



WITMANS
ADVANCED FLUIDS



LUBRICANTS



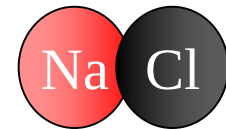
OEST – WAFPL : WHAT VALUE WE BRING ON THE TABLE

YOUR's KPIs are OUR's



WITMANS
ADVANCED FLUIDS

What are salts?



+ **Cations are charged positive**
magnesium, calcium (hardness)

- **Anions are charged negative**
chloride, sulfate, nitrite; nitrate

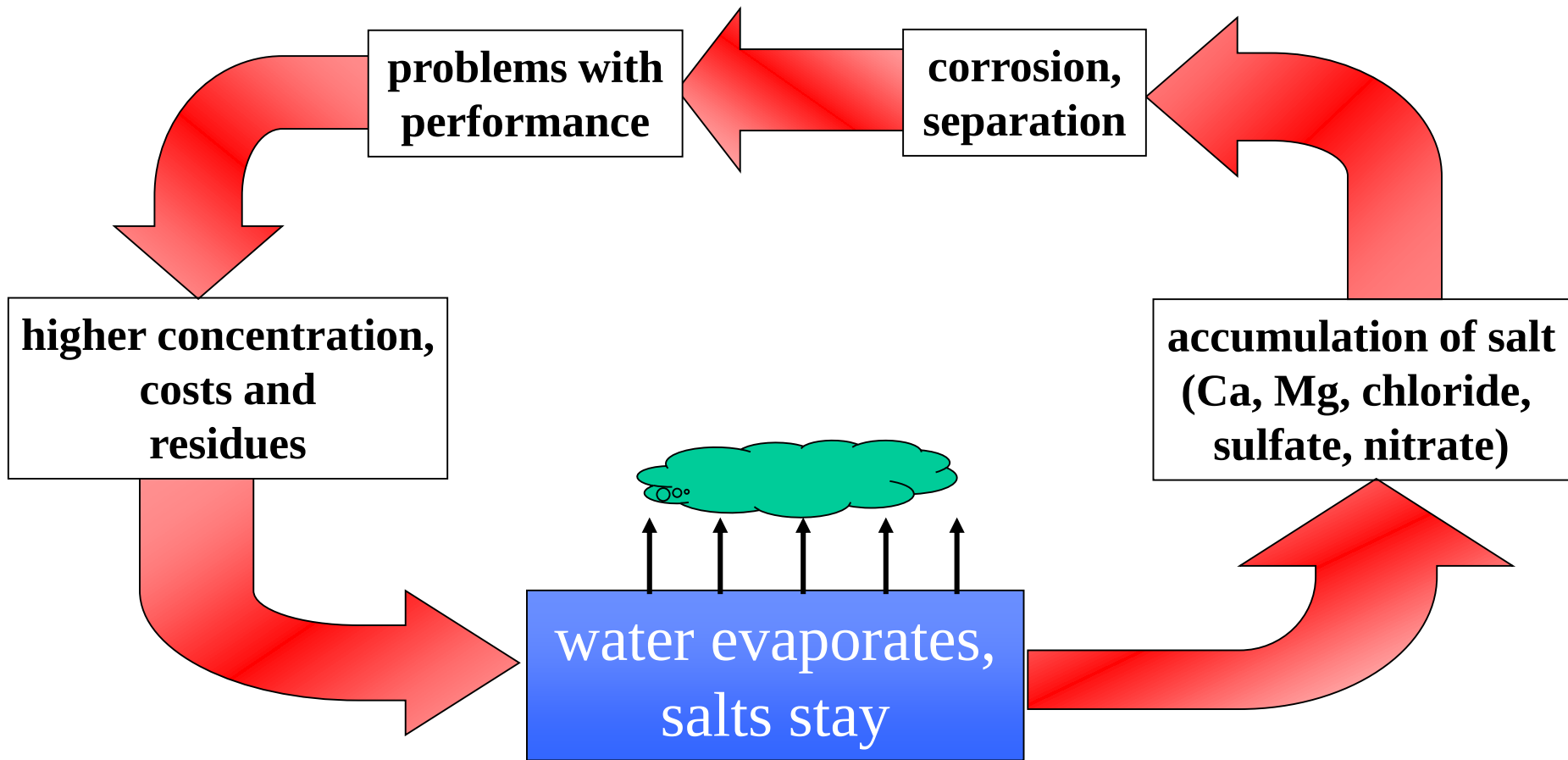


Cations:
(Ca, Mg)

