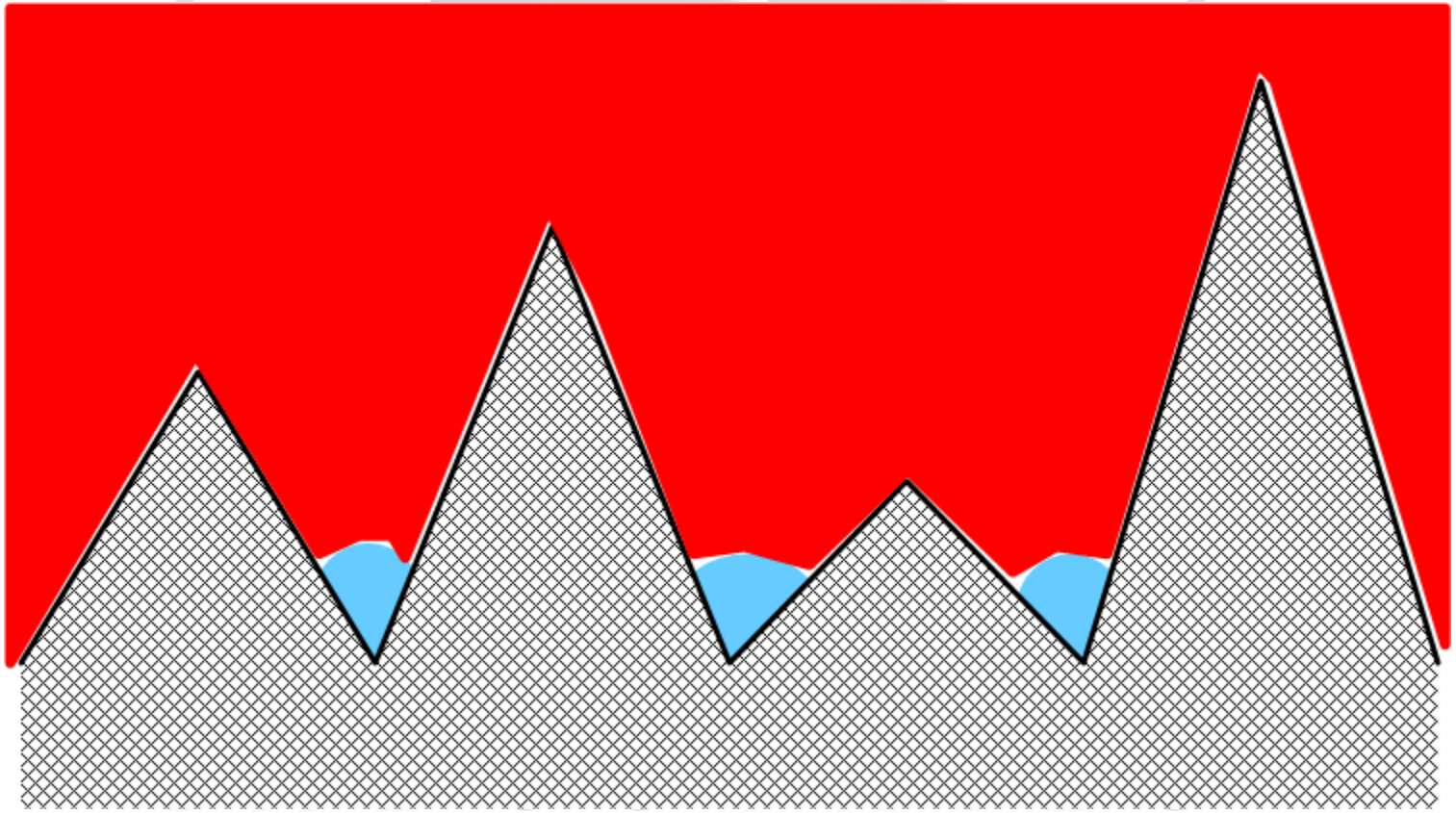
Epoxy: +/- 672 to 974 psi
Alkyd: +/- 300 psi
Poly-urea: +/- 39 to 413 psi

Surface preparation to:

