Final results and explanation on ISO 12944 results ZINGA

Because we receive a request for ISO 12944 certification more and more and we see the relevance of this for the international market, we decided to have two of our most important (and easiest) systems tested according to this standard.

I) What is ISO:

The ISO (International Organization of Standardization) is the world's largest developer and publisher of International standards. ISO is a network of the national standards institutes of 163 countries, one member per country (see: http://www.iso.org/iso/iso_members), with a central secretariat in Geneva, Switzerland, that coordinates the system.

ISO is a non-governmental organization that forms a bridge between the public and private sectors. On the one hand, many of its member institutes are part of the governmental structure of their countries, or are mandated by their government. On the other hand, other members have their roots uniquely in the private sector, having been set up by national partnerships of industry associations.

Therefore, ISO enables a consensus to be reached on solutions that meet both the requirements of business and the broader needs of society.

II) What is ISO 12944:

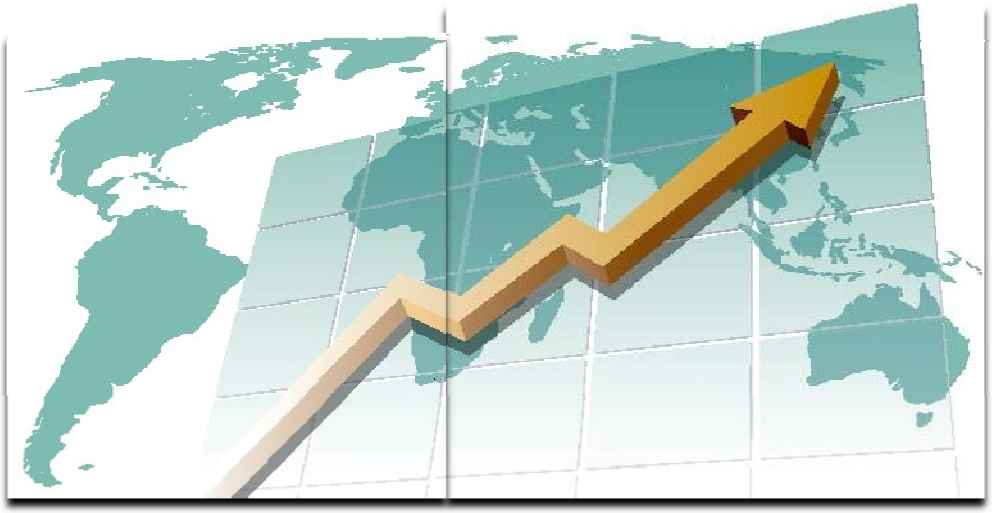
The ISO 12944 standard is intended to assist engineers and corrosion experts in adopting best practice in corrosion protection of structural steel at new construction and repairs. ISO 12944 is progressively superseding regional standards to become a truly global benchmark in corrosion control (see also: http://www.iso.org/iso/catalogue_detail.htm?csnumber=41862).

Selecting specifications that comply with ISO 12944 provides:

- Confidence that the corrosion protection you specify will be fit for purpose
- An objective approach to coating selection
- A simplified matrix of coating systems to select from
- A meaningful coating design life
- A universally accepted standard

These properties of this ISO 12944 standard allow your customer (be it architects, engineers, corrosion experts or simply a customer wanting guidance) to know that what we present them is really tested and approved by an independent test centre according to an international and very complete standard.

In annex, you will find a summary of this extensive, detailed standard for you (as a guideline) to get to know what this specific standard stands for and thus get the most out of it during communication with your customer.



III) <u>What are the systems tested and their respective results:</u>

When using the ISO 12944 standard to compare our results (ISO 12944-6 tests) with earlier general conclusions from the ISO itself (ISO 12944-5), you get the following very interesting conclusion:

<u>Results for ZINGA 2 x 60µm DFT:</u>

For the system: ZINGA 2 x 60µm DFT we fall in the category C5I-Medium (atmospherically) and Im2-Medium and Im3-Medium (immersion).

