

# CARBOHYDROPROP

Low-density, high-transport ceramic proppant

## Features

- Ideal for slickwater fracturing applications
- Higher thermal stability than sand or resin-coated sand
- 40/80 mesh provides similar transport characteristics to 40/70 sands

## Benefits

- Best combination of proppant transport and conductivity on the market
- Priced similarly to resin-coated sand for optimum value
- Higher conductivity: 40% more conductivity than higher priced 40/70 premium resin-coated sand
- Increased productivity: More than twice the conductivity of standard 40/70 resin-coated sand or white sand



## Superior combination of conductivity, ease of placement and cost competitive

CARBOHYDROPROP® low-density, high-transport ceramic proppant was engineered for fracturing applications such as slickwater. It offers 40% to 100% greater conductivity than sand-based products, delivering higher value, but at a similar cost structure.

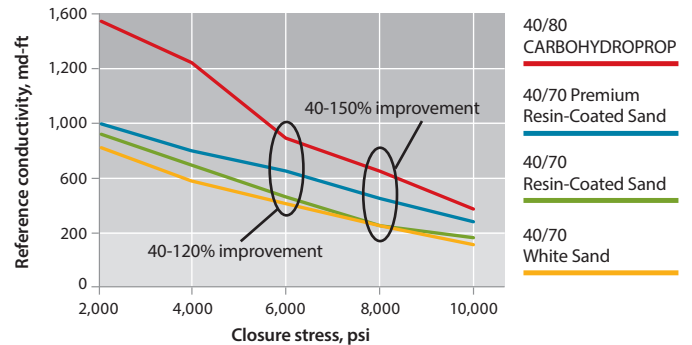
## Long-term conductivity

### Reference conductivity @ 250°F (121°C)

| Closure stress [psi] | Conductivity [md-ft] | Permeability [Darcies] |
|----------------------|----------------------|------------------------|
| 2,000                | 1,570                | 80                     |
| 4,000                | 1,210                | 60                     |
| 6,000                | 890                  | 50                     |
| 8,000                | 610                  | 35                     |
| 10,000               | 360                  | 20                     |

Reference conductivity and permeability are measured with a single phase fluid under laminar flow conditions in accordance with API RP 19D. 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 - "Determining Realistic Fracture Conductivity and Understanding its Impact on Well Performance -Theory and Field Examples."

### 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 proppant would be further accentuated.

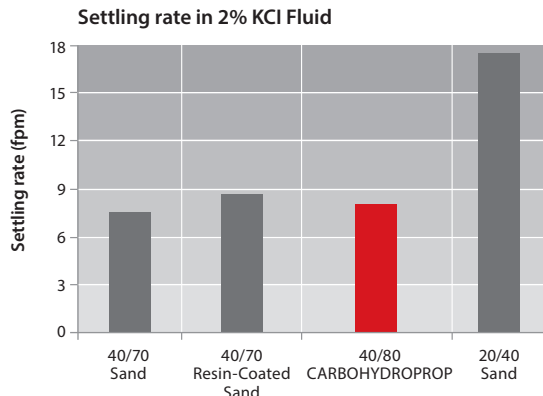


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## Proppant transport



40/80 CARBOHYDROPROP capitalizes on the reduced settling rates afforded by its 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. As such, 40/80 CARBOHYDROPROP provides similar settling velocities to 40/70 sand or resin-coated sand, and exhibits uniform, spherical and rigid particles.

40/80 CARBOHYDROPROP provides settling rates similar to 40/70 sand and resin-coated 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         |
| <b>Median particle diameter [microns]</b>                |             | <b>325</b> |
| <b>API/ISO crush test</b><br>% by weight fines generated | @ 5,000 psi | 0.5        |
|  | @ 7,500 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 API RP 19C.

### Typical additional properties

|  |            |   |       |
|--|------------|---|-------|
| Roundness  | 0.8        | Apparent specific gravity                         | 2.60  |
| Sphericity   | 0.9        | Absolute volume [gal/lb]                          | 0.046 |
| Bulk density [lb/ft <sup>3</sup> ]<br>[g/cm <sup>3</sup> ] | 91<br>1.46 | Solubility in 12/3 HCl/HF acid<br>[% weight loss] | 3.3   |

All data represents typical values.

Talk to CARBO to find out how we can help you enhance your production.

[carboceramics.com](http://carboceramics.com)

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