

# Assessment of the granite, quartz and heavy mineral sand industry

Report

**Submitted to Midwest Ltd.**

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Consulting

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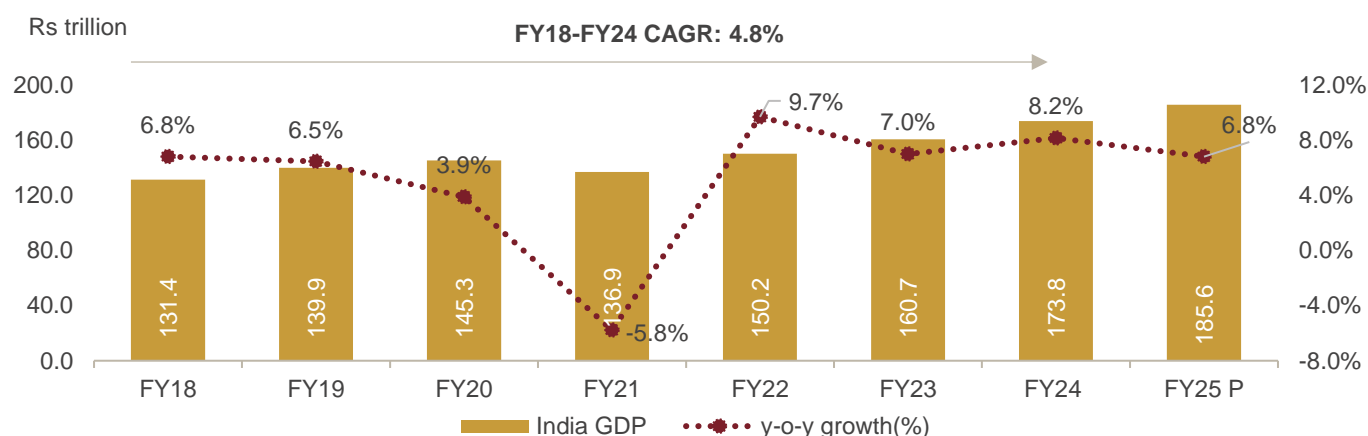
# 1 Indian macroeconomic overview

## 1.1 GDP trend

India's gross domestic product (GDP) clocked a compound annual growth rate (CAGR) of 4.8% between fiscals 2018 and 2024 to Rs 173.8 trillion<sup>1</sup> based on the change in base year for GDP calculation to fiscal 2012 from fiscal 2005 effected by the Ministry of Statistics and Programme Implementation in 2015.

The pandemic-induced lockdowns led to a decline in GDP to 5.8% in fiscal 2021, but the post-pandemic scenario has been positive, starting with a 9.7% on-year print in fiscal 2022 led by manufacturing and construction sectors.

### India's GDP trend



P: Projected

Source: Central Statistical Office (CSO), CRISIL MI&A Consulting

India's real GDP grew 8.2% on-year this fiscal compared with 7.0% the previous fiscal. Growth is estimated to have been stronger in the first half compared with the second. Despite weak agricultural growth, overall GDP growth is seen as robust, indicating that the resilience of non-agricultural sectors more than offset the agricultural slowdown.

On the demand side, investment (gross fixed capital formation) emerged as the primary driver of growth (10.3% on-year this fiscal vs 11.4% the previous fiscal), spurred by the government's infrastructure push. Government consumption expenditure grew 2.5% on-year compared with 9.0% last fiscal and punched below its weight in overall GDP.

However, private consumption growth, with a near 56% share in GDP, is estimated to have fallen short of overall GDP growth (4.0% vs 6.8% the previous fiscal).

Net exports (exports minus imports) are likely to be a bigger drag this fiscal compared with the previous one. Export growth is expected to be much weaker this fiscal (2.6% vs 13.4%) than that of imports (10.9% vs 10.6%).

<sup>1</sup> Statistics from provisional estimates of national income 2022-23 and quarterly estimates of gross domestic product for the fourth quarter (Q4) of 2022-23

**Yearly demand-side real GDP growth**

At constant 2011-12 prices	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Private consumption	6.2%	7.1%	5.2%	-5.3%	11.7%	6.8%	4.0%
Government consumption	11.9%	6.7%	3.9%	-0.8%	0.0%	9.0%	2.5%
Gross fixed capital formation	7.8%	11.2%	1.1%	-7.1%	17.5%	6.6%	9.0%
Exports	4.6%	11.9%	-3.4%	-7.0%	29.6%	13.4%	2.6%
Imports	17.4%	8.8%	-0.8%	-12.6%	22.1%	10.6%	10.9%

Source: CRISIL MI&A Consulting, CSO

On the supply side, agriculture and allied sectors sustained their momentum till fiscal 2023, while industry and services were severely impacted by the pandemic in fiscal 2021. Manufacturing and service sector growth declined in fiscal 2023, but that of agriculture, construction (including end-use sectors for granite and quartz such as building and infrastructure), mining, and electricity accelerated. In fiscal 2024, growth of manufacturing and industry was remarkable, while that of agriculture and allied sectors, as well as services, declined.

**On-year supply-side gross value added by economic activity**

At basic prices	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Agriculture and allied	6.6%	2.1%	6.2%	4.0%	4.6%	4.7%	1.4%
Industry*	1.1%	3.1%	-0.5%	-6.3%	8.3%	5.7%	7.3%
Manufacturing	7.5%	5.4%	-3.0%	3.1%	10.0%	-2.2%	9.9%
Construction	5.2%	6.5%	1.6%	-4.6%	19.9%	9.4%	9.9%
Services^	6.3%	7.2%	6.4%	-8.4%	9.2%	10.0%	7.6%

\* Industry includes mining and quarrying, electricity, gas, water supply and other utilities

^Services include those related to trade, hotels, transport, communication, broadcasting, finance, real estate, public administration, defence, and professional and other services

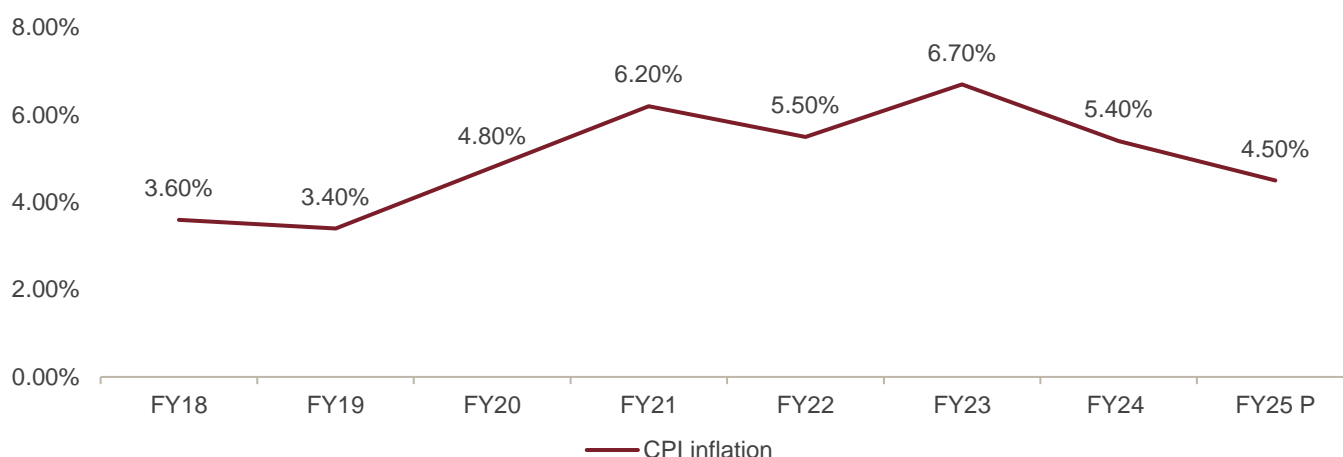
Source: CRISIL MI&A Consulting, CSO

## 1.2 Performance of key macroeconomic indicators

India's consumer price index (CPI)-based inflation remained ~4.7% on average between fiscals 2018 and 2022. However, it increased to 6.7% in fiscal 2023 primarily led by surging food prices before moderating to an average of 5.4% in fiscal 2024. Although core and fuel inflation numbers have remained low, food inflation has continued to hold CPI inflation above the Reserve Bank of India's (RBI's) medium-level target of 4%. For instance, as per March 2024 data, food inflation remained at 8.5% primarily led by strong acceleration in inflation in foodgrains, meat and fish and a slower pace of deflation in the edible oil category.

CPI inflation is expected to moderate further to 4.5% on average in fiscal 2025 on the back of a potential dip in food inflation led by a favourable monsoon and a high base effect.

### CPI inflation trend

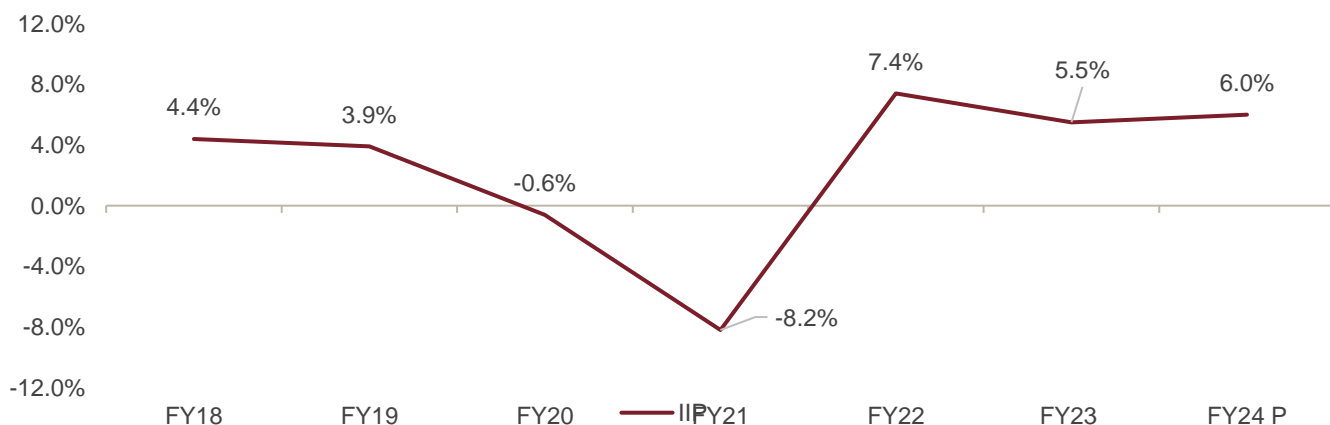


P: Projected

Source: NSO, the Ministry of Industry and Commerce, CRISIL MI&A Consulting

The Index of Industrial Production (IIP) surged to 6.0% in fiscal 2024 after averaging 2.6% between fiscals 2018 and 2023 primarily led by a strong pickup in the sectors pertaining to manufacturing of electrical equipment and basic metals. Further, an uptick in the consumer durables sector supported IIP growth.

### IIP growth trend



Source: NSO, the Ministry of Industry and Commerce, CRISIL MI&A Consulting

**Increasing per capita income**

Per capita income (or per capita gross national income or GNI) is estimated to have grown 5.7% in fiscal 2023 and by a further 7.2% in fiscal 2024. This will be an enabler for domestic consumption. According to International Monetary Fund (IMF) estimates, India’s per capita income (at constant prices) is expected to increase at a 5.4% CAGR over 2024 to 2028. Increasing disposable income typically has a positive correlation with demand for housing units as it increases affordability and, eventually, housing demand.

**Per capita income trend**

Per capita GNI	Level in FY24 (Rs '000)		Growth at constant prices (%)									
	Current prices	Constant prices	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
	169.49	99.4	6.2	6.7	6.9	5.5	5.3	2.5	-8.9	9.3	5.7	7.2

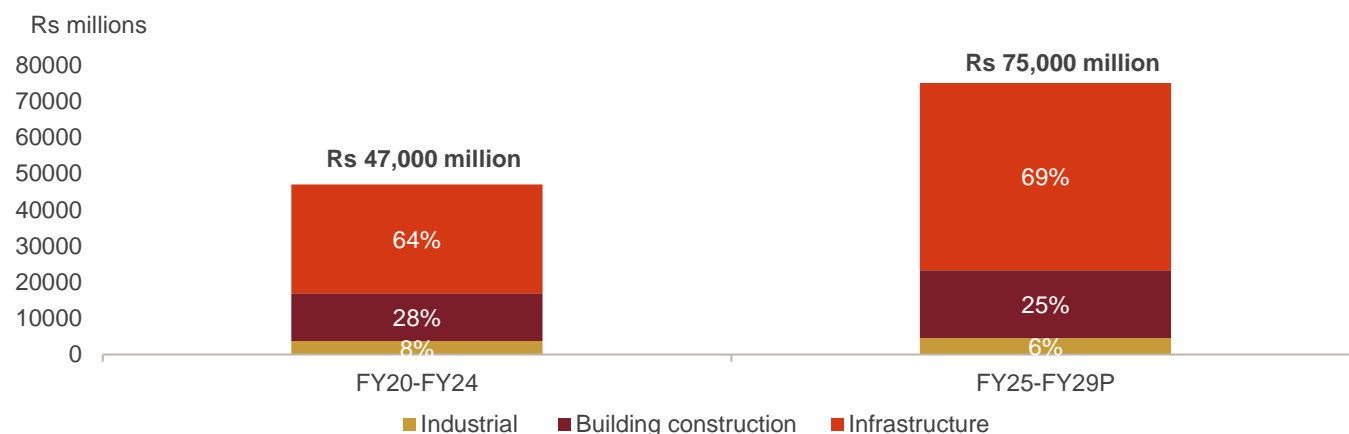
Source: MoSPI, IMF, CRISIL MI&A Research

**1.3 Construction investment outlook in key infrastructure segments**

The construction sector is projected to grow 7-9% in fiscal 2025, with a major contribution from the infrastructure segment, coupled with the increasing pace of progress of schemes such as the National Infrastructure Pipeline (NIP), the National Monetisation Pipeline (NMP) and PM Gatishakti initiatives.

Construction capex is estimated to have risen 13% on-year to Rs 12,000 million in fiscal 2024 led by a visible increase in central and state budget allocations to meet the infra development target outlined in the NIP.

**Construction investment review and outlook**








Source: CRISIL MI&A Research

The overall investment is expected to increase 60% to Rs 75,000 million over fiscals 2025-29P compared with the levels over fiscals 2020-24. The share of infrastructure projects is expected to increase to ~70% over the next five years from ~64% in fiscal 2024, as investments in infrastructure are expected to grow faster than that in other segments due to the government's focus on the NIP, NMP and the PM Gatishakti initiatives. The central government's focus on roads, urban infrastructure and railways will also boost infrastructure investments.

Construction investments are projected to grow at a 6-8% CAGR over fiscals 2025 to 2029, led by the infrastructure segment over the medium to long term as the building construction and industrial sectors record sedate growth rates.

Roads and railways dominated by public funds will lead growth in the infrastructure segment. The key infrastructure sub-sectors will see healthy growth over the medium term, led by the government’s infrastructure push and the NIP.

**Key infrastructure sub-sectors**

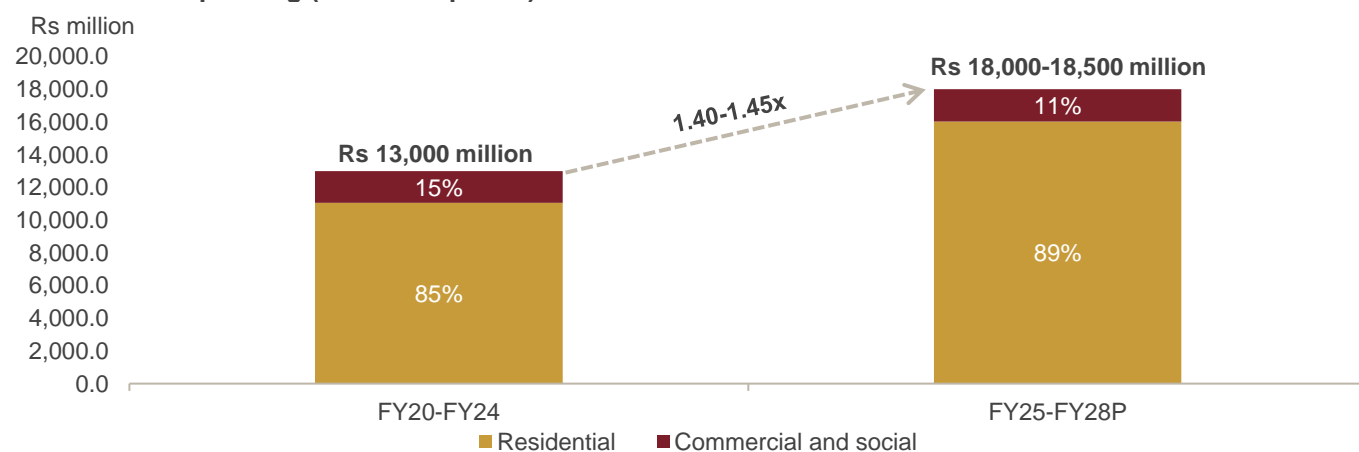
	Sector	FY20-FY24 CAGR	FY24A Rs lakh crore	FY25P (growth)	FY26P (growth)	FY25-29P/ FY20-24	Source of funds (FY24E-28P)
	Roads	13%	3.8	11-13%	10-12%	1.8x	60% Center, 21% State, 19% Private
	Power	12%	0.4	9-11%	2-4%	1.5x	16% Center, 30% State, 54% Private
	Railways	15%	1.1	5-7%	5-7%	1.7x	84% Center, 16% State
	Urban infra	33%	1.4	4-6%	4-6%	1.8x	43% Center, 53% State, 4% Private
	Irrigation	11%	0.9	6-8%	6-8%	1.5x	9% Center, 91% State
	Other infra	8%	0.2	6-8%	8-10%	1.2x	
	<b>Total Infrastructure</b>	<b>16%</b>	<b>8.0</b>	<b>7-9%</b>	<b>7-9%</b>	<b>1.7x</b>	

Source: CRISIL MI&A Research

Construction investments are projected to rise ~60% over fiscals 2025-29 compared with those over fiscals 2020-24 with investments in infrastructure expected to rise 1.7 times and building construction and industrial segments lagging at 40% and 30%, respectively, over the same period.

Investments in building construction are expected to grow 4-6% in fiscal 2025 mainly led by urban affordable housing, which currently constitutes ~25% of the incremental urban addition and is expected to slowdown in the coming fiscals as the government approaches its targets.

**Construction spending (at current prices)**



Note: P: Projected

Source: CRISIL MI&A Research

Investments in the sector are expected to rise ~1.4 times to Rs 18,000-18,500 million over fiscals 2025-29 from Rs 13,000 million over fiscals 2020-24.

## 2 Sectoral overview: Granite

### Overview of the natural stone and engineered stone industry

The natural and engineered stone industry encompasses the extraction, processing, and distribution of both naturally occurring stones such as granite, marble, and limestone, as well as man-made materials such as engineered quartz slabs. Natural stones are valued for their unique patterns, durability, and timeless appeal, making them a popular choice for countertops, flooring, and architectural elements. In 2021, the US produced ~2.5 million metric tonne of dimension stone, according to the US Geological Survey (USGS), highlighting the significant scale of natural stone extraction.

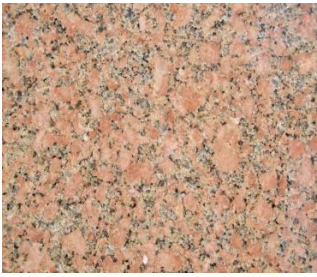
In contrast, engineered stones are manufactured by combining natural stone fragments with resins and pigments, offering durability, uniformity, and a wide range of design options. The Indian Bureau of Mines reported that domestic production of stone products was ~10 million tonne in 2021, including both natural and engineered varieties, reflecting the country's substantial role in the global stone industry.

The industry has seen significant growth due to advancements in quarrying and manufacturing technologies, increased consumer preference for sustainable and high-quality materials, and expanding applications in residential, commercial, and infrastructure projects. For example, the adoption of advanced technologies such as diamond wire sawing and computer numerical control (CNC) machinery has improved the precision and efficiency of stone processing.





In recent years, there has been a growing emphasis on sustainable materials and environmentally friendly practices, leading to increased demand for natural stones that are responsibly sourced and have a minimal environmental impact.

Consumers are increasingly seeking certifications such as Leadership in Energy and Environmental Design (LEED) for sustainable construction projects.

The different types of natural stones are given below:

Sr. No.	Type	Picture	Brief description
1	Granite		Granite is the most widespread of igneous rocks, underlying much of the continental crust. An intrusive igneous rock, it is high in quartz (about 25%), feldspar, and mica. It is widely used for architectural facades, construction materials, ornamental stones and monuments. Over 40% of dimension stone quarried is granite.
2	Marble		Appreciated for its beauty and veining, marble is a popular choice for sculptures, building facades, and flooring material



Sr. No.	Type	Picture	Brief description
3	Limestone		Mainly used in construction materials and as a raw material in cement production, limestone is a sedimentary rock rich in calcium carbonate
4	Travertine		Characterised by its porous surface, travertine is commonly used in flooring, wall cladding, and decorative elements
5	Sandstone		With its wide range of colours and workability, sandstone is extensively used in construction, paving, and as a decorative stone
6	Quartzite		Offering high durability and resistance to chemical weathering, quartzite is suitable for countertops, flooring, and wall coverings

#### End-use industries

These stones are used in the following end-use industries:


- **Construction:** Utilised in structural components, cladding, paving and decorative elements for both residential and commercial projects
- **Interior design:** Popular for countertops, flooring, wall panels and decorative pieces due to their aesthetic appeal and variety of finishes
- **Monuments and memorials:** Used for gravestones, statues and memorial structures, with granite and marble being common choices
- **Industrial applications:** Limestone serves as a raw material for cement production, while various stones are used as aggregates in road building

- **Art and sculpture:** Marble and onyx are favoured for sculptures, artistic installations and ornamental objects due to their workability and aesthetic qualities

**Overview of granite**

Granite, a highly valued natural stone, plays a crucial role in various industries worldwide due to its durability, versatility and aesthetic appeal. The industry encompasses extraction, processing, distribution and utilisation of granite products across diverse sectors. An overview of the industry, including granite types, is provided below:

**Types of granite:**


Sr. no.	Type	Brief description	Application
1	<b>Coloured granite</b>  White granite, brown granite, blue granite, etc	With its distinct green hue, green granite is popular for its unique appearance and durability	Used in countertops, kitchens, bathrooms, flooring, backsplashes and accent pieces in interior design
2	<b>Black granite</b>  	Known for its deep uniform black colour, it is prized for its elegance and versatility	Construction and building: Used extensively for flooring, countertops, wall cladding and decorative purposes in residential and commercial buildings  Monuments and memorials: Popular choice for monuments, gravestones and architectural elements due to its durability and aesthetic appeal

Source: Industry

Out of all the varieties of granite, Black granite is categorised as a premium granite. Replicating the appearance and texture of black granite with synthetic materials is not economically feasible. This is due to the high costs associated with production, the complexity of the manufacturing process, and the challenge of achieving the same durability and aesthetic quality. Additionally, synthetic alternatives often lack the natural variations and unique patterns found in authentic black granite, further reducing their appeal.