C5I-Medium (equals to C5M-Medium and C4-High) relates to real life situations as follows:

- C5I: industrial zones with high humidity <u>and</u> aggressive environment (continuous condensation and high pollution)
- C5M: Coastal zones and marine zones with high salinity (continuous condensation and high pollution)
- Medium: life expectation between 5 and 15 years
- C4: industrial or coastal (with moderate salinity) zones (chemical factories, swimming pools, shipyards)
- High: life expectation >15 years

<u>Examples</u> of <u>existing</u> systems for <u>atmospheric</u> conditions that fall into that same category are:

- 100µm epoxy combination
  + 3 layers adding up to 300µm DFT epoxy combination
  Total thickness: 400µm
- 80µm hot-dip
  + 1 x 80µm DFT primer (epoxy or polyurethane)
  + 3 layers adding up to 240µm DFT epoxy or polyurethane
  Total thickness: 400µm
- 100µm metallisation
  + 1 sealer coat (epoxy or polyurethane)
  + 3 layers adding up to 320µm DFT epoxy or epoxy combination
  Total thickness: 420µm

Im2-Medium and Im3-Medium relate to real life situations as follows:

- Im2: sea or brackish water (harbors with locks, jetties, offshore structures; make sure there is no stray current)
- Im3: soil (underground storage, iron poles)
- Medium: life expectation between 5 and 15 years

<u>Example</u> of <u>existing</u> system for <u>immersion</u> conditions that fall into that same category are:

- 60µm DFT zinc rich primer
  + 3 to 5 layers adding up to 360µm DFT
  Total thickness: 420µm DFT

Since 1988, several pulp and paper factories in Canada used ZINGA in 2 layers of 60µm DFT to treat their structures. In 2005 (17 years after application), no touch-ups were necessary.
This agrees with the ISO 12944-6 test results for ZINGA 2 x 60µm DFT predicting a life expectancy of >15 years in an industrial zone.

Results for ZINGA 2 x 90µm DFT:

For the system: ZINGA 2 x 90µm DFT we fall in the category C5I-High (atmospherically) and Im2-Medium and Im3-Medium (immersion).

C5I-High (equals to C5M-High) relates to real life situations as follows:

- C5I: industrial zones with high humidity and aggressive environment (continuous condensation and high pollution)
- C5M: Coastal zones and marine zones with high salinity (continuous condensation and high pollution)
- High: life expectation >15 years

Examples of existing systems for atmospheric conditions that fall into that same category are:

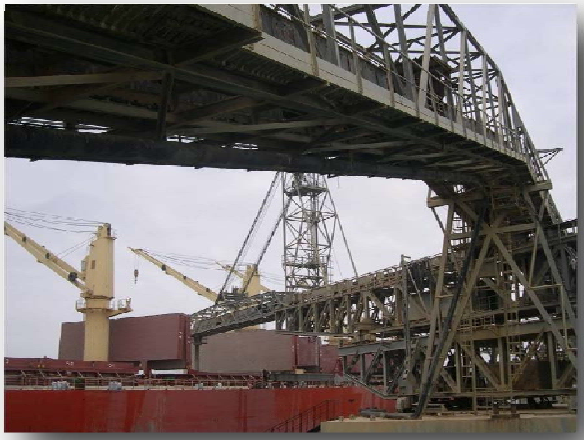
- 60µm zinc rich primer (epoxy or polyurethane)
  + 3 to 4 layers adding up to 400µm DFT epoxy combination
  Total thickness: 460µm
- 80µm hot-dip
  + 1 x 80µm DFT primer (epoxy or polyurethane)
  + 3 layers adding up to 320µm DFT epoxy or polyurethane
  Total thickness: 480µm
- 100µm metallisation
  + 1 sealer coat (epoxy or polyurethane)
  + 3 layers adding up to 450µm DFT epoxy or epoxy combination
  Total thickness: 550µm

Im2-Medium and Im3-Medium relate to real life situations as follows:

- Im2: sea or brackish water (harbors with locks, jetties, offshore structures; make sure there is no stray current)
- Im3: soil (underground storage, iron poles)
- Medium: life expectation between 5 and 15 years

Example of existing system for immersion conditions that fall into that same category are:

- 60µm DFT zinc rich primer
  + 3 to 5 layers adding up to 360µm DFT
  Total thickness: 420µm DFT



The phosphate Mine in Togo (Office Togolais des Phosphates) was treated in 1994 with 2 layers of ZINGA. In 2006 (12 years after application), no trace of rust was found.
This agrees with the ISO 12944-6 test results for ZINGA 2 x 90µm DFT predicting a life expectancy of >15 years in an industrial zone with high humidity and aggressive environment.