Star™ and Centron™ Chemical Resistance Guide

CHEMICAL	CONCENTRATION	ANHYDRIDE MAXIMUM RECOMMENDED TEMPERATURE		ALIPHATIC AMINE MAXIMUM RECOMMENDED TEMPERATURE		AROMATIC AMINE MAXIMUM RECOMMENDED TEMPERATURE	
		° F	° C	° F	° C	° F	° C
ACIDS							
Acetic Acid	<20%*	NR	NR	NR	NR	150	66
Citric Acid	<25%	150	65	200	93	210	99
Hydrochloric Acid	1-3%	75	25	150	65	75	24
Hydrochloric Acid	4-15%	NR	NR	150	65	NR	NR
Hydrochloric Acid	16-36%	NR	NR	75	25	NR	NR
Hydrofluoric Acid	Any	NR	NR	NR	NR	NR	NR
Mud Acid, (containing HF)		NR	NR	NR	NR	NR	NR
Sulfuric Acid	1-3%	75	25	75	25	75	24
Sulfuric Acid	4-10%	NR	NR	75	25	NR	NR
Sulfuric Acid	>10%	NR	NR	NR	NR	NR	NR
ALCOHOLS							
Ethanol	100%	75	25	150	65	120	49
Ethylene Glycol		150	65	150	65	210	99
Isopropanol	10%*	100	38	200	93	120	49
Methanol	20%	100	38	200	93	100	38
CAUSTICS							
Ammonium Hydroxide	28%	NR	NR	75	25	100	38
Sodium Hydroxide	≤1%	NR	NR	NR	NR	NR	NR
Sodium Hydroxide	>1%	NR	NR	NR	NR	NR	NR
GASES							
Air, wet or dry		150	65	200	93	210	99
Carbon Dioxide, dry, <800 psi		150	65	175	80	210	99
Carbon Dioxide, dry, >800 psi		NR	NR	150	65	150	66
Carbon Dioxide, wet, <800 psi		150	65	175	80	150	66
Carbon Dioxide, wet, >800 psi		NR	NR	150	65	150	66
Hydrogen Sulfide, dry		150	65	175	80	150	66
Methane, Natural Gas		150	65	200	93	210	99
Sour Gas (w/H_2S), wet, <500 psi	≤5% H_2S	125	50	150	65	150	66
Sour Gas (w/H_2S), wet, >500 psi	>5% H_2S	NR	NR	NR	NR	NR	NR
HYDROCARBONS							
Crude Oil, sweet (CO_2) or sour (H_2S)		150	65	200	93	210	99
Diesel Fuel		150	65	200	93	210	99
Gasoline, all types		150	65	200	93	210	99
Kerosene		150	65	200	93	210	99
Naphtha		100	38	200	93	210	99
SOLVENTS							
Benzene	<10%	75	25	75	25	120	49
Heptane		125	50	150	65	200	93
Hexane		75	25	150	65	150	66
Methylene Chloride		NR	NR	NR	NR	NR	NR
Toluene		100	38	150	65	100	38
Xylene		125	50	150	65	150	66
WATERS							
Water, Brine / Salt / KCl / Hard		150	65	200	93	210	99
Water, Chlorinated	100 ppm	100	38	150	65	150	66
Water, Demineralized / Distilled		100	38	200	93	200	93
Water, Produced, sweet (CO_2) or sour (H_2S)		150	65	200	93	210	99
Water, Sea		150	65	200	93	210	99

Refer to Product Data for Acidizing Procedures

NR-Not Recommended

* For greater concentrations, please contact NOV Fiber Glass Systems for further review.

ACID TREATMENT OF LINE PIPE OR TUBING

Introduction

- Never use hydrofluoric acid in fiberglass tubulars since it will permanently damage the product.
- Typical acid treatment of fiberglass tubulars includes up to 15% hydrochloric acid and in some instances up to 5% total solvents such as Xylene or Toluene and a surfactant are added for paraffin removal.
- Other acid treatment formulations should be reviewed by NOV Fiber Glass Systems.

Acidizing Procedure

- Hook up the acid truck to the well/line.
- Check to see that the tubing annulus is full to the surface, fill to the surface if necessary.
- The acid in the pump truck must be between 60° F (15.6° C) and 100° F (37.8° C).
- Pump the acid at the minimum pressure necessary to force the fluid into the formation or through the line.
- The well head pressure must not exceed 75% of the rated pressure.
- The exposure time shall not exceed 4 hours.
- If the acid pumping is interrupted, immediately flush the line pipe or tubing.

Caution: The acid must not be left sitting in the fiberglass pipe. Line pipe will require pigging the line to avoid leaving traces of acid in valleys, low spots, or bends in the line.

- Once the required amount of acid is pumped, immediately flush the well/line with water or BRINE until a minimum of five times the volume of the pipe has been injected.
- Do not leave the acid sitting in the fiberglass pipe.

Tubing Precautions

- Extremely hot wells (≥175° F (79.4° C)) require cooling down prior to acidizing, contact NOV Fiber Glass Systems for specific considerations.

Line Pipe Precautions

- Avoid over-bending pipe during installation (see catalog product data for minimum bending radius). Exceeding the minimum bending radius can cause stress cracking which could lead to acid attack during acid treatment for scale build-up.
- Flush the line using a pig ahead of the flush water.
- The volume of flush water through each branch of the line must be calculated to meet the minimum requirement of five times the volume of the line.

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