METALTEC MCU

MCU-Coatings produces world's best performing 1 Component Moisture Curing Urethanes (MCU).

How does the MCU-Coatings Technology reduce your Total Project Costs?

When you make a project cost estimation comparing multiple coating systems, it is hardly a matter of coating material cost. It is a matter of:

"short term costs" including 'Total Material Cost' + 'Implementation Cost' + 'Indirect costs'

\+ "long term costs" depending on the 'Long Term performance' of the chosen coating system

The major short term direct costs like i.e. labour, materials, equipment,… primarily depend on 'Time' and 'Quantity'. The short term indirect costs like i.e. shut down, road blocking, etc. which can be 10 x greater than the total project cost, primarily depend on 'Time'. The 'Quality' and even more the 'Quality Assurance' properties of the chosen coating system are decisive for the 'Long Term Performance' and so, long term cost estimations.

Due to the revolutionary properties of the **MCU**-Coating's Single Component Moisture Cure Polyurea technology, ""**MCU**-Coatings"" is able to offer you a coating system that:

1. saves 'Time'
2. reduces 'Material Costs'
3. guarantees 'Fastest Project Completion Time'
4. maximises 'Quality Assurance'
5. has proven superior 'Long Term Performance'

How is that ALL possible?

1. 'Time' is money!:

Almost any short term direct cost like labour, rental of equipment, fuel, … or indirect cost like shut down, road blockings, … is Time related. In 1989, "**MCU**-Coatings" managed to develop a stable one component moisture cure polyurea coating which eliminates most of the weather restrictions and limitations in surface tolerance which are typical to most coating systems used today. Major projects around the world have proven that surface tolerance- and weather restrictions are THE major causes for project delays and loss of 'TIME'. Where most other coating technology has to STOP painting, **MCU**-Coating's revolutionary moisture cure technology continues saving 'TIME' and 'MONEY' on any individual Time related cost. MCU coatings can be applied in any climate around the world, day and night.

*Have a look at the comparison between **MCU** coatings & traditional systems in Table 1: Time is money!*

2. Thin Film Surface Tolerant Technology:

Typically, only 60% of the total DFT is required to meet or exceed the performance of a typically used competitive high performance system **reducing paint cost** and VOC emissions. The higher surface tolerance of the "**MCU**" coatings typically **reduce paint & surface preparation material costs**.

*Have a look at the comparison between "**MCU**" coatings & traditional systems in Table 2: Thin Film Surface Tolerant Technology.*

3. Quality assurance

A coating system with less restrictions like the **MCU**-Coating's one component moisture cure technology logically guarantees a higher QUALITY ASSURANCE.

*Have a look at the comparison between "**MCU**" coatings & traditional systems in Table 3: Quality Assurance.*

4. Quality

Extensive testing and 25 years field performance have proven that the "**MCU**" single component moisture cure polyurea coatings outperforms the best performing and most common used high performance coating systems used in the last 50 years, including inorganic zinc primers, coal tar epoxy, lead based primer, etc.

The five most important causes of corrosion are Cracking, Chemical attack, UV chalking, Blistering, and Erosion

Why is that MCU-Coatings "Don't Crack"?

"MCU" coatings are based on a 100% pure polyurethane resin. It is not comparable to traditional 2 component acrylic PU coatings, which contain only ¼ to 1/8th pure PU resin.
"MCU" combines durable flexibility with high impact resistance and outstanding abrasion resistance. The idea is very much comparable to the sole of any sport shoe, which is generally also made of a pure PU resin. Even a 10 year old sport shoe is still flexible and maintains its durability.

Structures coated with **MCU coatings** like the Astoria Megler Bridge show no visible cracking after more than 20 years of exposure. Outstanding abrasion resistance using thin film "**MCU"** technology was recently proven once more on the decks of RORO vessels from the largest Dutch ship owner named Wagenborg. A 150µm **"MCU"** system outperformed ceramic and high solid epoxy systems at more than 10 times our film thickness. These RORO vessels load 60 ton containers on steel wheels resulting in extremely high impact and fast abrasion. After 1 year of testing, **"MCU"** was the only in tact system.

What makes "MCU" coatings "Chemical Resistant"?

