

# LAB TESTING AND CASE HISTORIES OF CORTEC PRODUCTS USED IN CROATIA

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# APPLICATION OF CORROSION INHIBITORS IN SHIPBUILDING

- Inhibitors are used to protect inaccessible spaces of ship structures such as:
  - keel,
  - rudder – inner part,
  - rudder frame,
  - bumpers,
  - pipelines,
  - ship equipment,
  - electric contacts etc.



## **Application of corrosion inhibitors for protection of the rudder inner parts**

### **Advantages:**

- **Easy application (no need to use the scaffold)**
- **Uniform protection of all parts of the structure**
- **No need for surface preparation**
- **Not bound by climatic conditions**
- **Environmentally friendly**





1. Corrosion inhibitor is blown into the rudder through openings.



*Shipyard Uljanik, Pula*  
**CROATIA**

2. This process lasts until the VCI inhibitor starts to come out on the other side of the rudder.





### 3. Closing of the first opening with the tap.

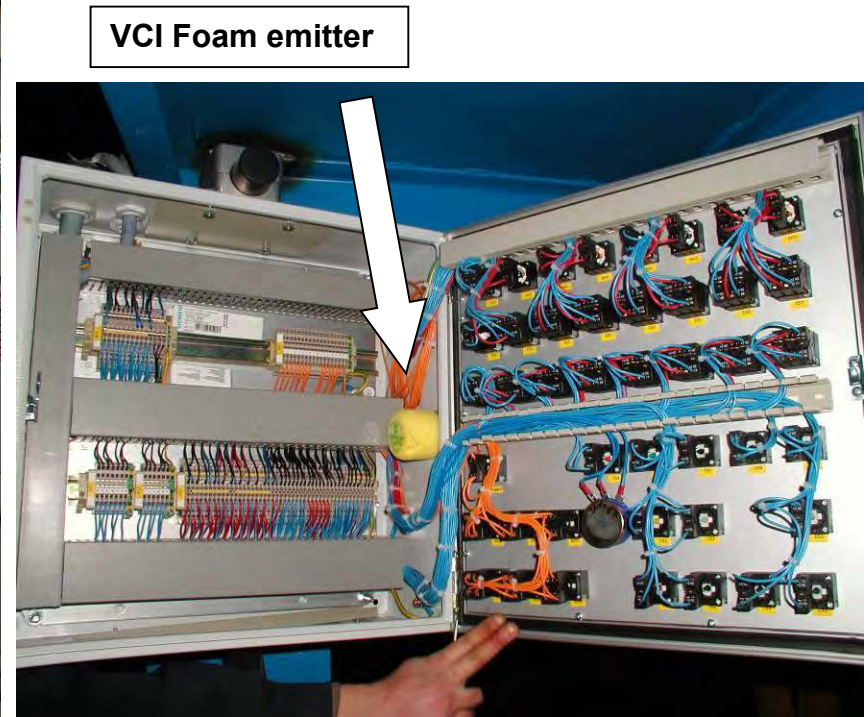
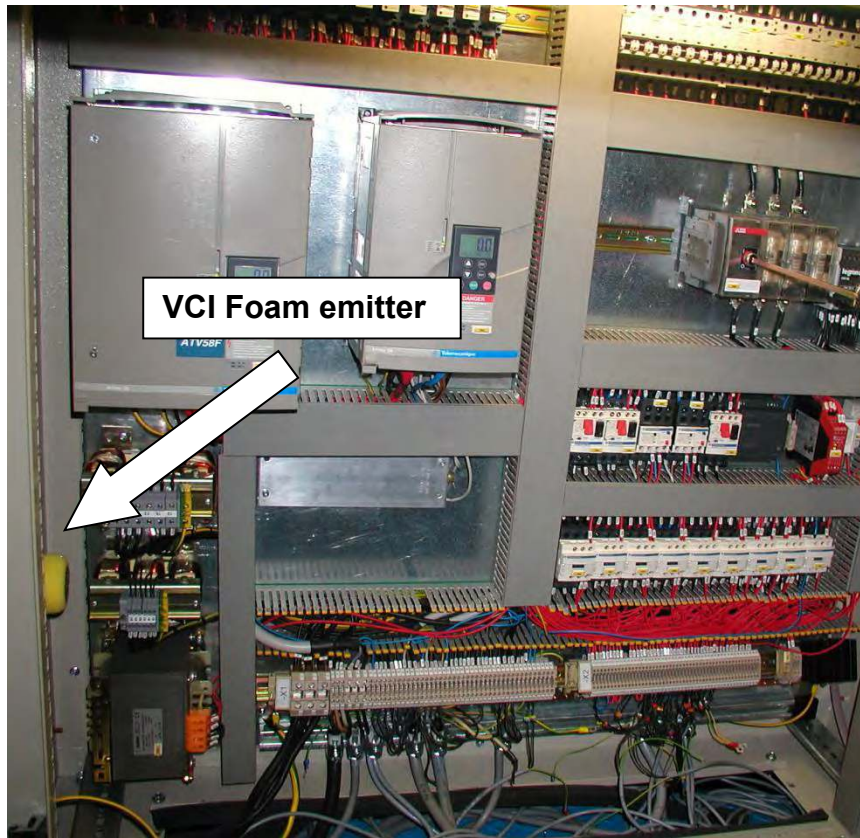