**Black Galaxy Granite**

One of the types of black granite, Black Galaxy Granite, also known as Star Galaxy, Galaxy Granite, and Gold Star Granite.

Picture	Brief description
	<ol style="list-style-type: none"> <li>1. It is a highly sought-after natural stone that has been quarried in the Chimakurthy village of the Ongole district in Andhra Pradesh, India, for over 35 years</li> <li>2. It is a unique deposit in the world. Substantiated by the highest tax levied by the government compared to any other Dimensional stone</li> <li>3. Its exceptional durability and strength have made it a popular choice among architects, designers and builders. Its colour pattern and properties make it highly valuable</li> </ol>

Source: Industry

High demand for Black Galaxy Granite in the export market has resulted in its extensive and intensive quarrying by private entrepreneurs.

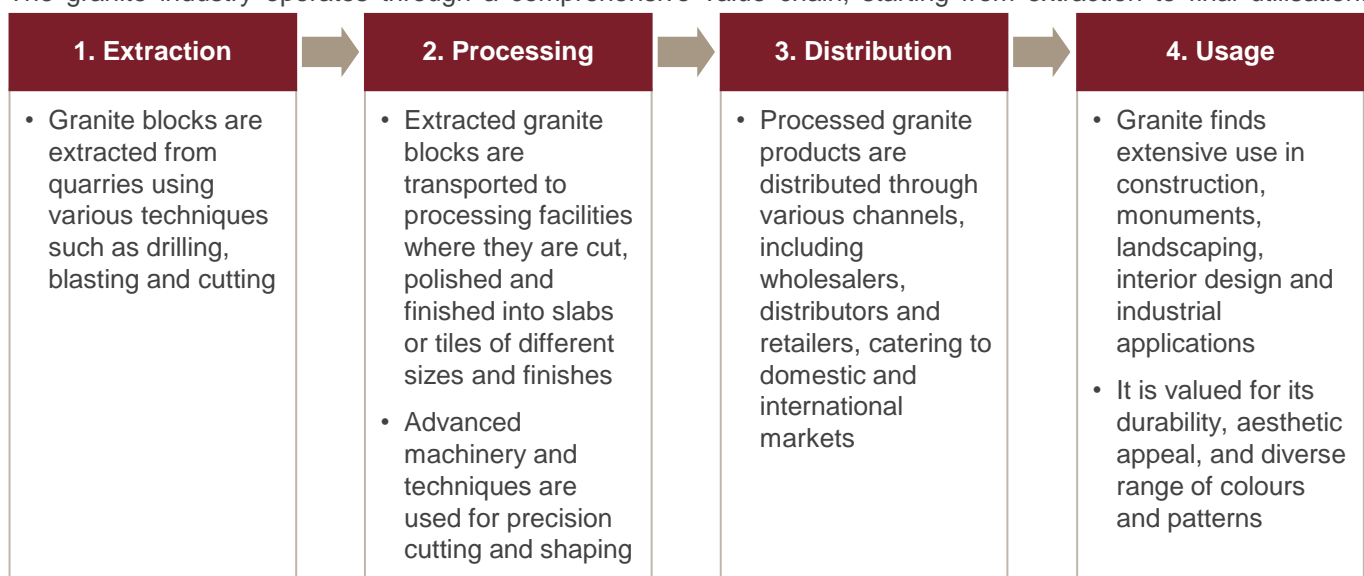
This versatile stone can be used in a variety of applications, including:

- **Countertops and vanities:** A popular choice for kitchen and bathroom countertops and vanities due to its durability and resistance to scratches and stains
- **Flooring:** Its elegant and sophisticated appearance makes it an ideal choice for flooring in homes, offices and public spaces
- **Cladding:** Can be used as a cladding material for exterior walls, providing a durable and visually appealing finish
- **Handicrafts:** Its unique veining patterns and colours make it an excellent choice for creating beautiful handicrafts, such as sculptures, tables and decorative objects
- **Swimming pool areas:** Its non-slip properties make it an excellent choice for swimming pool areas, providing a safe and comfortable surface for users
- **Bathroom walls and floors:** A popular choice for bathroom walls and floors due to its resistance to moisture and stains
- **Fireplace walls:** Its elegant appearance and durability make it an excellent choice for fireplace walls, providing a cozy and inviting focal point in any room
- **External and internal aids in construction:** Black Galaxy Granite can be used for various external and internal construction purposes, such as wall cladding, paving and stair treads

Overall, Black Galaxy Granite is a highly valued natural stone that offers a unique combination of durability, beauty and versatility, making it a popular choice for architects, designers and builders around the world.

## Value chain of granite

The granite industry operates through a comprehensive value chain, starting from extraction to final utilisation:



## Industry characteristics

- **Capital-intensive and requires huge investments:** The granite industry is highly capital-intensive, characterised by long gestation periods and significant entry barriers. Establishing operations in this sector requires substantial upfront investment in mining.

Further, mechanised mining requires the acquisition and deployment of highly customised and expensive machinery, and technical and skilled personnel with competence in various disciplines such as geology and engineering. It employs complex production methods with significant learning curves. Accordingly, these requirements of the dimensional stone granite mining industry in India offer established players a competitive advantage over new players.

Moreover, the dimensional stone industry's reliance on natural resources and the complexities of extraction and processing further contribute to its high entry barriers. These factors collectively underscore the challenging, yet lucrative, nature of the granite industry, where strategic planning and substantial financial resources are essential for sustained success.

- **Dependence on price negotiations:** Unlike commodities such as coal, crude oil or iron ore, dimensional stone granite does not have an industry-wide or recognised benchmark index, and pricing is determined through direct negotiations between buyers and sellers.
- **Top producing countries:** The top five granite producing countries are China, Brazil, India, Saudi Arabia and Italy. India possesses one of the best granite deposits in the world, having excellent varieties comprising over 200 shades. India accounts for over 20% of the world resources in granite. It has significant production across states such as Rajasthan, Telangana, Andhra Pradesh, Gujarat, Karnataka, Kerala, Tamil Nadu and Goa.
- **Top consuming countries:** On the consumption side, the US is the world's largest consumer of granite, primarily importing from Brazil, China and India. The European Union (EU) represents a major market for the global natural stone industry, with India playing a significant role in global stone exports.

## Quartzite

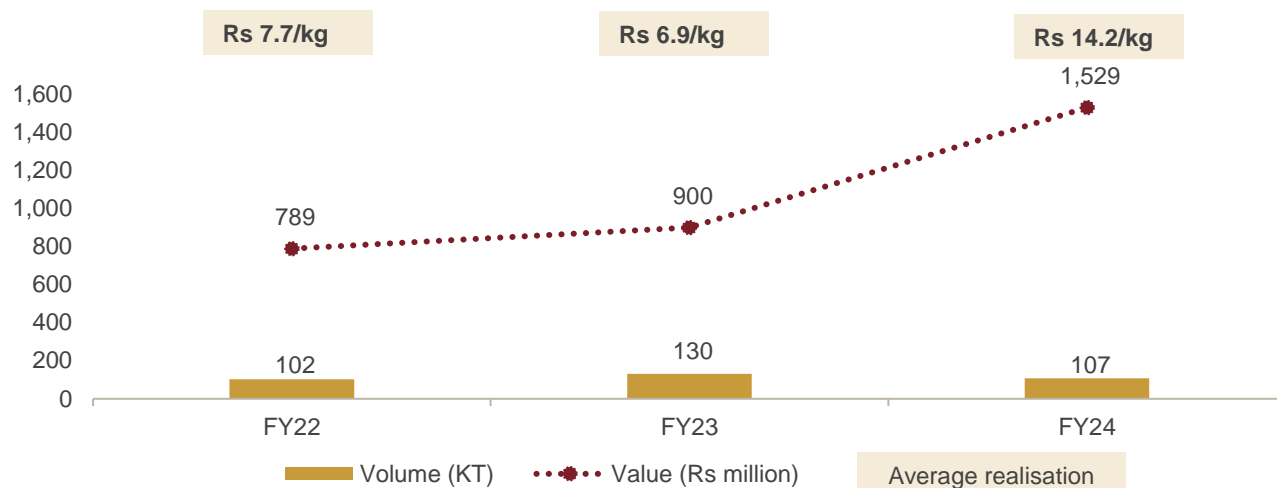
Quartzite is a metamorphic rock that is formed when quartz-rich rocks are subjected to high pressure and temperature. It is considered a high utility product category due to its exceptional durability, aesthetic appeal and versatility in various applications.

It is highly resistant to heat, scratches and stains, making it ideal for kitchen countertops, backsplashes, and flooring where durability is crucial.

Quartzite's natural beauty, with unique patterns and colours, also makes it a popular choice for decorative uses in both residential and commercial settings. Its robust physical properties and aesthetic versatility contribute to quartzite being highly valued in the construction and interior design industries worldwide.

It is emerging as a lower cost alternative to ultra-premium marble varieties as it possesses similar aesthetic attributes while also having certain advantages over marble which is being imported. Quartzite scores 7 out of 10 on the Mohs hardness index while granite scores 6 and marble scores 3, making quartzite ideal for building walls, flooring, roofing tiles, stair steps and countertops in kitchens.

**Quartzite exports trend by value and volume over fiscals 2022-2024**



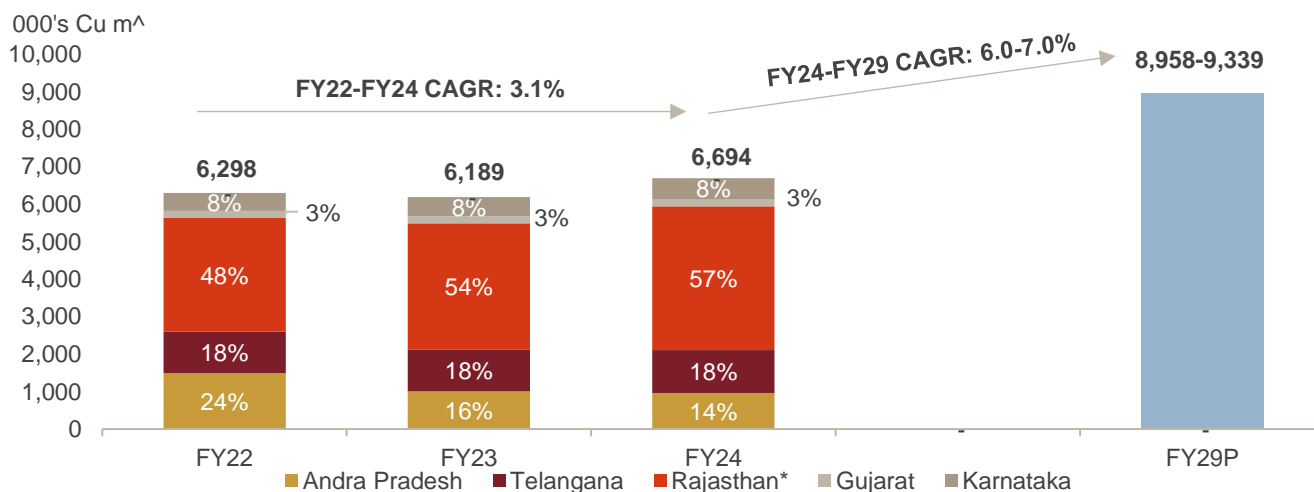
Source: DGFT, CRISIL MI&A Consulting

The exports volume of quartzite from India increased from 102 KT in fiscal 2022 to 107 KT in fiscal 2024 whereas the exports value of quartzite increased at a much faster rate, from Rs 789 million in fiscal 2022 to Rs 1,529 in fiscal 2024, clogging a CAGR of 39.3% over fiscals 2022-2024.

**2.1 Overview of the granite market in India**

In India, the granite industry significantly impacts the economies of states such as Tamil Nadu, Andhra Pradesh, Telangana, Karnataka and Rajasthan. Valued at \$40 billion, it holds the potential to create semi-skilled employment, particularly in rural areas. While granite is considered costly for decorative purposes domestically, its export potential surpasses its utilisation and trade within the country. As per IBM, the total granite resources in India stood at an estimated 46,320 million cubic metre as on April 1, 2015. In terms of classification by grade, ~7% of total resources consist of black granite, while 92% consist of coloured granite. About 1% of the resources remain unclassified.

**Granite production overview (fiscal 2022-2024) and outlook (fiscal 2029)**

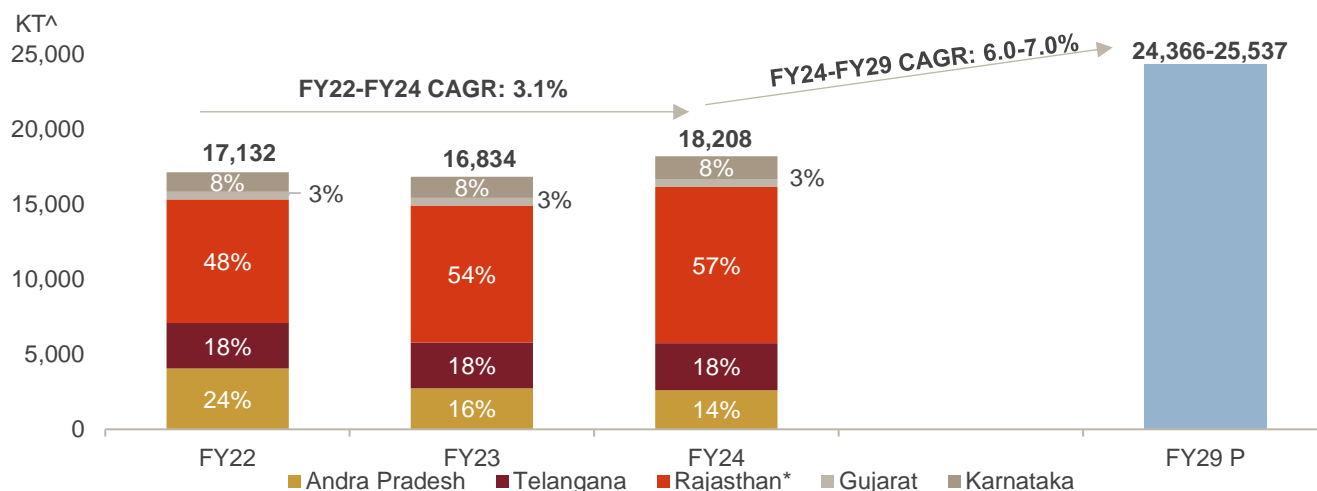


^ Average density of granite stone= 2.72 metric tonne per cubic meter; \*Numbers reflective of dispatches

P: Projected

Source: State DGMS and their websites, CRISIL MI&A Consulting

**Granite production overview (fiscal 2022-2024) and outlook (fiscal 2029)**



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P: Projected

Source: State DGMS and their websites, CRISIL MI&A Consulting

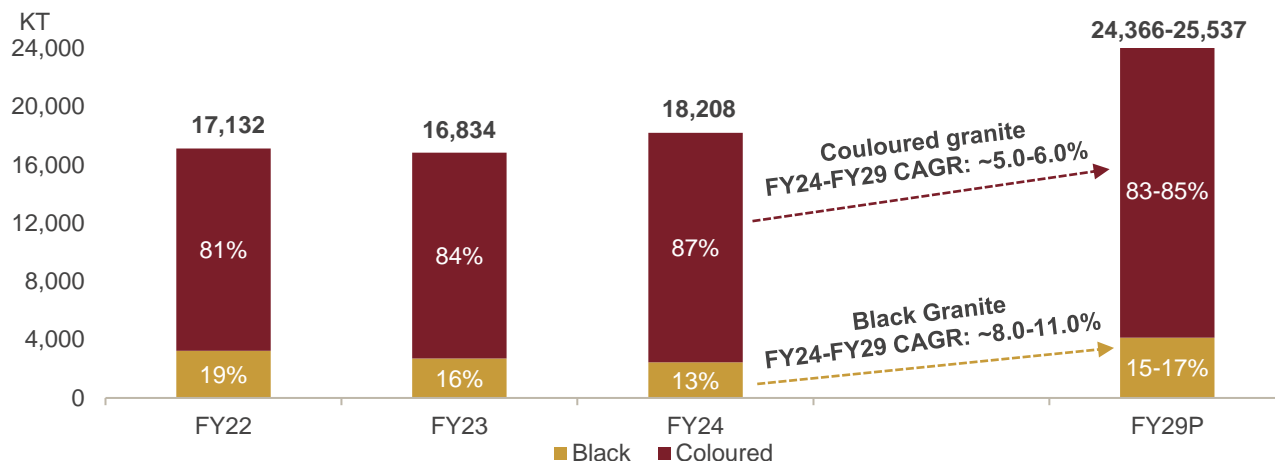
Granite production increased from 17,132 KT in fiscal 2022 to 18,208 KT in fiscal 2024, clocking a CAGR of 3.1%, driven by domestic demand for granite from the building and construction industry.

Rajasthan is the largest producer of granite in India, accounting for 57% (~10,422 KT) of the total granite produced in fiscal 2024. Other significant granite producing states are Telangana and Andhra Pradesh, which accounted for 18% (~3,126 KT) and 14% (~2,616 KT), respectively, of production in fiscal 2024. While Rajasthan's share in overall granite production increased from 48% in fiscal 2022 to 57% in fiscal 2024, Telangana's share remained at 18%. Other producing states include Karnataka and Gujarat, whose share remained 8% and 3% respectively, throughout the fiscals 2022-2024.

Granite production is projected to grow to 24,366-25,537 KT in fiscal 2029, logging a CAGR of 6.0-7.0% between fiscals 2024 and 2029. The production is expected to be driven by increased domestic demand as well as exports of granite.



**Black vs coloured granite production overview (fiscal 2022-2024) and outlook (fiscal 2029)**



P: Projected

Source: State DGMs and their websites, CRISIL MI&A Consulting

Out of the total production of 18,208 KT in fiscal 2024, coloured granite accounted for 87% (~15,755 KT) and black granite for 13% (~2,453 KT). By black granite type, Black Galaxy Granite, which is exclusively produced in Andhra Pradesh, accounted for 31% (~771KT) of overall black granite production in fiscal 2024. Absolute Black Granite, produced in Karnataka, accounted for 47% (~1,162 KT) and Absolute-Black Granite, produced in Andhra Pradesh and Telangana, accounted for 21% (~520 KT) of overall black granite production in fiscal 2024.

Midwest’s black granite production accounted for 10.8% (~97,624 cubic metre) of overall black granite production during fiscal 2024 in India.

In fiscal 2029, the share for black granite is expected to be ~15-17% (~3,655-4,142 KT) of overall domestic granite production, increasing at a CAGR of ~8-11%, owing to increase in corresponding demand for black galaxy granite from both domestic market as well as exports.

The royalty paid on granite varies by type. For example, in Andhra Pradesh, the royalty charged by the state government on granite for Black Galaxy Granite is Rs 1,550-4,600 per cubic metre; for black granite – Rs 1,150-3,450 per cubic metre; and for coloured granite – Rs 1,100-2,700 per cubic metre. Among all the granite varieties, royalty charged on black galaxy granite is the maximum, establishing its position as a premium material.

Midwest leads the industry in royalty payments for Black Galaxy granite and paid the highest between 2020 and 2024, with a notable contribution of Rs 406 million in fiscal 2024, accounting for 31% of the total royalty for black galaxy granite.

To boost productivity in the cutting and polishing industry, the Government of Andhra Pradesh introduced a slab system under G.O. Ms. No.58 dated March 28, 2022. This system levies royalty on granite blocks consumed at processing plants rather than at the quarrying field, with the rate fixed per blade per month. A unit holder can procure up to 22 cubic metres of granite from quarries before extra royalty is charged. These measures aim to streamline the process and reduce costs for granite block players, potentially increasing their profitability and market competitiveness.

According to the Andhra Pradesh’s mining and geology department’s data, the average sale price for Black Galaxy Granite is Rs 50,000-1,00,000 per cubic metre, black granite is Rs 30,000-75,000 per cubic metre, and coloured granite is Rs 15,000-35,000 per cubic metre. The price range for black granite is wide and varies as per its quality,

size, look and appeal. Among all the granite categories available in India, average realisations are the highest for Black Galaxy Granite.