The pure PU resin used in **"MCU"** has also proven an outstanding chemical resistance. Just like vinylester and silicones, pure polyurethanes are known to have a good chemical resistance. High chemical resistance of the used raw materials combined with high cross linking of the moisture cure technology makes a very chemical resistant product. This is the explanation for the success of **MCU** systems used in chemically harsh environments like in the waste water-, chemical, petrochemical and pulp- and paper industry.

Where have "MCU" coatings proven their "Excellent UV resistance"?

Also, Florida UV exposure testing have proven a UV resistance of 95% after 36months of exposure. Offshore structures coated for the US coast guard in bright yellow, red and white have proven perfect colour stability and UV resistance after 10 years of exposure.

How do "MCU" coatings manage to "Resist Blistering"?

"MCU" uses Micaceous Iron Oxide in primer, intermediate and topcoat. MIO creates a designed permeability into the coating. This means that moisture damp is allowed to penetrate, but the structure also allows vapour to dissipate without forming blisters. This technology also makes the coating more tolerant to salt contaminated substrates.

MIO also improves:

1. Film build over sharp edges
2. UV resistance
3. Intercoat adhesion

4. Crack and craze resistance
5. Durability of the coating

In this way, **MCU-Coatings** has a solution for all of the most important causes of corrosion proving superior corrosion resistance compared to traditional paint systems.

Other interesting properties of "MCU" coatings:

MCU's 'Thin film technology' works:

Recent testing performed by the US Army Corps of Engineers have proven that the "**MCU"** systems using thin film technology outperform the currently best performing organic/inorganic zinc, coal tar epoxy systems at average total DFT of 360µm. Systems like MC-Zinc overcoated with a MIO intermediate and a UV resistant coloured topcoat at 200µm total DFT or even MC-Zinc overcoated with 2 coats of MC-Aluminum at only 150µm total DFT exceeded the performance of the best performing traditional system after 10000 hrs of cyclic testing. The USACE spends more than 70 million dollars every year fighting corrosion.

Proven outstanding performance to marginal surface preparation:

A comparison test performed by the FHWA (Federal Highway Administration), an organisation that covers the maintenance of more than 200.000 steel bridges, has proven the superior performance of **"MCU"** coatings to minimally prepared substrates. The FHWA tested 2 "**MCU"** systems of different suppliers applied to A. an SA 2,5 blasted substrate and B. a mechanically prepared substrate. The results were astonishing. The performance on the mechanically prepared substrate was almost equal to the performance on the Sa 2,5 blasted substrate, even when applied to a salt contaminated substrate. This proves the outstanding surface tolerance of **"MCU"** systems to marginally prepared substrates, salts, blistering and still supplying high quality corrosion resistance. Please have a look to the test report at www.MCUcoatings.com

"MCU": Best choice for encapsulating lead based systems and overcoating low solvent resistant coatings.

Moisture curing urethane technology have proven to be the best system for overcoating led based alkyd paint. Nepcoat, the U.S. Army Corps of Engineers and Powertech labs. have tested and approved moisture curing urethanes **exclusively** for encapsulating lead based paint systems.

*Have a look at the comparison between **"MCU"** coatings& traditional systems in Table 3: Performance!*

Table 1: Time is Money

"MCU" single component coatings.	**2 Component Coatings.**
Can be applied at 6% to 99% humidity	STOP painting at 87% RH
No dew point restrictions when surface is visibly dry. Dry of wet surface with a cloth is sufficient	STOP painting when steel temp. is >3°C above dew point.
Recommend for immersion in 30min.	STOP painting when rain is expected
Short cure times, even at -12 ºC.up to 150°C	Long cure times, especially at low temperatures.
Overcoating in 20min. with PURQuik	Typically much longer cure times.
No induction time	Typically 20 minutes.
Surface tolerant zinc primers (ISO Sa 2)	Zinc primers require Sa 2.5 → longer blasting
MCU-Miozinc tolerates flash rusting	Zinc primer do not tolerate flash rusting → re-blasting is often required.
MCU-Miozinc is recoatable by itself	Complex and time consuming repair methods for inorganic zinc primers
No inspection required for humidity, temperature, dew point, etc.	Time consuming extra inspections
Excellent adhesion to minimal surface profile	Extra roughening of old coating is more often

	required.
Adheres to green concrete (≥4 days for cure).	At least 24 days of cure and must be dry.