SP1 Solvent Cleaning
ST2 Hand Tool Cleaning
ST3 Power Tool Cleaning
Sa 2 Commercial Cleaning
Sa 2,5 Near White Metal Cleaning
WJ5 UHP Water-jetting
WAB 6, etc…

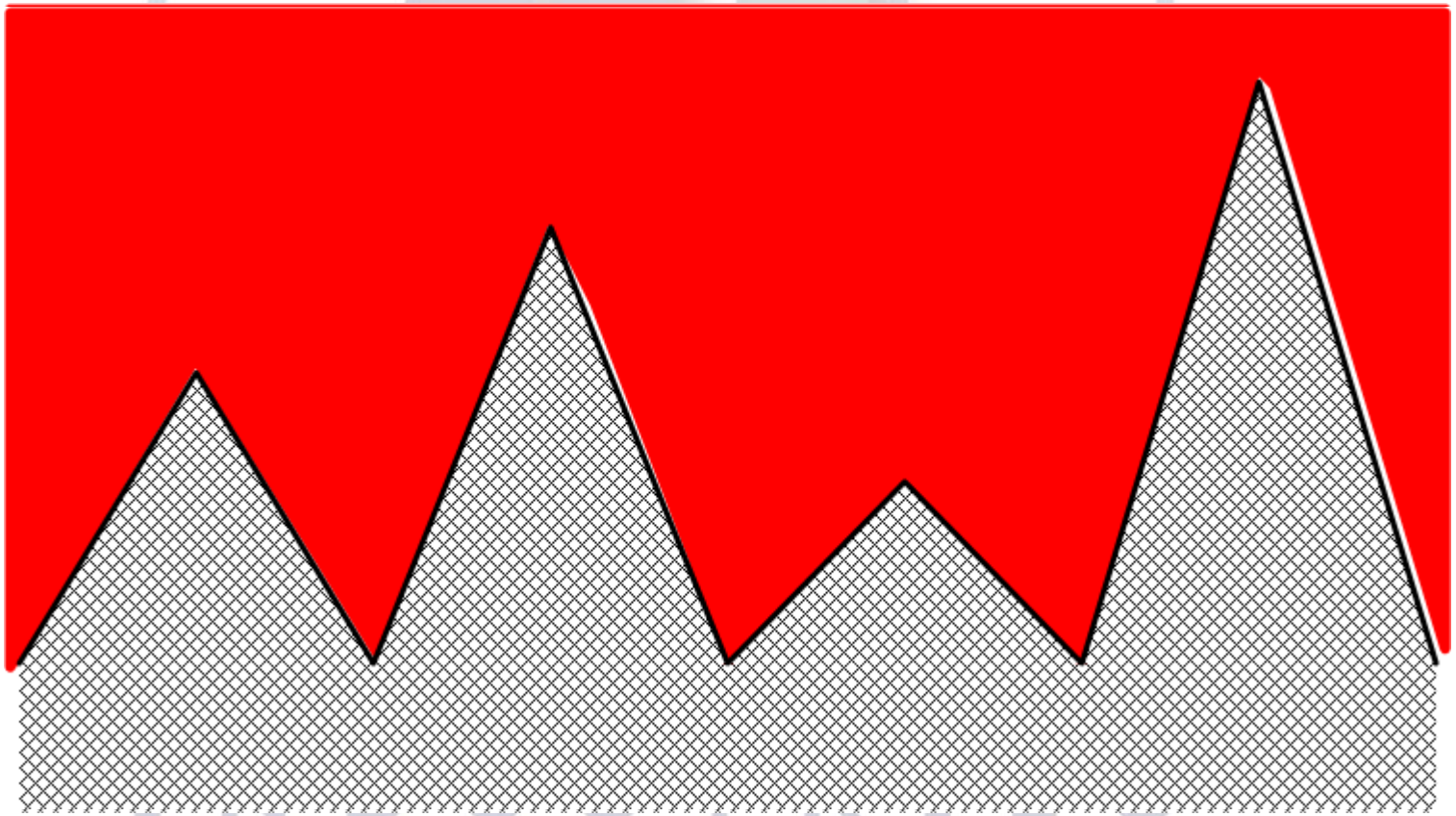
Reaction using "non-moisture curing" coating on micro-level.

