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SANDS INDUSTRY INFORMATION

SILICA SAND

High-grade silica sand is an essential raw material for the production of solar panels, smartphones and other speciality glass uses. Solar panel manufacturers' feed stock requires more than 99% purity silica with less than 120ppm iron oxide levels. An estimated 70% of each typical commercial solar panel comprises glass sheeting made from low iron, high purity silica.

Researchers IMARC predict the global silica sand market will grow from US$22.9 billion in 2022 to US$32.1B in 2028, with a CAGR of 5.6%. The Asia-Pacific region is seen as the fastest-growing region for silica sand demand.

Silica sand is currently enjoying healthy growth, with a CAGR of nearly 8.7% in value terms from 2009 to 2016 and a market value of US$6.3 billion (source: IMARC Group). This has been fuelled by its applications across a range of industries, including glass making, foundry casting, water fibration, chemicals and metals, along with the hydraulic fracturing process. IMARC expects the demand for silica sand to exhibit a CAGR of 7.2% through to 2022, reaching revenues of US$9.6 billion.

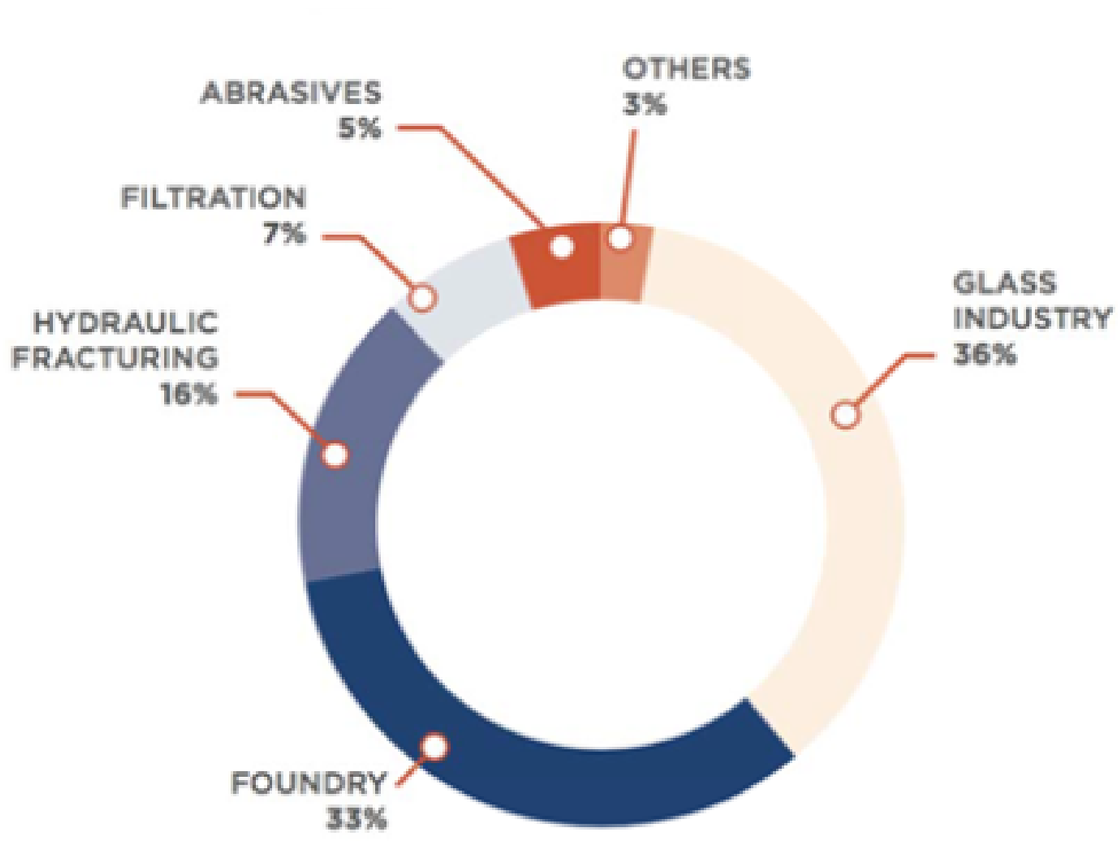
As one of the major consumers of high purity silica, the global glass market has recently realised significant growth due to increased demand from the construction and automotive markets, along with expanding per capita income and technological advancements.

Currently there are no direct substitutes for silica sand in the majority of its applications. As a result, the threat of competitor products remains low.

Expanded growth is being enjoyed in the Asian market, especially China, which is seeing rising glass manufacturing in line with construction and infrastructure growth.
The end uses of silica sand include five major markets comprising glass, foundry, hydraulic fracturing, filtration and abrasives, as shown by the graph:

The International Energy Agency projects global solar investment in 2023 will exceed oil investment for first time ever, with estimated solar power spending of US$382B compared to oil's US$371B.