Table 2: Thin film surface tolerant technology:

MCU's single component coatings	**2 Component Coatings.**
1 component.	Typically >5% extra paint loss and waste.
Surface tolerant zinc primers to Sa 2.	Zinc primers require Sa 2.5 → longer blasting using more grit.
MCU-Miozinc primer tolerates flash rusting.	Zinc primers do not tolerate flash rusting → re-blasting is often required using more grit.
No waste or wrong mixing.	Typically >5% extra loss and waste.
Adhesion to 25µm surface roughness.	Usually >60µm required increasing primer consumption by >15% and grit consumption.
MCU-Miozinc primer tolerates flash rusting.	Zinc primer do not tolerate flash rusting → re-blasting is often required increasing grit consumption.
Limited overspray	Usually more

Table 3: Quality Assurance

Frequently occurring causes of premature failure with 2 component commercial systems.	**"Why not"? with "MCU" coatings**
Wrong mixtures.	1 Component.
Wrong components or thinner.	1 Thinner.
Pot life not respected.	No pot life.
To short induction time.	No induction time.
To high/low humidity during application or cure.	6% to 99% humidity.
Rain or fog during cure.	Resistant to rain, fog or immersion within 30 minutes of application.
Temp. lower than 5ºC during application or cure.	Up to -12ºC to 150°C
Cracking of inorganic zinc primers when DFT is over 50µm.	MC-Zinc and MC-Miozinc DFT over 125µm.
Dew point. Precipitation of dew point during cure.	No dew point restrictions.
Roughness of substrate is too low.	Surface tolerant.
Too high contamination (>50 mg/square meter).	Contamination above 100mg/square meter.
Substrate is to wet.	Tolerant to damp surfaces.
Insufficient roughening of old coating.	Good adhesion without roughening. (Do a test).
Not respecting maximum overcoat time.	No recoat window.

"MCU" coatings makes your surface protection simple and easy. Superior Protection with "**MCU**" Hard Coatings.

Tabel 4: Performance

Typical Quality causes of premature failure:	What makes MCU's coatings perform better?
Cracking caused by impact or stretch of coatings that have become brittle.	Flexible resin resists cracking and serious impact, even after long term exposure.
Chemical deterioration in chemical environments.	High resistance to atmospheric chemicals
Epoxy has poor UV resistance.	UV resistant chemical resistant topcoats recommended for heavy duty service like decks, splash zone, marine environments, ….
Blistering caused by salt contamination.	Designed permeability and high tolerance to moisture increases tolerance to salts.
Epoxy glass flake typically >90mg loss on ASTM D 4060 Taber abrasion test, 1kg load, 1000 cycli.	<30mg loss for all products.
Undercreep, blistering and corrosion typically between 1,000 to 5,000 hours Salt spray.	Passes 10.000 to 20.000 hours without corrosion, blistering or undercreep.
Delamination caused by insufficient surface roughness.	**"MCU"** coatings adhere to minimal surface roughness of less than 25µm
Delamination caused by thermal stress overwhelming the adhesion of the undercoating.	Low glass transition temp. and high flexibility. Minimal stress to underlying coating.
Poor adhesion.	Typically 10 to 17 Mpa.
Corrosion at sharp edges.	Thin film technology combined with good M.I.O. film build on edges.
No adhesion with zinc primer to old coatings. ISO Sa 2.5 is required.	MC-Zinc and MC-Miozinc adhere to old coatings and St 2 prepared substrates.

MCU-Ferroguard compared to Coal Tar Epoxy.

MCU-Ferroguard	Coal Tar Epoxy.
Improved UV resistance.	Fast chalking.
Flexible.	Brittle.
Abrasion resistant (ASTM 4060-90 ≤ 3,1mg loss).	Variable.
No recoat window.	Sweep blasting before recoating.
Free of tar	Contains up to 90% raw coal tar.
No irritation to applicator's skin or eyes.	Irritation.
Max. film build of 250µm in one coat.	Requires min. film build of 450µm DFT.
Passes LC 50 Fish Toxicity test	Does not pass
Contains MIO (Micaceous Iron Oxide).	No MIO.

