

WATER GELLING AGENT – WGA-1

WGA-1 is a Hydroxypropylguar (HPG) gelling agent that self hydrates for continuous mixing or pre-gelling. Dispersants and pH buffers allow easy, lump-free mixing of WGA-1 to quickly develop maximum viscosity. WGA-1 is normally used at concentrations of 20–50 lbs per 1,000 gallons.

WGA-1 improves fluid rheology by increasing the 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-1 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.

WGA-1 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-1 is readily cross-linked with a borate, titanate or antimony cross-linker. Upon cross-linking the resultant fluid can handle high concentration of proppant and provides increased fracture width and penetration.

Rheology – Linear Gel

30 pounds / 1,000 gallons – Viscosity Development

FANN 35 RPM	1 min	5 min	15 min	30 min
300	6	14	19	20
100	2	8	10	10

40 pounds / 1,000 gallons – Viscosity Development

FANN 35 RPM	1 min	5 min	15 min	30 min
300	20	26	29	33
100	10	15	19	20

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