

PURE STRENGTH AND MAXIMUM CONDUCTIVITY

UNIFRAC® Europe Hydraulic Fracturing Sands are Pleistocene age and are of fluvio-glacial origin. These durable proppants will not degrade during handling or pumping.

These grains, reworked by wind, give the pack round, spherical surfaces allowing for even distribution of closure pressure which minimizes embedment. Excellent suspension properties makes UNIFRAC® ideal to extend the proppant pack, maximizing hydrocarbon recovery. This combination of features only occurs in rare locations, selectively mined by Sibelco.

API RP 19D 2 lb/ft², 150°F

Conductivity (md - ft)

Permeability (Darcy)

| psi | 12/20 | 16/30 | 20/40 | 30/50 | 40/70 |
|--------|--------|-------|-------|-------|-------|
| 2,000 | 11,154 | 6,565 | 4,042 | 1,974 | 870 |
| 4,000 | 2,838 | 2,848 | 2,216 | 1,271 | 631 |
| 6,000 | 900 | 1,060 | 971 | 607 | 398 |
| 8,000 | 329 | 529 | 412 | 258 | 225 |
| 10,000 | | | | | 120 |
| 12,000 | | | | | 68 |

| psi | 12/20 | 16/30 | 20/40 | 30/50 | 40/70 |
|--------|-------|-------|-------|-------|-------|
| 2,000 | 607 | 358 | 231 | 106 | 48 |
| 4,000 | 168 | 164 | 131 | 71 | 36 |
| 6,000 | 56 | 64 | 60 | 36 | 23 |
| 8,000 | 22 | 33 | 26 | 15 | 13 |
| 10,000 | | | | | 7 |
| 12,000 | | | | | 4 |

Conductivity and permeability results are average values compiled in repetitive testing per API RP 19D
Analyses are conducted by recognized and independent industry laboratories.
Test Conditions: 2 lb/ft² cell loading at 150°F with 2% KCl between Ohio Sandstone

Physical Properties (API RP 19C)

| | 12/20 | 16/30 | 20/40 | 30/50 | 40/70 |
|------------------------------------|-----------|-----------|-----------|-----------|-----------|
| Crush Resistance (K Factor) | 2K | 4K | 6K | 7K | 8K |
| Specific Gravity | 2.65 | 2.65 | 2.65 | 2.65 | 2.65 |
| Bulk Density (lb/ft ³) | 95 | 95 | 95 | 95 | 94 |
| Bulk Density (g/cm ³) | 1.53 | 1.53 | 1.53 | 1.53 | 1.50 |
| Krumbein Roundness | 0.7 - 0.9 | 0.7 - 0.8 | 0.7 - 0.8 | 0.7 - 0.8 | 0.7 - 0.8 |
| Krumbein Sphericity | 0.7 - 0.9 | 0.7 - 0.8 | 0.7 - 0.8 | 0.7 - 0.8 | 0.7 - 0.8 |
| Turbidity (FTU) | <100 | <75 | <50 | <50 | <50 |



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