

## RAISING the STANDARDS

### HIGH PERFORMANCE WATER BASED PAINT SYSTEMS FOR THE PROTECTION OF DRILLMEC SPA DRILLING EQUIPMENT

By Dr. Marco Trentini - *FROSIO-Inspector Level III* - Ti.Pi.Ci. s.a.s. Div. LABORIS

**U**nprotected steel that is exposed to air, immersed in water, or buried, is vulnerable to corrosion that may cause damage but there are several ways to protect steel structures from corrosion. Standard UNI EN ISO 12944 is about the protection of steel

by painting and takes into account, in its different parts, all the important factors to obtain proper protection against corrosion.

Standard UNI EN ISO 12944-2 classified atmospheric environments into six classes of corrosivity:

Class of corrosivity	Examples of typical environments (indoor)	Examples of typical environments (outdoor)
C1 (very low)	-	Heated buildings with clean atmosphere, for example; offices, shops, schools, hotels.
C2 (low)	Environments with low levels of pollution. Especially natural areas.	Unheated buildings where condensation can occur, for example; deposits, local sports.
C3 (medium)	Urban and industrial environments, moderate sulphur dioxide pollution. Coastal areas with low salinity.	Production rooms with high humidity and some air pollution, for example; food industries, laundries, breweries, cheese factories.
C4 (high)	Industrial areas and coastal areas with moderate salinity.	Chemical plants, swimming pools, coastal sites for boats.
C5-I (very high industrial)	Industrial areas with high humidity and corrosive atmosphere.	Buildings or areas with almost permanent condensation and high pollution.
C5-M (very high marine)	Coastal and offshore areas with high salinity.	Buildings or areas with almost permanent condensation.

Since the duration of the protective coating is generally less than the service life of the structure, planning and design should be given adequate attention to the possibility of maintenance or renovation of the paint.

The level of degradation of paint before the first major maintenance work has to be agreed between the parties involved and must be determined according to Parts 1 to 5 of UNI EN ISO 4628, unless otherwise agreed between the involved parties.

In the UNI EN ISO 12944-1 durability is expressed in three classes:

**Low (L)**                      **from 2 to 5 years**  
**Medium (M)**                **from 5 to 15 years**  
**High (H)**                     **more than 15 years**

Durability is not a "lifetime warranty". Durability is a technical consideration that can help the customer in writing a maintenance programme.

Part 6 of the UNI EN ISO 12944 specifies the methods and conditions of a laboratory tests for





evaluation of coatings to protect steel structures from corrosion. The results of these tests (neutral salt spray, condensation of water, chemical resistance and immersion in water) should be considered as an aid in the choice of suitable coatings and not as accurate information, making it possible to determine the durability.

Ti.Pi.Ci., through studies and experiments of Div. LABORIS, has developed a complete line of water-based anticorrosive coatings with the following brands:

- HYDROGUARD® (high performance water-based epoxy paints, also zinc rich)
- HYDROTHANE® (water-based polyurethane topcoat, also fluorinated)
- HYDROSINTEX® (quick drying alkyd water-based paints )
- HYDROCRYL® (water based acrylic paints)

Ti.Pi.Ci., has qualified various coating systems according to standard UNI EN ISO 12944 for the following durability and environments:

#### DRILLMEC SPA PROJECT

An example of Ti.Pi.Ci.'s worldwide experience when it comes to the use of the coatings involves Drillmec Spa, and a project for the Sultanate of Oman.

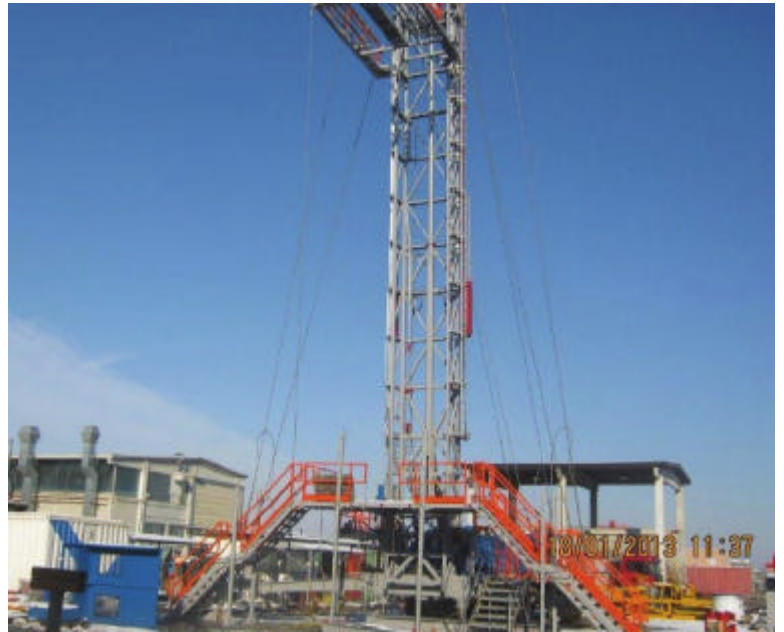
Drillmec Spa, is an international leader in design, manufacture and distribution of drilling and workover rigs for onshore and offshore applications as well as a wide range of drilling equipments.

The company is very sensitive to new innovations, particularly when they offer environmental benefits. The most frequent requests from final customers are in relation to paint systems that comply with classes C5, with durability high in accordance to the ISO 12944 standard.

It is for this reason that Drillmec Spa agreed to introduce the water based paint system TIPICI-MT-0051 into their standard painting procedure.