The moisture rejects the coating, less adhesion and undercutting corrosion … causes premature failure



MCU-Coatings absorbs the moisture on the substrate.

This results in a larger adhesion surface, less under cutting corrosion and better protection of the substrate



Fast Curing

4 hours over-coating (normal T°)

With “Quickcure” only 30 minutes

A 3 layer system can be applied in less than 2 hours!!

Quickcure will cure rapidly the paint in absence of moisture

Easy to use

1 component

1 Thinner

No induction time

No potlife

Ready for spray – roll – brush application

Only 6 products will cover ALL area's as
(exposed to immersion, UV, impact, abrasion, etc…)

Typical short term costs savings 1

related to

No loss of TIME

- Apply in 0 – 99 % Relative Humidity
  (0 – 30 % RH use Quickcure)
- No dew point restrictions (paper test)
- Immersion within 45 minutes
- Short cure times, even at -15 ° C
- All year round and night application
- Adhesion to green concrete
- Over-coating within 45 minutes with Quickcure

INDUSTRIES
ADVANCED & FUTUREPROOF

Typical short term costs savings 2

related to

No loss of LABOUR COSTS

INDUSTRIES
ADVANCED & FUTUREPROOF

Surface preparation:
- Less blasting – less profile needed
- Less re-blasting
- No roughening between coats

Application:
- No mixing multiple components
- No induction time
- Fast cure & overcoat time

Fast project completion time:
- Less man hours
- Less equipment renting costs

Accessibility (no condition of the area)

Performance and higher rentability of the contractor

SHORT term costs savings 3

related to

QUANTITY

- Less blast profile (1 mils /25 µ)
- Tolerates flash rust (L)

= Less grit

- Lower blast profile: 15%-35% savings on primer paint consumption
- Thin film technology: only 60% of DFT required compared to traditional systems
- Less waste: 1 component

= Less amount of coating:

Typical long term costs savings 2

by

QUALITY ASURANCE (tolerance to critical circumstances DURING application)

Coating film will not be damage by:

- Dew
- Humidity
- Temperature
- Immersion after 45 minutes
- High DFT of zinc primer

or

Implementation:

- 1 component only (no mixing errors)
- 1 Thinner only (no mixing errors)
- No induction time
- No pot life restrictions

INDUSTRIES
ADVANCED & FUTUREPROOF

MCU Coatings versus 2 Pack in Practice:

INDUSTRIES
ADVANCED & FUTUREPROOF

A typical case history comparing 2 pack system to MCU Sea side and moisture areas.

	Module 1 Epoxy Zinc 70 mu DFT Epoxy MIO 300 mu DFT 2 pack Polyurethane 60 mu DFT	Module 2 MCU-Miozinc 75 mu DFT MCU-Miomastic 75 mu DFT MCU-Topcoat 75 mu DFT
Day 1	Steel surfae prep.	Steel surfae prep.
Day 2	1st blast	1st blast
Day 3	Pick up blast to **Sa 2,5** Profile check: profile was Rz 90 mu. It was expected that the primer would be low DFT, but because of the high profile, a lot of build up would be required. But this is **not possible to apply the Zinc thicker** as it would crack above 100 mu DFT.	Pick up blast to **Sa 2** since Miozinc does not require Sa 2,5 as a surface tolerant product. Price difference Sa 2,5 at 2 = 1 €/m2 Profile check: profile was Rz 90 mu. Primer was applied thicker to reach higher DFT. **MCU-Miozinc tolerates up to 350 mu DFT**
Day 4	**Salt & Chloride check: 80 mg/m2. Too high**... fresh water wash to lower mg/m2 (sea side) **No painting because of too high humidity** (rust bloom)	Salt & Chloride check: 80 mg/m2. As MCU primer **retract humidity from the surface, 80 mg/m2 is accepted** Stripe coat + application of primer. No humidty restrictions
Day 5	**Re-blast** to Sa 2,5	DFT check Stripe coat + application of second coat
Day 6	Salt & Chloride check: 80 mg/m2. Too high... fresh water wash to lower mg/m2 (sea side)	DFT check + application of the Topcoat
Day 7	Application of the primer stripe coat Application of full primer	
Day 8	DFT check Application of the stripe coat + fu ll primer 2nd coat	
Day 9	No painting because **dew point restrictions & T°/moisture**	
Day 10	Application of Topcoat	

