



Moerdijk , March 13th 2012



Performance Standard for Protective Coating

Waterballast tanken

Jan de Waart New Building manager

Herman Spilker Marine Manager

Bureau Veritas Netherlands

Move Forward with Confidence



**BUREAU
VERITAS**

Why ?

***Corrosion problems as part of the reason for disasters
In combination with High Tensile Steel.***



Why ?

High Tensile Steel.

When high strength steel has been utilized to add strength without weight, rapid corrosion degrades structural strength quickly.

While high tensile steel can be thinner than mild steel for the same strength, it will corrode at the same rate.



First change – Common structural Rules



1st April 2006

- ▶ The intention of the new Rules is to encourage the design and construction of robust bc / tankers and to eliminate competition on scantlings.
- ▶ Stringent and clarified requirements to critical areas
- ▶ The minimum fatigue design life has been upgraded from the 20 year worldwide trading to 25 year North Atlantic environment.
- ▶ The Rules include design standards for the net scantlings of a vessel meaning that the renewal thicknesses for the in service time is checked and known at the newbuilding stage.
- ▶ The corrosion additions that have been established takes into account the location and the environment to which the structural member's surface is subjected

Coating second change: What is it aiming for?

Coating that will last for minimum 15 years



POOR



NEW



GOOD



FAIR

Introduction – Key Dates



Adoption of **PSPC:**

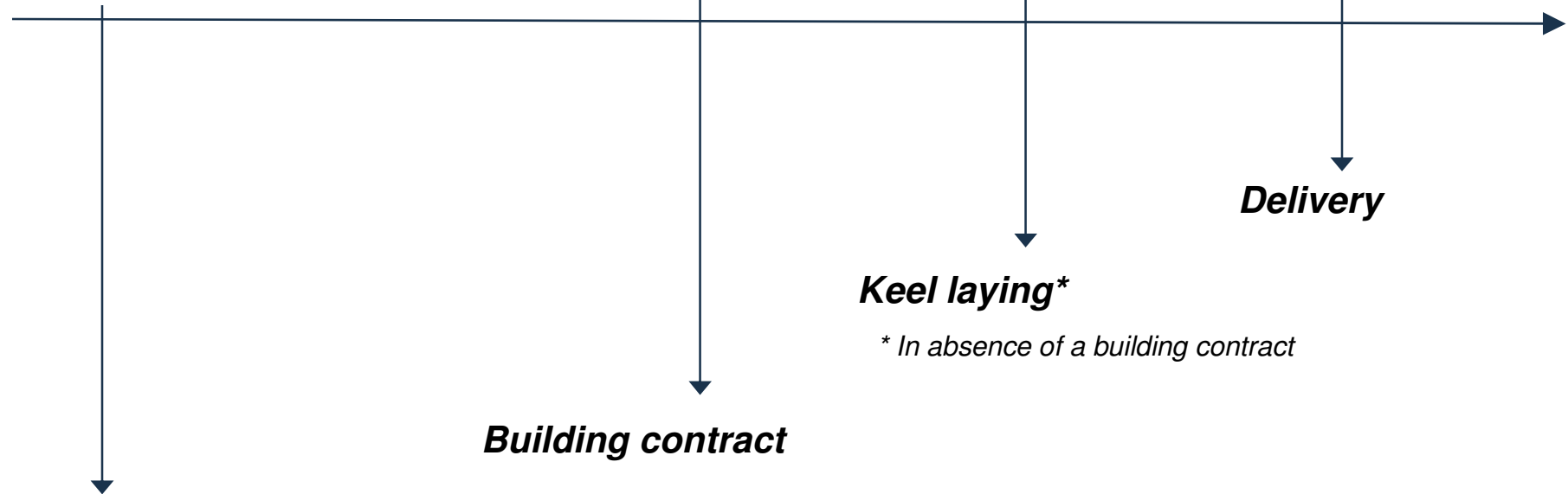
Dec. 2006

Entry into force of **PSPC:**

1st July 2008

1st Jan. 2009

1st July 2012



- **MSC.215 (82) (PSPC)**
- **MSC.216 (82)**

Statutory matter

SOLAS Reg. II-1 / 3-2 amended by MSC.216(82)
WBT All Ships ≥ 500 G.T. , DSSS Bulk Carriers ≥ 150 M

Few words about the situation in the Netherlands



Eis is stralen **na lassen** Sa 2 ½ bij $T > 3^{\circ}\text{C}$ boven dauwpunt en luchtvochtigheid boven 85 %.

