



STEJARU HPP

HYDRO POWER PLANT IN ROMANIA

PAINT SPECIFICATION OF BUTTERFLY VALVES

ORIGINAL

0	31.05.2024	Paint Specification	Ševčík, Krupa
Rev.	Date	Description:	Elaborated by:

Document No: CKD.740 142-04 REV.00

Elaborated By: Vlastimil Ševčík, Michal Krupa
Checked: Pavel Matula

Approved: Jiřina Čípková

1. APPLIED PAINT SYSTEM

Final shades shall be discussed with Client during Basic Design approving.

W - surfaces in contact with water (brand new parts)

Colour	Shade	Paint thickness NDFT (no. x layer thickness)	Spreading rate
HEMPADUR 15570	12430-MIO grey	60 µm (1x60µm)	4,5 m ² /liter
Thinner 08450			20% of paint
HEMPADUR QUATTRO 17634	19990- black 50630- red 19990-black	450 µm (3x150µm)	0,9 m ² /liter
Thinner 08450			20% of paint
Total thickness NDFT		510 µm	

A - surfaces in contact with air or condensed water

Colour	Shade	Paint thickness NDFT (no. x paint thickness)	Spreading rate
HEMPADUR 15570	12430 - MIO - grey	60µm (1x 60µm)	4,5 m ² /l
Thinner 08450			20% of paint
HEMPADUR QUATTRO 17634	49980 - green	150µm (1x150µm)	2,8 m ² /liter
Thinner 08450			20% of paint
HEMPATHANE HS 55610	...	100µm (2x 50µm)	3,9 m ² /liter
Thinner 08080			20% of paint
Total thickness NDFT		310µm	

O - surfaces in contact with oil:

Colour	Shade	Paint thickness NDFT (no. x layer thickness)	Spreading rate
HEMPADUR QUATTRO 17634	50630-red	100µm (2x 50µm)	4,3 m ² /l
Thinner 08450			20% of paint
Total thickness NDFT		100µm	

C - surfaces of concrete and reinforcement:

Colour	Shade	Paint thickness NDFT (no. x layer thickness)	Spreading rate
HEMPADUR QUATTRO 17634	50630-red	30µm (1x 30µm)	14 m ² /l
Thinner 08450			20% of paint
Total thickness NDFT		30µm	

K - transport preservative agent

Preservative agent, designation	Surfaces to be conserved	Spreading rate
Conservation wax CORTEC VCI - 368	Machined, contact and functional surfaces	8 m ² /kg
Long-term protective effect for C5 degree of corrosion aggressiveness of the atmosphere according to ČSN EN ISO 12944-2		
Conservation oil KONKOR 101	Machined contact and functional surfaces	45 m ² / l
Short-term protective effect 3-5 months for C3 corrosion aggressiveness (medium aggressiveness)		

2. PAINTS AND CONSERVATION

2.1. Scope of paints and delivery of paints to site

The components of equipment the coating of which is not supposed to be damaged during the site erection shall be delivered to site provided with complete coating including top coat from manufacturer's workshop. Manufacturer will also deliver 10% of total quantity of paint for top coat repairs at site.

Damaged coating shall be repaired by specialist from erection department.

2.2 Colour shade

Colour shades are specified for paint systems **W** (surfaces in contact with water) and **O** (surfaces in contact with oil). These colour shades cannot be modified because they are standardly offered by manufacturer.

Colour shades in paint system **A** (**surfaces in contact with atmosphere**) are determined according to customer's requirements and shall be specified in project technical documentation.

Medium flow direction shall be indicated on piping in the shape of arrow and in colour corresponding its respective kind.

2.3 Technical requirements on paint application

a/ preparation of the surfaces for paint application has to be performed in compliance with standard:

ČSN ISO 8501-1 *Preparation of steel surfaces before paint application and similar products - Visual check of surface cleanliness - Time 1: Corrosion degree and preparation grade of steel base without coat and preparation grade of steel base after complete removal of old coatings*

Namely the following instructions have to be strictly followed:

- surface to be coated have to be dry and roughen with sand blasting. Each part is prepared with sandblasting in manufacturer's workshop or at site for paint application at cleanliness degree Sa=2,5 with roughness Rz= 40÷60, if not agreed otherwise.
- parts than can be deformed or damaged (e.g. thin plates) are mechanically cleaned to degree St 2 according to ČSN ISO 8501-1 (03 8221), or are blasted with low deformation effect (soda or dry ice blasting).
- accessible edges have to be chamfered / rounded 1x45° / R1
- blasting has to be performed with steel chippings, or with sharp-edged slag on perfectly degreased surface.