40 % project delay compared to MCU Technology

Typical long term costs savings 3

by

long term PERFORMANCE

INDUSTRIES
ADVANCED & FUTUREPROOF

Better performance:

- Anticorrosive (20,000 hours salt spray test)
- Abrasion resistance
- Impact resistance
- Flexibility
- Adhesion
- Weather resistance
- Temperature resistance

MCU-Coatings versus Galva:

A single coat of MCU-Miozinc at 100-125 µm will outperform galvanization at 125 µm when equal or higher to ISO 12944-2 C4 High.

Especially when there is possibility for (atmospheric) chemical attack, the life time expectancy of galvanised substrates will decrease rapidly where MCU-Miozinc has excellent chemical resistance

tested by the US Galvanisers Association

MCU-Coatings Products

INDUSTRIES
ADVANCED & FUTUREPROOF

MCU-Zinc
MCU-Miozinc
MCU-Aluprime
MCU-Zinc HH
MCU-Aluminium HH

MCU-Mastic
MCU-Miomastic
MCU-Ferroguard

MCU-Topcoat
MCU-Miotopcoat
MCU-Alutopcoat
MCU-Clearcoat
MCU-Shieldcoat

MCU-QuickCure
MCU-Thinner
MCU-Thinner 25

MCU-Coatings offers you a technology that:

INDUSTRIES
ADVANCED & FUTUREPROOF

Easy and Durable

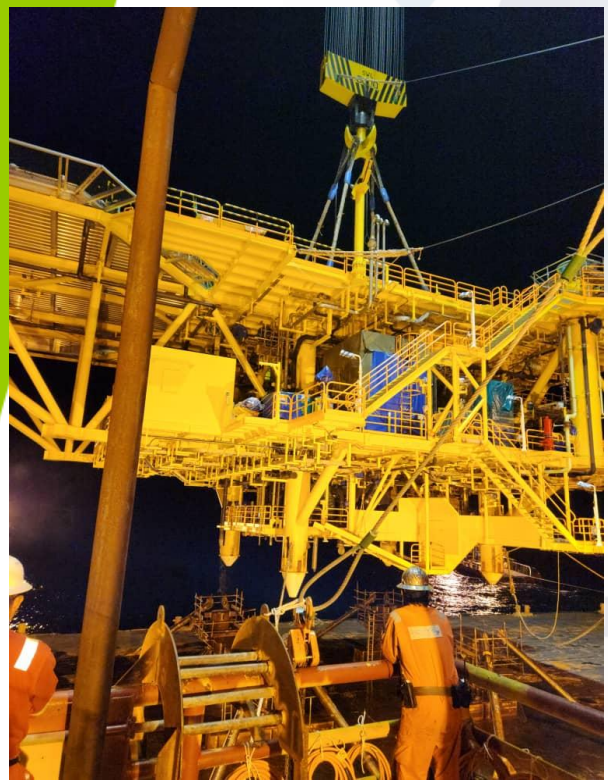
Material Costs… reduced by 10% - 30%

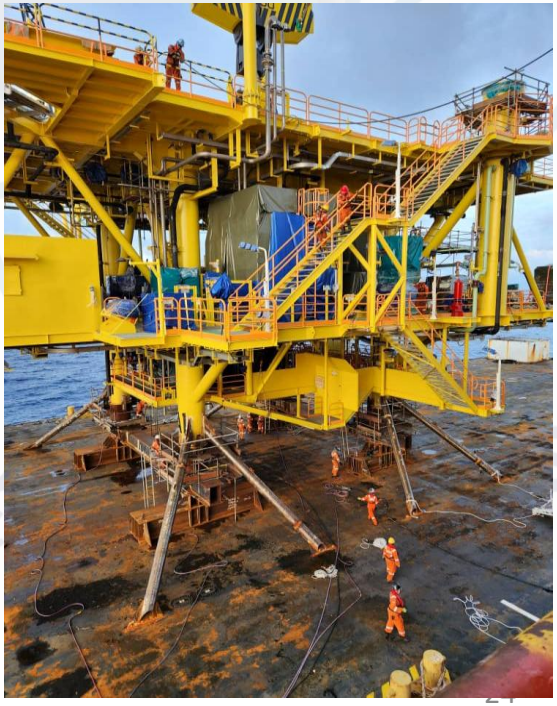
Fastest Project Completion time… guaranteed

