



We keep on working  
against corrosion



Custom Built Marine & Offshore Cranes

We keep on working against corrosion

# SPECIAL CYLINDER

## Heila Anti-Corrosion Programm

Heila Cranes offers multiple solutions to increase the lifetime of the marine cylinders exposed to the marine and offshore environment

### INCREASE VALUE AND EFFICIENCY



#### THE INNOVATIVE TREATMENT

The corrosion resistance of the very hard **HD4+** coating is very durable due to the unique compressive resistance characteristics that keep **HD4+** coating free from micro-cracks.

The exceptional bonding high degree resistance of substrate makes **HD4+** the most suitable treatment for harshest environment.

The resistance to scratches is remarkable.  
Normally finished **HD4+** coatings have a roughness of  $R_a = 0.1-0.3 \mu m$  (0.0039-0.0118”).



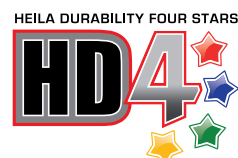
#### THE ANTI-CORROSION MATERIAL

New cylinder material **H.D. FOUR STARS** representing the best possible solution for longer hydraulic cylinder rod lifetime.

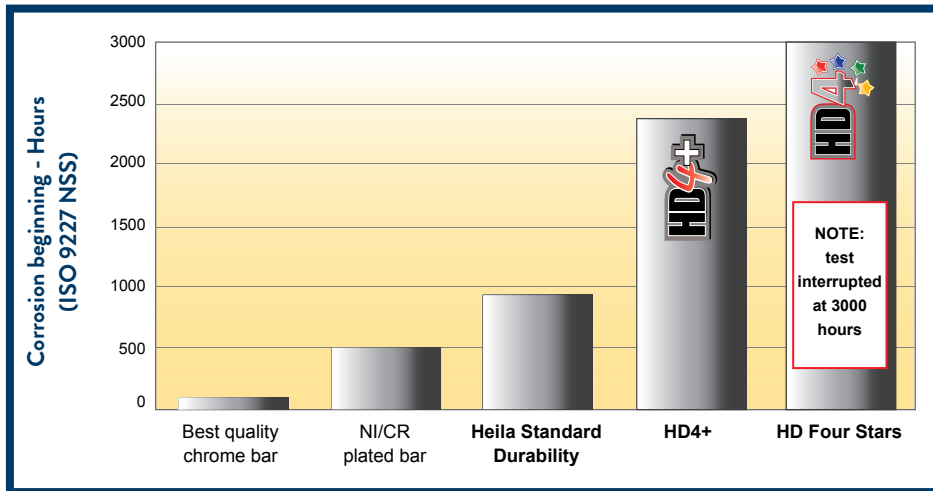
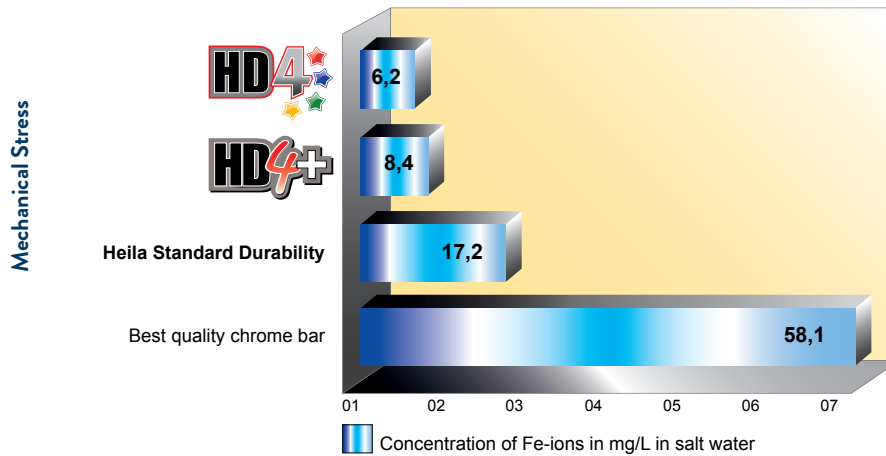
An innovative solution of stainless steel material with the latest combination of Nickel-chromium advantages.

The new cylinder material **H.D. FOUR STARS**, combines the best peculiar steel properties so far pursued to reach high performance during operation in the most severe conditions.

