

WATER GELLING AGENT – WGA-5

WGA-5 is a Carboxymethylhydroxypropyl guar (CMHPG) that is used as a water-based gelling agent. It can also be used to viscosify brines and acid. WGA-5 is normally used at concentrations of 20–50 lbs per 1,000 gallons.

WGA-5 improves fluid rheology by increasing viscosity of the fracturing fluid. Increasing viscosity creates wider fractures, which changes fluid viscosity in the fracture and improves proppant placement. With the increase of viscosity of WGA-5 gelled fluids, proppants are carried further from the well bore, increasing the drainage radius.

The possibility of screen-outs is reduced and fracture conductivity is increased because the viscosity decreases proppant settling rates due to gravity, both while pumping and at the end of pumping. Therefore, proppants are more evenly distributed in the fracture.

WGA-5 helps to stabilize foam fracs by strengthening the thin water film surrounding the nitrogen bubbles, making the water less likely to drain out of the foam structure.

WGA-5 is readily cross-linked with zirconate-based cross-linkers. Upon cross-linking, the resultant fluid can handle high concentration of proppant and provides increased fracture width and penetration.

Rheology – Cross-Linked 40 lbs / 1,000 gallons

FANN 35 RPM	Viscosity (cps)
600	46
300	35
200	30
100	23
6	6
3	4

The 300-rpm reading corresponds to fluid moving through the fracture, while 100-rpm reading represents the viscosity of leak-off fluid.