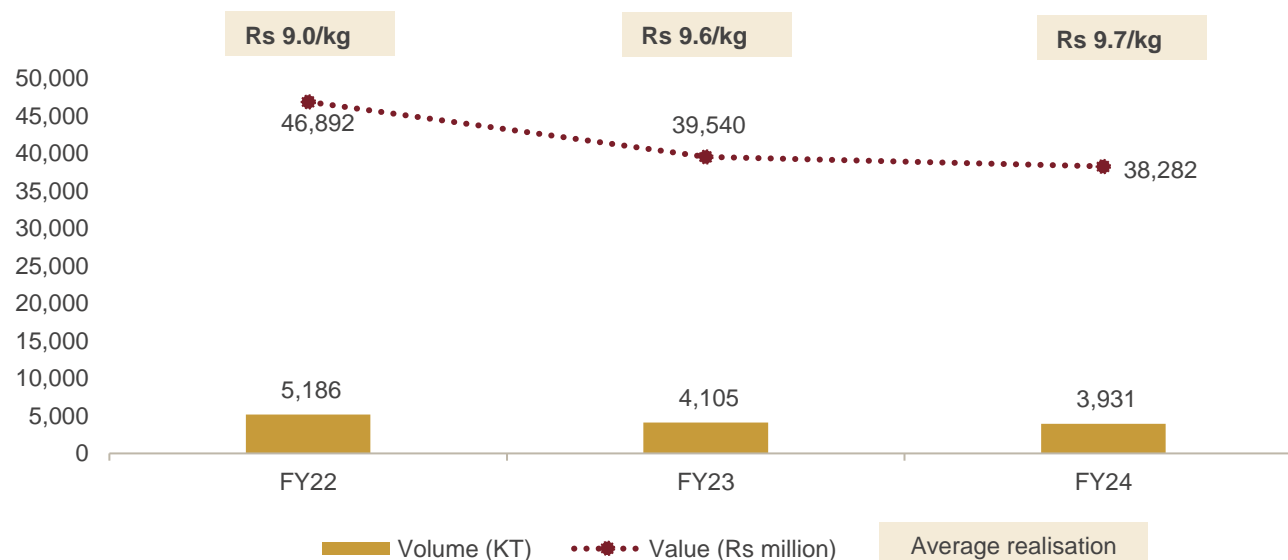
## 2.2 Trade overview of granite

### Export

In fiscal 2022, India exported 5,186 KT of granite, valued at Rs 46,892 million. In fiscal 2023, the exports volume dropped 1,081 KT to 4,105 KT, with a corresponding decrease in value to Rs 39,540 million, indicating an on-year decrease by 20.84% in volume and 15.68% in value. The downward trends in export are due to increased demand in domestic consumption reasons being attributed to the rising demand in construction sector. Moreover, conversion time is faster for domestic supply.

A significant proportion of raw materials in the granite industry is commonly sent to China for processing before being distributed to the rest of the world. This practice underscores China's pivotal role as a major processing hub within the global granite supply chain. By sending materials to China for processing, companies benefit from the country's extensive infrastructure, expertise and cost-effective manufacturing capabilities. Such strategic approach allows granite producers to ensure high-quality standards and competitive pricing for their products when reaching international markets. This is further supported by pro industry export policies like exports cash back credits and other benefits like power subsidy. Moreover, leveraging China's processing capabilities enables efficient global distribution, facilitating the seamless supply of granite products to meet diverse market demands worldwide.

### Granite export trend by value and volume over fiscals 2022 to 2024

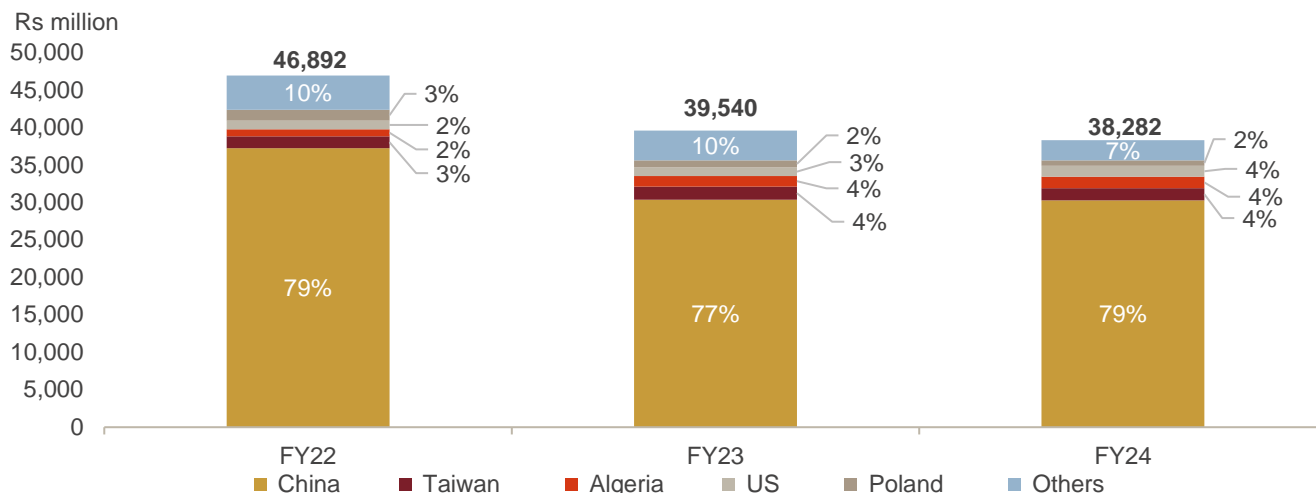


Source: Directorate General of Foreign Trade (DGFT), CRISIL MI&A Consulting

As much as 90-93% of India's granite exports head to five countries: China, Taiwan, Algeria, the US and Poland. Among these, China is the largest importer, maintaining a significant share of 77-79% of the total exports over fiscals 2022 to 2024. Despite a decline in the overall value of granite exports during this period, the proportional share of exports to these countries has remained largely unchanged, indicating while the total export value has decreased, the distribution of exports among the major importing countries has remained stable.



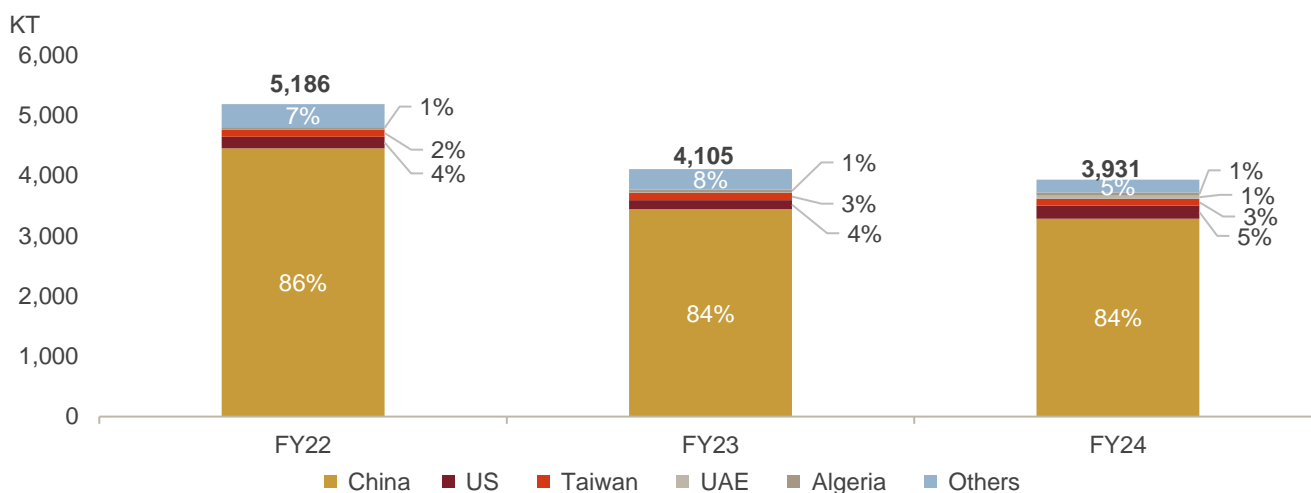
**Country-wise granite export value over fiscals 2022 to 2024**



Source: DGFT, CRISIL MI&A Consulting

China is the largest importer by volume, consistently accounting for 84-86% of India's total granite exports over fiscals 2022 to 2024. However, while China dominates in terms of volume, it contributes a slightly lower percentage to the overall export value, at 77-79%, indicating that although the country imports the largest quantity of granite, the value per unit is lower compared with other importing countries. Despite these differences, the distribution of exports among these primary countries has remained relatively stable over the years.

**Country-wise granite export volumes over fiscals 2022 to 2024**

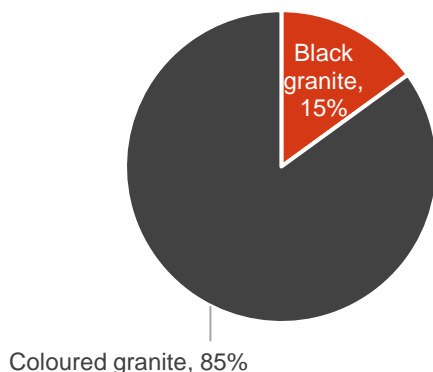


Source: Directorate General of Foreign Trade (DGFT), CRISIL MI&A Consulting

The decline in Indian granite exports can be attributed to increased domestic consumption of granite due to a corresponding increase in the construction activities. Other reasons for a downfall in exports includes higher pricing of granite due to which the domestic sellers are inclined to sell locally.

Exports of jet black and black galaxy granite for fiscal 2024 (based on volume)

Black granite exports (Volume basis)



Note: Coloured granite includes the categories of granite other than black granite like- tan-brown granite, red granite etc

Source: CRISIL MI&A Consulting

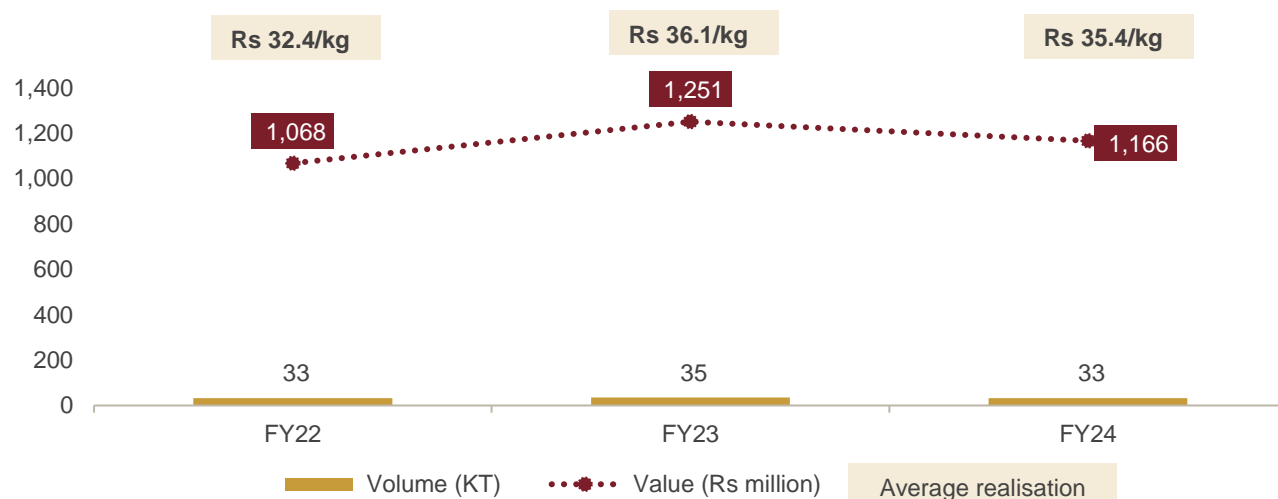
In fiscal 2024, the coloured granite accounted for 85% of the overall granite exports and black granite accounted for 15%.

Midwest, one of the key producers of black galaxy granite, accounted for ~23% (~131KT) of overall black galaxy granite exports volume in fiscal 2024.

Imports

In fiscal 2022, India imported 33 KT of granite valued at Rs 1,068 million. While the import volume remained constant in fiscal 2024, the import value fluctuated. In fiscal 2023, the import volume increased to 35 KT, with a corresponding rise in value to Rs 1,251 million, indicating an on-year increase of ~6.06% in volume and ~16.82% in value. Despite the stable import volume, the import value decreased to Rs 1,166 million by fiscal 2024, representing a ~6.40% on-year decrease in value. This fluctuation in import value despite a consistent import volume suggests potential factors such as changes in market dynamics, fluctuations in exchange rates, or variations in the quality and origin of imported granite impacting the import value over the years.

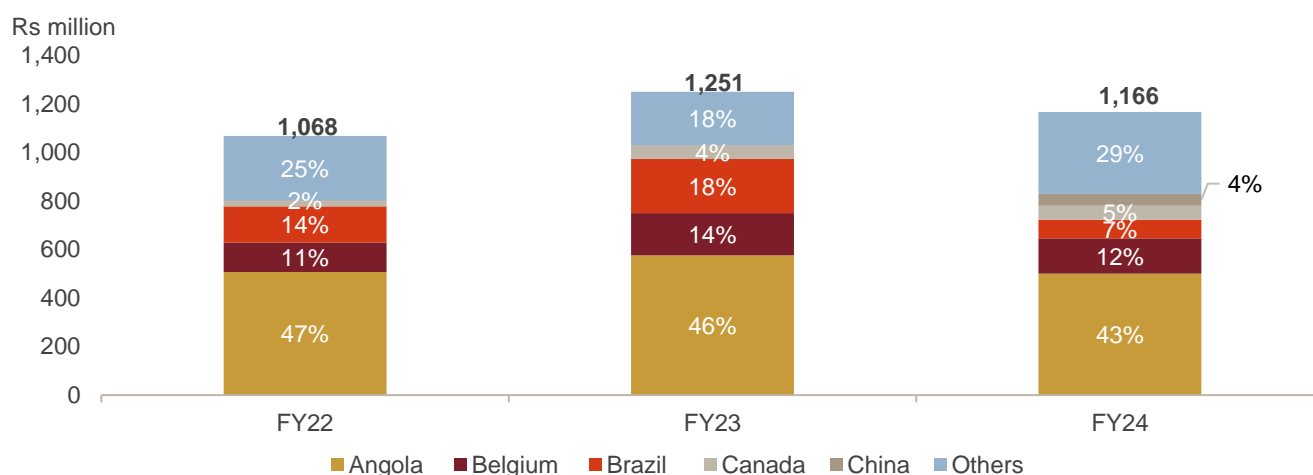
Granite import trend by value and volume over fiscals 2022 to 2024



Source: DGFT, CRISIL MI&A Consulting

Some 70-75% of India's total granite imports by volume are sourced from five countries — Angola, Belgium, Brazil, Canada and China. Among these, Angola has consistently held the highest share, ranging from 43% to 47% between fiscals 2022 and 2024. Notably, Brazil's share experienced significant fluctuations, increasing from 14% in fiscal 2022 to 18% in fiscal 2023 before sharply decreasing to 7% in fiscal 2024. This variability suggests variations in India's sourcing patterns, potentially influenced by factors such as changes in supplier relationships, market conditions or regulatory environments.

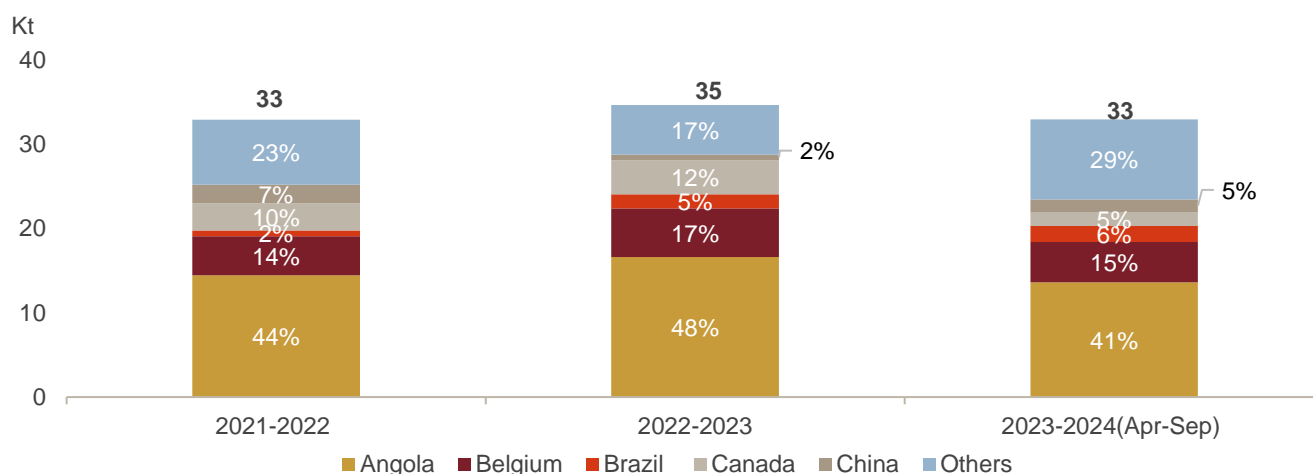
**Country-wise granite import value over fiscals 2022 to 2024**



Source: DGFT, CRISIL MI&A Consulting

Mostly, varieties of black, brown and white granite are imported to India. This includes Angola Black Granite, which contains feldspar and labradorite in a medium-sized grain, making it a popular choice for kitchen or bathroom countertops. Its prominence in the market is due to its unique and attractive appearance. Moreover, imported granite is often available in large slabs due to the advanced manufacturing facilities of foreign producers. These facilities allow for more efficient production of larger slabs, making them more accessible to Indian consumers. Imported granite is often used in high-end applications, such as luxury homes, commercial buildings and public spaces, where aesthetic appeal and durability are paramount.

**Country-wise granite import volume over fiscals 2022 to 2024**

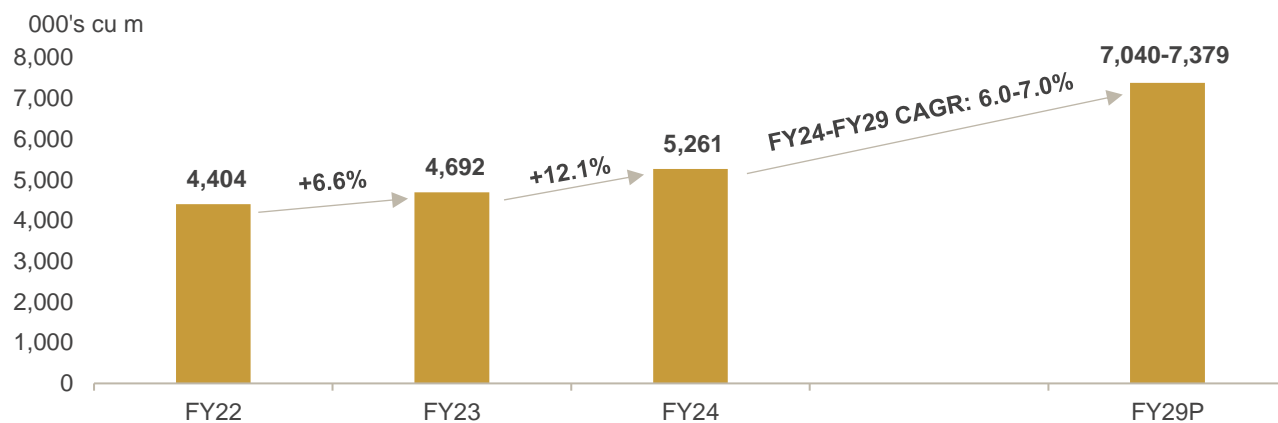


Source: DGFT, CRISIL MI&A Consulting

Between fiscals 2022 and 2024, India consistently exported significantly larger volumes and values of granite compared to the imports. This trend indicates India is a net exporter in the granite industry.

## 2.3 Assessment of domestic consumption of granite

### Domestic demand for granite- overview (fiscal 2022-2024) and outlook (fiscal 2029)

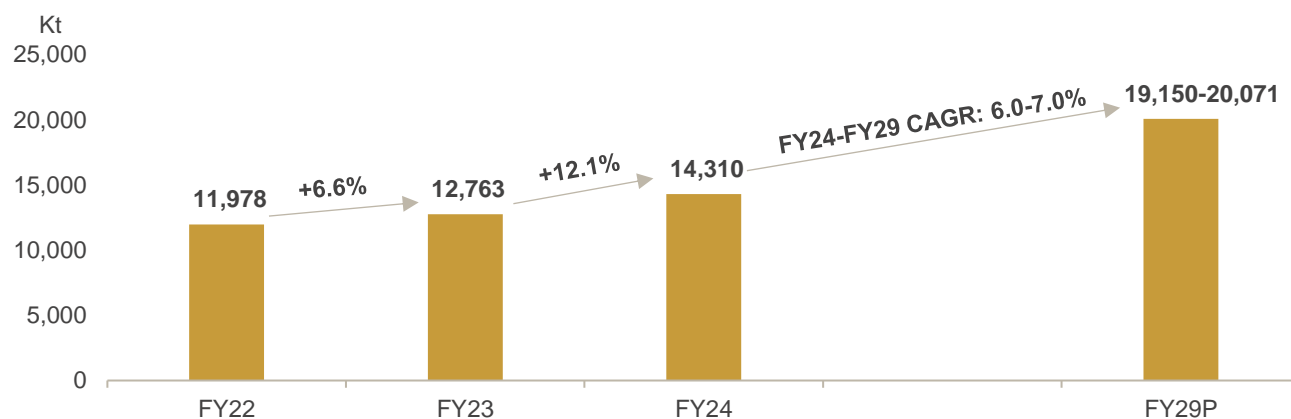


^ Average density of granite stone= 2.72 metric tonne per cubic meter

P: Projected

Source: CRISIL MI&A Consulting

### Domestic demand for granite-overview (fiscal 2022-2024) and outlook (fiscal 2029)



^ Average density of granite stone= 2.72 metric tonne per cubic meter

P: Projected

Source: CRISIL MI&A Consulting

The domestic demand for granite saw an upward trend over fiscal 2022 to fiscal 2024, increasing 9.3% CAGR. Domestic demand stood at 11,978KT in fiscal 2022, which increased 6.6% to reach 12,763 KT in fiscal 2023 and further by 12.1% to reach 14,310 KT in fiscal 2024. Indian consumption for granite blocks has increased over the years owing to increased offtake by processing industries as well as an increased demand from the residential sector.