Long Term Performance… has proven 2 to 3 times better

Coating offshore facilities

Coating of Offshore platforms,
New-Build and Maintenance





ENSCO Offshore drill platforms

Maintenance of Platforms in the North Sea

Water jetting

Coated at night and ready for traffic next morning

ENSCO 100: World's biggest jack-up rig - full rehabilitation

Why remove good coating?

Remove all loose existing paint

Remove loose and scale corrosion

FSPO BW MV-Enterprise

After 6 years of testing and evaluations have rated MCU Coatings the best in protection…

When long term is required and…
ideal surface preparation is not possible
MCU-Coatings has been used

Tank work on MV-Enterprise
MCU-Miozinc coating on tight rust

Application of 300-400 µm without mud-cracking

FSPO BW MV-Peace

The decision to use MCU-Coatings on the current project due to short time frame and long-term protection required

The vessel's deck, superstructure, piping & modules have aged inorganic Zinc – largely failing with covered Zinc salts

MCU-Miozinc is used as the universal primer over UHP and slurry preparation

Coating of gas facilities

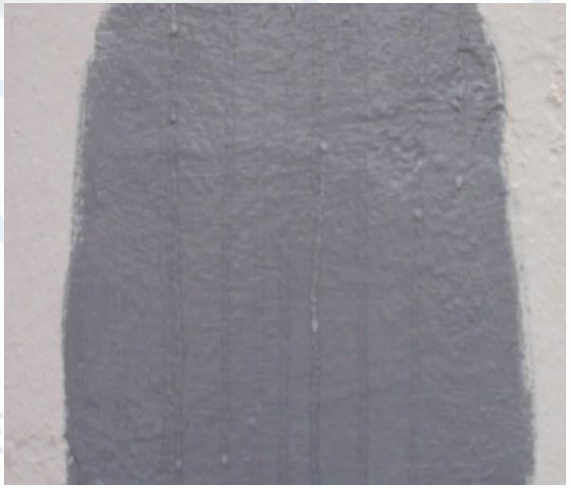
Pipes, pumping stations, collectors, etc. can be coated in operation **without a shut down**!

Will not amine blush – retain color and gloss

Used by important gas companies like: Sonatrach, BP, Shell, Statoil, Qatar Gas, etc.

Gasport Dornum
3 years maintenance
with MCU-Coatings

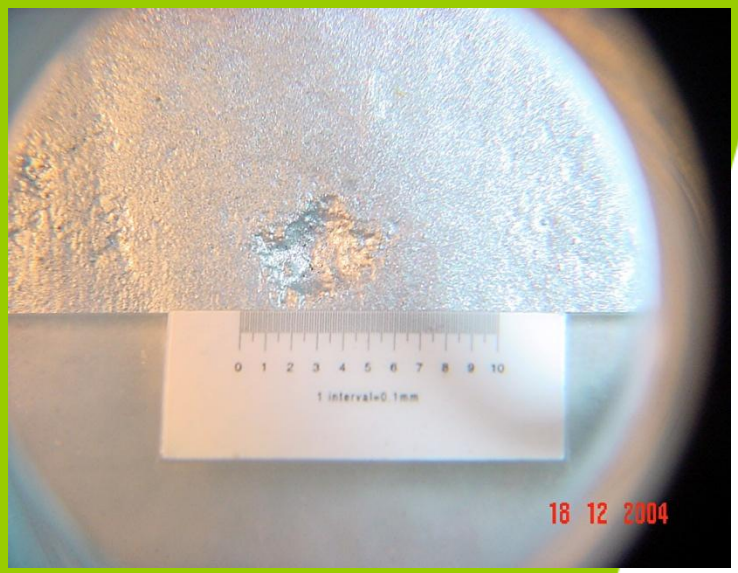
Application of sweating and frozen pipelines and reservoirs in operation is possible with MCU-Coatings



Stena MV-Discovery

The fast going aluminum catamaran ferry developed some severe pitting in the untreated areas, specifically in the turbine intake rooms.

