

Enviro-Syn[®] HCR-7000-WL[™]

Plug & Perf Acid

Environmentally responsible and wireline compatible Modified Acid[™] system, that can be spotted as an effective spearhead acid with the perforating guns in hole, reducing pumping time and water requirements.

Enviro-Syn HCR-7000-WL Modified Acid system is a technically advanced and environmentally responsible wireline cable/BHA compatible Modified Acid system that can be deployed during pump-downs as an effective spearhead acid with the perforating guns. This greatly reduces pumping time and water requirements.

The combination of the perforation and spearhead acid stages reduces both frac spread pumping times (as high as 1 hour per stage) and water requirements (wellbore displacement volume per stage).

The recommended acid concentration of HCR-7000-WL Acid[™] for a spearhead acid is 33%.

The solubility of HCR-7000-WL concentrate is:

CaMg(CO ₃) ₂	1.6 lb/gal
CaCO ₃	1.8 lb/gal
FeS	1.4 lb/gal

Features

- A powerful modified acid that has similar solubilizing abilities of ~15% HCl (concentrate of HCR)
- Wireline compatible and conventional blends
- Technique allows acid to be spotted across all perforation clusters
- Concentration can be adjusted on the fly for zones with tougher breakdowns

Benefits

- Improves uniform fracturing fluid placement
- Reduces frac spread pumping time by 15 to 30 minutes per stage
- Reduces water requirements by up to one hole volume per stage
- Reduced acid trucking (hauled as a concentrate diluted with location water)
- Minimal corrosion on tubulars & CT (No need to circulate acid out if equipment problems arise)
- Highly reactive spearhead acid with ability to adjust concentrations "on the fly" for tougher breakdowns
- Reduce personnel exposure to hazards
- Reduced environmental impact
- High pH stable: will not precipitate solubilised calcium at high pH as HCl does

Technical Specification

Appearance	Amber liquid
Specific Gravity	1.105
Freezing point	~ -50°C/33% blend (fresh water diluted): ~20°C
Boiling point	>212°F
pH	<0.5
Odor	Slight
Salinity	~ 32%
Solubility	100% in water
Thermal Stability	375°F
Shelf life	Confirm after 60 days





Time to consume 0.4gram of Calcium Carbonate at 60°F	
15wt% HCl	8secs
HCR-70010 (33%)	13secs

Enviro-Syn HCR-7000-WL Modified Acid System can be spotted with perforating guns, given that it has long term corrosion protection on most oilfield grade steel.

- 33-50% Enviro-Syn HCR-7000-WL has been tested and approved with major wireline companies
- 96-hour corrosion tests at 195°F were conducted at 600psi (see the below images)

Corrosion Protection

Conc. %	Temp °F	Coupon	Time (hours)	Corrosion (lb/ft ²)
50	195	P-110	72	0.012
33	130	P-110	6	0.007
50	195	P-110	168	0.027
33	250	L-80	3	0.011
33	230	QT-900	6	0.005
33	195	316 SS	6	0.024

HSE features

- Virtually eliminate all hazards associated with HCl
- Non-irritant to skin (diluted product)
- Low vapor pressure (fuming)
- Non-corrosive to dermal tissue (concentrate)
- Biodegradable (OECD 301F) > 34% 10 days
- Low oral toxicity
- Non-regulated for ground transportation in the USA

Storage

Should be stored long term in sealed drums or IBC totes. Fittings and valves should be HDPE, brass, or stainless steel. If heating of the product is required it is suggested to utilize a stainless steel heat exchanger or tank steam coils if equipped and kept below 150°F.



33% HCR-7000FRAC-WL



Premium 7.5% HCL Acid Blend



Urea-Hydrochloride