

# United States Proppant Market Segmented By Type (Frac Sand Proppant, Resin-Coated Proppant, and Ceramic Proppant), By Application (Shale Gas, Tight Gas, Coal Bed Methane, Others), By Region, Competition

<https://marketpublishers.com/r/UBFF72B7EF35EN.html>

Date: October 2023

Pages: 70

Price: US\$ 3,500.00 (Single User License)

ID: UBFF72B7EF35EN

## Abstracts

The United States Proppant Market recorded a valuation of USD 3653.00 million in 2022 and is poised for robust growth throughout the forecast period, projecting a Compound Annual Growth Rate (CAGR) of 8.04% until 2028 and is expected to reach at USD 6105.50 million. Proppant, a durable material consisting of uniformly sized particles, plays a pivotal role in hydraulic fracturing (fracking) by maintaining fractures in the earth's formations, facilitating the extraction of oil and gases. The proppants landscape offers a diverse array of options, encompassing both naturally occurring and synthetic variations. Notable examples of the latter category include resin-coated sand and robust ceramic materials. These proppants come in various sizes and shapes, such as spherical and cylindrical, catering to a range of applications like coalbed methane, shale gas, tight gas, tight oil, deep gas, among others. The composition of fracking fluid varies based on the employed fracturing method, encompassing gel, foam, or slickwater-based mixtures, with possible unconventional formulations. Notably, under low closure stresses, large mesh proppants showcase higher permeability compared to their smaller counterparts. Nevertheless, high closure stresses result in mechanical failure, yielding fine particles, causing smaller mesh proppants to outperform larger ones in permeability beyond a specific stress threshold.

## Key Market Drivers

Rising Mining Activities through Hydraulic Fracking to Propel Market Growth

The advent of hydraulic fracturing, popularly known as fracking, has heralded a revolutionary transformation in the energy sector. It has enabled the extraction of hydrocarbons from geological formations that were previously inaccessible. This technique involves injecting a high-pressure fluid blend into underground rock formations to generate fractures. These fractures are sustained by proppants, enabling the unimpeded flow of hydrocarbons to the surface. This breakthrough has unlocked substantial reservoirs of oil and gas confined within unconventional formations like shale and tight sandstone, thus revolutionizing energy production. The indispensability of proppants in the efficacy of hydraulic fracturing cannot be overstated. They serve as 'propping agents,' preventing fractures from closing post-injection, ensuring the consistent hydrocarbon flow to the wellbore. Proppants not only optimize extraction but also elevate well productivity and long-term reservoir yields. As the industry veers toward unconventional reservoirs, the demand for fracking and proppants has witnessed a significant surge. Driven by population growth and industrial expansion, the escalating energy demand has spurred energy companies to explore alternative hydrocarbon sources. The proppants-aided hydraulic fracking offers a viable solution to access previously untapped reserves. The economic incentive of fracking, generating jobs and revenue through amplified energy production, further amplifies mining activities and the corresponding demand for proppants. Given the persistent importance of fracking in energy production, the proppants market is poised for sustained expansion. Research and development initiatives are concentrated on developing more efficient, environmentally-friendly, and economically viable proppant options. Additionally, the expansion of hydraulic fracking beyond North America into regions harboring untapped unconventional reserves is projected to further propel the demand for proppants.

### Increasing Demand for Natural Gases Driving the Proppants Market

The nation's energy landscape is undergoing a seismic shift, marked by a growing emphasis on cleaner and more sustainable energy sources. In this transition, natural gas has ascended to prominence, recognized as a bridging fuel capable of reducing carbon emissions while providing a dependable energy reservoir. Notably comprised of methane, natural gas has gained favor due to its relatively lower carbon emissions in comparison to other fossil fuels like coal and oil. It serves as a versatile energy source, catering to diverse needs ranging from electricity generation and heating to industrial processes and vehicular fuel. Against the backdrop of global efforts to meet climate goals and reduce reliance on carbon-intensive energy sources, natural gas emerges as an attractive option for transitioning to cleaner energy systems. The symbiotic relationship between natural gas demand and the proppants market is evident. With increasing natural gas demand, energy companies are compelled to explore and tap

into unconventional gas reservoirs, often ensconced in deep rock formations. Such reservoirs necessitate advanced extraction techniques such as hydraulic fracturing, thereby driving the demand for proppants. The proppants market has risen to this challenge by innovating and developing novel proppant technologies. For instance, ceramic and resin-coated proppants offer superior durability and conductivity, rendering them suitable for the high pressures and temperatures characteristic of deep reservoirs. As energy companies continue to push the boundaries of extraction, the proppants market evolves in tandem, ensuring the efficiency and sustainability of natural gas production.