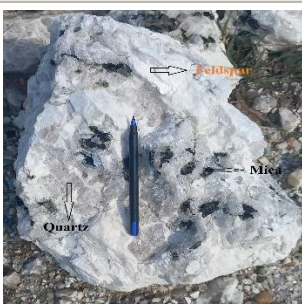
Granite's domestic demand is projected to grow to 19,150-20,071 KT in fiscal 2029, logging a CAGR of 6.0-7.0% between fiscals 2024 and 2029 driven by increased demand from housing and construction sector.

### 3 Sectoral overview of quartz

Quartz, a crystalline mineral composed primarily of silicon dioxide (SiO<sub>2</sub>), is one of the most abundant minerals found in the Earth's crust. It occurs in various forms and is widely distributed across different geological environments worldwide. It exhibits a wide range of physical and chemical properties, including hardness, transparency and resistance to chemical weathering. It has a distinctive hexagonal crystal structure and often forms well-defined crystals with six-sided prisms and pointed terminations.

Quartz occurs in a variety of geological settings, including igneous, metamorphic, and sedimentary rocks. It is commonly found in veins, pegmatites, and hydrothermal deposits, as well as in sandstone and quartzite formations and has numerous industrial applications due to its hardness, abrasion resistance, and electrical properties. It is an industrial mineral having a wide range of applications including building materials such as engineered stone, glass, and industrial application such as solar glass, foundries, refractory, crucibles, semi-conductors, fillers in paint and rubber and ceramics. Though it is abundant in nature, very few mines qualify to meet the large volume and good quality.

It is available in the following varieties:

S no	Type	Picture	Brief description
<b>Crystalline varieties</b>			
1	<b>Vein quartz</b>		Massive crystalline quartz found in mineral veins
2	<b>Milky quartz</b>		Opaque to translucent quartz with a milky appearance due to microscopic inclusions
3	<b>Pegmatite</b>		Coarse-grained igneous rocks formed from the crystallization of magma, characterized by large crystals and often containing rare minerals

**Applications areas**

Quartz is a versatile mineral with diverse properties and applications, ranging from industrial uses to decorative and ornamental purposes. Major end-use industries where quartz finds its application are as follows:

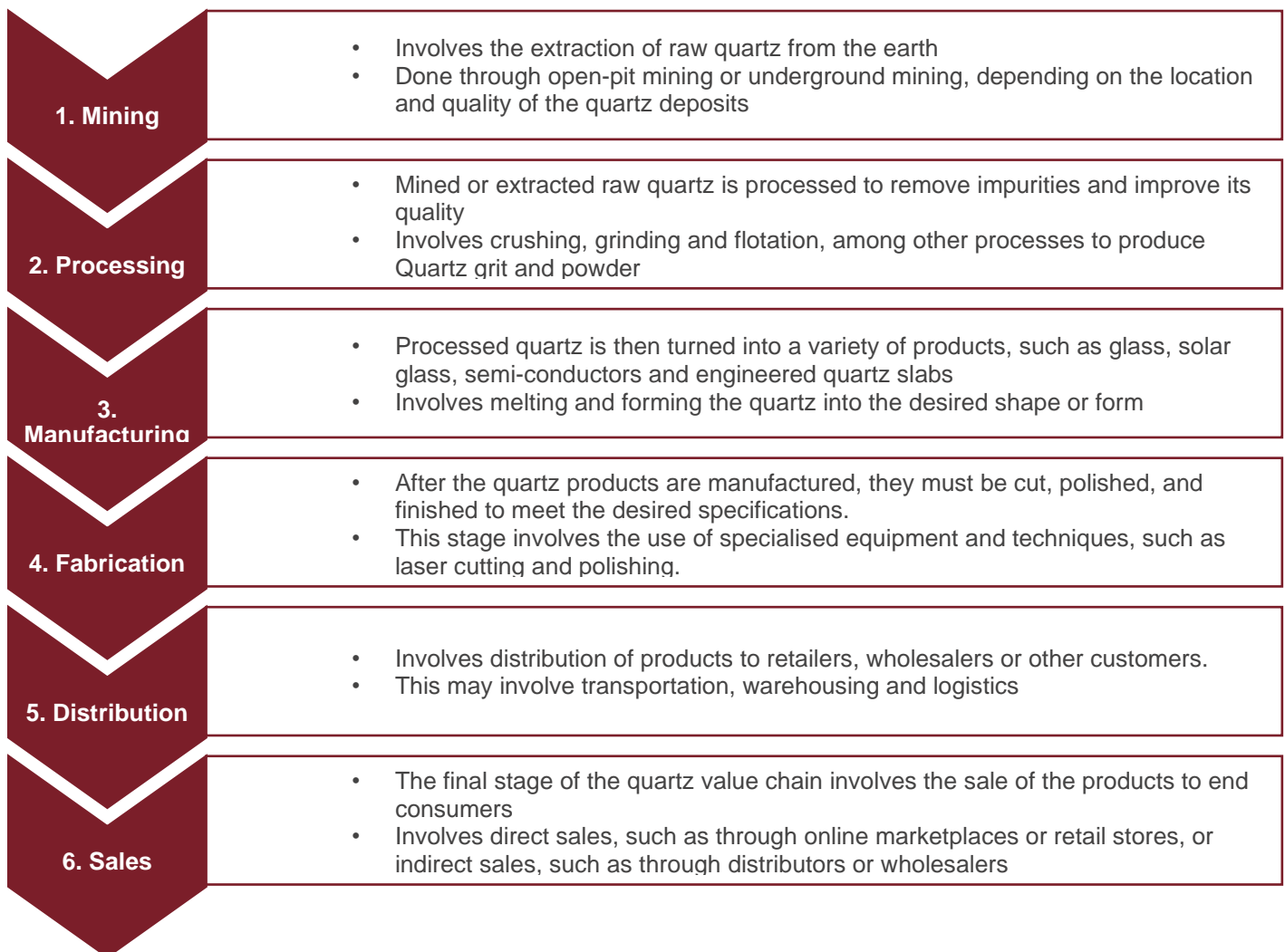
- Kitchen and bathroom countertops: Quartz is highly valued for its durability, stain resistance and wide range of colours and patterns, making it a preferred material for countertops
- Interior designing: Used for backsplashes, flooring and vanity tops in residential and commercial interiors due to its aesthetic versatility and low maintenance

Its abundance and wide distribution make it an essential component of various geological formations and a valuable resource in numerous industries worldwide.

It is a highly unorganised sector in India wherein the mines or processing facilities required to process quartz are of small scale. There are very few large-scale integrated players in India having the ability to mine, process and market it.

**Value chain of quartz**

Here are the key stages of the quartz value chain:



**After-sales service:** After the sale, the quartz products may require maintenance, repair or replacement. This stage involves providing after-sales service, such as warranty and maintenance programs, to ensure customer satisfaction and loyalty.

**Classification of quartz based on size and purity - Grit, cristobalite and high purity quartz**

Grit, cristobalite and high-purity quartz are commonly used in various industries, including the electronics, optical and materials science sectors.

Sr. no.	Quartz type	Size/properties	Application
1	<b>Grit quartz</b>	Fine powder, typically ranging from 0.1mm to 1.2mm	<ul style="list-style-type: none"> <li>• Abrasive blasting: Used to clean and polish surfaces through abrasive blasting, which involves blowing compressed air or water through a nozzle to remove impurities and smooth out surfaces</li> <li>• Abrasive cutting: Used in abrasive cutting tools, such as saw blades and grinding wheels, to cut through hard materials, such as metal, stone and manufacture engineered stone</li> <li>• Water filtration: Used in water filtration systems to remove impurities and contaminants from water</li> <li>• Used in manufacturing of Engineered Slab Industry, Solar and Glass Industries</li> </ul>
		0.1mm to 1.2mm	<ul style="list-style-type: none"> <li>• Solar glass manufacturing: For production of solar glass used in solar panels</li> <li>• Used in manufacturing of Engineered Slab Industry, Solar and Glass Industries</li> </ul>
2	<b>Cristobalite</b>	Fine grain sized, typically ranging from 0.1 to 1 micron in diameter	<ul style="list-style-type: none"> <li>• Electronics: Used in electronic components, such as semiconductors and transistors, owing to its high thermal conductivity and electrical insulation properties</li> <li>• Optical: Used in optical lenses and prisms because of its high refractive index and optical transparency</li> <li>• High-power electronics: Used in high-power electronic devices, such as power transistors and diodes, owing to its high thermal conductivity and electrical insulation properties</li> </ul>
3	<b>High purity quartz</b>	High purity level, typically having SiO <sub>2</sub> purity above 99.99%	<ul style="list-style-type: none"> <li>• Electronics: Used in semiconductors and transistors, owing to its high purity level and electrical insulation properties</li> <li>• Optical: Used in optical lenses and prisms because of its high refractive index and optical transparency</li> <li>• Advanced material: Used in piezoelectric material and optical fibres</li> <li>• Solar cells: Used in the production of solar cells. Low-iron sands and dolomite are used to make the glass cover for solar panels. The low-iron properties help increase light transmission, which maximises the level of electricity generation</li> </ul>

Quartz grit and powder are essential materials in the manufacturing of engineered stone and solar glass. They are used as the primary components in the production of high-quality, durable and energy-efficient products.

Prices of different types of quartz by grade and related products are as follows:



Product name	Unit*	Price range
Quartz Grit	INR/Ton	13,000-15000
Quartz Powder	INR/Ton	9,000-11,000
Feldspar	INR/Ton	6,500-7,000
Mica	INR/Ton	17,136-17,388
Solar grade Grit	INR/Ton	6,300-6,500
High Purity Quartz sand (Quartz crucible for the outer layers)	INR/Ton	226,100-357,000
High Purity Quartz sand (Quartz crucible for the middle layer)	INR/Ton	416,500-595,000

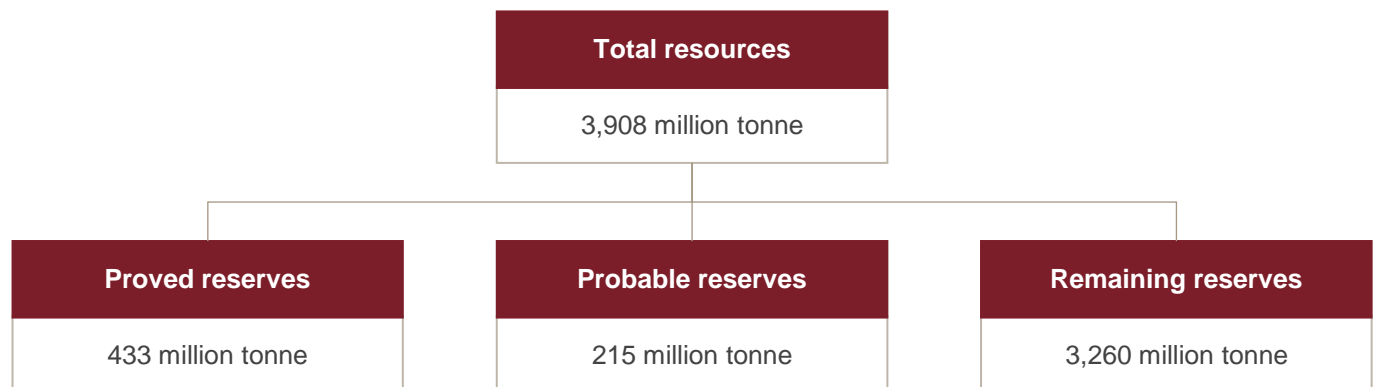
Source: Industry, CRISIL MI&A Consulting

\*Conversion factor taken as, 1USD=84INR, 1CYN=11.9INR

### 3.1 Overview of the quartz market in India

#### 1. State-wise quartz and silica sand reserves and resources available in India

The total quartz and silica sand resources in India as on April 1, 2015 is estimated to be 3,908 million tonne, the details of which are:

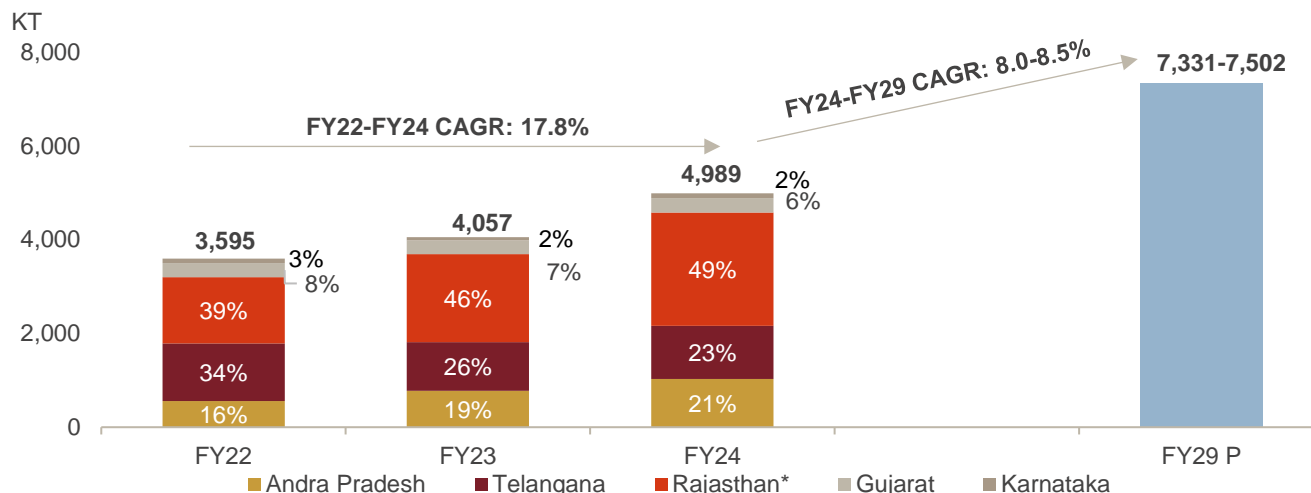


Source: IBM

Out of the total resources of 3,908 million tonne, ~11% (~433 million tonne) are proved reserves-resources that have been discovered, have a known size and can be extracted at a profit. Around 215 million tonne of the total resources are probable reserves- with odds of commercial extraction over 50-90%, with 3,260 million tonne accounting for the rest. Rajasthan houses 55% of the proved reserves, followed by Andhra Pradesh (~22%), Tamil Nadu and Gujarat (~6% each).

The silica sand includes sands and gravels with high silicon dioxide (SiO<sub>2</sub>) content. These sands are used in glassmaking; for foundry, abrasive, and hydraulic fracturing (frac) applications.

**Quartz production review (fiscal 2022-2024) and outlook (fiscal 2029)**



\*Numbers reflective of dispatches

P: Projected

Source: State DGMS and websites, CRISIL MI&A Consulting

The quartz production saw tremendous increase over fiscal 2022-2024, logging a CAGR of 17.8% to 4,989 KT in fiscal 2024 from 3,595 KT in fiscal 2022. The increase is mainly derived by higher exports and domestic demand for quartz and its products in glass, foundry, ferroalloys, refractory industries and building materials industry.

Rajasthan is the largest producer of quartz in India and accounted for almost 49% (~2,420 KT) of the produce in fiscal 2024. Other significant quartz producing state include Telangana and Andhra Pradesh, which accounted for 23% (~1,133 KT) and 21% (~1,029 KT), respectively, of the production in fiscal 2024. Andhra Pradesh's share of production has significantly increased over the years from 16% (~561 KT) in fiscal 2022 to 21% in fiscal 2024.

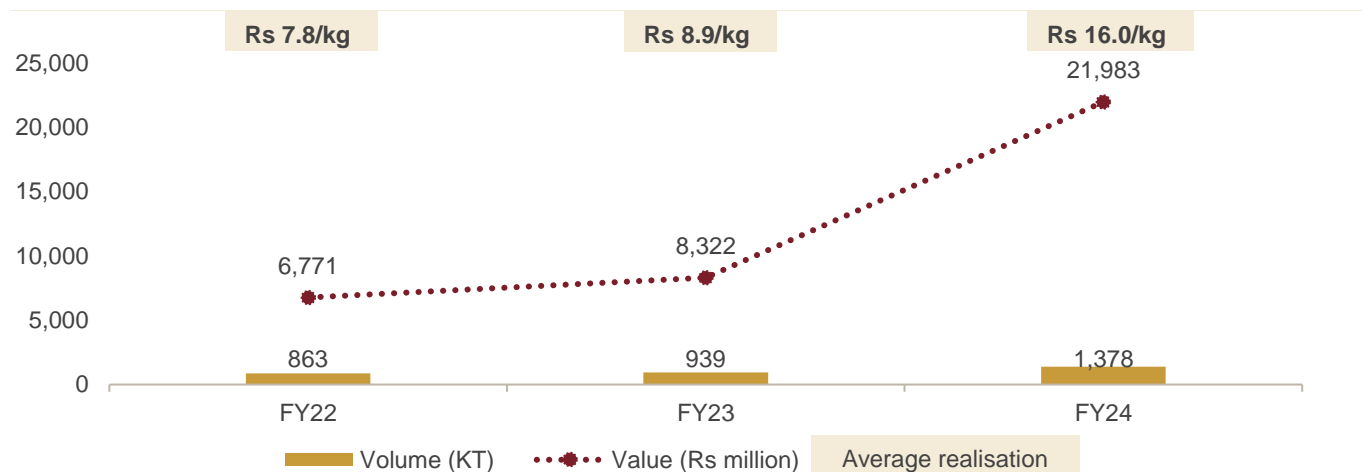
The quartz industry is projected to register a CAGR of 8-8.5% and the production is expected to reach 7,331-7,502 KT in fiscal 2029 from the 2024 level. The demand for quartz and quartzite has been increasing over the years to cater to the requirement of refractories, glass and engineered stone industries.

### 3.2 Trade overview – Quartz

#### Exports

In fiscal 2022, India exported 863 KT of quartz valued at Rs 6,771 million, which steadily grew over the subsequent years. In fiscal 2023, the export volume increased to 939 KT, representing a growth rate of ~8.82%, with the export value rising to Rs 8,322 million. In fiscal 2024, the export volume further rose to 1,378 KT, reflecting a notable growth rate of ~47%, while the export value saw a significantly higher growth rate, reaching Rs 21,983 million. However, despite robust growth in export volume and value, the export values increased 164% at a much higher rate in fiscal 2024.

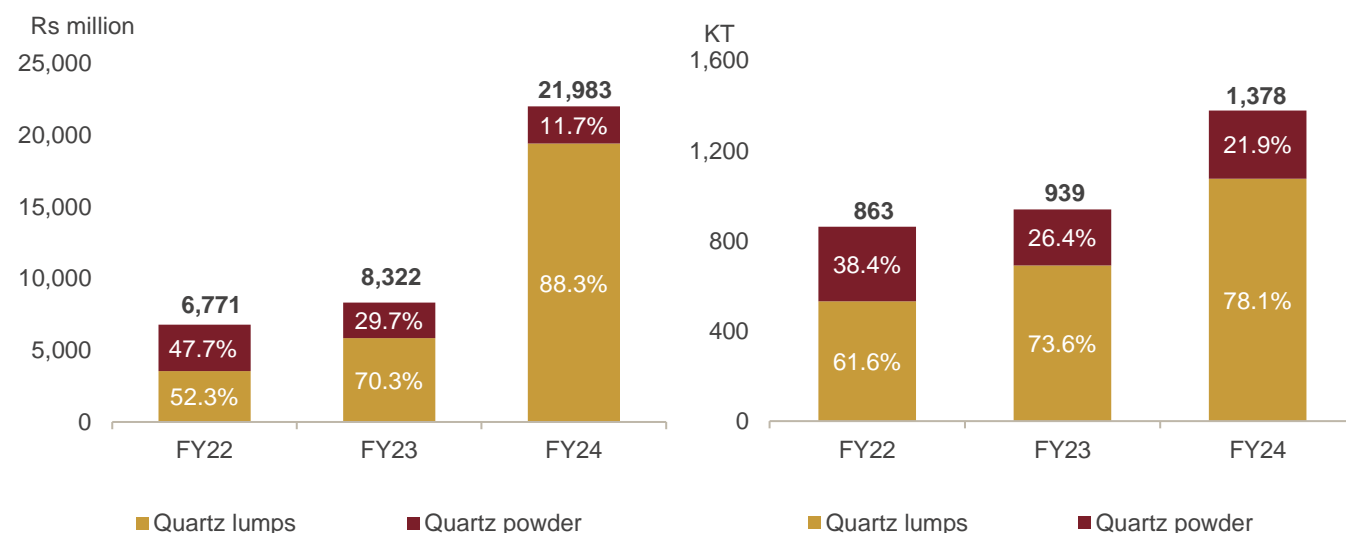
**Quartz exports trend by value and volume over fiscals 2022-2024**



Source: DGFT, CRISIL MI&A Consulting

Quartz from India are exported in the form of lumps as well as powder.