- + low foam**
- instability**
- oil residues**
- blocked filters**

Anions:
(chloride, sulfate)

- corrosion**
- instability**
- discoloration of aluminium**





Reverse osmosis (RO) is a water purification technology that uses a semipermeable membrane to remove ions, molecules, and larger particles from drinking water.

**** note :** RO is not capable to remove 100% of Ions from Water ..
i.e. suppose we are Feeding 500 TDS water , The water out from the RO can max goes up to 150 TDS (Including Positive and Negative Ions . But can never be Zero .

**** From Cutting Oil Point of View it will always be good to have Negative Ions as Zero , so recommended to use DM water**



Demineralised water is **water** completely free (or almost) of dissolved minerals as a result of one of the following processes: distillation.

deionization.
Process utilizing special-manufactured ion exchange resins which remove ionised salts from water. Can theoretically remove 100 % of salts.

Read more:

<http://www.lenntech.com/applications/process/demineralised/deionised-demineralised-water.htm#ixzz4OvGa4cPX>

Generally Direct Feeding of Raw water is avoided in the DM water Plant , Hence most of the time RO water is Feed to Produce best quality DM water .



CRITERION	WATER	EMULSION
Chloride(PPM)	< 20 PPM	<150 PPM
Ph	6.5~7.5 (Best 7.0)	8.5~9.5
Hardness	< 90 PPM	<200 PPM
Concentration		Based on Application



Objectives :

- ❑ to understand, when and how corrosion occurs
 - corrosion on different materials
 - types of corrosion

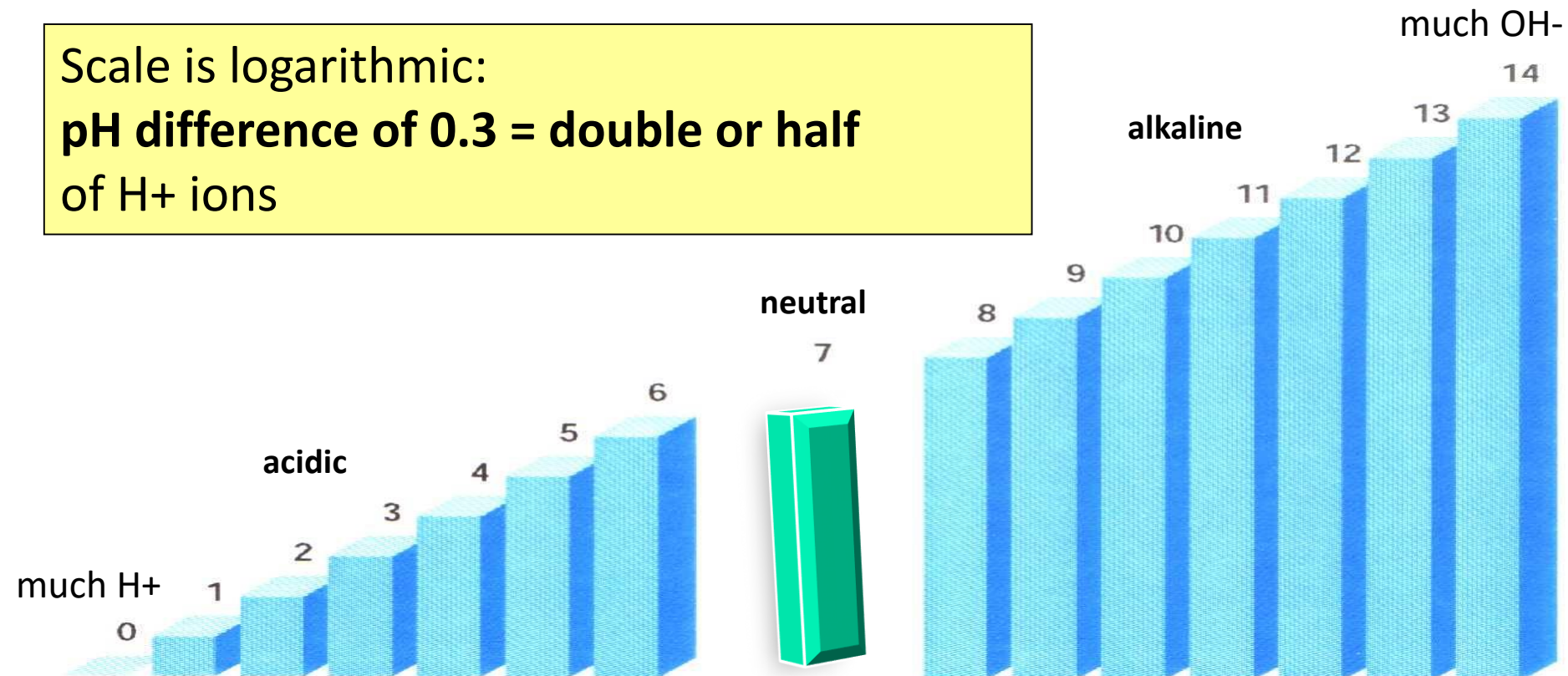
- ❑ to know what to do against corrosion