Paint system TIPICI-MT-0051 is qualified according to the UNI EN ISO 12944 standard, for class C5M with high durability, and refers to system A5M-06 shown in Part 5 of above standard.

The first step is related to the surface preparation; the contaminants (soluble salts, oil and grease) are removed and then the



NEW

## PosiTector<sup>®</sup> SPG Surface Profile Gage

Advanced model shown

Measures and records peak to valley surface profile height.

- Durable tungsten carbide tip for long life and continuous accuracy—field replaceable
- All models have internal memory, statistics and a USB port
- Browse gage readings and charts using your computer's file explorer or synchronizing with PosiTector.net
- SmartBatch™ allows entry of user-defined parameters and criteria to comply with various standards and test methods
- **NEW** PosiTector body accepts all PosiTector SPG, 6000 and DPM probes easily converting from a surface profile gage to a coating thickness gage or dew point meter

DeFelsko<sup>®</sup>

The Measure of Quality

1-800-448-3835

www.defelsko.com

DeFel • Ogdensburg, NY  
+1 (315) 393-4450 • techsale@defelsko.com

European Coati  
Hall 7, Stand No 7-563

**HUNTSMAN**

Enriching lives through innovation

We see a better world

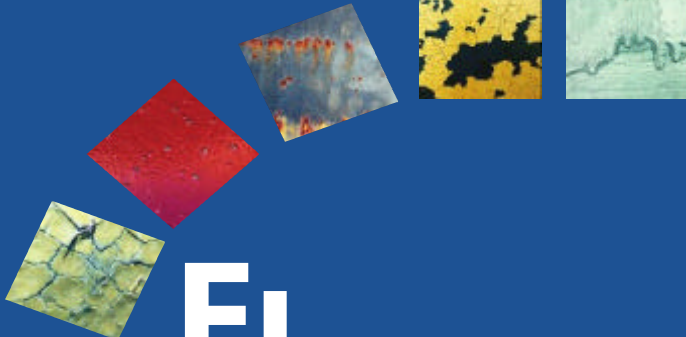


[www.huntsman.com](http://www.huntsman.com)

Let's work together to deli



TM



**Fi**

**of coati**

A comprehensi

**Now avai**

Followi  
2. A useful reference gui  
who understand coati  
and i  
coati

For more i

Fi



SCAN THE  
QR CODE TO  
OUR WEBSI



ENVIRONMENT	DURABILITY		
	L (low)	M (medium)	H (high)
C3	TIPICI-MT-0006	TIPICI-MT-0010 TIPICI-MT-0021 TIPICI-MT-0028 TIPICI-MT-0043	
C4	TIPICI-MT-0023		TIPICI-MT-0003 TIPICI-MT-0004
C5-M			TIPICI-MT-0001 TIPICI-MT-0002 TIPICI-MT-0005 TIPICI-MT-0019 TIPICI-MT-0020 TIPICI-MT-0027 TIPICI-MT-0029 TIPICI-MT-0031 TIPICI-MT-0032 TIPICI-MT-0033 TIPICI-MT-0051 TIPICI-MT-0052 TIPICI-MT-0057 TIPICI-MT-0060
C5-I			TIPICI-MT-0034 TIPICI-MT-0035 TIPICI-MT-0036 TIPICI-MT-0038 TIPICI-MT-0039 TIPICI-MT-0040 TIPICI-MT-0058



**PERFORMANCE IS SIMILAR AND IN MANY CASES SUPERIOR TO TRADITIONAL SOLVENT BASED PAINT SYSTEMS AVAILABLE ON THE MARKET.**



surface is sandblasted with metallic abrasive to Sa3 grade, according to the ISO 8501-1 standard.

The final surface profile is a medium grade according to the UNI EN ISO 8503-2 standard.

After surface preparation, one coat of HYDROGUARD® Zinc, a three component water based zinc rich epoxy primer according to regulatory SSPC Paint 20 level 1 (the highest level), must be applied. The final dry film thickness is 60 microns, as in the standard painting procedure.

HYDROGUARD® Zinc is supplied with zinc dust ASTM D520 Type 2 and contains 88% by weight of metallic zinc in dry film thickness.

Drillmec Spa chose a zinc rich epoxy primer instead of HYDROGUARD® SZ (water based two pack epoxy primer, with anticorrosive pigmentation zinc phosphate free) at the ever more frequent request of the end user, to cathodically protect the drilling machinery.

The second coat, is a layer of HYDROGUARD® Midcoat, a two components, fast drying, water based epoxy intermediate with a final dry film thickness of 90 microns.

Drillmec prefer to use HYDROGUARD® Midcoat

instead of HYDROGUARD® HB (high solid water based epoxy) to reduce the drying time of the entire paint system.

This allows the application of the entire TIPICI-MT-0051 coating system in a single working day.

The third coat is a layer of HYDROTHANE®, a water-based two pack polyurethane topcoat with excellent gloss and colour retention, at the final dry film thickness of 50 microns.

Through the HYDROTHANE® brand, Drillmec Spa is able to satisfy all the requests of end users because it could be provided in RAL, aluminium, metalized, and in general personalised colours.

For particular requirements HYDROTHANE® FL (a water-based fluorinated polyurethane topcoat) could be applied, when high stability to light and chemical attack is required.

Finally, Ti.Pi.Ci. is able to supply a full range of high performance water based paint systems, qualified according to the UNI EN ISO 12944 standard up to C5 classes with high durability.

Performance is similar and in many cases superior to traditional solvent based paint systems available on the market.