In Nederland werken we voorgestraalde shopprimerplaten, ronden beperkt af strijken de randen voor en brengen een hoogwaardige coating aan in een niet vergelijkbaar klimaat met het Verre Oosten.

Resultaat zou zijn bij onverkorte toepassing van de eisen het verwerken in verwarmde overdekte loodsen en de consequentie voor de concurrentiepositie.

Hier is succesvol gelobbyed !!!

Paar verklaringen

SA 2 1/2 Zeer zorgvuldig stralen; alles is verwijderd en is nog slechts als lichte schaduw of verkleuring te zien.



Dauwpunt bij gelijkblijvende dampdruk treedt condensatie op.





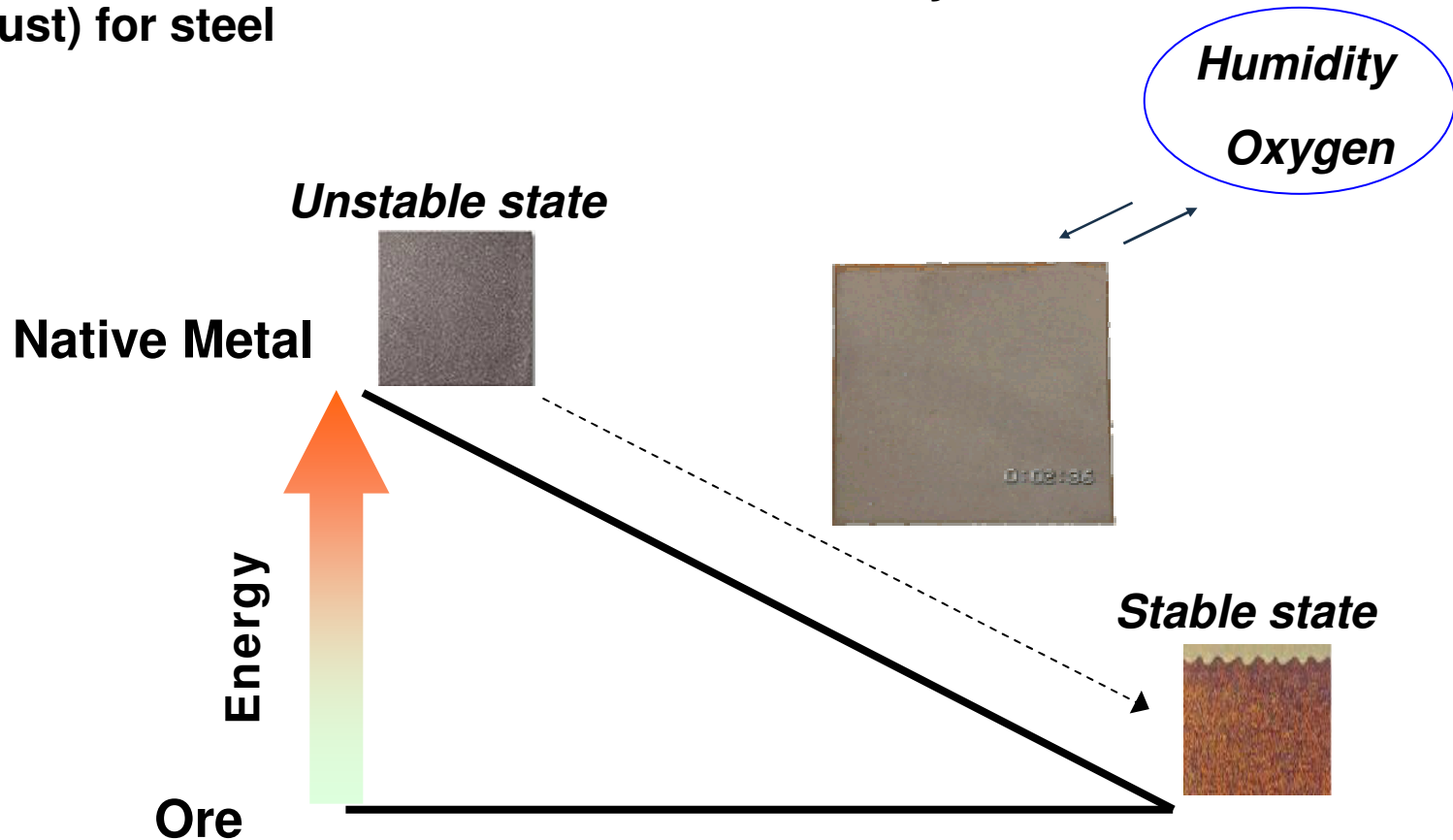
Corrosie Hoe zat het ook al weer?