Remark: in case of paint repair, the surface has to be mechanically cleaned and perfectly degreased.

b/ paint application has to be performed in conformity with the following standards:

ČSN EN ISO 12944-1 Paints - Anti-corrosion protection of steel structures with protective paint systems - Part 1: General principles

ČSN EN ISO 12944-2 Paints - Anti-corrosion protection of steel structures with protective paint systems - Part 2: Ambient conditions classification

ČSN EN ISO 12944-3 Paints - Anti-corrosion protection of steel structures with protective paint systems - Part 3: Specifying of coating

ČSN EN ISO 12944-4 Paints - Anti-corrosion protection of steel structures with protective paint systems - Part 4: Types of base surfaces and their preparation

ČSN EN ISO 12944-5 Paints - Anti-corrosion protection of steel structures with protective paint systems - Part 5: Protective systems

ČSN EN ISO 12944-6 Paints - Anti-corrosion protection of steel structures with protective paint systems - Part 6: Laboratory test methods

ČSN EN ISO 12944-7 Paints - Anti-corrosion protection of steel structures with protective paint systems - Part 7: Painting and paint application monitoring

ČSN EN ISO 12944-8 Paints - Anti-corrosion protection of steel structures with protective paint systems - Part 8: Making specifications for new and maintenance paints.

Namely the following principles have to be followed:

- paints to be used for equipment coating has to be properly checked and quality of the paint has to be tested according to respective standards
- paints are stored under temperature of +5°C to +25°C in warehouses that conforms to inflammable liquids regulations according to ČSN 650201 including principles for storage of paints according to ČSN 670811
- primer has to be applied within 8 hours after sandblasting of the surface to be coated depending on climate conditions to avoid repeated corrosion of the sandblasted surface
- surfaces to be painted have to be cleaned, degreased and free of any impurities
- surface has to be dry and air temperature during paint application cannot be lower than +5°C (with exception of paints suitable for application under lower temperatures), temperature of the surface, on which the paint is applied, has to be higher by 3°C than the value of dew point at instant conditions, i.e. temperatures and air relative humidity
- during application of combined coatings (metallization + paint) the air temperature cannot be lower than +5°C, first paint should be applied within max. three hours after application of metalized layer. Further paint layers cannot be applied under temperature lower than +5°C.
- paint application has to be performed under optimal conditions (20°C, humidity within 40 - 60%)
- paint layer thickness has to be even on the complete surface
- each paint layer has to be of different shade
- instructions of paint manufacturer have to be followed, curing time of each paint layer has to be kept
- each paint layer has to be smooth free of visible traits and drops, blisters, cracks and other defects and has to create smooth and uniform surface

2.4 Inspection of painted surfaces

Paint application works are checked during its complete procedure, specified technology and conditions during paint application are recorded. Paint inspection can be included in Test and certificates review.

Paint Inspections performed in addition to standard workshop inspections, their scope, evaluation and quality, shall be carried out after agreement with technical department, technology development department and with respect to customer's requirements.

Inspections and their evaluation according to specified requirements shall performed by specialists from manufacturer's quality department.

Condition of paints have to be checked regularly checked - usually twice a year (inspections shall be specified in equipment operating manual). Condition of paints shall be inspected after dispatch of the equipment and site erection.

Standard methods of paint inspection in manufacturer's workshop

- Inspection of surface cleanness after sand blasting - CSN ISO 8501,2
- Visual check of technical quality of paint after application - CSN EN ISO 12944
- Inspection of paint or metallization thickness - CSN EN ISO 12944
- Inspection of paint adhesion - CSN EN ISO 4624

Remark: scope of performed testing and inspections shall always be adopted to customer's requirements for each particular part of equipment.

3. INSTRUCTIONS FOR COATING APPLICATION

W - Surfaces in contact with water:

1x 60µm HEMPADUR 15570/12430 MIO - grey

- NDFT 60 µm

Two-component epoxy coating pigmented with micaceous iron oxide suitable for application in high humidity conditions.

Used as universal primer and top coat in high corrosion ambient conditions.