**Quartz exports bifurcation based on Quartz lumps and Quartz powder (value and volume over fiscals 2022-2024)**



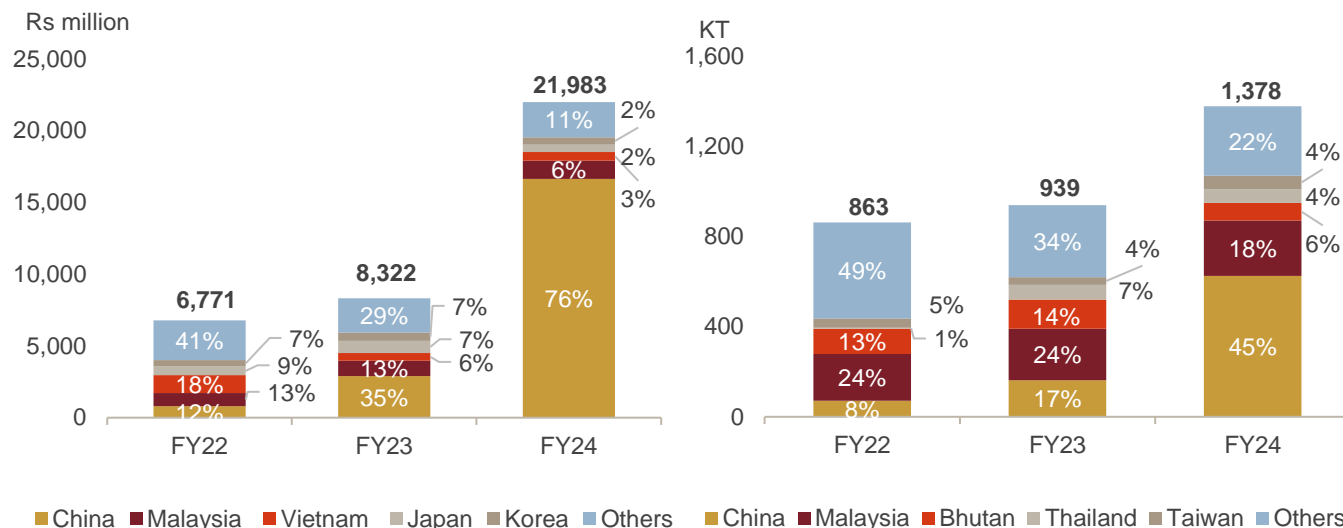
Source: DGFT, CRISIL MI&A Consulting

The share of quartz lumps exports in overall quartz exports has increased over fiscals 2022-2024. While the share of quartz lumps in overall export volumes increased from 61.6% in fiscal 2022 to 78.1% in fiscal 2024, its share in overall quartz exports value increased much faster (from 52% in fiscal 2022 to 88% in fiscal 2024), highlighting a significant increase in the average exports' realisations from quartz lumps.

In fiscal 2024, quartz lumps exports of ~1,076 KT was valued at ~Rs 19,406 million.

Quartz powder accounted for ~11.7% of overall quartz export value (~Rs 2,578 million) and ~21.9% by volume (~302 tonne), highlighting lower average realisations from exports when compared to quartz lumps. Its share has decreased over fiscals 2022-2024.

**Country-wise quartz export value and volume over fiscals 2022-2024**



Source: DGFT, CRISIL MI&A Consulting

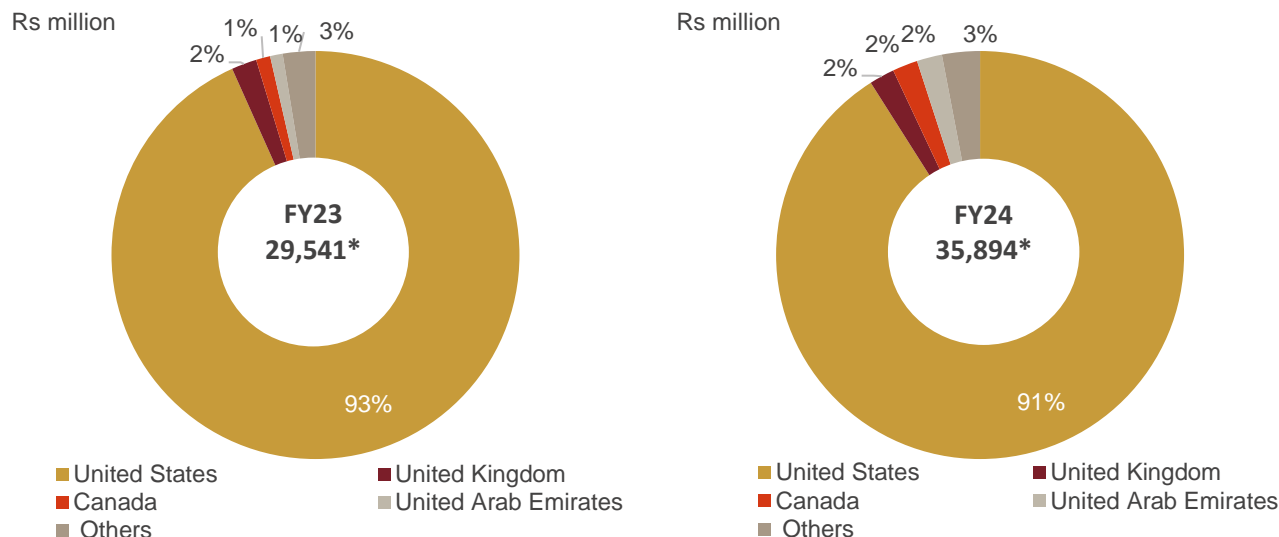
In fiscal 2024, China, Malaysia, Vietnam, Japan and Korea emerged as the dominant players in the quartz export market, collectively accounting for 89% of the total export value. This represents a decent increase from their combined share of 71% in fiscal 2022 and 59% in fiscal 2023. China stood out as the leading importer, responsible for 45% of volumes import in fiscal 2024, marking a substantial rise from its previous minimal share. While exports to China contributed 76% of the total export value, the export volumes constituted only 45%. Conversely, Malaysia's share in export volume was 18%, yet its contribution to export value was just 6% in fiscal 2024, suggesting that China paid a higher price for the quartz it imported. This pricing trend persisted over three years, potentially driving the overall increase in export share to China.

**Engineered Quartz Slab**

Quartz grit is used for manufacturing of Engineered slabs. Quartz grit is a type of abrasive material that is used to create a uniform and consistent texture in engineered stones and slabs. It is made by crushing and grinding natural quartz into small particles, which are then mixed with a binding agent and other materials to create a composite material. The resulting product has a smooth, uniform texture and is used in the production of countertops, vanities and other decorative surfaces.

The global demand for engineered quartz slabs has led to a significant surge in exports from major producing countries. China, India, and Turkey are among the top exporters of engineered quartz slabs.

**Engineered quartz slabs exports from India- by value for fiscals 2023 and 2024**



\* FOB Value

Source: Industry, CRISIL MI&A Consulting

The total exports market of Quartz Slabs increased at significant rate of 21.5% from Rs 29,541 million in fiscal 2023 to Rs 35,894 million in fiscal 2024.

United States (US), United Kingdom (UK), Canada and United Arab Emirates are the top importers of Indian Quartz Slabs. The US market accounted for ~93% (Rs 27,474 million) and ~91% (Rs 32,663 million) of total engineered quartz slabs exported from India in fiscal 2023 and 2024 respectively. India is a significant exporter of quartz slabs to the US market with a long-standing reputation for quality craftsmanship and innovative designs.

The surge in India's quartz slab exports to the US can be attributed to several key factors, including its vast manufacturing capacity, competitive pricing, and a well-established network of exporters and distributors. By capitalizing on these strengths, Indian manufacturers are able to offer a diverse range of high-quality quartz slabs that meet the exacting standards of the US market.

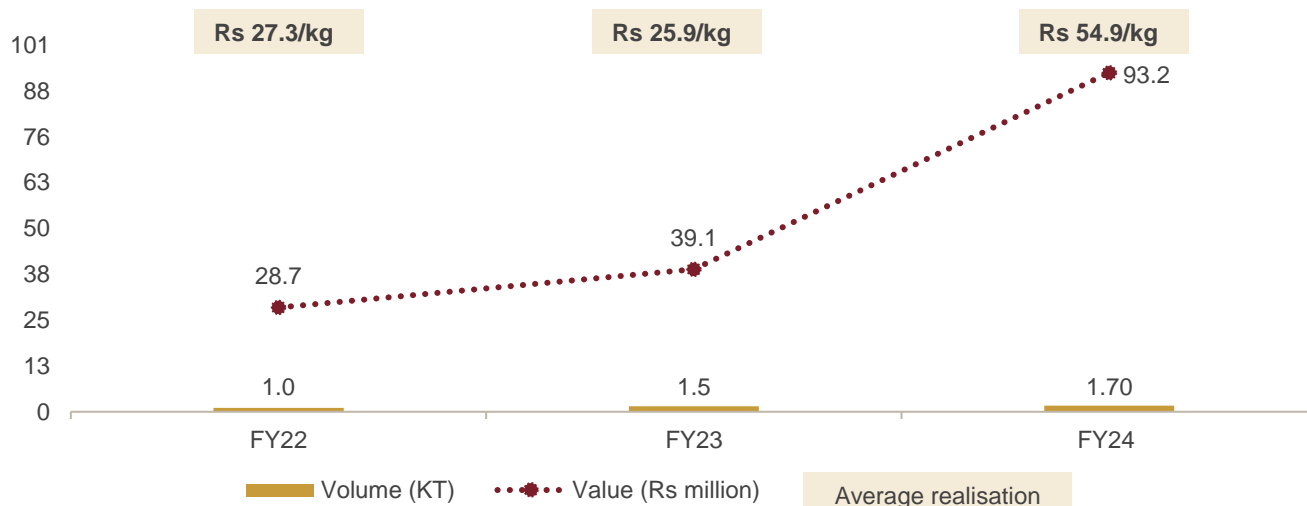
As the global construction and interior design industries increasingly seek out durable and low-maintenance surfacing materials, India's engineered quartz slab exports are poised to continue their upward trajectory, driven by growing demand.

As mentioned in the annual report of 2022-2023 of Global Surfaces, the global engineered stone market size reached US\$ 24.7 billion in 2023. Looking forward, it is expected that the market to reach US\$ 38.7 billion by 2032, exhibiting a growth rate (CAGR) of 5.12% during 2024-2032. The engineered quartz stone market in India has been experiencing significant growth, with an estimated value of \$3,643 million in 2022. It is projected to grow at a compound annual growth rate (CAGR) of 7-8% between 2022 and 2027, reaching \$7,355 million by 2032.

**Imports**

In fiscal 2022, India imported 1 KT of quartz valued at Rs 28.7 million. In the subsequent years, both import volumes and values showed an increasing trend. In fiscal 2023, the import volume increased 44.47% to reach 1.5 KT, while the import value increased 36.56% and stood at Rs 39.1 million. Notably, in fiscal 2024, the import volume remained relatively stable at 1.7 KT, but the import value experienced a remarkable 138.18% surge, reaching Rs 93.2 million. This highlights that while both import volumes and values have been increasing, the latter has escalated at a much higher pace, suggesting potential shifts in market or demand-supply dynamics.

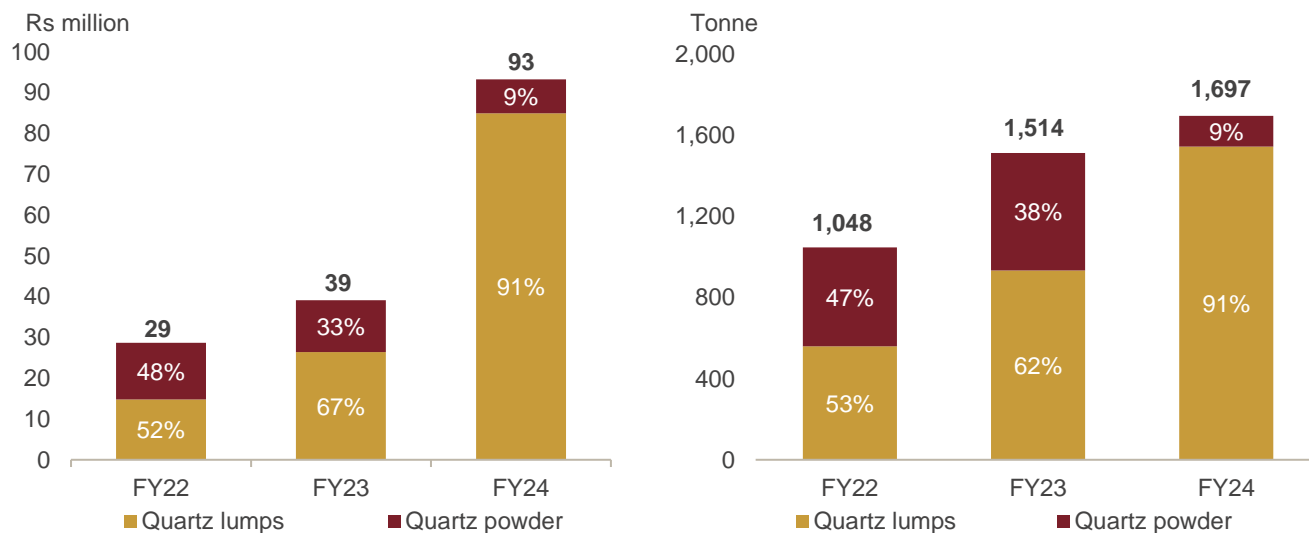
**Quartz imports trend by value and volume over fiscals-2024**



Source: DGFT, CRISIL MI&A Consulting

Quartz is imported in the form of lumps as well as powder.

**Quartz imports bifurcation based on Quartz lumps and Quartz powder (value and volume over fiscals 2022-2024)**



Source: DGFT, CRISIL MI&A Consulting

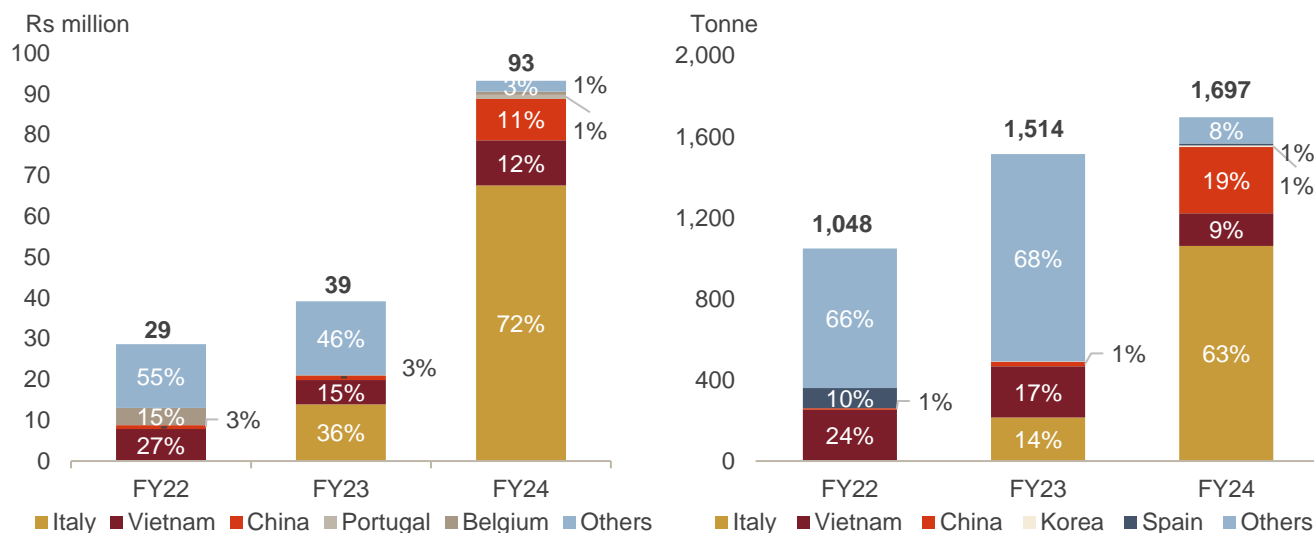
The share of quartz lumps in overall imports has increased over fiscals 2022-2024. While the share of quartz lumps in overall import volumes increased from 53% in fiscal 2022 to 62% in fiscal 2023, its share in overall quartz imports value increased faster (from 53% in fiscal 2022 to 67% in fiscal 2023), highlighting an increase in average import costs for quartz lumps. In fiscal 2024, quartz lumps accounted for 91%, both value wise (~Rs 85 million) and volume wise (~1,546 tonne).

Quartz powder accounted for 9% of overall quartz import value (~Rs 8 million) and volume (~151 tonne). Its share has decreased over fiscals 2022-2024.

In fiscal 2024, Italy, Vietnam, China, Portugal, and Belgium emerged as the key players in quartz imports, collectively contributing 97% of the total imports value. This represents a substantial increase from their combined contribution

of 45% in fiscal 2021 and 55% in fiscal 2023. Notably, Italy dominated the market in fiscal 2024, accounting for 72% of import value, marking a significant rise from its negligible presence in previous years. Vietnam's share declined from 27% in fiscal 2021 to 12% in fiscal 2024. Belgium also experienced a reduction in its import value share. The US, previously a major player with a 10% share in fiscal 2021 and 20% in fiscal 2023, recorded negligible exports in fiscal 2024.

**Country-wise quartz import value (in lakh) and volume (in tonne) over fiscals-2024**



Source: DGFT, CRISIL MI&A Consulting

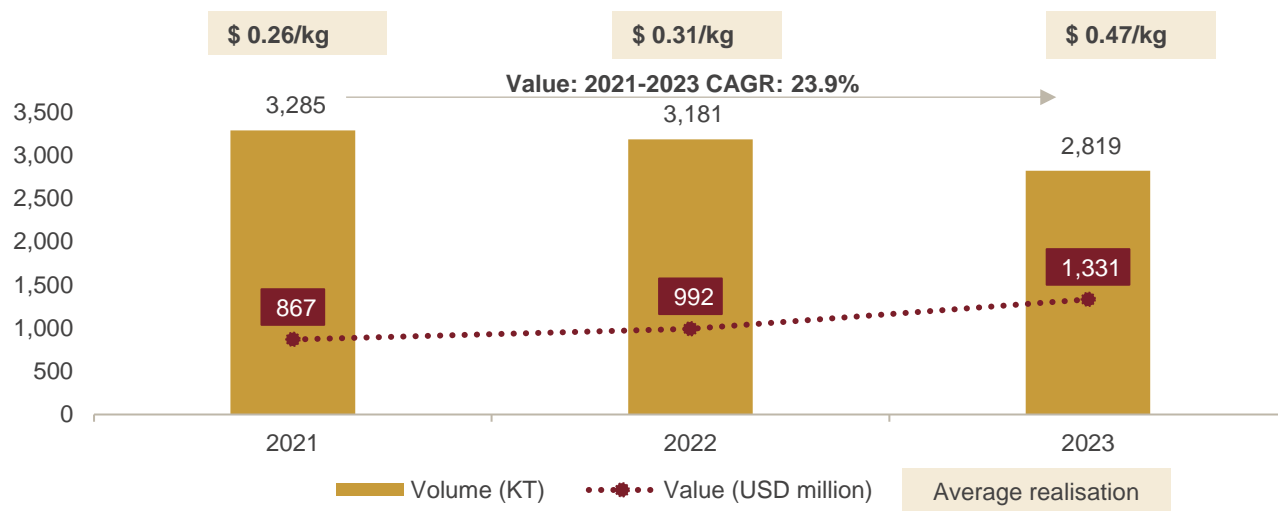
In fiscal 2024, the quartz import landscape witnessed a significant transformation, with Italy, China, Vietnam, Korea and Spain emerging as the five major players collectively responsible for 92% of total volume of quartz imports. This marked a substantial increase from their relatively modest contribution of 34% in fiscal 2022 and 32% in fiscal 2023. Notably, Italy emerged as the largest importer, accounting for 63% of quartz imports in fiscal 2024- a remarkable rise from its minimal share in preceding years. There has been a growing preference for sanitaryware, and other bathroom products, such as sinks, wash basins and bathtubs made from quartz imported from Italy. Similarly, China saw a noteworthy surge, with its share increasing from a mere 1% in fiscals 2022 and 2023 to 19% in fiscal 2024. However, amidst these developments, Vietnam, previously a significant player in the market, witnessed a dramatic decline, virtually ceasing imports in fiscal 2024 after consistently exporting substantial volumes in earlier years.

Between fiscals 2022 and 2024, India consistently exported significantly larger volumes and values of quartz, compared with the imports. This trend indicates that India is a net exporter in the industry.

**Global Quartz trade**

In 2021, global quartz imports were 3,285 KT, valued at USD 867 million, which stood at 2,819 KT, valued at USD 1,331 million in 2023.

**Quartz global imports trend by value and volume over fiscals 2021-2023**

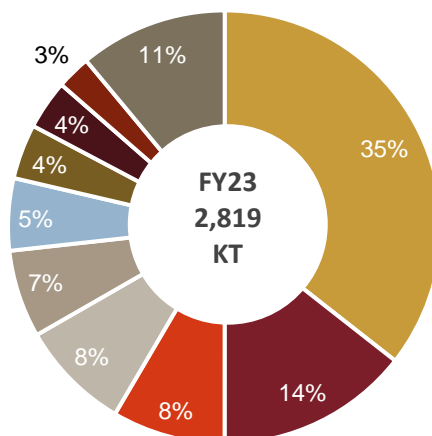


Note: Volume analysis based on reported countries' data

Source: World Integrated Trade Solution, CRISIL MI&A Consulting

During 2021-2023, while volumes declined, the value increased at a CAGR of 23.9%, highlighting an increase in average realisations.

**Country-wise imports trend by volume for fiscal 2023**



China Norway Canada Malaysia France Italy United States Iceland Germany Others

Note: Volume analysis based on reported countries' data

Source: World Integrated Trade Solution, CRISIL MI&A Consulting

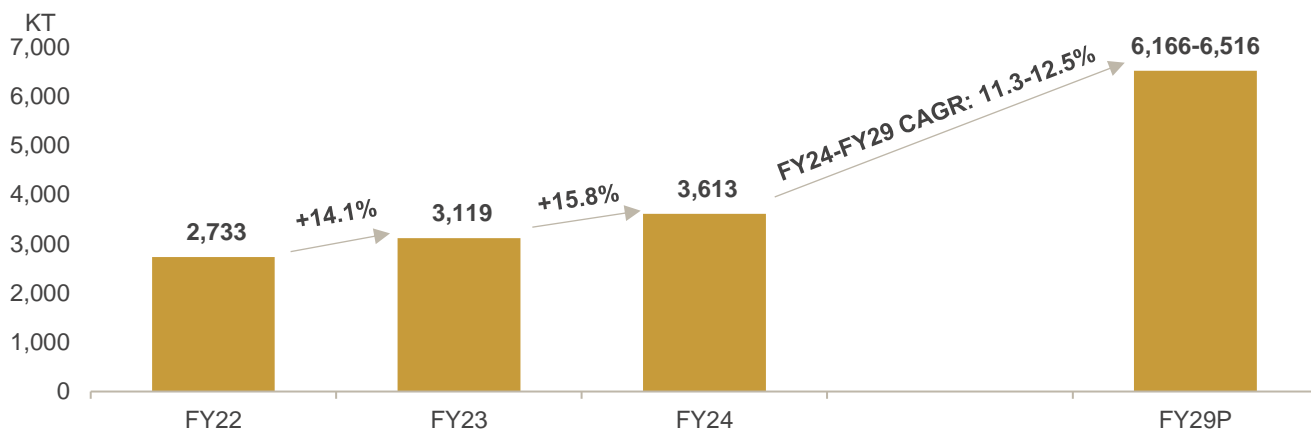
During 2023, top 9 importers- China, Norway, Canada, Malaysia, France, Italy, US, Iceland and Germany contributed to 89% (~2,498 KT) of the global imports by volumes. China topped the list of importers, accounting for 35% (~999 KT) of the global imports, followed by Norway and Canada.