Epoxy coatings were not able to penetrate and adhere into the pitting and offered unsuitable adhesion.



MV Discovery – Test application

A test was carried out on a hatch plate form the air intake room. The plate was prepared 50% with a chloride remover, then entirely blasted with 3000 bar.

MCU-Aluprime was applied 50% as a the first coat and 50% as the second coat.

After 2 months of service testing a positive evaluation was completed by Stena.

Wagenborg Shipping

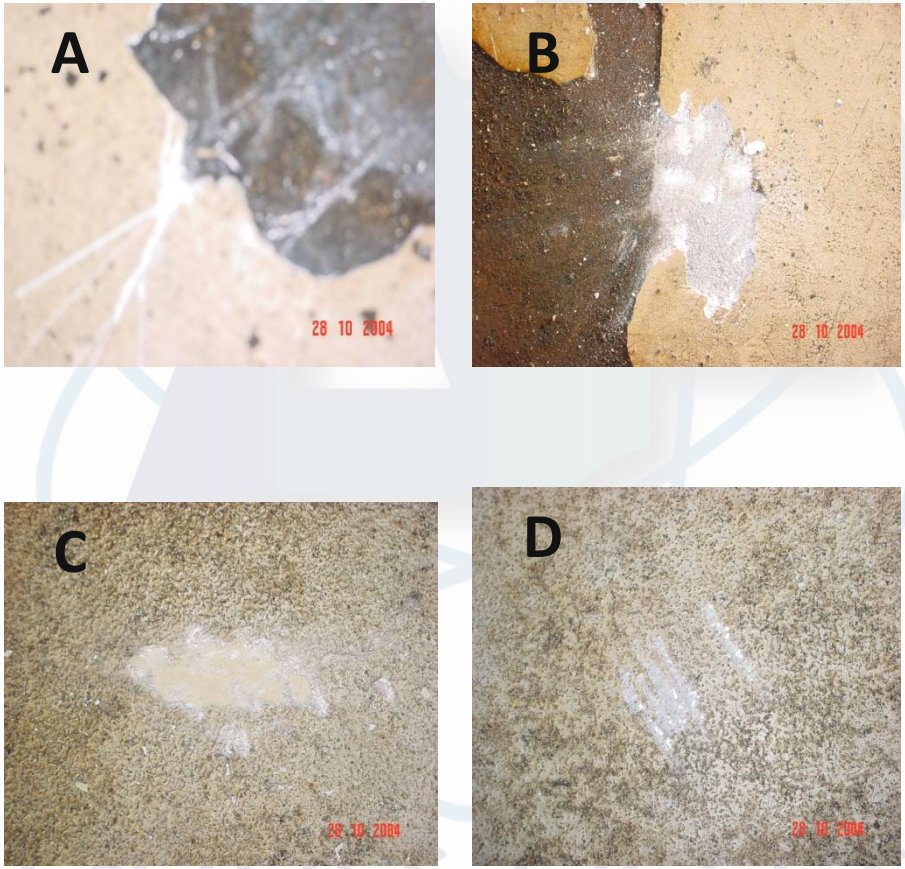
RoRo

9 vessels

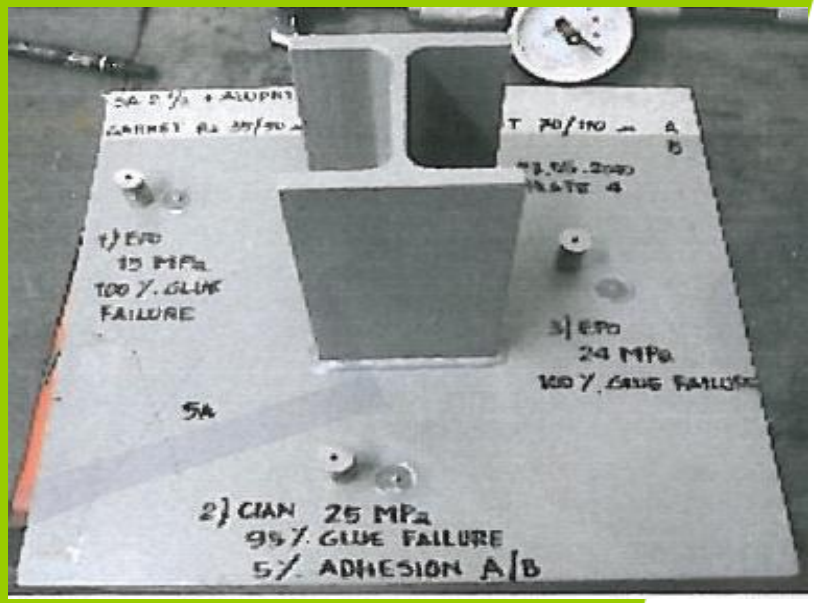
Wagenborg:
Abrasion Comparison test

A -Glass flake epoxy 1000 µ
B - Ceramic epoxy 1000 µ
C - HS epoxy 700-1000 µ
D – MCU-Coatings 250-300 µ

MCU-Miozinc 75-100 µ
MCU-Aluprime 200 µ
With aluminum oxide non skid



SAIPEM & RINA



- ASTM D 4541 & 3359 – Adhesion Test
- Criteria for ENI Saipem is 5 MpA
- MCU Coatings applied on various plates with and without QuickCure had values up to 25 MpA
- 5 X acceptable criteria

TABELLA RIASSUNTIVA:

PANNELLO NR.	VALORE (MPa)	% FALLIMENTO ADESIONE	% FALLIMENTO COESIONE	% FALLIMENTO COLLA	LOCALIZZAZIONE FALLIMENTO
1 VEDI FOTO 1	1) 17 MPa 2) 19 MPa 3) 16.5 MPa		1) 10% 2) 95% 3) 100%	1) 90% 2) 5%	1) B 2) B 3) B