Specifically designed to resist under mechanical stress **H.D. FOUR STARS** material has also acquired the ultimate EPQ corrosion approval.



Amount of galvanic carbon steel substrate corrosion in 4% NaCl water (PH 3.5) in case of controlled damaged coating (drilled hole Ø 3 mm/12")



#### TECHNICAL BENEFITS HEILA DURABILITY

##### NO RUST

and no subsurface corrosion with better proved resistance to corrosion

##### NO OIL LEAKAGE

due to very high scratch resistance

##### NO PEELING PROCESS

due to accidents but only localized deformations

##### NO SEAL WEAR

due to high hardness and lower friction on seals

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# FOCUS ON KEY-POINTS

## Heila Anti-Corrosion Program

Integrated technical and structural solutions, with care for innovative components to guarantee proper and long lifetime of the sealings and complete crane structure for operating in harsh environments

### INCREASE VALUE AND EFFICIENCY

#### SURFACE TREATMENT PROCESS

Heila coating surface process ensures to our products the right features to prevent marine corrosion.

All external and internal surfaces are treated for a long-term corrosion resistance in accordance with C5M HIGH DURABILITY ISO 12944.

#### STRUCTURAL SOLUTIONS

The process begins through specific design solutions adopted to facilitate the correct adhesion of the protective coating



#### SURFACE PREPARATION

In-house sandblasting process using Garnet blast grits size 20/40 red color, able to grant a surface preparation in class SA 2,5 ISO 8501-1



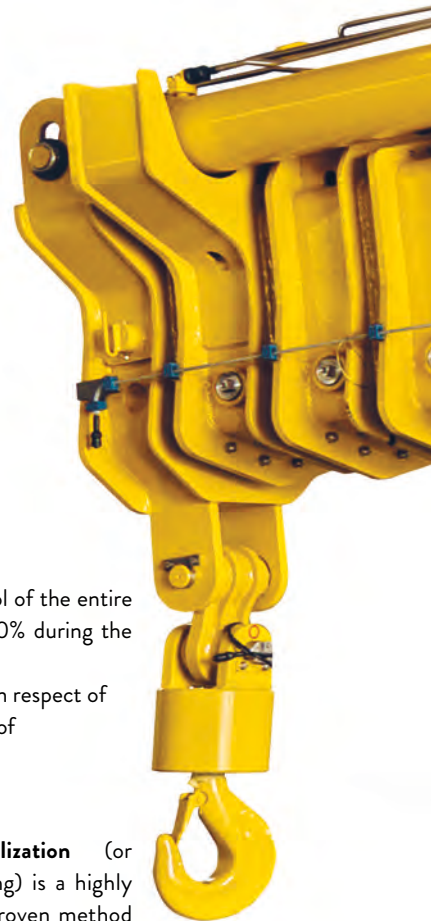
#### SURFACE PAINTING PROCESS

In-house dry spray painting plant that permits a direct control of the entire process, granting an ambient with air humidity less than 60% during the whole painting phases.

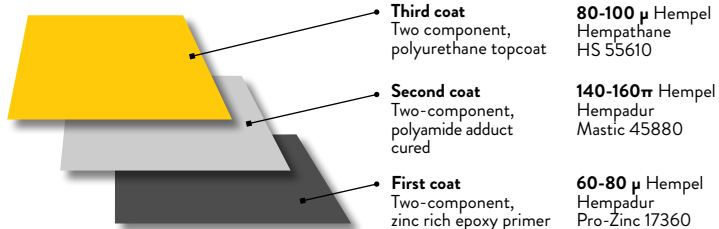
Heila standard program grants a painting final treatment in respect of ISO 12944-5 C5M with a total paint thickness of **minimum 280 micron**.

On request surface painting process in accordance to NORSOK M501 rev. 6 System 2B with 4 layers and total thickness of **minimum 330 micron** NORSOK M501 rev. 6 System 2B with flame metallization and total thickness of **minimum 350 micron**.

**Flame metallization** (or thermal spraying) is a highly effective and proven method of anti-corrosion treatment obtained with a layer of Zinc and aluminum coatings applied on the steel base through a thermal spraying system.



