

**DESCRIPTION**

EnCap-LE is an encapsulated enzyme breaker used in hydraulic fracturing applications. EnCap-LE slowly releases the enzyme into the fracturing fluid, delaying the break of the fluid or allowing the breaker concentration to be increased to insure break of the fluid. EnCap-LE can also be used in conjunction with EnCap-A or EnCap-SBS (delayed release acids) in fluids above pH 8.5. The coating protects the enzyme from denaturing in these fluids, and then the fluid will break when EnCap-SBS drops the pH of the fluid below a pH of 8.5.

**ADVANTAGES**

- Increase break times can be obtained
- Higher concentrations can be used without compromising fluid viscosity during proppant placement.
- Solid breaker which will concentrate in the proppant pack during fluid leak-off.
- Increase conductivity of the created fracture by:
  - clean-up of proppant pack
  - breaking of filter cakes from linear or borate crosslinked fluids.

**APPLICATION**

- EnCap-LE can be directly substituted into fluids using enzyme breaker to reduce viscosity.
- EnCap-LE can be used in high pH or low pH systems (greater than pH of 8.5, below 140°F) when an encapsulated acid, such as EnCap-A or EnCap-SBS, are also added.
- Break guar or HPG based fluids that are below pH 8.5 or 140°F. If a delayed release acid is also added, high pH or borate crosslinked fluid can be broken.
- Breaker concentrations can be increased without effecting proppant transport capabilities of the fluid.
- Breaker will concentrate in the fracture and break filter cakes from low pH linear or foamed fluids or high pH or borate crosslinked fluids if an encapsulated acid is also added.

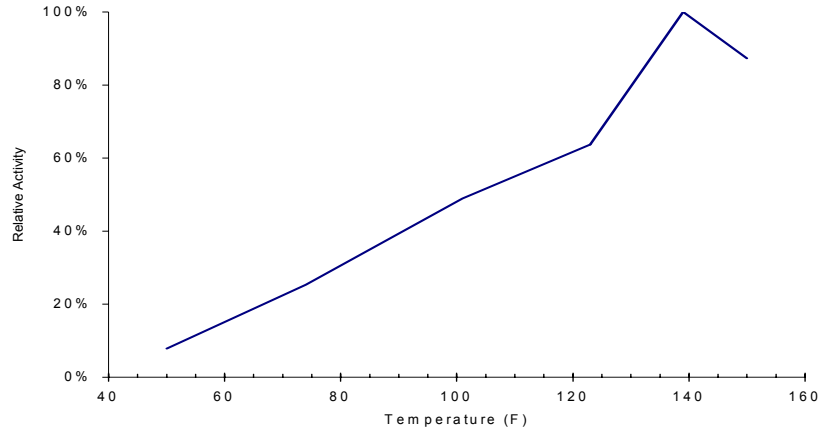
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**PROPERTIES**

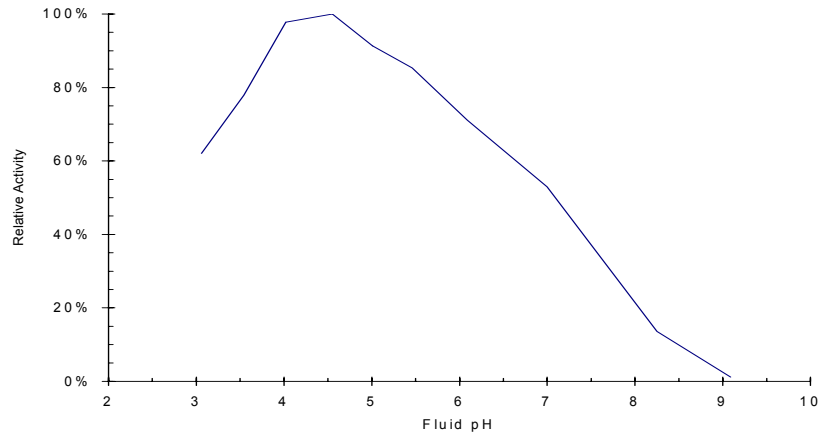
- Blue Granules
- Faint Organic Odor
- Partially soluble in water
- Specific gravity – 1.30
- Bulk density – 35 to 43 lb./ft.<sup>3</sup>
- Particle size – 10/50 mesh
- Enzyme activity versus:
  - pH see FIGURE 1
  - Temperature see FIGURE 2
- Viscosity Profiles at Room Temperature see FIGURE 3

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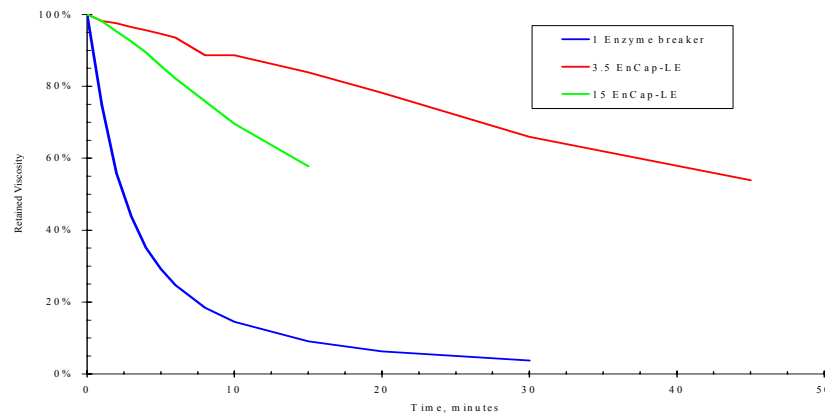
**FIGURE 1**



**FIGURE 2**



**FIGURE 3**



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