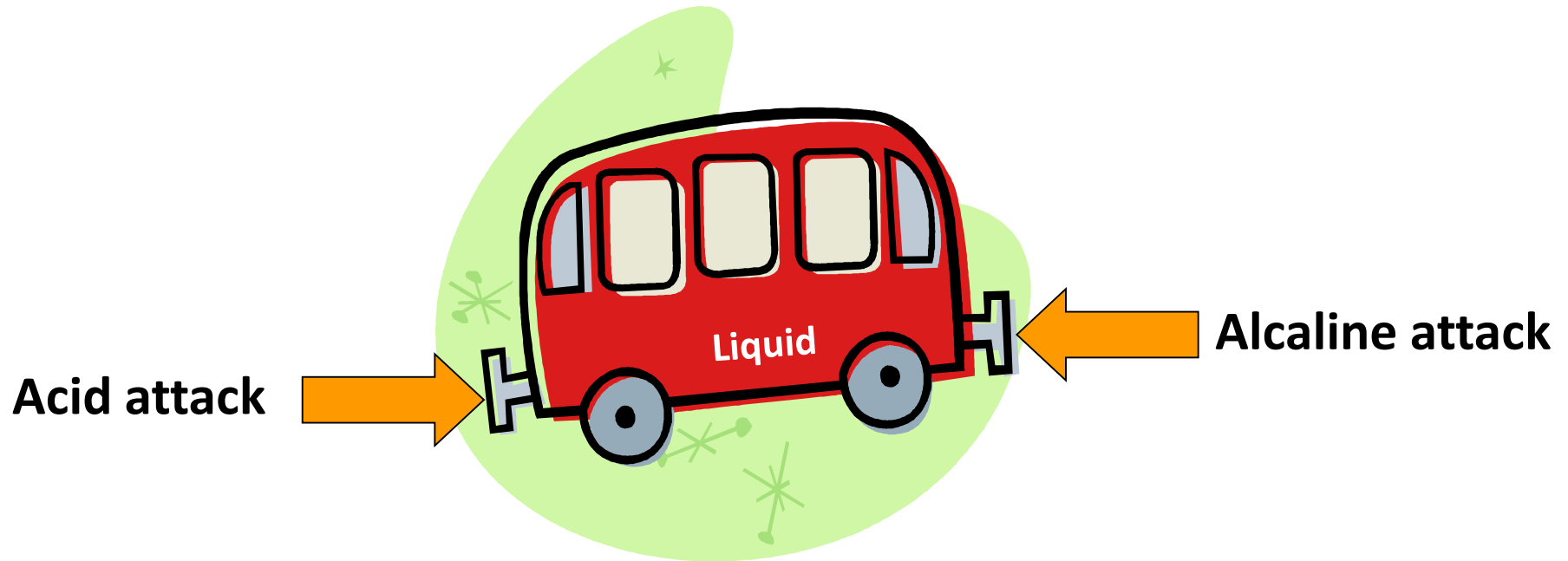
Corrosion on the most important materials

What is the pH value ?