#### STANDARD SURFACE PAINTING PROCESS



Corrosion is a natural process, which converts a refined metal to a more stable form, such as its oxide or hydroxide.  
It is the gradual destruction of materials (usually metals) by chemical reaction with their environment.  
[From Wikipedia, the free encyclopedia]



#### CYLINDER RODS TREATMENT

Heila standard cylinder rods are treated with double cross 40 microns nickel and 40 microns chrome plating with total thickness of 80 micron

#### HEILA STANDARD DURABILITY

High corrosion strength cylinders.

These cylinders are suitable for the worst environmental conditions.

#### SPECIAL ANTI-CORROSION PROGRAM

**ANTI-CORROSION MATERIAL** - Heila Durability Four Stars: **HD4\***

**ANTI-CORROSION TREATMENT** - Heila Durability Four Plus: **HD4+**



#### LOCKING SYSTEM ACCORDING TO DIN 15058

A stainless steel plate lock the chrome treated pin and it is fastened with stainless steel screws.

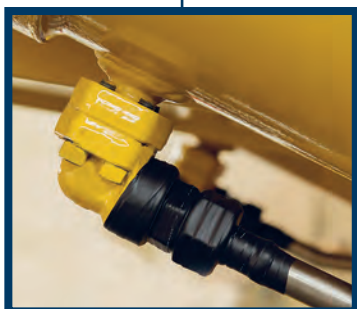




#### HYDRAULIC FITTINGS PROTECTION

Standard fittings on flexible hoses are zinc-cadmium protected. In order to avoid the risk of corrosion a special rubber vulcanized tape is manually applied on each hydraulic connection. This ozone free special tape permits to isolate and seals the connection.

On request flexible hoses fittings can be provided in stainless steel material.



#### SCREWS AND BOLTS PROTECTED BY SILICONE

The silicone provides the perfect protection for outdoor environments. All screws and bolts are manually protected with silicone and later painted in order to avoid water stagnation and prevent dangerous rusting point.



1<sup>ST</sup> COAT PAINTING PROCESS WITHOUT SILICONE

2<sup>ND</sup> COAT PAINTING PROCESS WITH SILICONE

3<sup>TH</sup> COAT PAINTING PROCESS WITH SILICONE AND NAME PLATE



#### **SPIRAL GUARDS TO PROTECT FLUID POWER HOSES AND MULTIPLE CABLING**

All electric cables and flex hoses are appositely wrapped with spiral guards. Solution for abrasion crush, UV, ozone, low temperature.



#### **RIGID PIPES**

All hydraulic pipelines are of stainless steel 316-L with stainless fittings steel AISI316L, according to DIN EN ISO 8434-1



#### **SLEW BEARING BOLTS & NUTS**

GEOMET 500 B grade treatment, according to ISO 9227, increases the bolts and nuts resistance in salty environment up to 1000 hours. This permits robust, low abrasion, temperature-resistant, blow-resistant characteristics and provide good sealing features.



#### **PLASTIC PROTECTIVE CAPS**

The caps provide the perfect protection for outdoor environments.



#### **STAINLESS STEEL JUNCTION BOXES AND ENCODERS**

Boxes specially designed for applications in Oil & Gas sector. Standard with protection IP66



# BA Bowman Africa

Equipment Suppliers (Pty) Ltd

Tel: +27(0) 11 822 1211 • Email: [sales@bowmanafrika.co.za](mailto:sales@bowmanafrika.co.za) • Web: [www.bowmanafrika.net](http://www.bowmanafrika.net)



Custom Built Marine & Offshore Cranes

#### Heila Cranes S.p.A.

Via Romana, 34/6 - 42028 Poviglio (R.E) - Italy  
Phone +39 0522 966352 Fax +39 0522 960391  
[info@heila.com](mailto:info@heila.com) | [www.heila.com](http://www.heila.com)

#### Heila Cranes Nederland B.V.

P.O. Box 480 - 5140 AL Waalwijk - Zijlweg 5 - 5145  
NR Waalwijk - The Netherlands - Phone +31(0)416  
651012 Fax +31(0)416 650757 | [info@heila-nl.com](mailto:info@heila-nl.com)

#### Heila Cranes South East Asia Pte Ltd

8 Ubi Road 2 #05-17 Zervex - Singapore 408538  
Phone: +65 68343608 Fax: +65 65093159  
[desmond.lim@heila.com](mailto:desmond.lim@heila.com)