The value contribution of these 9 players stood USD 1,058 million, ~80% of the total value of global imports.

### 3.3 Assessment of domestic demand of quartz

#### Domestic demand of quartz- review (fiscal 2022-2024) and outlook (fiscal 2029)



*P: Projected*

Source: CRISIL MI&A Consulting

The domestic demand for quartz saw an upward trend over fiscal 2022-2024, logging a significant CAGR of 15.0%.

The domestic demand stood at 2,733 KT in fiscal 2022, which increased 14.1% to reach 3,119 KT in fiscal 2023 and further by a greater 15.8% to stand at 3,618 KT in fiscal 2024.

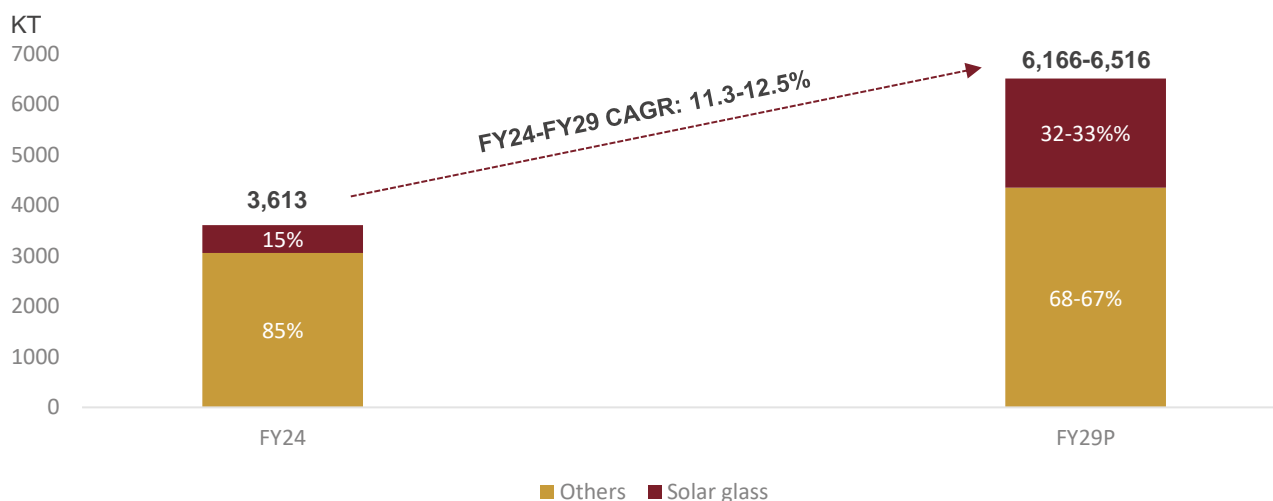
The requirements of these products are linked directly to the iron and steel industry, including alloy steel production, and sunrise industries like Solar, Electronics, Glass and Slabs. There are large prospects of increasing the production and the export of quartz and silica minerals to the neighbouring countries.

The quartz domestic demand is projected to register a CAGR of 11.3-12.5% and the consumption is expected to reach 6,166-6,516 KT in fiscal 2029 from the 2024 level, driven construction, solar glass, electronics and engineered stone industries.

#### Quartz for solar glass

Quartz is a crucial component in the production of solar glass, a high value glass used in solar panels to convert sunlight into electricity. The grit is a premium quality product in which the iron content is lower than 100-120 ppm, making it a suitable raw material to produce solar panel glass. Quartz grit constitutes ~65-70% of raw material used to produce the glass for solar panels. It is mixed with other materials and melted to create a thin, flexible sheet of glass that can be used in solar panels.

**Domestic demand of quartz by end use applications (solar glass vs others)**



*P: Projected*

*Note: Others- includes all the applications other than solar glass like- engineered stone, electronics etc.*

*Source: CRISIL MI&A Consulting*

In fiscal 2024, the demand for quartz to manufacture solar glass is estimated to be ~520-560 KT, accounting for ~15% of overall quartz demand. Others include the share from other applications such as engineered stone and electronics, among others.

Currently, India has high import dependency for solar glass where almost 65% of demand is met through imports and the rest (~35%) through domestic supply. But this scenario is expected to reverse in next 4-5 years with domestic supply to increase to 70-80% by fiscal 2029. Over 1.2 mnT of solar glass manufacturing capacity is planned by various players in the country over the next 4-5 years. The demand for quartz to manufacture solar glass is expected to increase at a strong CAGR of 30.7%-31.4%% to reach ~2,100-2,160KT in fiscal 2029, accounting for ~32-33%% share of overall quartz demand, driven by an expected increase of ~140 GW of solar capacity additions over fiscal 2025-2029.

Midwest, with a planned capacity addition of 0.5 mnT of quartz grit used for solar glass -manufacturing is expected to cater to 15-18% of the demand in fiscal 2029.

1. Growth drivers for solar industry in the country are as follows: Other central schemes: The Solar Energy Corporation of India (SECI) has also started tendering projects outside the JNNSM Batch programme. It has initiated the Inter-State Transmission System (ISTS) scheme, wherein projects are planned for connection with the ISTS grid directly. Under this, the SECI has already tendered and allocated more than 35 GW (including hybrid).
2. State solar policies: ~24 GW of projects are under construction and are expected to be commissioned over fiscals 2025-2029. Based on tendered capacities by states as of June 2024, a further ~24 GW worth of solar projects are expected to be up for bidding over the same duration.
3. PSUs: The Central Public Sector Undertaking (CPSU) programme under JNNSM has been extended to 12 GW in February 2019. The government is also encouraging cash-rich PSUs to set up renewable energy projects. In particular, NTPC has already commissioned a total of over ~2,120 MW of capacities, allocated ~5 GW, and tendered a further ~1 GW, under various schemes. It has a target of installing ~35 GW of renewable energy capacities by fiscal 2028. Similarly, NHPC had allocated 2 GW of projects in 2020, while

the Indian Railways has committed to 20 GW of solar power by 2030. Other PSUs such as NLC, defence organizations, and governmental establishments are also expected to contribute to this addition.

4. Rooftop solar projects: We expect 20-22 GW of rooftop solar projects (under the capex and opex mode) to be commissioned by fiscal 2029, led by PM Surya Ghar Yojana and industrial and commercial consumers under net/gross metering schemes of various states.
5. Open-access solar projects: We expect 13-15 GW of open-access solar projects (under the capex and opex mode) to be commissioned by fiscal 2029, led by green energy open access rules 2022, sustainability initiatives/RE 100 targets of the corporate consumers, better tariff structures and policies of states such as Uttar Pradesh and Karnataka, which are more long term in nature.
6. Push for Green hydrogen: Production for green hydrogen is expected to start from fiscal 2026 with production of 0.5-1 million tonnes of production. Government has set the target production of 5 million tonnes of green hydrogen by 2030. As per announcement, we expect 2.0-2.2 MTPA of green hydrogen to commission which can lead to further upside of solar capacity of 32-37 GW, by fiscal 2029. However, since developers may tie-up via grid / open access and not go to the captive route generation under this segment will remain a monitorable.
7. Renewable generation obligation (RGO): As per the guidelines upcoming coal plants are obligated to establish renewable generating capacity at a minimum of 40% of their generating capacity. This will be applicable for plant commissioning from April 2023 onwards. Plant commissioning prior to March 2025 will be required to achieve 40% RGO by April 1st, 2025. All plants commissioning after April 1st 2025 will be required to comply with RGO from the day of commissioning. However, upcoming coal power plants may also tie-up these capacities via the grid or open access as most of these projects would be in advanced stages of construction, where land and financing would already be tied-up. Hence, this segment may possibly add capacity of 8-10 GW by fiscal 2029, which as per tie-up is an upside to our current outlook.

Further, an amendment to open access regulations via the green energy open access rules through energy banking regulations, changes in minimum contract demand, standardizing calculation of charges, etc will solve the key issues of high levies, absence of banking provisions, and standardization across procedures prevalent in the open access market.

## 4 Sectoral overview- heavy mineral sand minerals

Heavy minerals sand, occur as placer deposits, are formed by the action of water and wind concentrating valuable minerals from weathered rocks in coastal and near-coastal environments. Heavy minerals have a higher density than typical sand minerals, which causes them to concentrate in certain areas through the action of waves and currents.



**Heavy minerals sand**-They are found on beaches, often in the form of sand and include:




- Quartz: The most abundant mineral, forming the bulk of sand on most beaches
- Feldspar: Another common mineral, often found alongside quartz
- Mica: Flaky minerals that can be present in small amounts
- Magnetite: A heavy, magnetic mineral often black or dark brown in colour

### 4.1 Overview of heavy mineral sand

Mineral sand deposits are characterised by their grade (the percentage of heavy minerals found in a particular deposit) and their assemblage (the relative proportion of different products of heavy minerals like ilmenite, zircon, etc. in the beach sand deposit). A typical composition of a mineral sands deposit has a heavy mineral grade ranging from 0.5% to above 20%. It means 100 tonnes of heavy minerals' beach sand deposit contain heavy minerals in the range of 0.5 to 20 tonnes.

Common heavy minerals sand include:

Sr. no.	Heavy mineral sand	Picture	Brief description
1	<b>Rutile</b>		A titanium dioxide mineral, also an important source of titanium, valued for its high purity and brightness in pigments
2	<b>Ilmenite</b>		An iron titanium oxide, a major source of titanium dioxide, used in pigments, cosmetics and aerospace components

Sr. no.	Heavy mineral sand	Picture	Brief description
3	Garnet		A hard, dense mineral, having a vitreous lustre, which means it has a glass-like appearance used as an abrasive and in water filtration
4	Zircon		A zirconium silicate, used in ceramics, refractory materials and as a foundry sand due to its high melting point and resistance to corrosion
5	Monazite		A phosphate mineral containing rare earth elements, thorium and uranium. Rich in rare earth elements, essential for electronics, renewable energy technologies and various advanced materials

Source: Industry

The two main product streams of heavy minerals are:

- 1. Titanium dioxide minerals:** The titanium dioxide minerals are ilmenite, rutile, and leucoxene. Ilmenite is also used to manufacture titanium slag and synthetic rutile products; and
- 2. Zircon minerals**

The titanium dioxide products (ilmenite, rutile, etc.) are normally in the greater preponderance, relative to zircon. It has been observed that in a typical heavy mineral deposit, an average ratio of titanium dioxide minerals to zircon is around 5:1 i.e. heavy mineral consists of 83.3% of titanium dioxide minerals and 16.7% of Zircon.

Australia, South Africa, India and Mozambique are key producers of heavy mineral sands. Countries such as Kenya, Madagascar and Sri Lanka are developing their heavy mineral sand mining capabilities, contributing to global supply.

In India, heavy minerals are mainly found along the country's coastal areas and inland placers.

According to IBM and the letter received from Department of Atomic Energy, Mumbai dated July 26, 2018, the details of total reserves and resources are as follows:

Mineral	Unit	Reserves/resources#
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<b>Ilmenite*</b>	<i>Million tonne</i>	629.57
<b>Rutile</b>	<i>Million tonne</i>	33.95
<b>Zircon</b>	<i>Million tonne</i>	33.71
<b>Garnet</b>	<i>Million tonne</i>	56.01
<b>Monazite</b>	<i>Million tonne</i>	12.73
<b>Sillimanite</b>	<i>Million tonne</i>	72.26
<b>Titanium (P)</b>	<i>Million tonne</i>	427.12

Source: IBM

Note: As per the letter received from Department of Atomic Energy, Mumbai dated July 26, 2018. The resources of beach sand minerals (BSM) viz. Ilmenite, Rutile, Zircon, Garnet, leucoxene, monazite and Sillimanite were last updated in 2016 by AMD.

P: Provisional (IBM)

# Inclusive of indicated, inferred and speculative categories

\* Including leucoxene

^The yield for Ilmenite is ~44-70% and that of Rutile is ~90-95% (titanium feedstock)

Prices of Heavy minerals sand are as follows:

<b>Mineral</b>	<b>Unit*</b>	<b>Price range</b>
Ilmenite (TiO <sub>2</sub> ≥56%)	<i>INR/Ton</i>	57,120-59,500
Rutile (TiO <sub>2</sub> ≥90%)	<i>INR/Ton</i>	173,740-192,780
Zirconium Dioxide (Zr (Hf)O <sub>2</sub> ≥99.5%)	<i>INR/Ton</i>	583,100-595,000
Sillimanite	<i>INR/Ton</i>	21,672-22,008
Garnet	<i>INR/Ton</i>	26,000-27,000
Monazite Concentrate	<i>INR/Ton</i>	470,050-493,850
High Titanium Slag (TiO <sub>2</sub> ≥90%)	<i>INR/Ton</i>	85,680-88,060
Titanium Concentrate (TiO <sub>2</sub> ≥47%)	<i>INR/Ton</i>	29,750-31,654

Source: Shanghai Metals Market

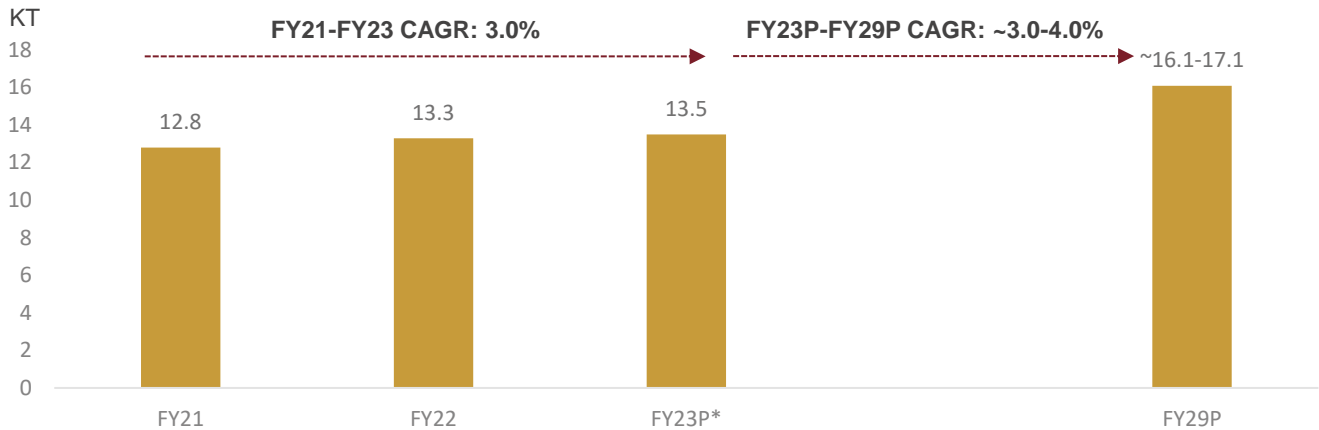
\*Conversion factor taken as, 1USD=84INR, 1CYN=11.9INR

Note: prices as of September 2024

## Rutile

Rutile is a mineral composed primarily of titanium dioxide (TiO<sub>2</sub>). It is a significant ore of titanium and known for its high refractive index and optical dispersion, making it valuable in various industrial applications. It is a mineral with a distinctive combination of red, reddish-brown, yellow and black colours, exhibiting adamantine to metallic lustre.

### Domestic production review- Rutile



*P: provisional*

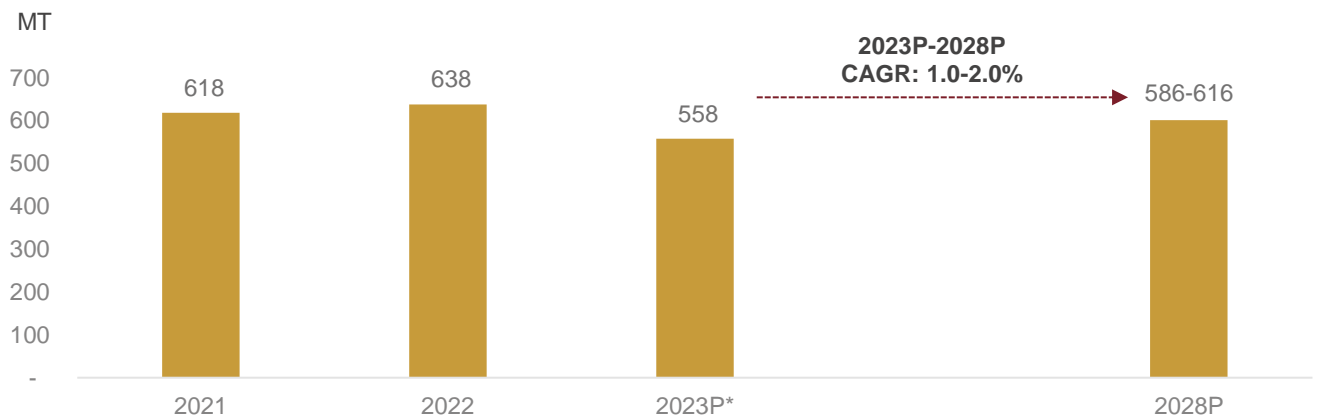
Sources: IBM

The domestic production of rutile increased from 12.8 KT in fiscal 2021 to 13.4 KT in fiscal 2023, clogging a CAGR of 3.0%. In India, the production of rutile is done by only 2 players- Indian Rare Earths Limited (IREL) and Kerala Minerals and Metals Ltd (KMML), accounting for ~89% and 11%, respectively, in overall domestic production for rutile.

During fiscals 2023-2029, the domestic production of Rutile is expected to increase at a similar CAGR of ~3.0% to reach ~16.1-17.1 KT.

The prices of Rutile were in the range of Rs 92,138- 93,052 per tonne during fiscal 2020, as reported by IBM.

**Global production review- Rutile**



*P: provisional*

Sources: USGS

Global production of rutile stood at 558 MT in 2023. In 2023, the global production of rutile experienced a decline because of reduced production in Ukraine which accounted for 15% (~95 MT) in 2022 and just 9% (50MT) in 2023 of the overall rutile production, caused by the ongoing Russia-Ukraine war. Major producers around the globe for rutile include Australia, South Africa and Sierra Leone.

During 2023-2028, the global production of Rutile is expected to increase at a CAGR of 1.0-2.0% to reach ~586- 516 MT, driven by global demand for titanium minerals.



Rutile finds its application as follows:

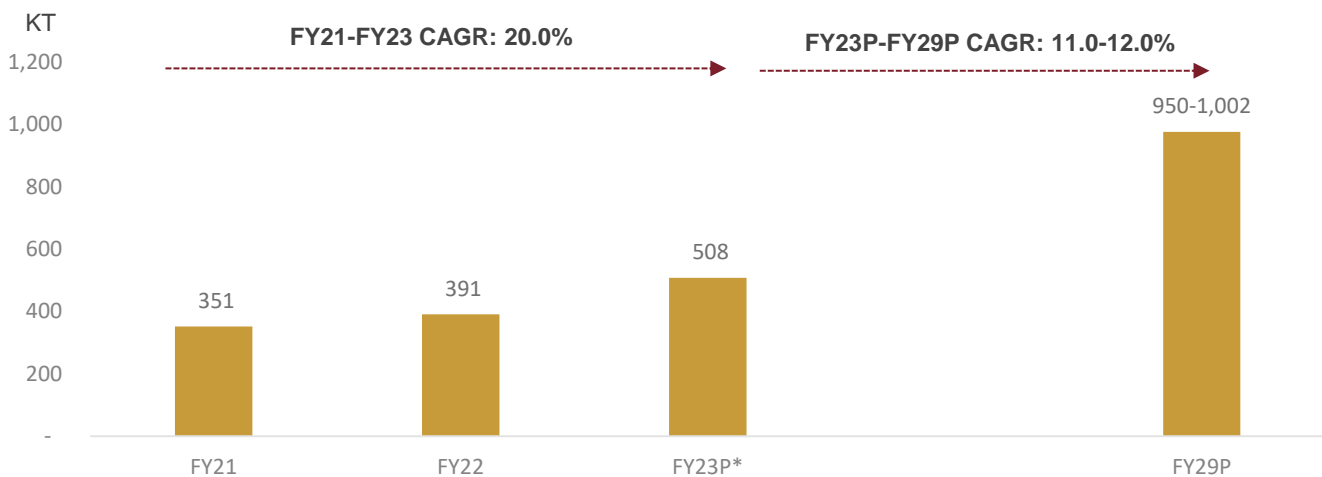
- **Titanium dioxide production:** The primary use of rutile is as a source of titanium dioxide. Titanium dioxide produced from rutile is suitable for application in high-performance segments such as the automotive and aerospace industry while also being suitable for use in pigments, plastics and welding rods as a coating material
- **Metallurgy:** Titanium metal is derived from rutile, used in aerospace, military and medical applications due to its strength and corrosion resistance
- **Welding rods:** Rutile is used in the coating of welding rods to stabilise the arc and improve the quality of the weld
- **Gemstones:** Due to its high refractive index, rutile is occasionally used as a gemstone or in the production of synthetic star sapphires and rubies

Furthermore, synthetic rutile is used as a flux component in the production of welding electrodes and also to manufacture titanium tetrachloride, which is then used to make titanium sponge. This mineral is also an ingredient in special abrasives.

**Ilmenite**

Ilmenite is a titanium-iron oxide mineral. It is an important source of titanium and is typically found in igneous and metamorphic rocks as well as in placer deposits. It is a dark brown to black mineral with a metallic to submetallic luster, characterized by a smooth, glassy appearance with a slight iridescence.