"MCU" coatings
SINGLE COMPONENT MOISTURE CURE URETHANES

MCU-Miozinc HIGH TEMPERATURE (150°C)

Description

- ✓ Surface tolerant MIO/zinc filled primer.
- ✓ Most of the corrosion resistance typically associated with IOZ, with surface tolerance rivaling epoxy mastics.
- ✓ High DFT tolerance and unlimited recoatable by itself
- ✓ When applied up to 25µm DFT this product is weldable.
- ✓ Compatible with most old coatings and different alloys.

Uses

- ✓ Full or spot primer on hand and power tool cleaned or abrasive blasted surfaces. Replaces epoxy and inorganic zinc and epoxy mastics. Versatile, easy to use, corrosion resistant primer.
- ✓ ISO Sa 2 Commercial Blast or better.

MCU-Aluprime

Description

Most surface tolerant primer.
Low viscosity, penetrating sealer to replace epoxy penetrating sealers.

Uses

Use as a universal primer on ISO St 2 hand or power tool cleaned surfaces.

Intermediate/topcoats :

MCU-Miomastic

Description

Used as an intermediate coat for new construction and full removal projects or as overcoat primer
Used as topcoat where color or gloss resistance is less important in marine or industrial environments.
High-solids light colored aromatic intermediate/topcoat for interior marine use.
Free of tar
Outperforms coal tar epoxy in many uses.
Miomastic contains a proprietary blend of corrosion inhibitors and MIO that has many application and performance advantages compared to epoxy mastics and other MCU intermediates.
Immerse in 30 minutes with or without the use of PURQuik in most conditions.
Available in different colors.

Uses

Best choice in the industry for overcoating old coatings, including lead.
Available as a stock item in Off White.
Adds performance to MCU-Miozinc when used as an intermediate and stripe coat.
On any marine, offshore, hydro, wastewater or other structure exposed to salt or fresh water and sewage treatment.
Easily re-coatable and repairable.
Ideal for use over MCU-Miozinc or MCU-Aluprime when painting ballast tanks and cargo holds where a light colored topcoat is required.

MCU-Mastic

Description

Intermediate coating that provides the smoothest finish of all our intermediate products.
Recommend for priming concrete when colored topcoats are used.
Can be used as a finish coat for interior surfaces where there is limited UV exposure and slight ambering is acceptable.
Aromatic chemical resistant gloss topcoat.
Available in Buff and custom colors.

High-solids, beige colored aromatic topcoat for interior marine use.

Uses
Universal intermediate coat over MCU-Miozinc to replace epoxy intermediates.
Available in buff as stock item and can be special ordered when specific colored intermediate coating is required.
Colored topcoat for interior use.
Excellent secondary containment concrete coating for mild chemical exposure.
Can be used in some water immersion service.
Ideal for use over MCU-Miomastic, MCU-Miozinc or MCU-Aluprime when painting ballast tanks and cargo holds where a light colored topcoat is required.

MCU-FERROGUARD

Description

MIO filled, refined coal tar MCU.
Outperforms coal tar epoxy in all uses.

Immerse within 30 minutes with or without the use of PURQuik in most conditions.
Available in black or red.
Less irritating than conventional coal tar epoxy.
Two coat MC-Ferroguard system passes 5,000 hours prohesion testing on steel

Uses
On any marine, offshore, hydro, wastewater or other structure exposed to salt or fresh water and sewage treatment.
Above or below grade service direct to concrete or steel.
Easily re-coatable and repairable.**Topcoats :**

MCU-Topcoat High Temperature (150°C)

Description
Semi-gloss (20-60o), aliphatic topcoat.
Available in RAL and custom colors.

Uses
Light stable exterior topcoat for atmospheric uses on bridges, tank exteriors, pipe, concrete, galvanized surfaces and marine splash zones.

MCU-MioTopcoat

Description
MIO modified, low sheen aliphatic topcoat.
Available in environmental colors due it's MIO load.
Resistant to checking and peeling.
Maintains its original appearance throughout its useable service life

Uses
Very durable topcoat for offshore, marine, and industrial applications.
MIO modification greatly extends coating life and allows easy overcoating for years on cleaned surface.

MCU-AluTopcoat

Description
Aluminum filled urethane.
Very durable, abrasion and weather resistant topcoat.

Uses
Outstanding topcoat for restoring weathered galvanized steel.
Use where high impact is required.

MetalTec coatings
Website : www.metaltec.eu
Email : info@metaltec.eu
Phone : +230.54.78.58.38