



**HYBRID CHEMICAL
TECHNOLOGIES**

WIRELIN SAFE ACID

WL-HCL-20

WL-HCL-20 is a low-fuming, inhibited concentrated 20% Hydrochloric Acid. The base wireline acid blend designed for 28% HCl acid is diluted on location, typically at a 1:1.5 ratio with water. The resulting dilution provides wireline-safe inhibition and dissolution properties for typical plug-n-perf operations but with significantly enhanced cost savings over the alternative wireline-safe acid packages on the market.

ADVANTAGES

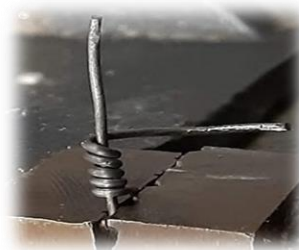
- Concentrated acid package is hauled out containing all the additives and inhibitors to provide protection for sensitive wireline, even after dilution down with water on-site.
- Significant cost savings on logistical hauling due to concentrate, in addition to superior cost-to-price performance.
- Low-fuming formulation provides 20% HCl equivalent without the evaporation and enhanced safety profile over normal 28% HCl.
- Contains corrosion inhibitors, iron control and surfactants for the complete all-in-one spearhead package.
- Approved by major North American wireline suppliers for use.

TREATMENT




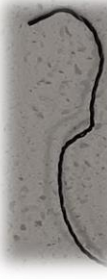


The base wireline acid blend (28%) is typically diluted 1:1.5 with water on-site, yielding an inhibited 15-20% HCl equivalent acid package for standard acid spearhead and plug-n-perf operations.

LAB RESULTS

WL Loop-Wrap
Brittleness Test
PASS



WL-HCL-28 (Diluted 1:2 v/v with water), 90C for 12 hrs Exposure

	Initial Mass (g)	End Mass (g)	Mass Loss (g)	Length (in)	Diameter (in)	Mass Loss (%)	Before Exposure	Post Exposure
Inner WL Strand	0.562	0.521	0.041	3.5625	0.04	7.21%		
Outer WL Strand	0.430	0.401	0.029	3.5625	Single wire: 0.02 3-wire bundle: 0.0385	6.74%		
Strand With Sheath	17.578	17.501	0.078	3.00	0.343	0.44%		
WL Metal Coupon	14.234	14.084	0.150	0.743	0.2525	1.05%	