2 VEDI FOTO 2	1) 19.5 MPa 2) 21.5 MPa 3) 17 MPa		1) 20% 2) 50% 3) 5%	1) 80% 2) 50% 3) 95%	1) B 2) B 3) B
3 VEDI FOTO 3	1) 22 MPa 2) 19 MPa 3) 21 MPa			1) 100% 2) 100% 3) 100%	
4 VEDI FOTO 4	1) 15 MPa 2) 25 MPa 3) 24 MPa	2) 5%		1) 100% 2) 95% 3) 100%	2) A/B
5 VEDI FOTO 5	1) 14 MPa 2) 20 MPa 3) 10 MPa		1) 20% 2) 50% 3) 90%	1) 80% 2) 50% 3) 10%	1) C 2) C 3) C
6 VEDI FOTO 6	1) 20.5 MPa 2) 22 MPa 3) 20.5 Mpa 4) 21.5 MPa		1) 50% 2) 15%	1) 50% 2) 85% 3) 100% 4) 100%	1) B 2) B
7 VEDI FOTO 7	1) 21 MPa 2) 19 MPa 3) 17.5 Mpa 4) 21 MPa		1) 50% 2) 80% 3) 95% 4) 100%	1) 50% 2) 20% 3) 5%	1) C 2) C 3) C 4) C
8 VEDI FOTO 8	1) 17.5 MPa 2) 16.5 MPa 3) 17.5 Mpa 4) 16 MPa		1) 70% 2) 95% 3) 100% 4) 100%	1) 30% 2) 5%	1) D 2) D 3) D 4) D
9 VEDI FOTO 9	1) 16 MPa 2) 18 MPa 3) 17.5 MPa		2) 5% 3) 10%	1) 100% 2) 95% 3) 90%	2) B 3) C

Scandinavian Electrical Energy

Painting in winter

United Kingdom

Splash Zones

Bahrain

GPIC the largest petrochemical of the country

After long test GPIC has selected exclusive to MCU-Coating for all maintenance projects

India

MCU-Coatings is approved by 13 big Oil & Gas companies (Reliance, ABAN Offshore, ONGC…)

ONGC new refinery underground pipes

Slovenia – Croatia – Austria – Hungary

prime MCU-Miozinc
finish MCU-Miotopcoat

The most tolerant paint technology over old coatings.