"This increased solar energy demand will drive increased demand for high-grade silica sand. However, while demand is increasing, supply is diminishing. Much of the sand used in Asia comes from rivers where environmental concerns are increasingly restricting extraction, hence the need for new projects in regulated, ESG friendly jurisdictions such as Australia.



Source: Analyst Report & IMARC Estimates

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CONSTRUCTION SAND

The primary structural component in a range of building and construction products, whole-grain silica is used in flooring compounds, roofing shingles, skid-resistant surfaces and other applications requiring packing density and flexural strength. Ground silica adds durability, anti-corrosion and weathering properties in caulks, expoxy-based compounds and sealants.

Growing Asian markets for construction sand include Singapore, where its building construction industry uses an estimated 1 million tonnes of concrete per month, including 300,000 tonnes of construction sand. Importantly for Australian suppliers, the Singapore Building and Construction Authority has placed a requirement that 5% of construction sand be sourced from non-traditional sources including Australia.

Other emerging Asian markets are also seeing growth, including India and Vietnam, where rapid industrialisation has driven increased demand for construction sand.
Further demand growth is likely given UN estimates that there will be more than 40 “megacities” home to more than 10 million inhabitants by 2030, up from 31 in 2016, resulting in more demand for housing and infrastructure, and thereby mineral sands.

TITANIUM

Titanium is a dark coloured mineral which, with processing, becomes white and opaque. It is primarily used as a whitening pigment in paints, plastics and paper. Other uses include the manufacture of titanium metal and welding flux wire cord.

Titanium dioxide feedstocks are graded by their titanium dioxide content, which ranges from around 50% for sulphate ilmenite to 95% for natural rutile. Feedstocks are either sold as raw minerals (rutile and chloride or sulphate ilmenite) or as processed or upgraded feedstocks, whereby ilmenite is processed to increase its titanium dioxide content. Upgraded feedstocks are synthetic rutile, chloride and sulphate slag and upgraded slag.

The feedstock market is split into two product streams: chloride and sulphate. In recent years, there has been an approximate equal supply of chloride and sulphate feedstocks.
Titanium dioxide feedstocks are used predominately for the manufacture of pigment due to its opacity, UV resistance and non-toxic properties. This pigment is in turn used in paints, paper and plastics. Use in pigment accounts for approximately 80 to 90 per cent of total global demand for titanium feedstocks. Titanium metal and welding flux cord wire jointly account for the remaining 10 to 20 per cent of demand. Historically, demand for titanium feedstock has grown broadly in line with global GDP growth.

ZIRCON

Zircon is primarily used in the production of ceramic tiles. Other applications include use in refractories and foundry casting and a growing array of specialty applications in the form of zirconia and zirconium chemicals, including in nuclear fuel rods, catalytic fuel converters and in water and air purification systems.

Zircon's unique properties include a high refractive index, opacity (whiteness), wear and chemical resistance and thermal stability.

Zircon usually occurs in lower quantities (lower assemblage) than titanium dioxide in mineral sands deposits.
Ceramics is the largest end use market of zircon, accounting for around 50 per cent of demand. Applications include tiles, sanitary ware and tableware. Regional tile demand is influenced by factors such as culture, climate, relative cost and personal taste.
Traditionally Europe (Italy and Spain) and the Middle East have been the largest tile producers, however recently China and other developing economies have shown a strong preference for tiled floors and tile production has grown strongly.

Zircon is also the primary input to zirconia and a wide range of zirconium-based chemicals. China is the major global producer of zirconium oxy chloride and derivative products. These products are used in a multitude of manufacturing and consumer applications, including auto catalysts, fuel cell technology, electronics and abrasives.
Zirconium metal is used in nuclear fuel rods and in specialised metal alloys, due to its high melting point and chemical resistance.
A small amount of zirconia is converted into the synthetic gemstone and cubic zirconia. The zirconia and zirconium-based chemicals end use segment is the fastest growing zircon end use with average annual growth of over 10 per cent since year 2000.

Zircon is also used in refractories, foundry and casting applications, such as for high precision casting of jet turbine blades.

Zircon demand is influenced by three main factors: urbanisation in developing economies, and the attendant increase in floor space under construction (much of which will be associated with ceramic tiling); consumption based growth which is expected to influence the intensity of use of zircon as well as titanium dioxide pigment; and the increasing array of end applications of zircon, particularly in zirconia and zirconium-based chemical applications.

Market analysts TZMI have projected an increasing supply deficit for zircon through to 2035, with demand increasing by 2.5-3 per cent year-on-year but production declining by an average of 5 per cent per annum.