**Domestic production review-Ilmenite**



*P: provisional*  
*Sources: IBM*

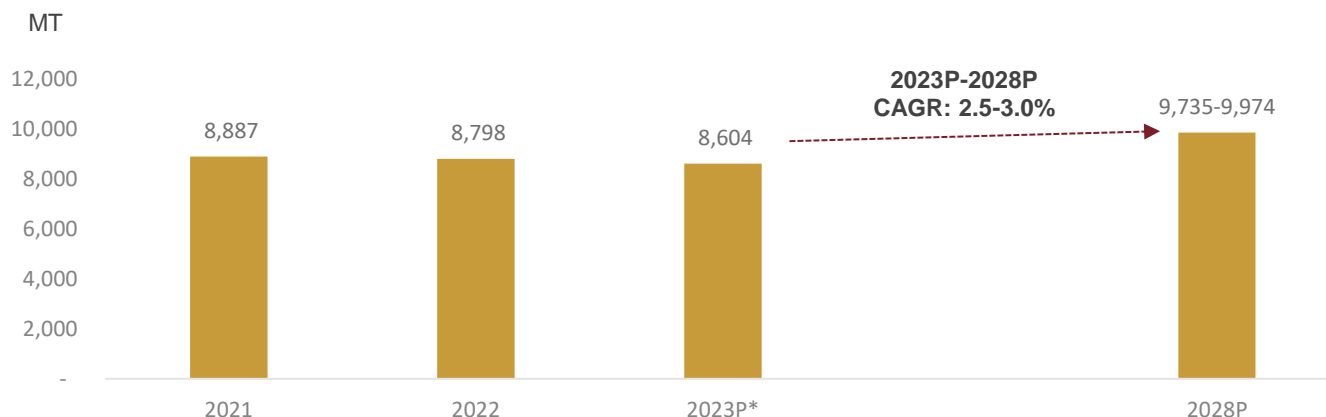
The domestic production of ilmenite increased from 351 KT in fiscal 2021 to 508 KT in fiscal 2023, clogging a CAGR of 20.0%. In India, the production of Ilmenite is done by only 2 players- Indian Rare Earths Limited (IREL) and Kerala Minerals and Metals Ltd (KMML), accounting for ~90% and 10%, respectively, in overall domestic production for Ilmenite.

During fiscals 2023-2029, the domestic production of Ilmenite is expected to increase at a CAGR of 11.0-12.0% to reach ~950- 1,002 KT, driven by the domestic demand for titanium minerals.



The prices of Ilmenite were in the range of Rs 13,167- 14,618 per tonne during fiscal 2020, as reported by IBM.

**Global production review-Ilmenite**



P: provisional  
Sources: USGS

Global production of ilmenite stood at 8,604 MT in 2023. The global production of ilmenite decreased because of reduced production in Ukraine, which contributed 190 MT in 2022 and just 60 MT in 2023 caused by the ongoing Russia-Ukraine war. Major ilmenite-producing countries include Australia, South Africa, Canada, and Norway.

During 2023-2028, the global production of Ilmenite is expected to increase at a CAGR of 2.5-3.0% to reach ~9,735-9,974 MT, driven by global demand for titanium minerals.

Its applications are as follows:

- Titanium dioxide production: The primary use of ilmenite is to produce titanium dioxide (TiO<sub>2</sub>), which is used as a white pigment in paints, plastics, paper and food colouring.
- Titanium metal production: Ilmenite is also a key raw material for producing titanium metal, used in aerospace, medical, and other high-performance applications, due to its strength, light weight, and resistance to corrosion.
- Welding rod coating: It is used in the manufacture of fluxes for welding rods.

**4.2 Assessment of titanium mineral market**

Among heavy minerals, ilmenite and rutile are the two primary sources of titanium.

Picture	Brief description
	<p>Titanium dioxide exists in various forms, including rutile, anatase (octahedrite), and brookite, although brookite is not found in large quantities in nature. Leucoxene is an alteration product of ilmenite and is often found associated with ilmenite.</p>

Source: Industry

The different grades of titanium minerals obtained from the mining of heavy minerals are provided in the table below.

Titanium minerals	TiO2 Content (%)	Availability
<b>Rutile</b>	>93%	Restricted occurrence
<b>Leucoxene</b>	up to 90%	Restricted occurrence
<b>Ilmenite</b>	44-70%	Most abundant product

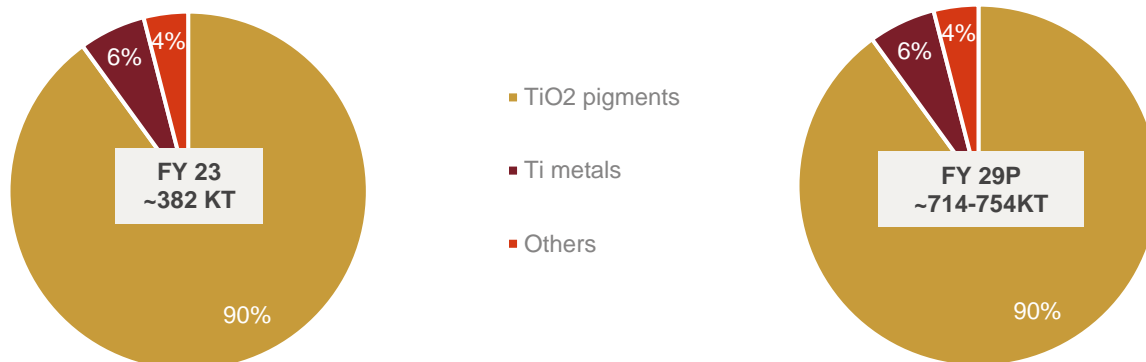
Source: Industry, CRISIL MI&A Consulting

The domestic production of titanium minerals is estimated to be ~365-375 KT in fiscal 2023.

These minerals (rutile, leucoxene and ilmenite) along with their value-added products like synthetic rutile and TiO2 slag constitute “Titanium Feedstock” for the following major industries:

1. TiO2 Pigments
2. Titanium Metal
3. Welding electrodes and titanium chemicals industry

**Domestic market of Titanium minerals by end use segments for fiscal 2023 and fiscal 2029P**



P: Projected

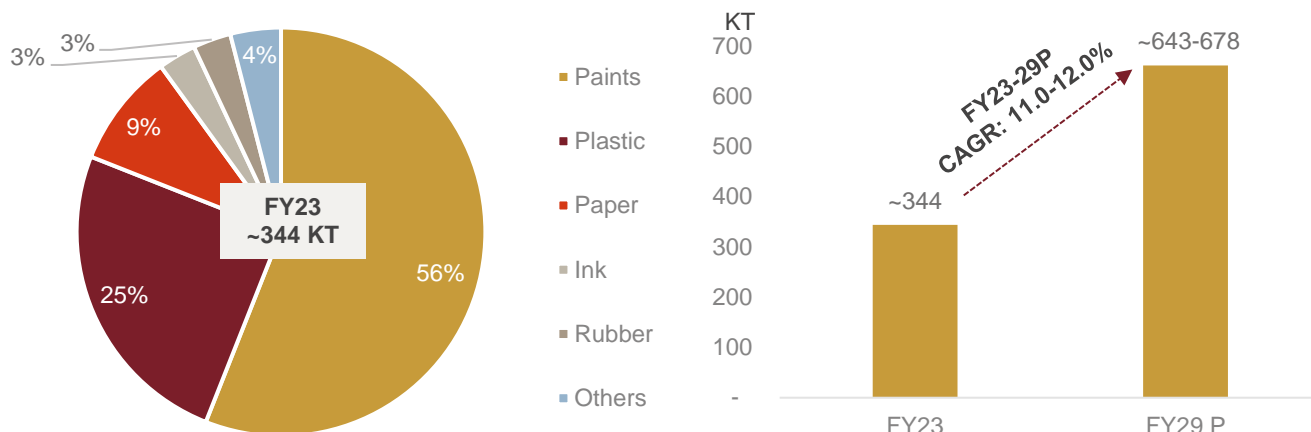
Source: CRISIL MI&A Consulting

The domestic consumption for titanium minerals is estimated to be ~382 KT. About 90% (~344 KT) titanium minerals is used in the manufacturing of white titanium dioxide pigment, followed by titanium metals (6%; 23 KT) and others (4%; ~15KT) during fiscal 2023.

**During fiscal 2023-2029, the domestic market of titanium minerals/feedstock is expected to increase at a CAGR of 11.0-12.0% to reach ~714-754 KT.**

This unique mineral offers a combination of exceptional properties, including high refractive index, low specific gravity, high hiding power, and opacity, as well as non-toxicity. These qualities make titanium dioxide a versatile material with numerous applications across various industries.

**Domestic market of Titanium dioxide (TiO2) pigments for fiscal 2023**



P: Projected

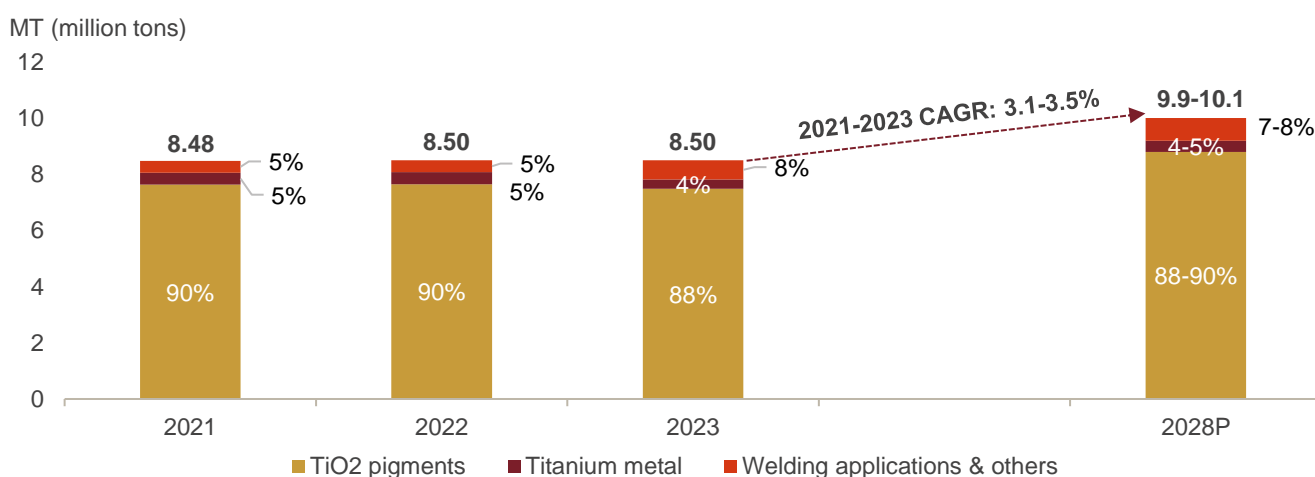
Source: CRISIL MI&A Consulting

- Paints accounted for 56% (~192 KT) of the market for TiO<sub>2</sub> pigments.
- Rest 44% (152 KT) is used in the production of white-walled tires, glazed papers, plastics, and printed fabrics. Additionally, its non-toxic nature makes it suitable for use in pharmaceuticals, and even in foodstuff as well as in toothpaste.

Titanium metal (6%; ~23KT, of domestic market of titanium minerals), on the other hand, is a versatile material with exceptional characteristics. Its lightness, strength, and durability make it an essential metal for the aerospace Industry. It is also used in desalination and power-generation plants, as well as in corrosive chemicals industries, due to its inertness and resistance to corrosion. Its non-reactive property makes titanium metal one of the few materials that can be used in the human body for orthopaedic use and in pacemakers.

During fiscal 2023-2029, the domestic market of Titanium dioxide pigments is expected to increase at a CAGR of 11.0-12.0% to reach ~643-678 KT.

### Global market of Titanium minerals by end use segments



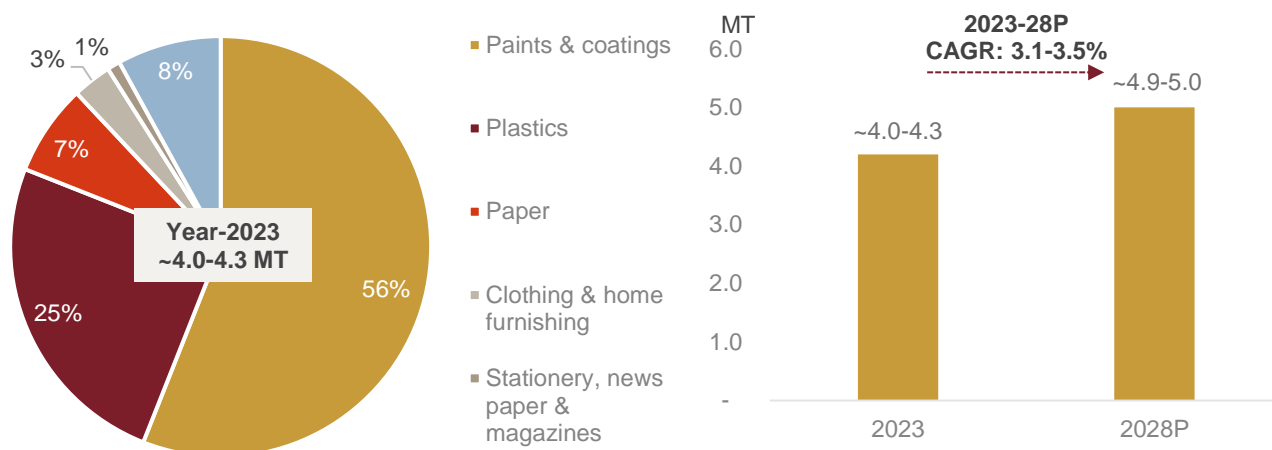
P: Projected

Source: CRISIL MI&A Consulting

The global consumption for titanium minerals (feedstock) increased from 8.48 MT (million tons) in 2021 to 8.50 MT in 2023. About 88% (~7.5 MT) of titanium feedstock is used in the manufacturing of white titanium dioxide pigment, followed by welding applications and others (8%; 0.7 MT) and titanium metals (4%; ~0.3 MT) during 2023.

During 2023-2028, the global market of Titanium feedstock is expected to increase at a CAGR of 3.1-3.5% to reach ~9.9-10.1 MT.

**Global market of Titanium dioxide (TiO2) pigments for 2023 and 2028P**



P: Projected

Source: CRISIL MI&A Consulting

- Paints & coatings accounted for 56% (~2.24 MT) of the market for TiO2 pigments. In the manufacturing of paints, titanium dioxide is used to create a wide range of white and pastel shades.
- Plastics accounted for 25% (~1.00 MT) of the market.
- Rest 19% (~0.76 MT) is used in production of ink and stationary materials like glazed papers, clothing and home furnishing- printed fabrics. Additionally, its non-toxic nature makes it suitable for use in pharmaceuticals, and even in foodstuff as well as in toothpaste.

Titanium dioxide is also used in cosmetics industry in manufacturing of sunscreen lotions and creams due to its non-toxicity and ultraviolet absorption properties.

As mentioned in the previous section, about 90% of the titanium dioxide pigment is predominantly used in the paint, plastic, and paper industry. Therefore, the demand for TiO2 is a function of economic activity. TiO2 is considered to be a quality-of-life product as its demand is driven by rising economies and standards of living. The correlation between TiO2 demand and world gross domestic product (GDP) has been noted by many TiO2 companies. This correlation holds because TiO2 is fundamental to many basic building blocks of economies including housing materials, automobiles, industrial equipment, consumer packaging, and construction materials. These segments do well when countries' economies (GDP) are doing well, which drives TiO2 demand growth.

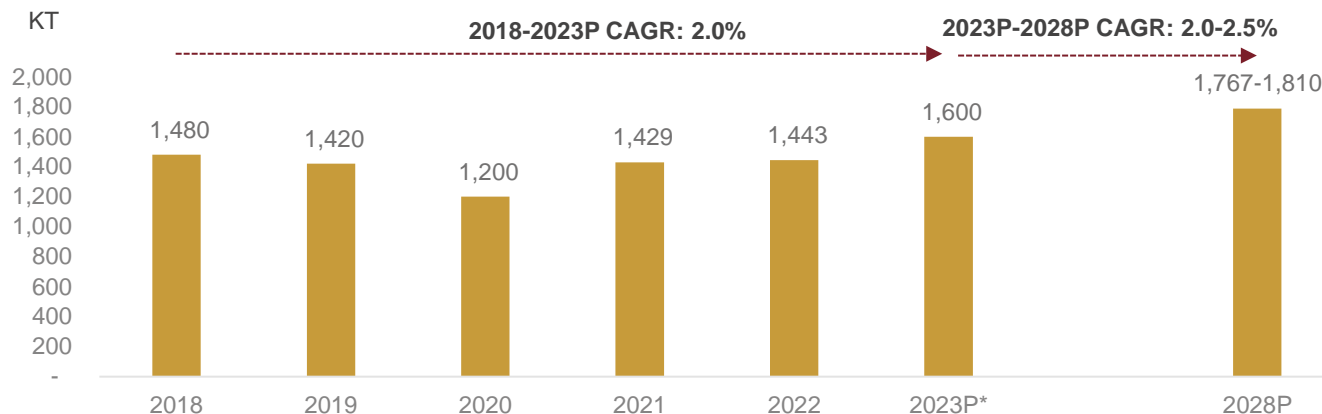
**During 2023-2028, the global market of Titanium dioxide (TiO2) pigments is expected to increase at a CAGR of 3.1-3.5% to reach 4.9-5.0 MT.**

### 4.3 Assessment of zircon mineral market

Zircon is a mineral that belongs to the group of silicates and is characterized by its high density, hardness, and resistance to corrosion and heat. The heat-resistant properties also make it suitable for use in refractories in foundries and other high-temperature industrial applications.

It is a common mineral found in igneous, metamorphic, and sedimentary rocks, and is used in a variety of industrial and commercial applications. It is highly resistant to corrosion, even in the presence of acidic or alkaline substances.

#### Global production review- zircon



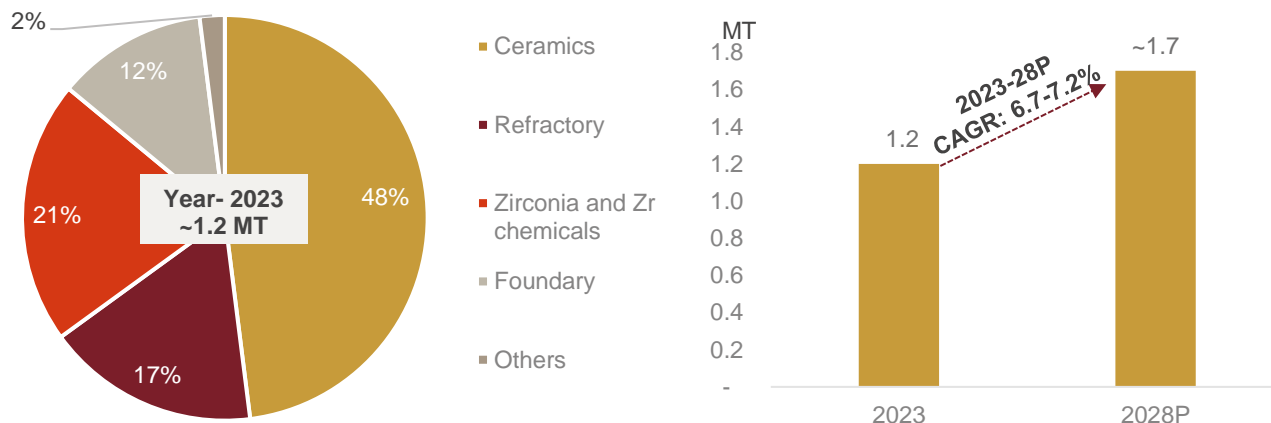
P: provisional  
Sources: USGS

As per U.S. Geological Survey (USGS), Global production of zircon increased from 1,480 KT in 2018 to 1,600 KT in 2023, clogging a CAGR of 2% over years 2018-2023.

As per IBM, the production for zircon stood ~ 9.1 KT in fiscal 2018, ~11.9 KT in fiscal 2019 and ~15.6 KT in fiscal 2020. While the global production decreased over fiscals 2018-2020, India's production increased at a CAGR of ~31%.

**The global production of zircon is expected to increase at a CAGR of 2.0-2.5% over 2023-2028, to reach ~1,767-1,810 KT by 2028.**

#### Global consumption review/ market of zircon for year 2023 and 2028P



P: Projected  
Source: CRISIL MI&A Consulting

Zircon is used in a variety of industrial and commercial applications, including:

- Ceramics accounts for ~49% (~0.58 MT) of the market of zircon, used in the production of ceramic products, such as tiles, bricks, and pottery.
- Zirconia and Zr chemicals accounts for 21% (~0.25%) used for abrasives, lamp filaments, jet engines and space shuttle parts etc.
- Refractory accounts for 17% (~0.20 MT) of the market  
Optical lenses: High refractive index and high dispersion make zircon useful for optical applications, such as gemstones and optical lenses, including those used in eyeglasses and telescopes.

Other applications includes;

- Jewellery: Zircon is used as a gemstone in the production of jewellery, particularly in rings, earrings, and other decorative items.
- Electronics: Zircon is used in the production of electronic components, such as capacitors and resistors.

**The global consumption of zircon is expected to increase at a CAGR of 6.7-7.2% over 2023-2028, to reach ~1.7 MT by 2028.**

Its high density, hardness, and resistance to corrosion make it a valuable material in a variety of industries, from abrasives to jewellery to electronics. Its optical properties also make it a popular choice for gemstones and other decorative items.