Chemische degradatie van vast materiaal door invloed van de omgeving

Generalities on Corrosion

► Definitions and causes

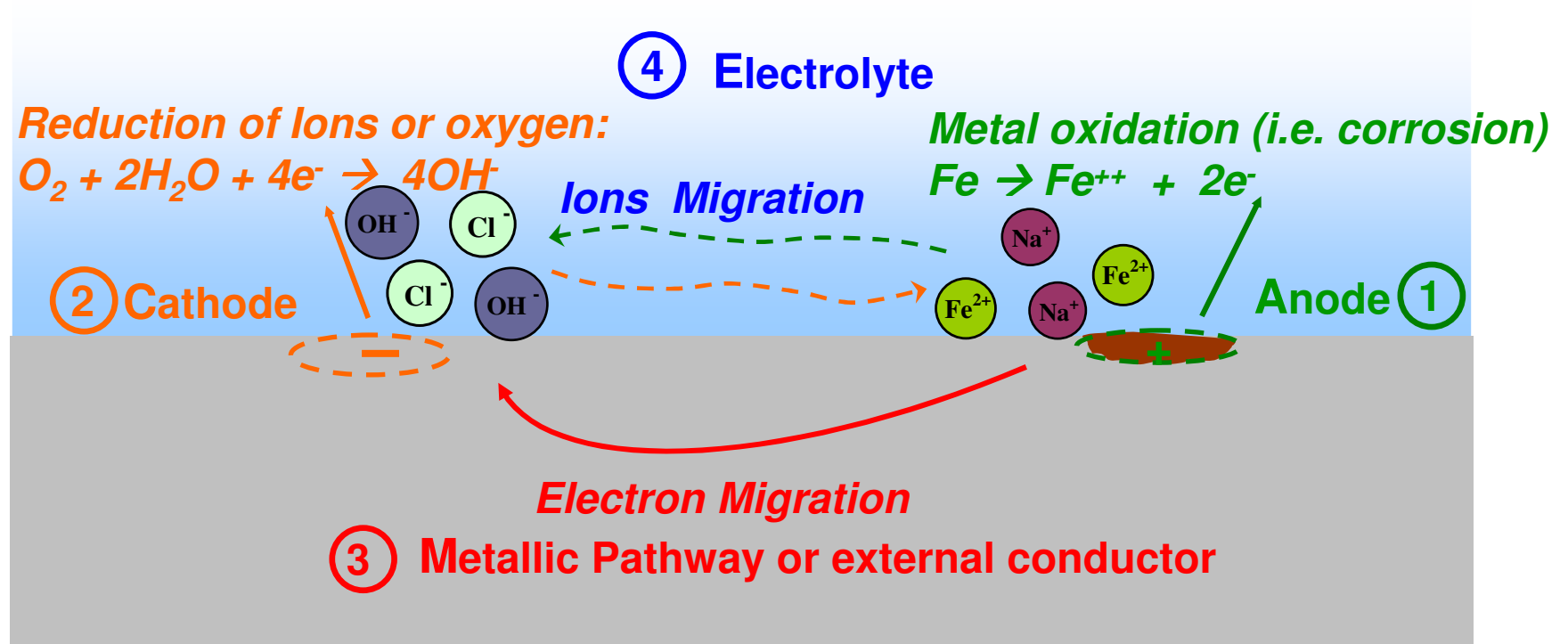
- Corrosion is the deterioration of the metal caused by its interaction with the environment
- The Metal tend to return to a more stable thermodynamic state: iron oxide (rust) for steel



