

# Enviro-Syn<sup>®</sup> HCR-7000-WL-FR<sup>™</sup>

Mitigates crosslinked iron and polyacrylamide “goo” formation

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

Enviro-SYN<sup>®</sup> HCR-7000-WL-FR<sup>™</sup> Modified Acid<sup>™</sup> System is a high performing hydrochloric acid replacement with ultra-low metal corrosion properties and HSE risk. Unlike corrosive HCl blends, Enviro-SYN<sup>®</sup> HCR-7000-WL-FR<sup>™</sup> can be spotted alongside perforating guns reducing the need for a separate spearhead acid stage. The combination of the perforation and spearhead acid stages reduces both frac spread pumping times (15–30 minutes/stage) and water requirements (wellbore displacement volume ~ 8,000 to 13,000 gallons per stage).

HCR-7000-WL-FR<sup>™</sup> has a high spent pH stability and a calcium acetate (Ca) co-ordinating effect that will eliminate the precipitation issues predominant with HCl. This will minimize or eliminate formation damage that can occur when using HCl as a spearhead acid.

Enviro-Syn<sup>®</sup> HCR-7000-WL-FR<sup>™</sup> “Plug & Perf” package will give your operations the ability to spot spearhead acid with the plug and perforating guns providing a new level of safety and efficiency for your operations (patent pending process).

Due to its immediate and aggressive spending nature, Enviro-Syn<sup>®</sup> HCR-7000-WL-FR<sup>™</sup> is an extremely effective spearhead acid at low to high temperatures.

33% Enviro-Syn<sup>®</sup> HCR-7000-WL-FR<sup>™</sup> has been extensively tested with major wireline companies.

In partnership with:



## Technical Specification

Appearance	Amber liquid
Specific gravity	1.105
Freezing point	-58°F (-4°F at 33%)
Boiling point	>212°F
pH	<0.5
Odor	Slight
Salinity	~ 32%
Solubility	100% in water
Thermal stability	375°F
Shelf life	Shelf life can vary based on specific blend additives. Confirm corrosion if product sits > 60 days.

## 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

- Mitigate/eliminate crosslinked iron and polyacrylamide “goo” formation
- Allows acid to be spotted across all perforation clusters
- Non-regulated for transportation in USA
- Reduces frac spread pumping time as ball and acid are at perforations (15-30 mins/stage)
- Reduces water requirements (8000-13,000 gallons per stage) - hole volume per stage
- Wireline compatible - custom blend allows spotting of acid with wireline and tools in hole (*patent pending process*)
- High thermal stability to 375°F
- Multiple US manufacturing & distribution locations





Enviro-SYN® HCR-7000-WL-FR™ Modified Acid™ performance:  
The recommended acid concentration of HCR-7000-WL-FR Acid™ for a spearhead acid is 33%.

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



Solubility of HCR-7000-WL-FR concentrate	
CaMg(CO3)2	1.6 lb/gal
CaCO3	1.8 lb/gal
FeS	1.4 lb/gal

### Corrosion Protection

With ultra-low metal corrosion properties, Enviro-Syn® HCR-7000-WL-FR™ is able to achieve corrosion rates on any typical oilfield grade steel well below traditional HCl acid systems.

*Fluids patented custom blends and patent pending process of spotting acid with wireline deployed perforating guns can save your operations substantial amounts of water and time.*

Blend	Temp °F	Coupon	Time (hours)	Corrosion
33% HCR-7000-WL-FR	230	316	6	0.012 lb/ft²
33% HCR-7000-WL-FR	230	P-110	6	0.007 lb/ft²
33% HCR-7000-WL-FR	230	L-80	6	0.027 lb/ft²
33% HCR-7000-WL-FR	230	N-80	6	0.011 lb/ft²
33% HCR-7000-WL-FR	230	QT-900	6	0.005 lb/ft²
33% HCR-7000-WL-FR	230	J55	6	0.024 lb/ft²
33% HCR-7000-WL-FR	194	P110	24	0.024 lb/ft²

Time	Initial	Exposure to 33% HCR-7000-WL-FR at 90°C
	40x magnification	40x magnification
120hrs		

### HSE features

- Low vapor pressure (fuming)
- Non-corrosive to dermal tissue (concentrate)
- Biodegradable (OECD 301F) > 34% 10 days
- Low oral toxicity

Reference SDS for additional information

### 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.

### Compatibility

Enviro-Syn® HCR-7000-WL-FR™ has increased compatibility with some oilfield friction reducers. Ask our sales team for more details.

### Safety Requirements

Even though there are far lower exposure risks associated with Enviro-Syn® HCR-7000-WL-FR™ compared to 15% HCl you should utilize similar operational procedures. With the corrosive to eyes rating of the product, it is required to ensure there is access to an eye wash bottle station and/or shower unit for every operation and enclosed eye protection utilized.

Enviro-Syn® HCR-7000-WL-FR™ is a strong acid, therefore appropriate chemical handling PPE is always recommended, as well as an operational risk assessment for each situation.

### Shipping and Handling

As Enviro-Syn® HCR-7000-WL-FR™ has a pH of less than one. Acid approved fittings, hoses and pumping equipment should always be utilized. Enviro-Syn® HCR-7000-WL-FR™ is considered not regulated as per exemption 49CFR 173.154 (d).

Enviro-Syn® HCR-7000-WL-FR™ can be shipped in IBC tote containers, or by bulk container methods, and has a storage life of over one year. Keep container closed when not in use.

As with all chemical products and materials, take care as to how you handle and where you store them. Personal protective equipment (PPE) is required for use when handling this product. Consult SDS for complete handling instructions.



33% HCR-7000FRAC-WL-FR