Oman

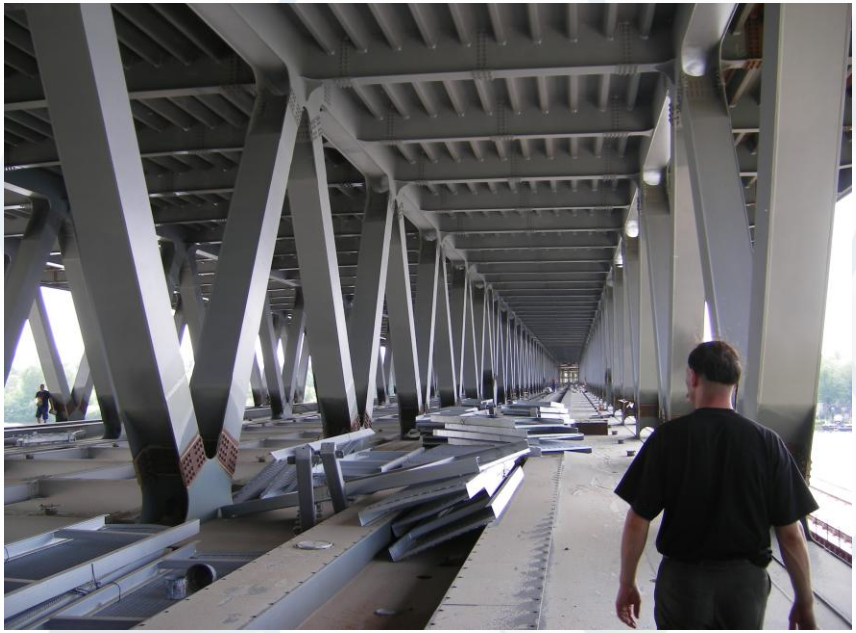
Spot prime MCU-Miozinc
Overcoat MCU-Topcoat

The most tolerant paint technology over old coatings.

Ukraine - Kiev

New build 5 km bridge project taken over from Jotun as cold and humid condition delayed the project for +100% as planned

With MCU they won the lost time by paint at minus 10° C and less during winter time



Romania

prime MCU-Mastic
finish MCU-Topcoat

Perfect adhesion on concrete

Mineral Mining

Rio Tinto – RBM

Richards Bay
South Africa
2011

MPD (Mine Pond D) Shutdown
Minerals People Diversity

After 8 months of Lab & Field tests in 2010, which included internationally well known epoxy systems, MCU Coatings was exclusively specified for an historic Rio Tinto/Richards Bay Minerals shutdown.

conducted in humidity's of 92% with temperatures peaking at 42 degrees Celsius.

Shutdown Overview
Completed in an unprecedented 3 weeks

- 3km Hydraulic Piping
- 1.5km Electric Cable on Dredge Alone
- 6km Grease Pipes
- 600 ton lifts
- 7.7tons of Fastners
- 80 tons of Scaffholding
- Erection of new Gantry

- <u>Coating & Corrosion Prevention</u>
- 1 Spud Carraige
- 2 Trommels
- 8 Surge Bins (Interior + Exterior)
- Dredge Cutter
- Dredge Railings + Stairs
- Dredge Walkway
- General Structures
- External Pipes

MCU Miozinc 125µ
MCU Miomastic 75µ
MCU Alutopcoat 65µ

Application Conditions

- High Humidity RH90%
- High Temperatures Avg 35◦c
- Damp Substrates
- 24r Coating
- 39 Contracting Companies
- Combination of Sa2½ & St3
- Time Allocated : 16 days
- Completed : 10 days
- 6 month inspection 0.00 Corrosion

MCU Coating systems for all corrosion Prevention Applications

Inspection on MPD Surge Bin's after 6 months Service

Trommel

Mid Section
MCU Miozinc 150µ DFT
Rubber Coating 3500µ DFT

End Sections
MCU Miozinc 125µ DFT
MCU Alutopcoat 75µ DFT

Thank you
for your attention

sales@afindustries.com

www.afindustries.com