

Fluid[®]

VALUE AND APPLICATIONS GUIDE

ENVIRO-SYN[®] HCR-7000[®]

Modified Acid[™]



ESG and HS&E Benefits of HCR-7000

Green House Gas (GHG) Emissions Reduction

- » Pad transportation reduced by **35-60%**
- » Delivered in concentrate and diluted onsite to 15%-33%
- » Carbon dioxide production from truck traffic to pad, reduced by 18 tons (est.) (USDOT)¹

Improved Environmental Impact and Worker Safety

- » 1/3 of all O&G related deaths are traffic related accidents (USDOT)¹
- » HCR does not create hydrogen embrittlement which compromises the wellbore and surface equipment



SINCE INCEPTION

there have been **ZERO** HCR related medical incidents or accidents reported.

Reduced Impact on Infrastructure



- » Cost of repairs to roads as a result of O&G traffic is estimated to be **\$2-3 million/mile¹**
- » In 2013, one Marcellus Operator was required to pay nearly \$300 million to maintain 400 miles of roads¹

Treatment Comparison: HCR versus HCl

In addition to Pressure Break, another parameter to evaluate the efficacy of treating with HCR-7000-WL vs. HCl is the Treatment Index.

$$\text{Treatment Index} = \frac{(\text{Pressure} \times \text{FR} \times \text{Volume})}{\text{Rate}}$$

The lower the index, the more efficient the treatment of the well

Techniques to Deploy HCR (to Replace HCl)



1 Run HCR as a direct replacement for HCl

Gallon for Gallon. Replace your current HCl volume with recommended dilution of HCR.

Across 4 wells, treating with an equal volume of HCR-7000-WL resulted in an **average 144% increase** in Pressure Break compared with HCl.

2 Run a reduced volume of HCR versus HCl

Run a stronger HCR concentration, reducing overall volume of acid.

Comparing side-by-side stages using a lower volume of HCR-7000 resulted in a **2.2-fold increase** in Pressure Break (Table 1). Across 4 wells, treating with less volume of HCR-7000 resulted in an **average 67% increase** in Pressure Break compared with HCl.

Table 1. Pressure Break comparison of HCR-7000 versus HCl

Well D	Acid	Acid Volume (gal)	Pressure Break (psi)	Difference
Stage 9	33% HCR-7000-WL	1,500	1,750	2.2-fold
Stage 10	7.5% HCl	2,000	800	

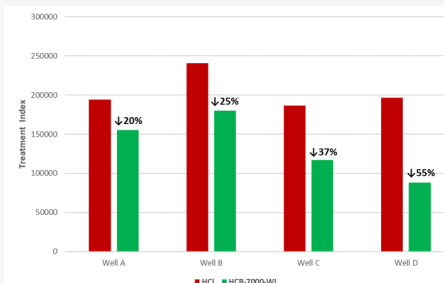


Figure 1. Treatment Index comparison of 33% HCR-7000 versus 7.5% HCl.

Overall, this operator achieved between 20-55% improvement (reduction) in the Treatment Index across 4 wells (Figure 1).

3 Run a reduced concentration of HCR versus HCl

Replace HCl with diluted HCR concentrations.

An operator compared 7.5% HCl to 20% HCR-7000. They achieved a **33% reduction** in Treatment Index (Figure 2).

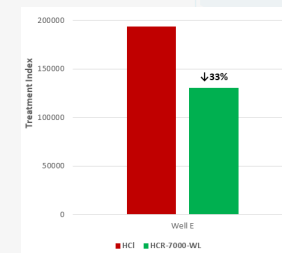


Figure 2. Treatment Index comparison of 20% HCR-7000 versus 7.5% HCl.

4 Run a split acid pill

Split the acid pill for hard to treat areas. First section of acid allows you to quickly achieve rate, second section of acid provides another relief directly in front of sand placement

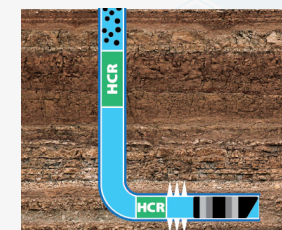


Figure 3. A second HCR acid pill can be left in the vertical and chased with a sand scour to initiate erosion of the perforations.

5 Run a dual acid system

Run HCR-7000 with the wireline tool during perforating operations, follow up with HCR-7000-SH at the start of the frac job to provide additional rate and pressure relief prior to sand entering the perforations.



Contact Us!



Source:

¹Fracuring-related Commercial Motor Vehicle (CMV) Crash Risk, U.S. Department of Transportation, June 2021