VSTAKE SOLUTIONS

INDUSTRIAL MINERALS RESEARCH, MANUFACTURER & SUPPLIER

PRODUCT – FRAC SAND

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Other Names: Hydraulic Fracturing Sand, Low Strength Proppant, Silica Fracking Sand, Silica Frac Sand.

What is Frac Sand?

"Frac sand" is a high-purity quartz sand with durable, round grains used in hydraulic fracturing ("fracking") to extract petroleum fluids from rock formations with insufficient pore space. Derived mainly from high-purity sandstone, it helps oil and gas flow more easily to wells. The demand for frac sand skyrocketed in 2010 with the rise of hydraulic fracturing in tight rock formations like the Marcellus and Utica Shales. This surge has turned frac sand into a billion-dollar industry, with millions of tons used annually. The trend is expected to continue as long as fracking remains prevalent or until cheaper, more effective alternatives are developed.

USES OF FRAC SAND

Frac sand used in Fracturing in oil well drilling process:

Certain subsurface rock formations, like organic shale, contain significant amounts of oil, natural gas, or natural gas liquids that do not flow easily to a well. This difficulty arises because the rock either lacks permeability (interconnected pore spaces) or has pore spaces too small for these fluids to pass through.

Hydraulic fracturing overcomes this challenge by creating fractures in the rock. The process involves drilling a well into the rock, sealing the portion within the petroleum-bearing zone, and injecting water at high pressure into this section. The water is mixed with chemicals and thickeners, such as guar gum, to form a viscous gel capable of suspending frac sand grains.

Powerful pumps at the surface increase the water pressure in the sealed section of the well until it surpasses the rock's breaking point. When this point is reached, the rock fractures, and water rapidly flows into the fractures, widening and extending them further into the formation. This water carries billions of sand grains deep into the newly created fractures. A single well can require thousands of tons of frac sand for proper stimulation.

USES OF FRAC SAND

Hydraulic fracturing is typically performed in the horizontal sections of wells, like those in the Marcellus Shale, to maximize the extraction area within the resource-rich rock. This approach significantly enhances the flow of oil and gas to the well.

When the pumps are turned off, the fractures in the rock begin to close but remain partially open due to the presence of billions of grains of frac sand. These sand grains are crucial, as they provide the necessary support to keep the fractures from fully closing.

The sand-filled fractures create a network of channels that allow oil, natural gas, and other petroleum fluids to move from the rock into the well. This is why frac sand is referred to as a "proppant" – it props the fractures open, ensuring a steady flow of fluids.

In addition to frac sand, other proppants like ceramic beads, aluminum beads, and sintered bauxite have been used. However, frac sand is preferred for its superior performance and is the most commonly used proppant in the petroleum industry today.

Size and Other Specification of Frac Sand

Usage / Application	Oil and Gas Industry
Colour	Light ivory
Acid Solubility	Less than 3%
Krumbein Roundness	0.6 Min
Krumbein Sphericity	0.6 Min
Acid Solubility in 12% HCl & 3% HF (on dry basis)	3% Max
Crush Resistance, Fines at 4000 PSI @ 2 min	14% Max
Clay and Soft Particle content	1.0% Max
Turbidity (on dry basis)	250 Max
ASTM Mesh	20/40
Silica	97% Minimum
Clay and soft particle content	1% max
Physical State	Granular

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THANK YOU