**VCI protection recovery at ship dry docking**





## **Application of VCI inhibitors for electric contacts protection**



**Control switchboxes**

## Temporary corrosion protection of welding wire.



**Shipyard Uljanik, Pula**



## **Application of VCI inhibitors for corrosion protection of ship engine parts before installation**







**Wartsila – shaft line**  
***Shipyard Uljanik, Pula***





*Shipyard 3. Maj, Rijeka*  
**CROATIA**





**SHIP ASPHALT CARRIER**

**12 asphalt tanks**

**1 tank = 1000 m<sup>3</sup>**

**SEA WATER HYDROSTATIC  
PROBE**

**VpCI 645 100 ml/m<sup>3</sup> per tank**



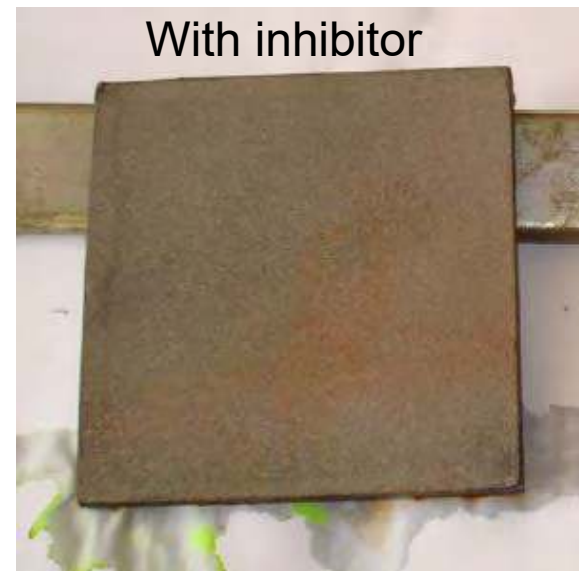


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## ***Application of inhibitors in hydro static testing***