Generalities on Corrosion

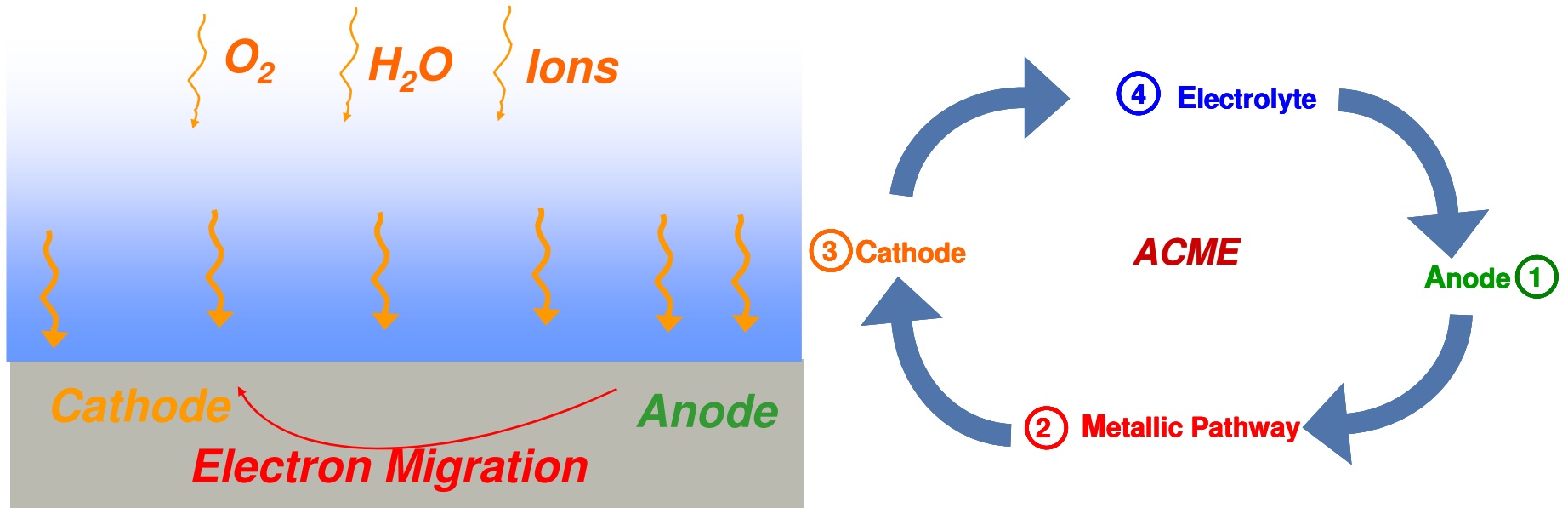
► Definitions and causes

- **Four** essential elements must be present to make the **corrosion process likely to occur**:



Generalities on Corrosion

► Protective Coating Functionality



Protective Coatings are used to break the ACME conditions

Voorbeeld BC aan 1 zijde



Coating conditions

- ▶ good: condition with only minor spot rusting
- ▶ fair: condition with local breakdown at edges of stiffeners and weld connections and/or light rusting over 20% or more of areas under consideration, but less than as defined for poor condition
- ▶ poor: condition with general breakdown of coating over 20% or more or hard scale at 10% or more, of areas under consideration



Coating Inspections

► Coating “Good”



Notes: Condition: GOOD
spot rusting: scattered 1%
spot rusting on edges or weld lines: localised less than 5%

Assessment scale:

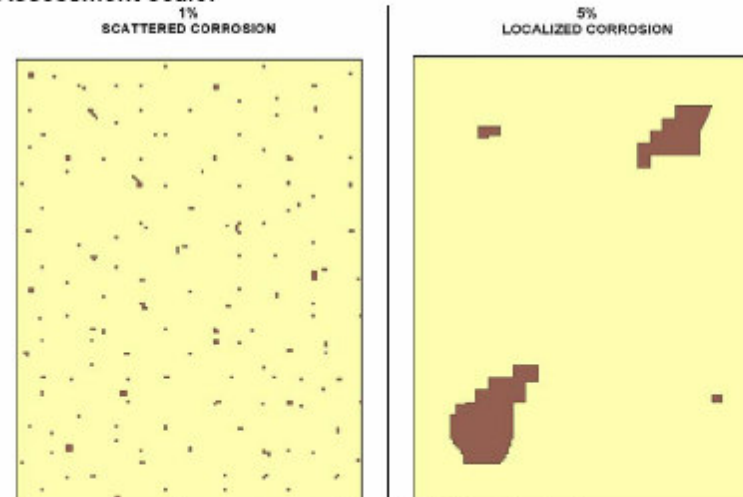


Figure O - Coating Condition Evaluation

Coating Inspections

► Coating “Fair”



