Technical Data Sheet

Paratene™ ACI

Acid Corrosion Inhibitor

Description

Paratene™ ACI is an excellent inhibitor for Nitric Acid, and a number of other cleaning agents, such as sulfuric, hydrochloric, acetic, hydrofluoric, sulfamic, and citric acids, as well as combinations such as citric- ammonium bifluoride, hydroxy acetic-formic, ammoniated citric, and ammoniated EDTA, and can be used with various metals and alloys.

Paratene™ ACI decreases the corrosion rate of various cleaning agents in most common alloys to less than 1 mm/year.

Paratene™ ACI provides excellent inhibition of hydrogen permeation and corrosion acceleration by Fe^{+++}.

Physical and Chemical Properties

- Appearance: light yellow solution
- Density: 1.06 (20 C)
- Toxicity: LD_{50} = 1130 mg/kg
- Explosiveness: non-explosive
- pH: weak alkaline
- Odour: aromatic

Applications

Paratene™ ACI can be combined with different cleaning agents to dissolve various scales such as carbonates, ferric oxide, calcium sulphate, silicates and mixed scales. The agent should be selected based on its compatibility with the materials and the scale to be dissolved.

Paratene™ ACI can be used in the cleaning of systems made of carbon steel, low alloys, stainless steel, copper, aluminum and their combination structures, depending on the chemical cleaning agent chosen.

Directions

1. Choose the appropriate chemical cleaning agent and cleaning conditions according to the materials and scales.
2. Choose the suggested concentration of **Paratene™ ACI** from Table 1.
3. Add **Paratene™ ACI** to the appropriate volume of water and agitate. Then add the appropriate amount of acid, agitate well and start pickling in normal manner.

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Table 1. Corrosion rate and inhibitor efficiency of carbon steel using various chemical cleaning agents plus **Paratene™ ACI**

Cleaning	Concentration		Temperature	Corrosion Rate	Inhibition
Agent	Agent %	ACI %	(°C)	(mm/yr.)	%
HNO3	10	0.25	25	0.13	99.9
H2SO4	10	0.25	65	0.67	99.9
H3PO4	10	0.25	85	0.93	99.9
HCL	10	0.20	50	0.74	99.4
HF	2	0.05	60	0.69	99.4
H2C2O4	5	0.25	60	0.40	99.4
HNO3-HF(8:2)	10	0.25	25	0.24	99.9
NH4-citrate	3	0.05	90	0.31	99.6
CH3COOH	10	0.25	85	0.52	98.9
EDTA	10	0.25	65	0.16	99.2
Sulfamic Acid	10	0.25	60	0.46	99.7
Hydroxyacetic Acid	10	0.25	85	0.38	99.4
NH4-Citrate-NH4HF2	1.8 – 0.24	0.05	90	0.39	99.3
Hydroxyacetic acid-Formic acid-NH4HF4	2.1-0.25	0.25	90	0.74	99.2

Table 2 and 3. Recommended inhibitor concentrations for Nitric and Hydrochloric acid strengths

Nitric (%wt)	Recommended ACI (%wt)	Temperature (°C)
1-5	0.2	25
6-10	0.2	25
1-5	0.2	60
6-10	0.3	60
1-5	0.3	80
6-10	Not recommended	80

Hydrochloric (%wt)	Recommended ACI (%wt)	Temperature (°C)
1-5	0.2	25
6-10	0.2	25
1-5	0.2	60
6-10	0.2	60
1-5	0.3	80
6-10	Not recommended	80

Inhibitor performance should always be checked by the end-user prior to application.

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