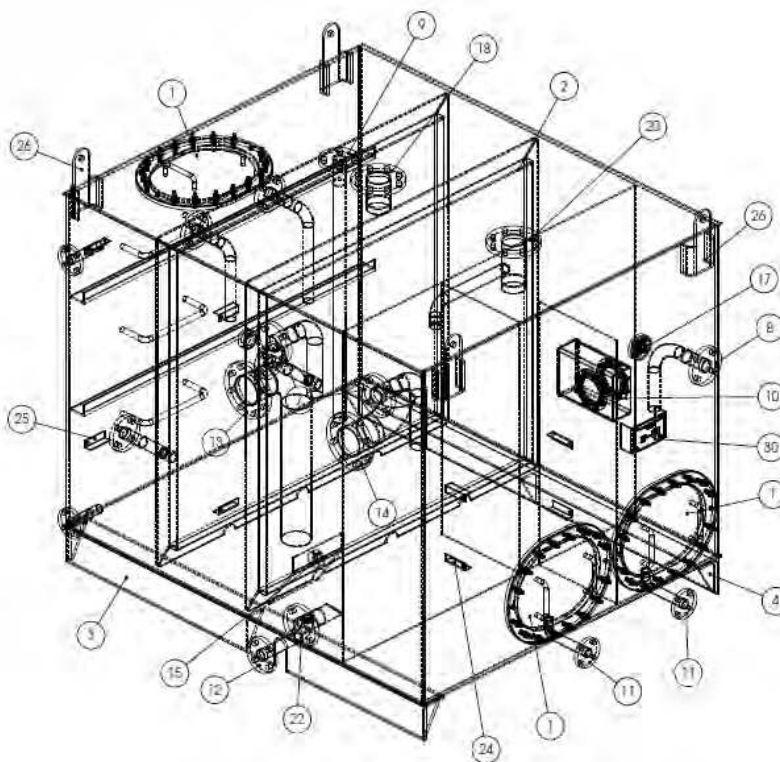
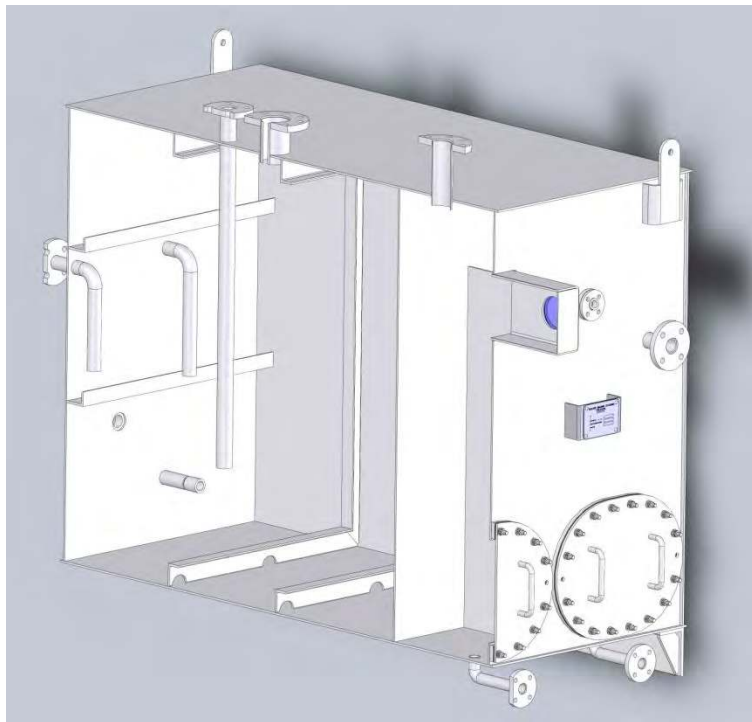
- 0,4% **VpCI 649BD** in potable water
- with VCI application, the same water is used many times over again
- Saving: 5000 m<sup>3</sup> of potable water in a 5 year period.



Mild steel after 24 hours in potable water.



## **Application of powder corrosion inhibitors for tanks protection**



300 – 500 g of VpCI powder for two year protection  
of 1 m<sup>3</sup> of tank

**VpCI 309 – Hot Well**

## **Application of VCI inhibitors for surface preparation**



- Environmentally friendly solution compared to conventional sand blasting techniques.
- Suitable for removal of old coatings.
- Enables corrosion prevention of newly prepared surfaces.