### Improvement in Fracturing Technology

The energy landscape has witnessed a paradigm shift due to technological innovations that have unlocked previously inaccessible oil and gas reserves. An instrumental advancement in this arena is the evolution of fracturing technology, a transformational force that has redefined hydrocarbon extraction and galvanized the proppants market's growth. Horizontal drilling, a key innovation, optimizes resource extraction over extended distances, optimizing production from individual wells. This shift necessitates the employment of more efficient proppants to sustain protracted fractures. The development of advanced proppant materials has significantly augmented well performance. Ceramic proppants, for instance, exhibit superior strength and thermal stability compared to traditional sand, endowing them with the capacity to withstand the demanding conditions of high pressures and temperatures deep underground. The introduction of resin-coated proppants provides an additional layer of protection, preventing proppant embedment and enhancing conductivity. This has translated into heightened well productivity and an increased demand for these specialized proppants. With global energy demand on a relentless ascent, the need for effective extraction methodologies has surged. The efficacy of fracturing technology in tapping unconventional reserves has cemented its status as a cornerstone of energy production. Enhanced proppants ensure consistent and robust production rates, aligning with the energy industry's overarching goal of optimizing output while minimizing costs.

### Key Market Challenges

#### Vulnerabilities in Supply Chain

The production of proppants hinges critically on the availability of raw materials, notably high-quality sand and ceramic materials. Disruptions in the supply of these materials

can exert substantial influence on the production capacity of proppant manufacturers. The proppants market is susceptible to geopolitical tensions and conflicts capable of unsettling the supply chain. The international nature of proppants import and export often involves traversing borders, rendering the supply chain susceptible to disruptions arising from geopolitical factors, resulting in delays and scarcities. The transportation of proppants from manufacturing facilities to well sites occupies a pivotal role in the supply chain. Delays in transportation, whether attributed to infrastructural limitations, meteorological factors, or logistical complexities, can impede the timely delivery of proppants to fracking locales. Ensuring stringent quality standards for proppants is indispensable to their effectiveness in hydraulic fracturing operations. However, maintaining consistent quality across different batches of proppants poses a formidable challenge, as any compromise in quality could reverberate throughout the extraction process.

### Volatility in Oil and Gas Prices

The inherent volatility of oil and gas prices engenders an environment of uncertainty for companies operating in the oil and gas sector, including those engaged in proppants production and distribution. The demand for proppants is inextricably linked to drilling and completion activities within the oil and gas domain. Elevated oil and gas prices instigate augmented exploration and production, leading to heightened demand for proppants. Conversely, periods of depressed prices typically entail reductions in drilling activities, translating to diminished demand for proppants. The ebb and flow of oil and gas prices influence market dynamics, impacting not only the demand but also the supply side. Market entry and exit decisions are intricately tied to price fluctuations. During phases of elevated prices, new entrants may seize opportunities to join the proppants market, potentially resulting in transient oversupply. Conversely, during periods of price decline, smaller and less established companies might grapple with viability, potentially culminating in industry consolidation. Research and development investments geared toward enhancing proppant efficacy can also be affected by the uncertain revenue streams arising from oil price volatility, prompting cautiousness in research commitments.