Notes: Condition: FAIR
Breakdown of coating/area rusted: localised 15-20%
Area of hard rust scale: Less than 10% of the area rusted
Local breakdown of coating or rust on edges or weld lines: 30-40%
Remarks: FAIR for longitudinal close to bottom, remaining surface;
GOOD

Assessment scale:

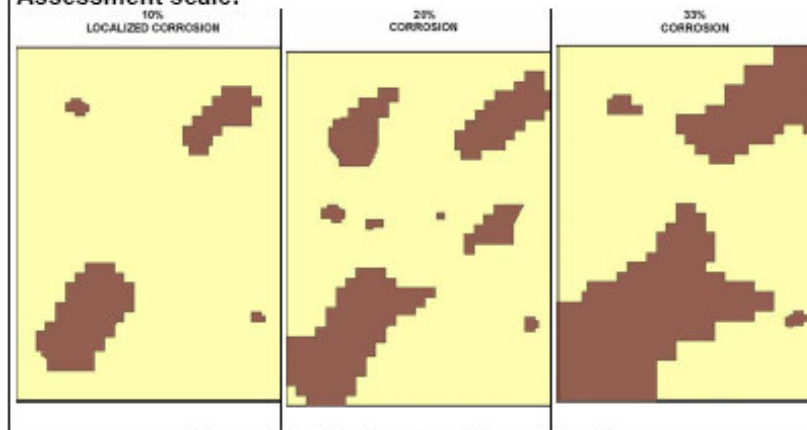


Figure P - Coating Condition Evaluation

Coating Inspections

► Coating “Poor”



Notes: Condition: POOR
Breakdown of coating/area rusted: approx. 30%
Area of hard rust scale: More than 10% of the area rusted
Local breakdown of coating or rust on edges or weld lines: 30-40%

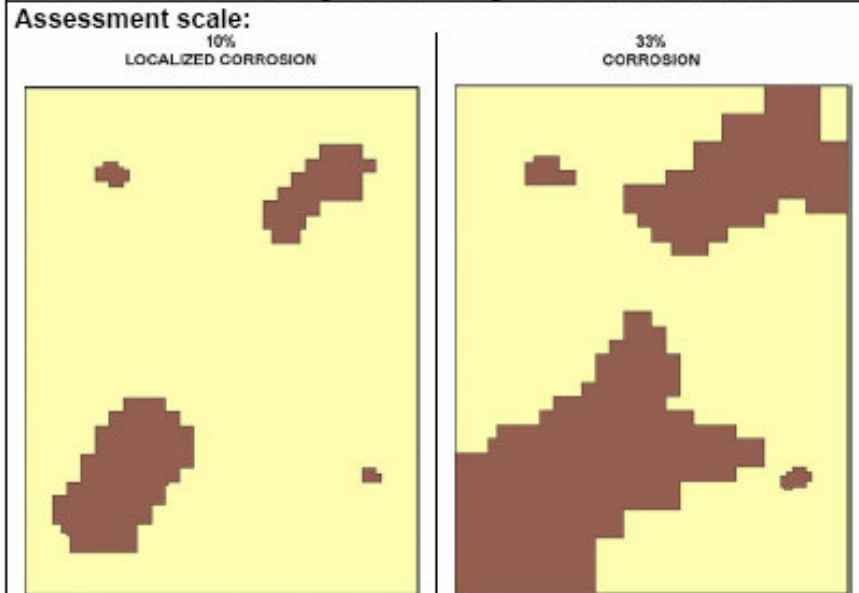


Figure Q - Coating Condition Evaluation

What is the result of the coating condition??