- basic component - marked 15579
- hardener (component B) - marked 95570
- hardening rate 3:1 (volume rate)
- dilution - thinner 08450 - 5% to paint AIR - MIX
- 5-15% for air spraying, brush
- volume of dry residue - 54%
- ready for application after mixing within 2 hours/20°C (3hours/15 °C)
- touch dry - 4hours/ 20 °C (8hours/10 °C, 16hours/0 °C)
- interval between each layer application 8 hours/ 20 °C (16hours/10 °C)
- practical spreading rate 4,5m²/l (60 µm)
- application - air spraying, AIR-MIX, brush.

3x 150µm HEMPADUR 17634/19990-50630-19990 (black-red-black) - NDFT 450 µm

Two-component epoxy coating with high resistance against abrasion, sea water and oil.

Used as a universal primer and top coat in systems suitable for surface submerged in water and in contact with air.

- hardener (component B) - marked 97334
- hardening rate 4:1 (volume rate)
- dilution - thinner 08450 - 3% to paint AIR - MIX
- 5-10% for air spraying, brush
- volume of dry residue - 72%
- ready for application after mixing within 2 hours/20°C (3hours/15 °C)
- touch dry - 4hours/ 20 °C (12hours/5 °C)
- interval between each layer application 5 hours/ 20 °C (12hours/5 °C)
- practical spreading rate 2,8 m²/l (150 µm),
- application - air spraying, AIR-MIX, brush.

A - Surfaces in contact with air:**1x60µm HEMPADUR 15570/12430 - MIO (grey)****- NDFT 60 µm**

Two-component epoxy coating pigmented with micaceous iron oxide suitable for application in high humidity conditions.

Used as universal primer and top coat in high corrosion ambient conditions.

- basic component - marked 15579
- hardener (component B) - marked 95570
- hardening rate 3:1 (volume rate)
- dilution - thinner 08450 - 5% to paint AIR - MIX
- 5-15% for air spraying, brush
- volume of dry residue - 54%
- ready for application after mixing within 2 hours/20°C (3hours/15 °C)
- touch dry - 4hours/ 20 °C (8hours/10 °C, 16hours/0 °C)
- interval between each layer application 8 hours/ 20 °C (16hours/10 °C)
- practical spreading rate 4,5m²/l (60 µm)
- application - air spraying, AIR-MIX, brush.

1x150µm HEMPADUR QUATTRO 17634/49980 (green)**- NDFT 150 µm**

Two-component epoxy coating with high resistance against abrasion, sea water and oil.

Used as a universal primer and top coat in systems suitable for surface submerged in water and in contact with air.

- hardener (component B) - marked 97334
- hardening rate 4:1 (volume rate)
- dilution - thinner 08450 - 3% to paint AIR - MIX
- 5-10% for air spraying, brush
- volume of dry residue - 72%
- ready for application after mixing within 2 hours/20°C (3hours/15 °C)
- touch dry - 4hours/ 20 °C (12hours/5 °C)
- interval between each layer application 5 hours/ 20 °C (12hours/5 °C)
- practical spreading rate 2,8 m²/l (150 µm),
- application - air spraying, AIR-MIX, brush.

2x50µm HEMPATANE HS 55610 RAL**- NDFT 100 µm**

Two-component polyurethane coating, with excellent persistence of colour shade and gloss, can be applied directly on metal as single-layer coating.

- volume of dry residue - 65% +- 1% (volume rate)
- hardening rate - 7 :1 (volume rate)
- hardener 97050
- dilution - thinner 08080 - 5% to paint
- layer curing - 5 hours (20 °C),
- practical spreading rate - 3,9 m²/l (100 µm) 7,8 m²/l (50 µm)
- recommended application - AIR-MIX , air brush, brush

O - Surfaces in contact with oil:**2x 50µm HEMPADUR QUATTRO 17634/50630 (red)****- NDFT 100 µm**

Two-component epoxy coating with high resistance against abrasion, sea water and oil.

Used as a universal primer and top coat in systems suitable for surface submerged in water and in contact with air.

- hardener (component B) - marked 97334
- hardening rate 4:1 (volume rate)
- dilution - thinner 08450 - 3% to paint AIR - MIX
- 5-10% for air spraying, brush
- volume of dry residue - 72%
- ready for application after mixing within 2 hours/20°C (3hours/15 °C)
- touch dry - 4hours/ 20 °C (12hours/5 °C)
- interval between each layer application 5 hours/ 20 °C (12hours/5 °C)
- practical spreading rate 3,9 m²/l (100 µm),
- application - air spraying, AIR-MIX, brush.

*