## **Efficiency testing of corrosion inhibitors in wet blasting process**

**- after 24 hours in marine environment**

**With inhibitor  
VpCI 611**

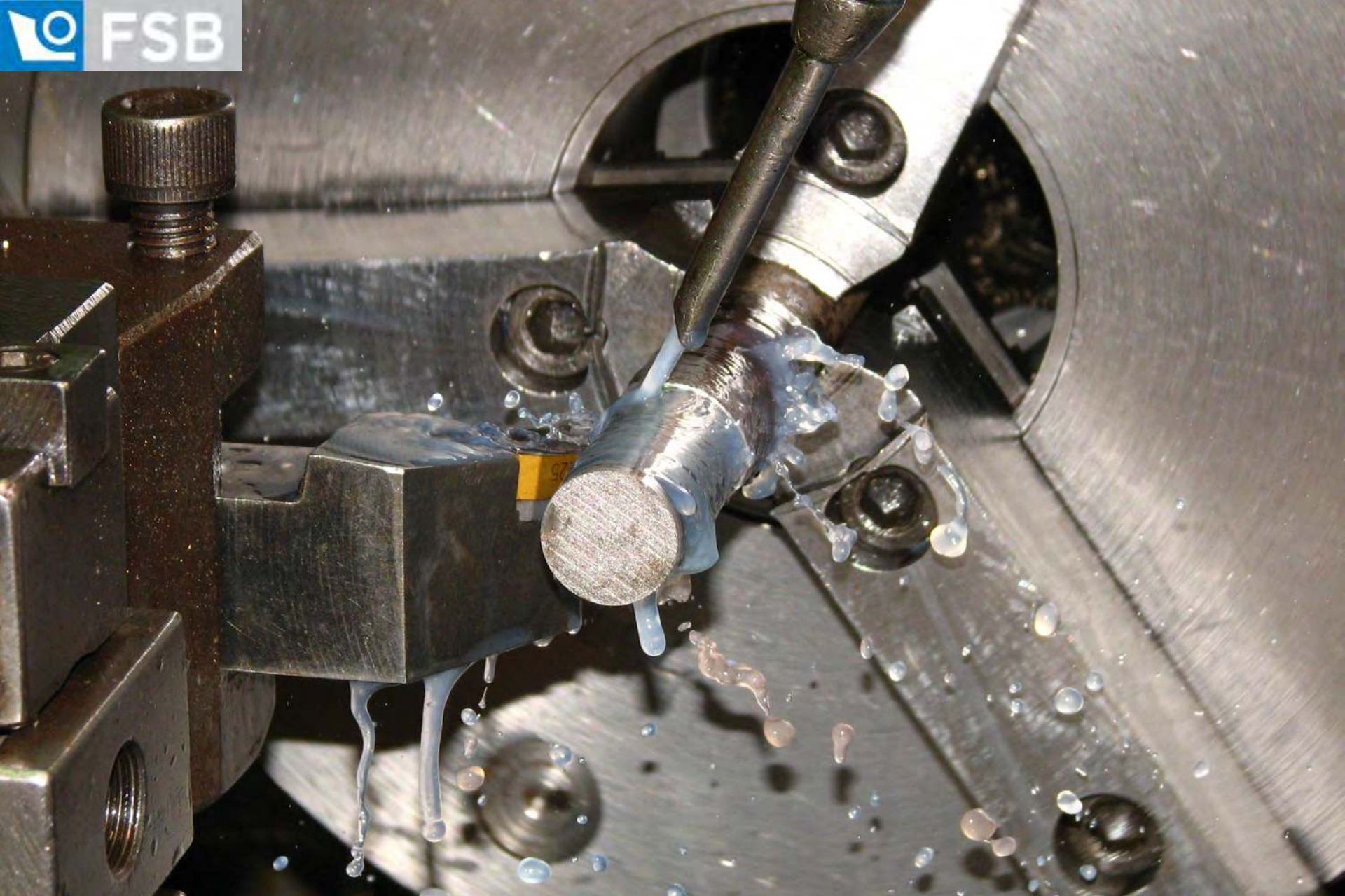
**Without inhibitor**





Laboratory testing of corrosion inhibitor efficiency





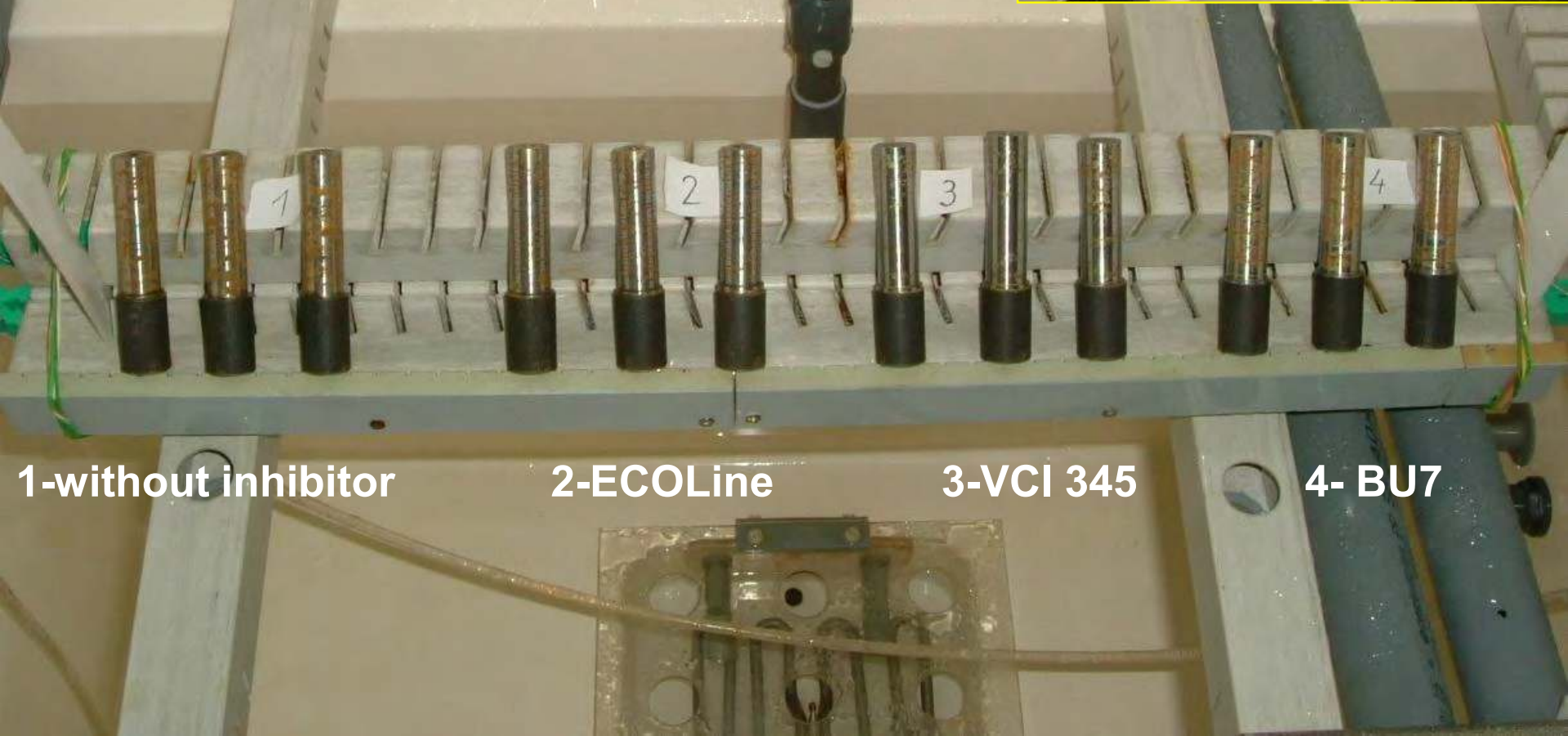
**INFLUENCE OF INHIBITORS IN COOLING EMULSION ON CORROSION OF  
WORKPIECE**







**TESTING IN SALT CHAMBER, 2 hours, ISO 9227**



1-without inhibitor

2-ECOLine

