

CARBOHYDROPROP®

Lightweight ceramic proppant for slickwater fracturing

FEATURES

- Ideal for slickwater fracturing applications.
- Best combination of proppant transport and conductivity on the market.

ADVANTAGES

- Superior thermal stability compared to sand or resin-coated sand.
- Priced similarly to resin-coated sand for optimum value.

- 40/80 mesh provides similar transport characteristics to 40/70 sands.

BENEFITS

- Greater productivity: 40% more conductivity than higher priced 40/70 premium resin-coated sand.
- Greater productivity: More than twice the conductivity of standard 40/70 resin-coated sand or white sand.

Physical and Chemical Properties

Typical Sieve Analysis [weight % retained]

U.S. Mesh [mesh]	Microns	40/80
+40 mesh	+425	2
-40+50 mesh	-425+300	68
-50+80 mesh	-300+180	30
Median Partide Diameter [microns]		325
API Crush Test		
% by weight fines generated	@5000psi	0.5%
	@7500 psi	2.0%

Sizing Requirements: A minimum of 90% of the tested sample should fall between the designated sieve sizes. These specifications meet the recommended practices as detailed in ISO 13503-2.

Typical Additional Properties

Apparent Specific Gravity	2.55
Roundness	0.8
Sphericity	0.9
Bulk Density [lb/ft ³]	87
[g/cm ³]	1.40
Absolute Volume [gal/lb]	0.047
Solubility in 12/3 HCl/HF Acid [% weight loss]	4.8



CARBOHYDROPROP 40/80

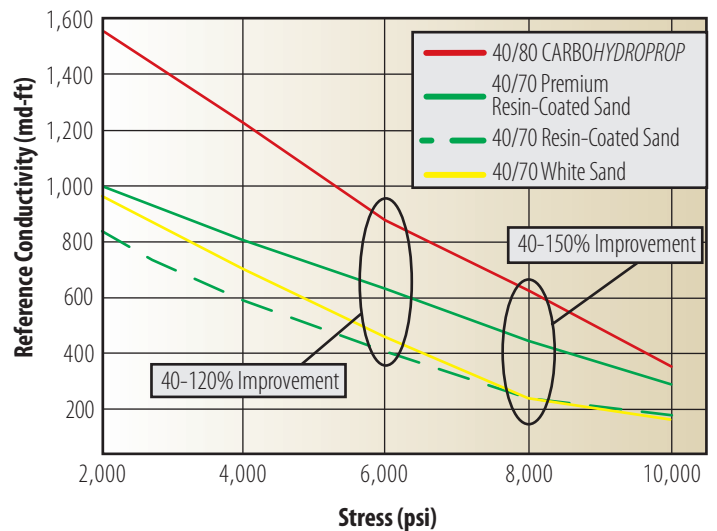
Long-Term Conductivity

Reference Conductivity* @ 250°F

Closure Stress [psi]	Conductivity [md-ft]	Permeability [Darcies]
2,000	1,570	80
4,000	1,210	62
6,000	890	47
8,000	610	33
10,000	360	21

*Reference conductivity and permeability are measured with a single phase fluid under laminar flow conditions in accordance with ISO 13503-5. In an actual fracture, the effective conductivity will be much lower due to non-Darcy and multiphase flow effects. For more information, please refer to SPE Paper #106301.

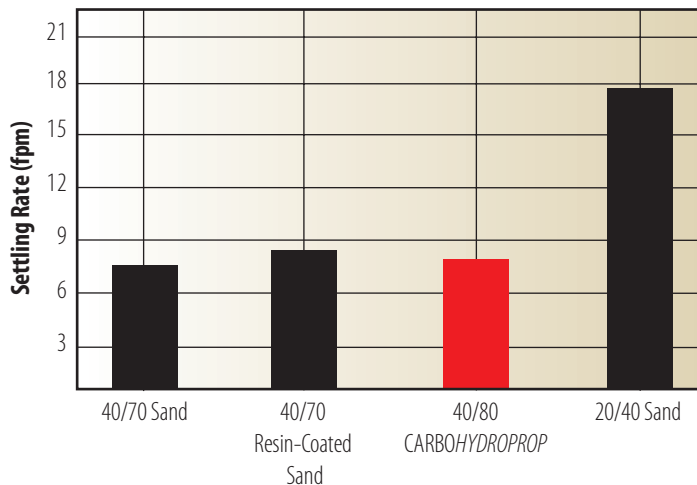
Reference conductivity comparison between 40/80 CARBOHYDROPROP and other products



40/80 **CARBOHYDROPROP** provides significantly higher baseline conductivity than competing sand and resin-coated materials (based on published data). Under realistic conditions, the advantage of stronger, more durable ceramic proppants would be further accentuated (SPE 106301).

Proppant Transport

Settling Rate in 2% KCl Fluid



40/80 **CARBOHYDROPROP** provides settling rates similar to 40/70 sand and resin-coated sand.

40/80 **CARBOHYDROPROP** capitalizes on the reduced settling rates afforded by small particle diameter, while retaining the benefits of a high quality ceramic proppant. According to Stokes' Law, pellet diameter has a greater impact on transport than particle density. 40/80 **CARBOHYDROPROP** provides similar settling velocities to 40/70 sand or resin-coated sand, and exhibits uniform, spherical and rigid particles.

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