Scale is logarithmic:
pH difference of 0.3 = double or half
of H^+ ions



pH and pH buffer

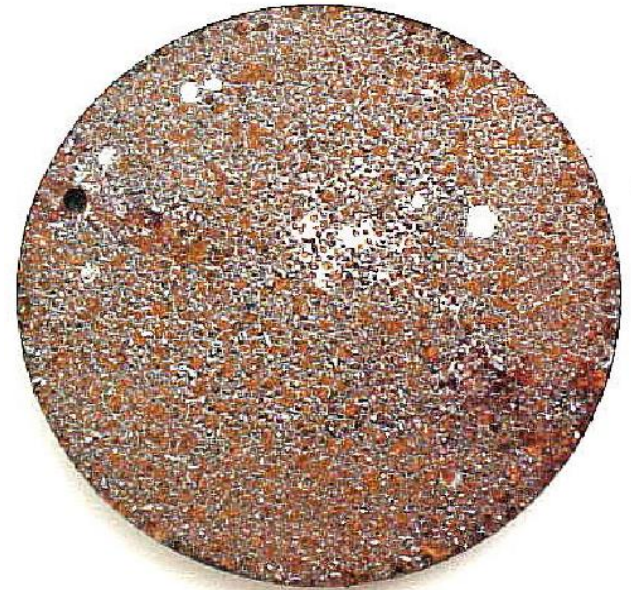


The pH of the liquid remains stable due to the pH buffer



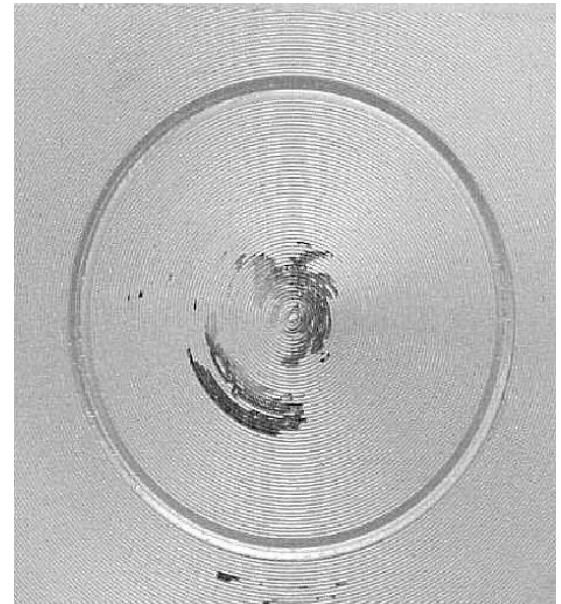
Ferrocorrosion: black stains, red rust

- ❑ pH lower than 8,5 risk of corrosion
- ❑ high chloride and sulfate contents accelerate corrosion

