

## Micro Stim™ and Micro Stim Plus™ Microproppant



Microproppant is an ultrafine mesh, high-quartz silica sand used to prop open induced or secondary fractures created around the main propped fracture in unconventional formations. Because the surface area of induced fractures can be significantly larger than the main propped fracture, stimulating induced fractures may substantially increase the size of the productive network.

However, induced or secondary fractures can range from less than 50 microns to 0.2 millimeters in width where typical 100M can't be placed. At a fraction of the size, Micro Stim™ and Micro Stim Plus™ microproppants are small enough to enter induced fractures thus increasing production through the fracture network.



### ADVANTAGES AND BENEFITS:

- Increases hydrocarbon flow from reservoir to the well through propped secondary fractures
- Reduces treating pressures thus assisting in a reduction in pressure dependent leakoff rates and occurrences of screen-outs
- Minimizes production loss thus helping to enhance production for the life of your well®
- Micro Stim™ products keep secondary fractures open where 100M can't
- Micro Stim Plus™ is 10-15 times smaller in particle size compared to 100M sands

### TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

TYPICAL PHYSICAL PROPERTIES		Micro Stim™
Physical State		Crystalline Solid
Appearance, color in bright light		white to light tan
Hardness	[Mohs]	7
Median Particle Diameter, D50 [µm]		109 - 135
Bulk Density	[g/cm <sup>3</sup> ]	1.38 - 1.50
Particle Density	[g/cm <sup>3</sup> ]	2.63 - 2.65

TYPICAL PHYSICAL PROPERTIES		Micro Stim Plus™
Physical State		Crystalline Solid
Appearance, color in bright light		white to light tan
Hardness	[Mohs]	7
Median Particle Diameter, D50 [µm]		44 - 53
Bulk Density	[g/cm <sup>3</sup> ]	0.70 - 0.80
Particle Density	[g/cm <sup>3</sup> ]	2.63 - 2.65

TYPICAL CHEMICAL ANALYSIS		Micro Stim™
Mineral		quartz
Silicon Dioxide	SiO <sub>2</sub>	99.6 - 99.8
Moisture	[%]	0.25
LOI, Loss on Ignition	[%]	0.1
Water Soluble Content	[%]	0.25
pH		neutral

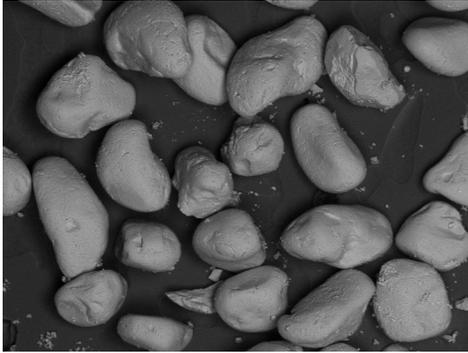
TYPICAL CHEMICAL ANALYSIS		Micro Stim Plus™
Mineral		quartz
Silicon Dioxide	SiO <sub>2</sub>	99.6 - 99.8
Moisture	[%]	0.25
LOI, Loss on Ignition	[%]	0.1
Water Soluble Content	[%]	0.25
pH		neutral



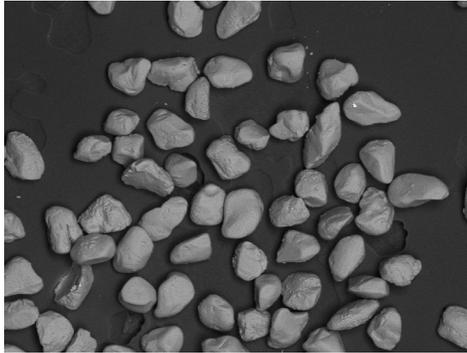
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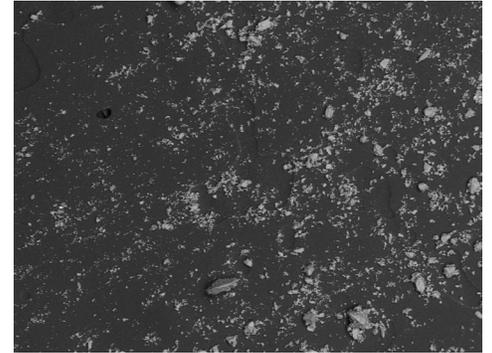
## PHOTOMICROGRAPH COMPARISON



100M Sand

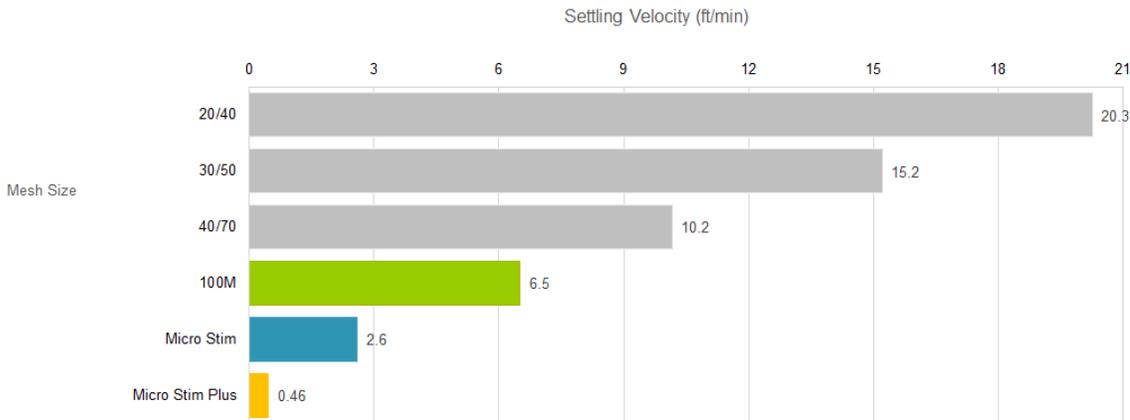


Micro Stim™ Microproppant



Micro Stim Plus™ Microproppant

## SETTLING RATE VS. PARTICLE SIZE



**Disclaimer:** The information set forth in this Product Data Sheet represents typical properties of the product described; the information and the typical values are not specifications. U.S. Silica Company makes no representation or warranty concerning the products, expressed or implied, by this product data sheet.

**Warning:** The product contains respirable crystalline silica-quartz, which can cause silicosis (an occupational lung disease) and lung cancer. For detailed information on the potential health effects of respirable crystalline silica - quartz, see the U.S. Silica Company Safety Data Sheet.

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