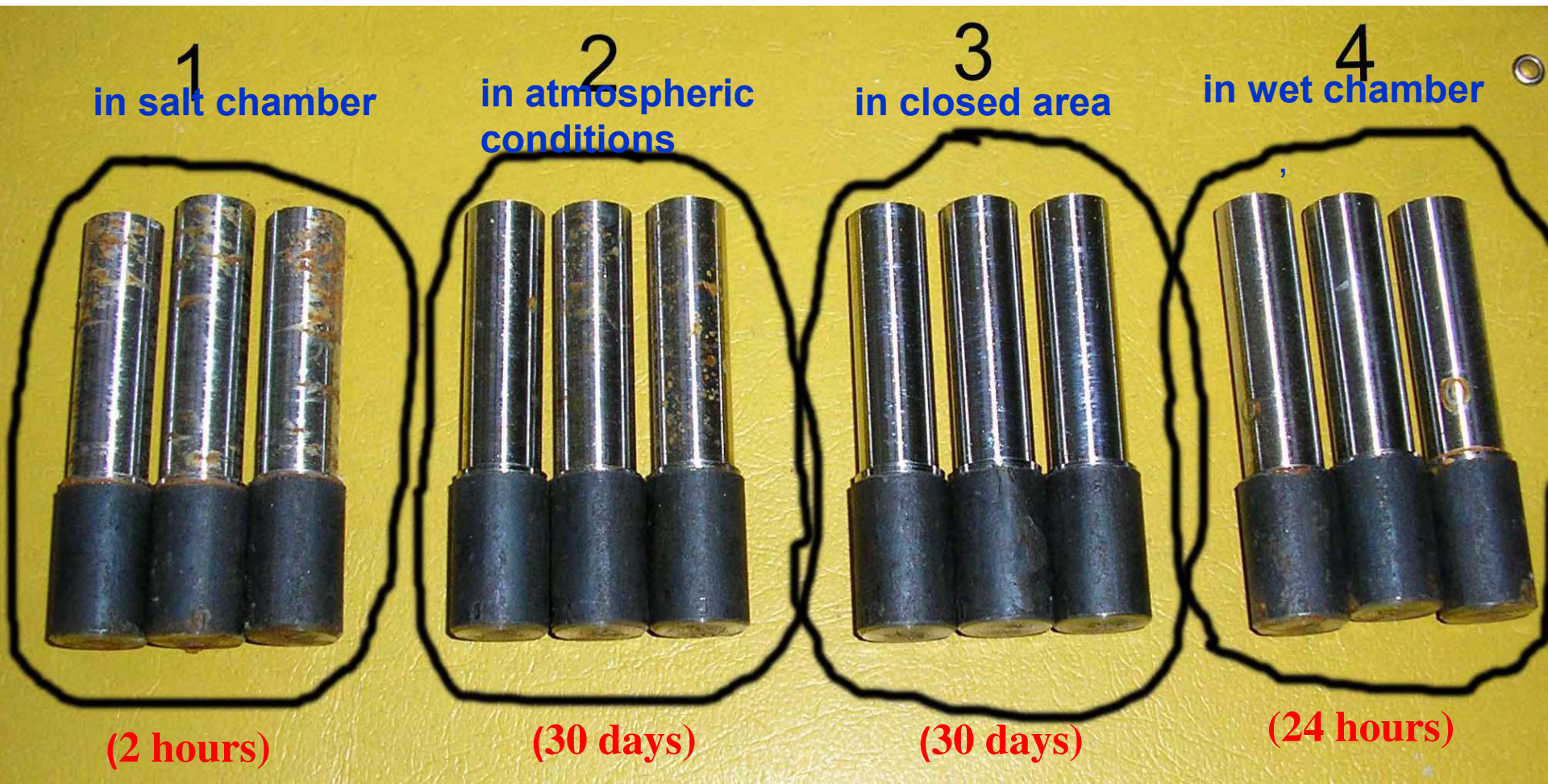
3-VCI 345

4- BU7



## RESULTS

Appearance of samples machined with application of coolant containing inhibitor EcoLine Cutting Fluid (INH1) after testing





## RESULTS

Appearance of samples machined with application of coolant containing inhibitor VCI-345 (INH2) after testing

1

in salt chamber



(2 hours)

2

in atmospheric  
conditions



(30 days)

3

in closed area



(30 days)

4

in wet chamber



(24 hours)



# CONCLUSION

- Corrosion inhibitors offer broad application possibilities that only need to be recognized and properly used.
- Based on the studies conducted in this field, it can be concluded that the application of corrosion inhibitors can be extended, whereby problems related to corrosion can be reduced.
- All tested *Cortec* products showed very effective corrosion protection properties and can be used in different aggressive environments.





*Thank you for your attention!*