### Key Market Trends

#### Environmental and Sustainability Concerns

The United States proppants market, a pivotal facet of the oil and gas sector, is undergoing a profound metamorphosis in response to amplified environmental and

sustainability considerations. Proppants, primarily deployed in hydraulic fracturing or 'fracking' endeavors, play an indispensable role in sustaining fractures in rock formations, facilitating the extraction of oil and natural gas. However, with an escalating global focus on environmental preservation, the industry is impelled to innovate and adapt to address its ecological impact. Conventional proppants, such as sand, have come under scrutiny for their potential to induce habitat disruption, water contamination, and other ecological challenges. In response, the proppants sector is witnessing an upsurge in research and development initiatives aimed at identifying and fabricating more environmentally benign alternatives. These innovations encompass biodegradable proppants designed to decompose post-use, as well as the integration of recycled materials in proppant production. These alternative solutions are aimed at mitigating the environmental footprint associated with hydraulic fracturing. Responsible sourcing of proppant raw materials, a pivotal concern in any mining activity, can yield substantial environmental consequences if not approached judiciously. As a result, proppant manufacturers are progressively adopting sustainable mining practices, encompassing strategies to minimize habitat disruption, implement water-efficient extraction methods, and restore land post-extraction. In their supply chains, companies are incorporating eco-friendly practices to ensure responsible sourcing of proppant materials. The carbon footprint emanating from proppant production and utilization has garnered considerable attention in recent years. From manufacturing to transportation and the actual fracking process, the proppants industry contributes to greenhouse gas emissions. In consonance with climate objectives, proppant manufacturers are proactively pursuing avenues to curtail carbon emissions. This could entail transitioning to renewable energy sources for production, optimizing transportation routes, and embracing energy-efficient manufacturing processes.

## Segmental Insights

### Type Insights

In 2022, the Frac Sand segment maintained dominance in the proppants market, and this trend is projected to persist. The ascendancy of this segment is primarily attributed to its cost-effectiveness vis-à-vis other proppant types. Frac sand, a prevalent type of proppant, is a high-purity sandstone variant found in nature. These proppants are typically employed under a closure pressure of 6,000 psi. The diameter of frac sand can range from as minute as 0.1 millimeters to as substantial as 2 millimeters, contingent on the specific fracking operation. The burgeoning use of frac sand in exploration and production endeavors within the fracturing process is poised to fuel the expansion of the proppant market in the forecast period. Raw frac sand stands as the most widely

employed proppant, owing to its broad applicability in oil and natural gas wells, coupled with its cost advantage over alternative options. According to the US Energy Information Administration (EIA), natural gas production is anticipated to escalate from 342 billion cubic feet per day (bcf/d) in 2015 to 554 billion cubic feet per day (bcf/d) by 2040. In Canada, shale gas production has been underway since 2008 and is estimated to constitute 30 percent of the nation's total natural gas production by 2040. These dynamics are poised to be pivotal drivers for the sustained expansion of the Proppant Market.

### Application Insights

In 2022, shale gas emerged as the dominant application segment in the Proppant Market, and this trajectory is expected to continue. The segment's ascendancy can be attributed to its increasing utilization of proppants. Shale gas, characterized by a methane composition ranging from 70% to 90%, serves as a valuable energy source, catering to heating and culinary applications within households. Geographically, North America held sway over the proppant market, accounting for over 67.0 percent of the market's value share in 2022. This region's dominance is propelled by its robust shale gas exploration and production activities.

### Regional Insights

The Midwest region stands at the forefront of the United States Proppant Market. Various countries within this region are harnessing cutting-edge techniques to extract shale gas from their reserves. Owing to limited conventional natural gas deposits and elevated natural gas prices, the development of coalbed methane takes center stage, thereby fostering market growth during the forecast period.

#### Key Market Players

U.S. Silica Holdings, Inc.

Smart Sand, Inc.

Badger Mining Corporation

Blue Diamond Proppants LLC

Eagle Materials Inc



CoorsTek Inc.

Carbo Ceramics Inc.

### Report Scope:

In this report, the United States Proppant Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

#### United States Proppant Market, By Type:

Frac Sand Proppant

Resin-Coated Proppant

Ceramic Proppant

#### United States Proppant Market, By Source:

Northeast

Midwest

South

West

### Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the United States Proppant Market.

### Available Customizations:

United States Proppant Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following

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customization options are available for the report:

### Company Information

Detailed analysis and profiling of additional market players (up to five).



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