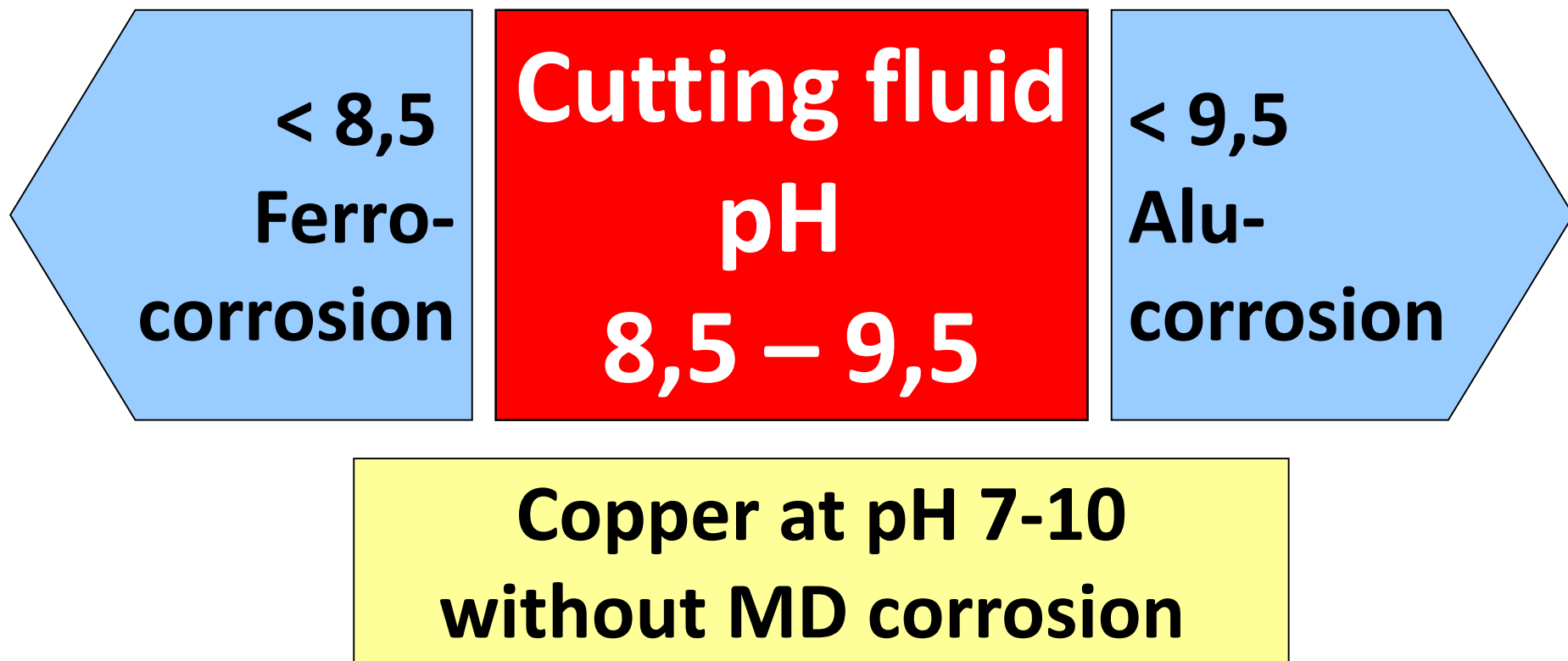


Aluminum-corrosion: black stains

- ❑ pH higher than 9.5 risk of corrosion
- ❑ high chloride concentration may cause corrosion
- ❑ certain amines may cause stains



