PRODUCT DATA SHEET

Enviro-Syn® HCR-7000-WL®

Wireline Compatible Modified Acid™ System

Enviro-Syn® HCR-7000-WL® is part of the proprietary, eco-friendly Modified Acid™ product portfolio that minimizes the hazardous exposure levels, corrosion rates and negative HSE properties of hydrochloric acid (HCl), while maintaining the positive aspects of solubilizing ability and reactivity rates. Enviro-Syn HCR-7000-WL is a strong modified acid that in concentrate has similar solubilizing abilities as 15% HCl and can be enhanced through the addition of conventional oilfield chemistry. Enviro-Syn HCR-7000-WL is typically deployed at 50% (1:1 HCR:water), 33% (1:2 HCR:water) or 20% (1:4 HCR:water) concentration to provide exceptional value and reduce transportation/storage costs.

Fluid's wireline compatible blends enable operators to spot acid with perforating bottom hole assemblies (BHAs) saving substantial amounts of water and time in hydraulic fracturing operations (patented formulas and methods). High spent pH stability, and the calcium- and iron-coordinating effects of Enviro-Syn HCR-7000-WL reduces the precipitation issues prevalent with HCl. This will minimize or eliminate formation damage that can occur when using HCl as a spearhead acid and assist with effluent management.

APPLICATIONS

- Acid spearhead, stimulation and workover treatments
- Enables spotting of spearhead acid with the perforating guns (patented formulas and methods)
- Low to high temperature wellbore conditions

Enviro-Syn HCR-7000-WL is compatible with all coated and uncoated wireline cables currently available and manufactured in North America.

PHYSICAL PROPERTIES

Appearance:	Amber liquid
Specific Gravity:	1.105
Odor:	Slight
Freezing Point:	≈ -50°C (-58°F) ≈ -20°C (-4°F) at 1:2 (HCR:water)
Boiling Point:	> 100°C (212°F)
pH:	< 1.0
Salinity:	≈ 32%
Solubility:	Soluble in water
Shelf Life:	> 1 year

Outstanding HSE profile

- Non-corrosive to skin
- Low fuming
- Biodegradable
- Non-regulated for ground transportation (USDOT)

FEATURES & BENEFITS

- Aggressive reaction rate (spend nature) versus typical modified or synthetic acid systems for spearhead treatments
- Wireline compatible – custom blend allows spotting of acid with wireline and tools in hole
- Reduces frac spread pumping time (average 10 – 15 min/stage depending on well design) as ball and acid are at perforations
- Reduces water requirements by one hole volume per stage (average 30 – 50 m^3/stage, 8,000 – 13,000 gal/stage depending on well design)
- Allows acid to be accurately spotted across all perforation clusters for optimal acid diversion and frac placement
- Adjust concentrations on the fly for zones with tougher breakdowns
- Minimal reprecipitation of scale at high pH levels
- Long-term casing and cable corrosion protection in case of delayed events
- No degradation of wireline coating or jacket
- Compatible with typical elastomers used in oil and gas (e.g., Viton, Nitrile and EPDM)
- High stability in solution
- Blends available up to 150°C (302°F)

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TOTAL SOLUBILITY

Table 1. Total solubility of Enviro-Syn HCR-7000-WL on a variety of scales.

Acid	Scale	Total Solubility (kg/m³)	Total Solubility (lb/gal)
15% HCl	$CaCO_3$	211	1.76
HCR-7000-WL Concentrate	$CaCO_3$	216	1.80
HCR-7000-WL Concentrate	$CaMg(CO_3)_2$	190	1.59
HCR-7000-WL Concentrate	FeS	170	1.42

NOTE: High temperature corrosion inhibitor loadings can alter total solubilizing ability.

CORROSION RATES

With ultra-low metal corrosion properties, Enviro-Syn HCR-7000-WL has corrosion rates well below oilfield industry accepted values on typical oilfield alloys.

Table 2. Corrosion rates of Enviro-Syn HCR-7000-WL blends.

Blend (HCR:water)	Temp (°C /°F)	Coupon	Time (hr)	Corrosion (mm/yr)	Corrosion (lb/ft²)
1:2	110 / 230	316SS	6	24.204	0.027
1:2	110 / 230	P-110	6	3.972	0.004
1:2	110 / 230	L-80	6	6.704	0.007
1:2	110 / 230	N-80	6	4.643	0.005
1:2	110 / 230	QT-900	6	4.530	0.005
1:2	110 / 230	J-55	6	3.656	0.004
1:2	90 / 195	P-110	42	2.071	0.016
1:4	93 / 200	P-110	6	1.408	0.002
1:4	93 / 200	P-110	12	8.483	0.019

NOTE: Oilfield industry typically accepts a corrosion rate less than 0.050 lb/ft² at 6 hours. Coiled tubing typically accepts a corrosion rate less than 0.020 lb/ft² at 6 hours.

WIRELINE TESTING

Enviro-Syn HCR-7000-WL has been extensively tested with major wireline suppliers' equipment.

Figure 1. Wireline after exposure to 1:2 Enviro-Syn HCR-7000-WL at 90°C (195°F) and 2,750 kPa (400 psi) for 120 hours.

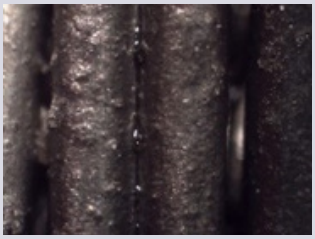
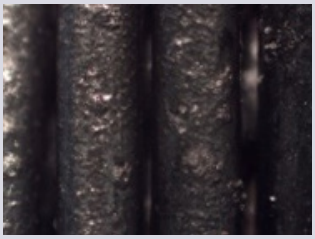
Blend (HCR:water)	Time (hr)	Temp (°C /°F)	Initial	HCR-7000-WL
			40X Magnification	40X Magnification
1:2	96	90 / 195		
1:2	120	90 / 195		
1:4	72	93 / 200		

Figure 2. Magnified wireline images after exposure to Enviro-Syn HCR 7000-WL blends at 2,750 kPa (400 psi).

Table 3. Tensile breaking force of wireline treated with Enviro-Syn HCR-7000-WL blends.

Blend (HCR:water)	Temp (°C /°F)	Time (hr)	Tensile Breaking Force (N / lbf)
Wireline sample prior to treatment with acid			1590 / 357
1:2	90 / 195	96	1532 / 353
1:2	90 / 195	120	1473 / 331
1:2	110 / 230	1 x 6	1552 / 349
1:2	110 / 230	2 x 6	1551 / 349
1:2	110 / 230	3 x 6	1479 / 333
1:4	93 / 200	72	1488 / 334

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SAFETY, STORAGE & HANDLING

- Stored in sealed containers, such as plastic pails, lined drums and HDPE IBC totes
- Fittings and valves should be HDPE, brass or stainless steel
- If heating, use a stainless-steel heat exchanger or tank steam coils, keeping the temperature below 65°C (150°F)
- Shelf life of > 1 year; confirm corrosion if product sits for > 60 days
- Consult SDS for additional information and PPE requirements

Talk to us today about our revolutionary products available globally.
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