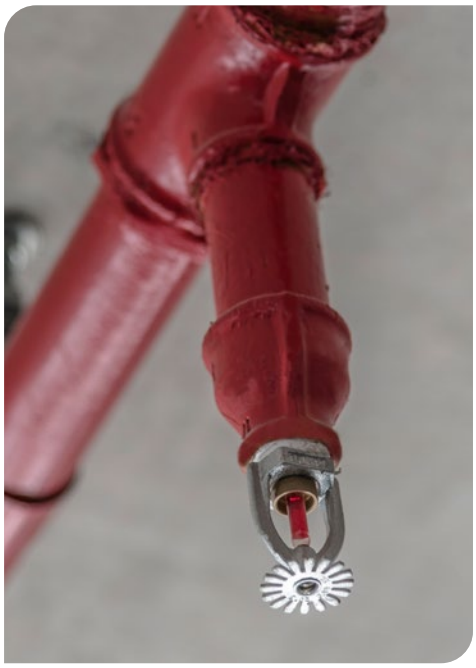
CAFLON Safe RHC7

Scale dissolver



Overview

CAFLON Safe RHC7 is part of the "Environmentally Responsible" modified acid product line that minimizes the hazards, corrosion rates, and negative HS&E properties of HCl, while maintaining the positive aspects, such as solubilizing ability and reactivity rates. Utilized where more aggressive removal of fouling, scale, or mineral deposits is required with ultra-low corrosion.

Application

- **CAFLON Safe RHC7** is supplied as a concentrate and is used "as is", or diluted 1 : 1 with water at site.
- Chemical cleaning / scale dissolution in pipes, pipe-lines, cooling towers, boilers, heat exchangers, fire-water systems, sea-water inlets, tubes, equipment, mill-scale etc.

Value Add/Benefits

- Dissolves typical hard scale (carbonates, iron oxides, seawater scale) very efficiently
- Ultra-low metal corrosion
- Non-corrosive to skin tissue (HS&E safe)
- Clear: ultra-low fuming / vapor pressure
- Easy to deploy
- Similar solubilizing abilities as ~HCL 15%
- High spent pH stability eliminating precipitation
- Compatible with typical elastomers
- Class 1 acid package

PRODUCT BLEND	TEMP.	METAL	TIME	CORR. MM/YEAR
50% HCR-7	20°C	1018CS	24 hours	0.181
	20°C	N-80	24 hours	0.137
	20°C	J-55	24 hours	0.145
	20°C	Brass*	24 hours	0.152
	40°C	1018CS	24 hours	0.239
	40°C	N-80	24 hours	0.299
	40°C	J-55	24 hours	0.267
	40°C	Brass*	24 hours	0.265
	60°C	1018CS	6 hours	10.96
	60°C	N-80	6 hours	3.130
	60°C	J-55	6 hours	2.030
	90°C	N-80	6 hours	6.110

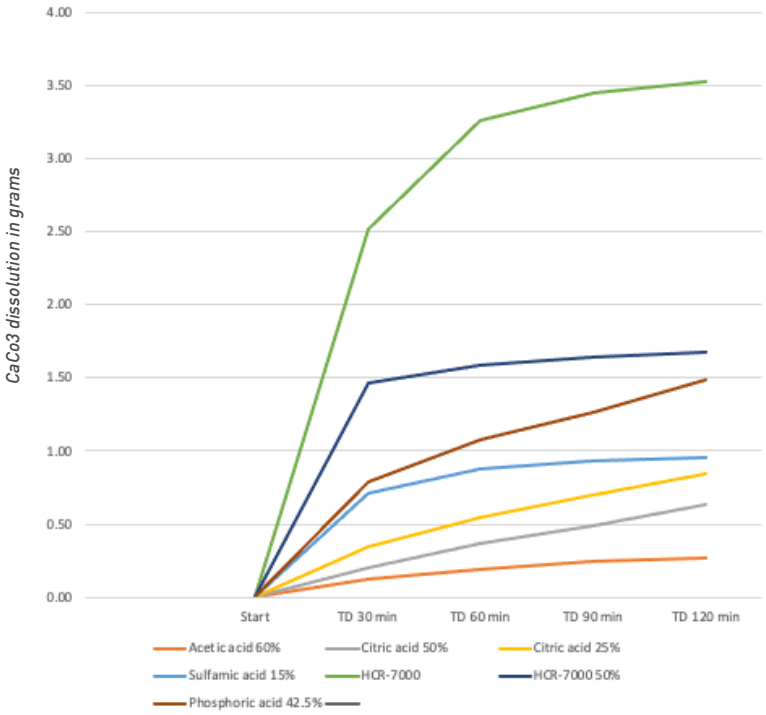
Specifications

- Appearance: Clear amber liquid
- Specific Gravity: 1.1 ±0.02
- Freezing Point: -30°C
- Boiling Point: > 100°C
- pH: < 1
- Solubility: 100% in water
- Thermal Stability: 180°C
- Shelf Life: >1 year
- CaMg(CO3)2 Solubility: ~195 kg/m³
- CaCO3 Solubility: ~220 kg/m³
- FeS : ~165 kg/m³

Corrosion

With inherently low metal corrosion properties, **CAFLON Safe RHC7** is able to achieve corrosion rates on any typical grade steel well below traditional acid systems.

HCR-7000 vs Conventional Acids



Scale Dissolution vs Conventional Acids

The graph in figure 1. shows the Calcium carbonate scale dissolution efficacy of **CAFLON Safe RHC7** (and HCR-7 diluted 1:1 with water) compared to conventional acids such as Citric acid, Sulfamic acid etc. ~4 gram scale lumps were immersed in 20 ml liquid @ 20°C, and weight reduction was measured at 30 minute intervals for each chemical.

RHC series vs HCL

	RHC SERIES	HCL
Hazard Classification	• Skin corrosion - None ref OECD 404* • Eye Irritation 2 • H319 Causes serious eye irritation	• Skin corrosion 1B • Eye irritation 1 • H314 Cause severe Skin burns and eye damage
Corrosion	• Ultra low corrosion on metals • N-80 Steel, 90C/6 hours - 6.60 mm/year	• Highly corrosive on metals • N-80 Steel, 90C/6 hours – 383 mm/year
Fuming	• Low fuming	• Exposure through inhalation can cause coughing, hoarseness, inflammation and ulceration of the respiratory tract, chest pain, and pulmonary edema (fluid in the lungs). The lethal dose, LC-50 for humans has been calculated at 1300 ppm.
Dermal Exposure Results		

HCR Exposure at 100% Concentrate for 15 minutes. No damage to dermal tissue.

HCl Acid Burn from Splash Exposure