Annual inspections of tanks when

Coating is poor they **must** be inspected

Fair is a consideration

Double bottom tanks exempted, they **may** be inspected

Extended scope of US gauging / close-up inspection depending ship type

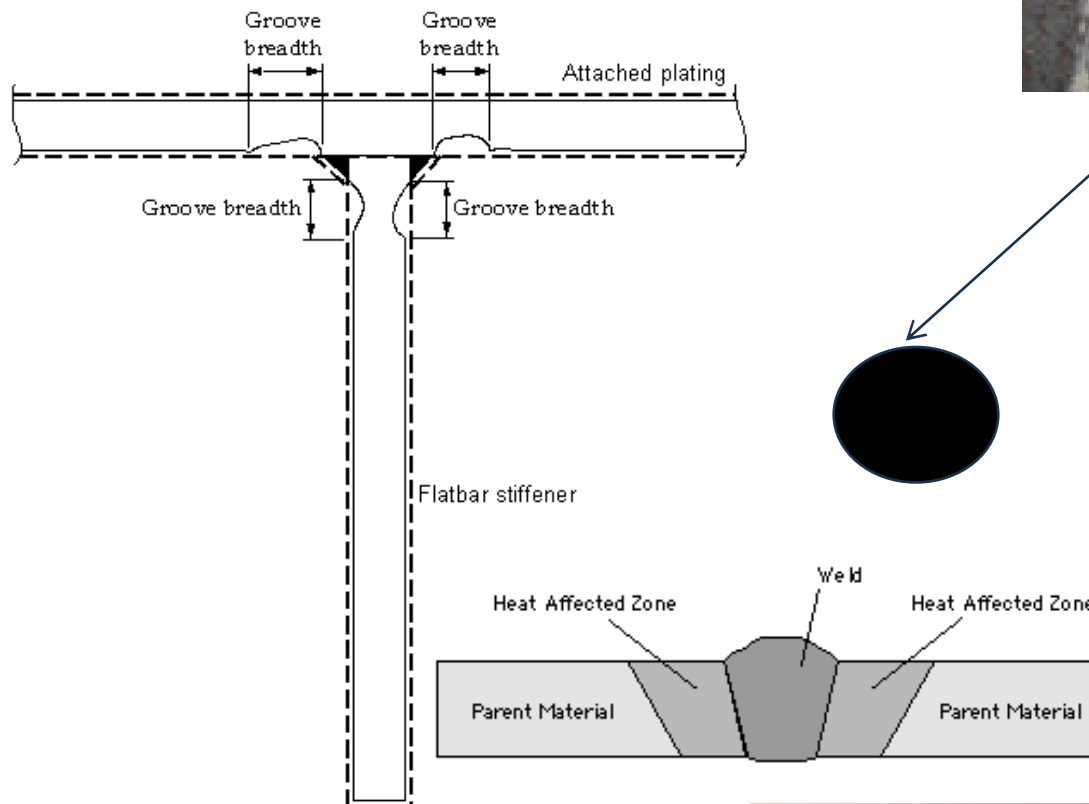
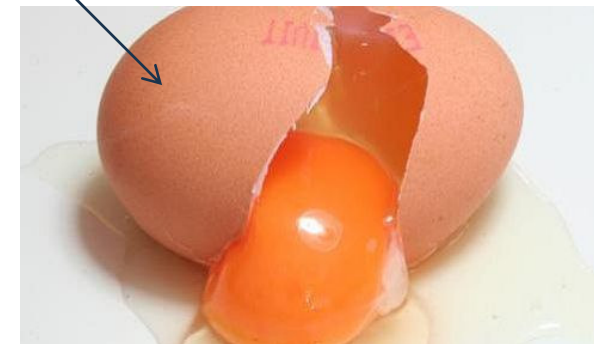
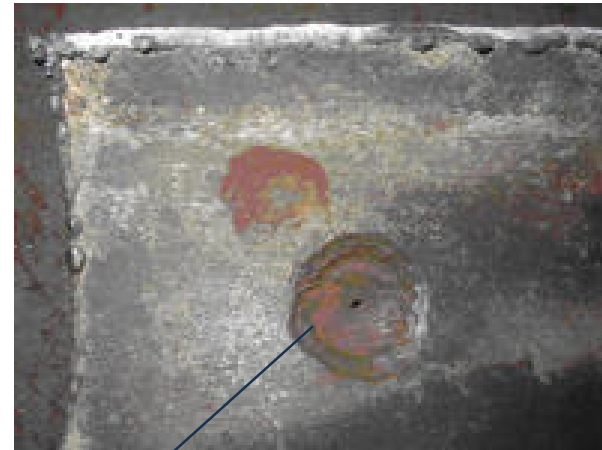


Corrosion & Corrosion Rate

0,2-0,4 mm/ jaar onbeschermd

Electrolytische corrosie (*algemeen*)

Grooving & Microbiele Corrosie





BUREAU
VERITAS



BUREAU
VERITAS

Move Forward with Confidence*

**Avançons en confiance*