pH and Corrosion of the main Metals





Measures against corrosion

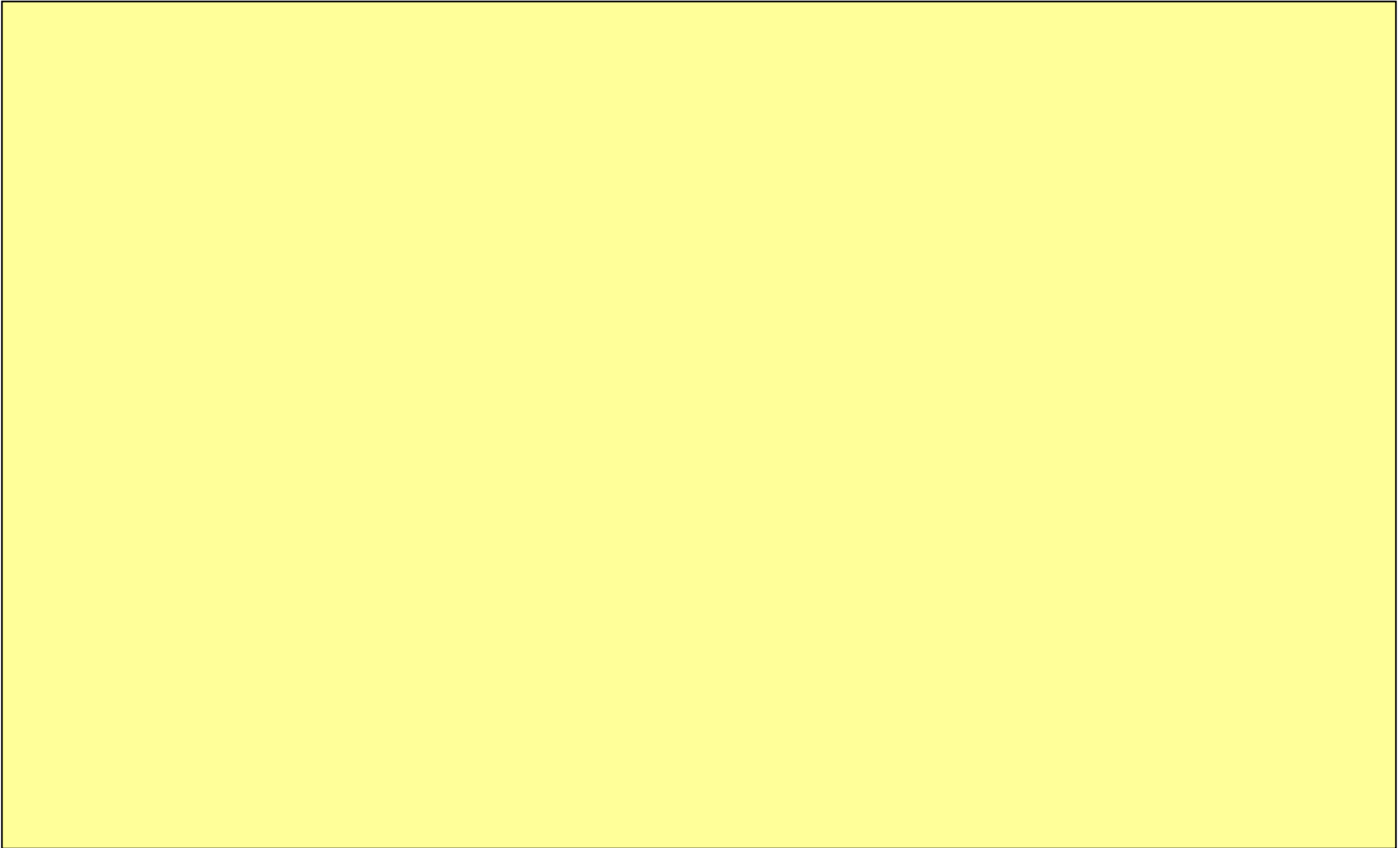


Corrosion depends on:

- ❑ the pH value of the emulsion (stabilised by pH buffer)
 - ions in water (particularly chloride)
- ❑ the concentration of the emulsion .
- ❑ pH buffer, additives, protective lubricating film)
- ❑ bacteria can decrease pH (especially anaerobic)
- ❑ dirt load or dissimilar metals in the emulsion
- ❑ improperly grounded machine



- ➔ Keep Emulsion pH stable (8.5-9.5) , Best is 9.0
- ➔ Maintain Correct Concentration – 5-7% (Best is 6%)
- ➔ Reduce ions in water (Chloride) - <20 PPM
- ➔ Eliminate contamination – pH Reduce / Bacteria Inc.
/ smell
- ➔ Regularly Remove Tramp oil – pH Reduce / Bacteria
Inc. / Smell





Indicators

- Top Up % High (nearly equal to running Concentration)
- Erratic refractometer readings .
- Highly diffused Refractometer reading
- Floating Oil layer .
- Rust on the Parts .
- Lesser Ph

Corrective action

- Partial Replacement .
- Oil Addition .



Indicators

- ❑ Rust on the components
- ❑ Smell
- ❑ High Bacteria
- ❑ High Sludge (Micro Fine Chips) remains in the Tank.

Corrective action

- ❑ Checking of Water to have pH 6.5 ~ 8.2
- ❑ Regular Top Ups
- ❑ Oil Addition
- ❑ Ph Booster Addition
- ❑ Remove the Sludge in Tank (Creating a Dead Zone to Increase Bacteria and Lower Down the pH)



Indicator

- ❑ Unstable Coolant (Dropping Concentrations and pH).
- ❑ Concentration Drop even after Top Ups .
- ❑ Rust on the parts / components

Corrective action

- ❑ Change of source of water . Chloride of water should be <20 ppm
- ❑ Partial Replacement of Emulsion .