## Garnet

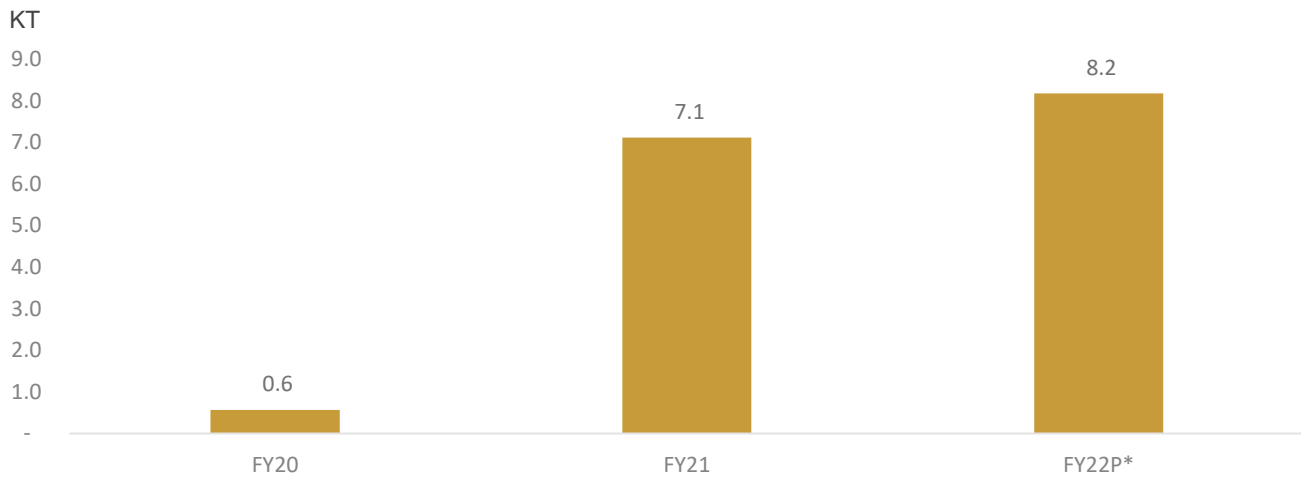
Garnet is a group of silicate minerals and are widely distributed in the Earth's crust, found in a variety of geological settings, including metamorphic rocks, igneous rocks, and sedimentary rocks, making up about 4% of the Earth's crust by volume.

It is a hard, dense mineral, having a vitreous lustre, which means it has a glass-like appearance when polished. It is a brittle mineral, which means it can break easily along cleavage planes. It is found in a wide range of colours, including red, orange, yellow, green and purple.

Uses of Garnet:

- Gemstone: Garnet is used as a gemstone and is prized for its deep red colour.
- Abrasives: It is used in abrasives, such as sandpaper and grinding wheels, due to its hardness and durability, and is also used in the manufacture of abrasive blasting media and in the production of refractory materials.
- Ceramics: Garnet is used in high-temperature applications, such as in the production of glass and ceramics.

**Domestic production of Garnet (abrasive)**

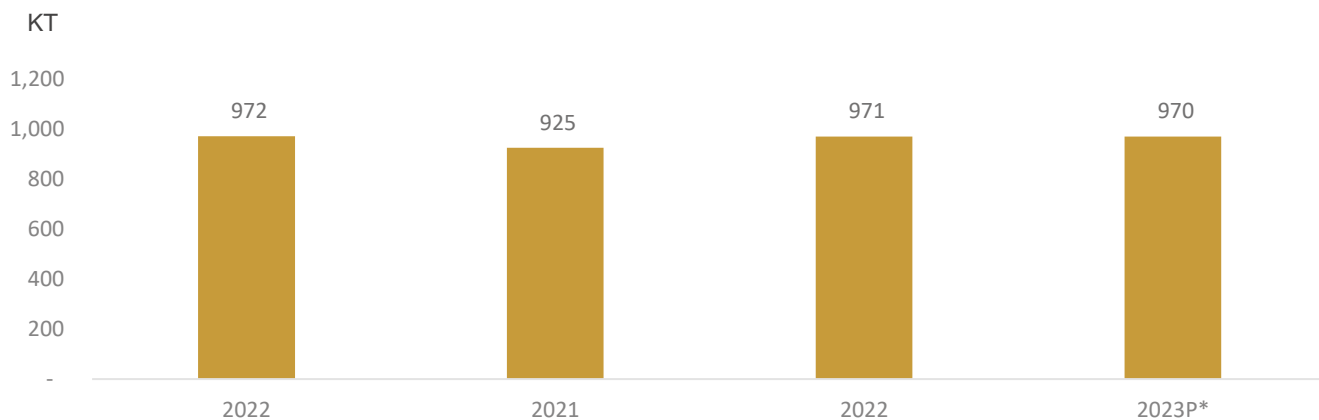


*P: provisional*

*Sources: IBM*

The domestic production of garnet (abrasive) increased from 0.6 KT in fiscal 2020 to 8.2 KT in fiscal 2022. In fiscal 2022, like fiscal 2021, Rajasthan was the sole contributor to production, with five major producers from the state accounting for approximately 100% of the total output.

**Global production of garnet (industrial)**



*P: provisional*

*Sources: USGS*

Global production of garnet (industrials) stood at 971 KT in 2022. In 2023, the production of garnet (industrial) is projected to be at 970 KT. As per USGS, the US natural gas and petroleum industry is one of the key end use industries which uses garnet for cleaning the drilling pipes and well casings. The expected decrease in the production can be attributed to the decline in the number of drill rigs operating in United States during 2023.

As per IBM, India's production of garnet industrial stood at 12 KT in 2021 and 15 KT in 2022.

**Monazite**

Monazite is a rare mineral that belongs to the phosphate mineral group. It is composed of phosphate minerals, specifically monazite-Ca and monazite-La. Monazite is found in rare earth element (REE) deposits and is a significant source of cerium, lanthanum, and neodymium.

Its applications are as follows:

- REE production: Monazite is a significant source of cerium, lanthanum, and neodymium, which are essential for a wide range of applications, including renewable energy technologies, catalysts, and advanced ceramics.
- Phosphor production: Monazite can be used as a phosphor in the production of lighting products, such as LEDs and fluorescent lights.
- Catalysts: Monazite has been shown to exhibit catalytic properties in certain chemical reactions, making it a potential component in catalysts for the production of chemicals and fuels.
- Advanced ceramics: Monazite can be used in the production of advanced ceramics, such as those used in aerospace and defence applications.
- Nuclear applications: Monazite has been explored as a potential component in nuclear applications, such as nuclear reactors and fuel cycles.

Monazite contains viable quantities of rare earth elements which are critical to produce high-quality strong magnets, which are found in various electronics, wind turbines and electric vehicles. These elements are also used in petroleum refining, automobiles and electronic screen displays.

In India, Monazite is produced by KMML and IREL. As per IBM, the production of monazite stood at 69.75KT in fiscal 2020.

Overall, the heavy mineral sand industry plays a critical role in supplying key materials for various high-demand sectors, ensuring its continued importance in the global market.

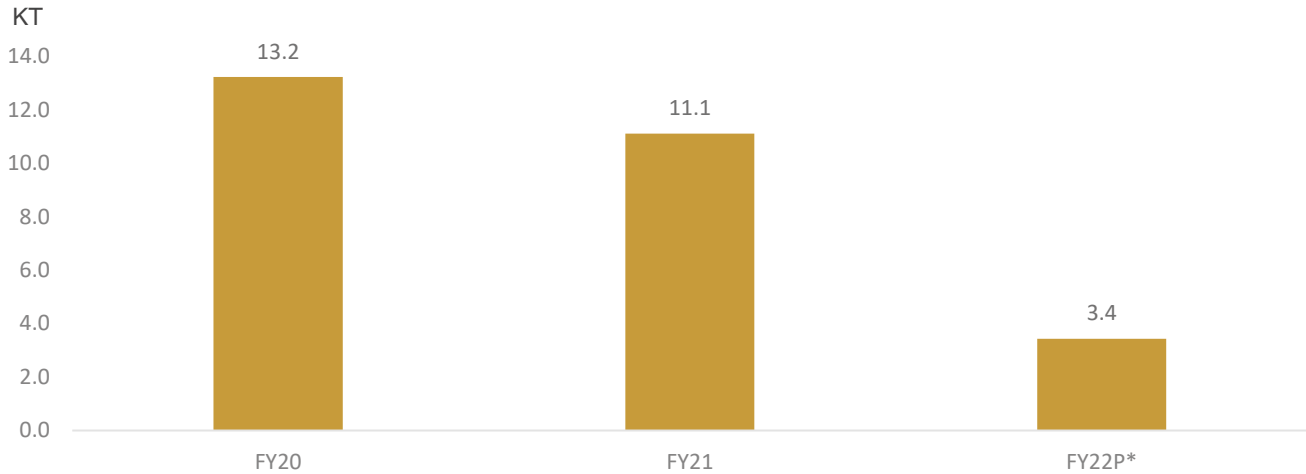
## **Sillimanite**

Sillimanite is an aluminosilicate mineral, and it is commonly found in metamorphic rocks such as schists and gneisses. Sillimanite typically forms under high-temperature and high-pressure conditions during the metamorphism of aluminium-rich sediments.

- Refractories: Sillimanite is primarily used in the production of refractory materials. Its high melting point and resistance to thermal shock make it ideal for lining furnaces, kilns, and other high-temperature equipment. Refractories made from sillimanite are used in industries such as steelmaking, glass manufacturing, and ceramics.
- Ceramics: Used to manufacture high-quality porcelain and stoneware. Its properties help enhance the durability and strength of ceramic products.
- Abrasion-resistant Materials: Sillimanite's hardness makes it suitable for use in abrasives. It can be incorporated into materials that need to withstand wear and tear, such as sandblasting media and grinding wheels.
- Geological Studies: In geology, sillimanite serves as an index mineral for determining the metamorphic grade of rocks. Its presence can help geologists understand the temperature and pressure conditions under which the host rock formed.
- Engineering Applications: It is used in various engineering applications where high-temperature stability and resistance to thermal shock are required.



**Domestic production of Sillimanite**



*P: provisional*

*Sources: IBM*

The domestic production of sillimanite stood at 11.1 KT in fiscal 2021. In fiscal 2022, the production for sillimanite is estimated to be at 3.4 KT.

As per IBM, the main reason for decrease in number of mines is classification of some sillimanite producing mines, as BSM mines in Andhra Pradesh, Kerala and Tamil Nadu. Earlier, these mines were considered under sillimanite mineral as a part of MCDR mineral as there was no separate classification of Beach Sand Minerals (BSM) and Non-Beach Sand Minerals (non-BSM).

Maharashtra is the only State which contributed 100% of the total production of sillimanite during fiscal 2022.

## 5 Company profile: Midwest Ltd

### 5.1 Business profile

Midwest Ltd., a Midwest group company, was incorporated in 1981 with the main objective of developing knowledge and expertise in the field of natural stones, namely granite, marble, quartzite, quartz and heavy mineral sand. Midwest mines over 1.37 million cubic meters (CBM) of granite per annum (average of fiscals 2022, 2023 and 2024), including saleable product and waste granite.

Midwest has built a strong presence over the past four decades in the business of mining and processing granite and further diversified into quartz mining and processing; heavy mineral sand extraction and processing of rare earth elements, including titanium; manufacturing of engineering diamond tools using eco-friendly techniques.

Quartzite and Laza Grey Marble, both recent additions to the company's portfolio, are being developed using a B2B2C strategy. The company is developing certain varieties of Laza Grey Marble and Celestia Quartzite, which could supplement the Indian market for imported Marble and Quartzite, as they possess similar aesthetic and functional attributes. This is expected to enhance revenue starting next year. These two products are recent additions to our portfolio, reflecting our commitment to offering cost-effective and high-quality materials.

The company aims to cater to the growing domestic market, which can complement demand patterns in international markets. For instance, while Black Galaxy Granite is sold at a premium in the overseas markets compared with the Indian market, Absolute Black Granite can serve as a lower-cost alternative to Black Galaxy Granite, which can be sold at competitive prices in the domestic market.

#### Major subsidiary companies



Source: Midwest Ltd.

#### 1. Midwest Ltd

Midwest Ltd, a distinguished entity with four decades of legacy, is based in Hyderabad, Telangana. Incorporated on December 11, 1981, the company specialises in mineral exploration, mining, processing and global distribution of natural-stone products. Midwest Ltd's diverse portfolio includes the exploration and extraction of Black Galaxy Granite, Absolute Black Granite, quartz, quartzite, and heavy mineral sand across various locations in India and Sri Lanka.

#### 2. Andhra Pradesh Granite (Midwest) Private Ltd

Andhra Pradesh Granite (Midwest) Private Ltd is a joint venture between Midwest Ltd and Andhra Pradesh Mineral Development Corporation Ltd, a state government enterprise. Incorporated on June 11, 2007, the company focuses on the mining and sales of Black Galaxy Granite, serving both global distributors and the domestic market.

#### 3. Midwest Neo Stone Private Ltd

Midwest Neo Stone Private Ltd, incorporated on January 17, 2017, is a quartz crushing and processing unit located in the SEZ in Ongole district, Andhra Pradesh. As Midwest Ltd already excels in mining, this venture represents the next stage of vertical integration with processing plants. By setting up this processing facility, the company has successfully extended its business operations, completing the industrial chain from mining to market to meet the demand for engineered stone, glass, solar, and semiconductor industries—a significant value addition for its growth.

#### **4. Midwest Heavy Sands Private Ltd and Trinco Mineral Sands Ltd**

Midwest Heavy Sands Private Ltd and Trinco Mineral Sands Ltd mark Midwest Ltd's strategic expansion into the heavy mineral sand sector. Midwest Heavy Sands Private Ltd (MHPL) was incorporated on November 9, 2022, and Trinco Mineral Sands Ltd (TMSL) on June 30, 2023, both in Sri Lanka. These companies are subsidiaries of Midwest Ltd.

The above companies have already obtained mineral exploration licences for Heavy minerals sand from the government of Sri Lanka and completed exploration activities. The company is in the process of obtaining mining licenses and various operational permits to start the mining activities and establish the processing plant.

### **Management profile**

#### **1. K Raghava Reddy, Founder and President**

Midwest group is founded by K Raghava Reddy, who has more than 50 years of experience and expertise in the natural-stone industry. Reddy is a visionary entrepreneur and expert in clean-energy technologies with a track record of building diversified, sustainable, socially responsible enterprises. A natural-stone specialist in mineral prospecting, mining and project management, he is actively involved in many global research projects in the areas of natural stone, clean energy, including solar, wind, coal to liquids, carbon sequestration, oil sands/shale, and is a pioneer in mineral exploration and development in various countries, such as India, China, the US, Mozambique, Zimbabwe, Indonesia and Vietnam.

#### **2. Rana Som, Chairman and Independent Director**

Rana Som holds a bachelor's degree in arts (economics) from the University of Calcutta and has passed the examination for a master's degree in arts (economics) from the University of Calcutta. He also holds a post-graduate diploma in personnel management from the National Institute of Personnel Management. Prior to joining our Company, Mr. Rana Som was associated with Hindustan Copper Limited, NMDC Limited (as its chairman-cum-managing director), ArcelorMittal Nippon Steel India and Essar Steel Minnesota LLC.

#### **3. K Ramachandra, CEO and Director**

With more than 15 years of experience in the mining and mineral processing segments, Ramachandra is currently heading the group's mining operations. He specialises in mining, processing technologies and information systems. He has been associated with the company as a lead member from last 15 years. He has in-depth knowledge about management and operations of the quartz manufacturing unit. He is also associated with plant and machinery suppliers globally.

#### **4. K Soumya, Director**

A graduate in commerce and computer science, Soumya's expertise is in R&D, production and quality control systems. A specialist in powder metallurgy, she is involved in the design, development and production of eco-friendly diamond tools for the mining, mineral processing and construction sectors. A skilled team builder and passionate leader, Soumya leads a young and dynamic team of experts providing clean energy solutions in the area of e-mobility.

#### **5. K Uma Priyadarshini, Director**

Priyadarshini is a post-graduate from Columbia University in financial engineering. She has been handling the group's investments, commercial transactions, liaison with government authorities and financial institutions, particularly in

Africa. She has worked as an investment banker on the Wall Street. She also holds an MBA from Colombia University and brings a wealth of knowledge and market contacts to the team.

## **6. Duvva Pavan Kumar, Independent Director**

Duvva Pavan Kumar holds a bachelor's degree in law from NALSAR University of Law, Hyderabad. He has over 20 years of experience in the legal industry. He has been a practising advocate for 21 years and has been associated with Amarchand, Mangaldas & Suresh A Shroff & Co., Mumbai and Trilegal after which he founded The Law Chambers in 2017.

## **7. Smita Amol Lahoti, Independent Director**

Smita Amol Lahoti holds a bachelor's degree in commerce from University of Pune and a master's degree in commerce from University of Pune. She is a fellow of the Institute of Chartered Accountants of India and has been a practising chartered accountant since 2004. She has been associated as a partner at M/s. Muttha & Lahoti, Chartered Accountants since 2005, and has an experience of over 25 years in accounting.

## **8. Dilip Kumar Chalasani, Chief Financial Officer**

Dilip Kumar Chalasani is a qualified Chartered Accountant and was granted certificate on 'International Financial Reporting Standards' by Institute of Chartered Accountants of India. He is having experience of 20 plus years on the commercial, finance and accounting aspects of business enterprise. He has associated with various businesses viz. telecom, transmission & distribution, stock broking, textiles, prefab, Railways, Electronic OEMs, Seeds, Renewable Power, transport, infrastructure, highly engineered composite services etc. He has expert knowledge in taxation matters of both direct and indirect taxes in India and various other countries and have experience in fund raising including in foreign countries with finest commercial terms that a business aspires.

## **9. Mallikarjuna Rao Kommana, Chief Operating Officer**

Mallikarjuna Rao Kommana has been associated with our Company since 2018. In his current role, he heads all mining operations carried out in dimension stone granite, quartzite, grey marble and quartz mines of the Company in India, and our international activities. He has been awarded the diploma of licentiate in mining engineering from the State Board of Technical Education and Training, Government of Andhra Pradesh. He has also been awarded First Class Mine Manager's Certificate of Competency to manage a Coal Mine under the Mines Act, 1952. Prior to joining our company, he worked with Dangote Industries (Africa), Monnet Ispat and Energy Limited, Lanco Infratech Ltd, Singareni Collieries Company Ltd.

## **10. Peddibhotia Venkata Shiva Prasad, Chief General Manager (Mechanical Maintenance)**

Peddibhotia Venkata Shiva Prasad, who has been associated with our Company since 2018, has completed a diploma course in engineering in Automobile Engineering from Andhra Polytechnic, Kakinada. In his current role, he is responsible for heading the mechanical department and support production of various dimension stone granite, quartzite, grey marble and quartz mines of the Company in India. He is also responsible for overseeing the business development in the diamond tools division of the Company.

## **11. Rohit Tibrewal, Company Secretary**

Rohit Tibrewal is an associate member of the Institute of Company Secretaries of India. He holds a bachelor's degree in commerce from the Government City College, Hyderabad, Osmania University. He has been with our Company since January 2024 and has over 12 years of experience in the Legal, Secretarial and Compliance. Prior to joining our Company, he worked with Karvy Insurance Repository Private Limited, Power Mech Projects Limited, Tanla Platforms Limited.

## **12. Aluvala Sivasankar, Senior Vice President (Mines)**

Aluvala Sivasankar is the Senior Vice President (Mining Operations) of our Subsidiary Company, Andhra Pradesh Granite (Midwest) Private Limited. In his current role, he is responsible for executing the mining operations of our

Company. He was granted ‘Manager’s First-Class Certificate of Competency’ to manage metalliferous mines having opencast workings only under the Mines Act, 1952. He also holds a certificate for a ‘Post Graduate Programme in Management for Senior Executives’ granted by the Indian School of Business. Prior to joining our Company, he was associated with Hindustan Zinc Limited, The Associated Cement Companies Limited, The Andhra Cement Company Limited (Durga Cement Works), Tamil Nadu Minerals Limited and Premium Granites Limited.

**13. Ainavalli Sreenivas, General Manger (Mines)**

A Shivshankar has been associated with our Company since 2006. In his current role, he is unit head statutory agent and mine manager for safety and productivity of black granite mine at Kodad. He is also responsible for mine planning, monitoring heavy earth moving machinery operations, drilling and blasting, quality control. He has completed a diploma course in mining engineering from Government Polytechnic Narsipatnam. He was granted ‘First Class Manager’s Certificate of Competency’ to manage metalliferous mines having opencast workings only under the Mines Act, 1952.

**14. K. Damodar Reddy, Chief General Manager (Mines)**

K. Damodar Reddy has been associated with our Company since 2006. In his current role, he is unit head statutory agent and mine manager for safety and productivity of Black galaxy granite at Andhra Pradesh Granite (Midwest) Pvt Ltd- Chimakurthy. He is also responsible for mine planning, monitoring heavy earth moving machinery operations, drilling and blasting, quality control. He has completed a diploma course in mining engineering from Government Polytechnic Narsipatnam. He was granted ‘First Class Manager’s Certificate of Competency’ to manage metalliferous mines having opencast workings only under the Mines Act, 1952.

**Infrastructure details**

The company’s infrastructure details are as follows:

Addresses	Area (sq ft)	Details (leased/ owned/ rented/ licensed)
Midwest Ltd 8-2-684/3/25&26, Road No.12, Banjara Hills, Hyderabad - 500 034 (T.S) INDIA	11,500	Leased (office building)
Midwest Ltd Plot No 29, Building Product SEZ at Growth Center, Gundlapally, Ongole, Prakasam District, Andhra Pradesh – reg	72,000	Leased (land leased for 33 years from the Andhra Pradesh Industrial Infrastructure Corporation Ltd [APIIC]. The company constructed the processing plant)
Midwest Neostone Pvt Ltd Plot No 30A, Building Product SEZ at Growth Center, Gundlapally, Ongole, Prakasam District, Andhra Pradesh – reg	1,25,280	Leased (land leased for 33 years from the APIIC. The company is constructing the processing plant)
Midwest Neostone Pvt Ltd Plot No 30B & 31, Building Product SEZ at Growth Center, Gundlapally, Ongole, Prakasam District, Andhra Pradesh – reg		Leased (land leased for 33 years from the APIIC. The company is constructing the processing plant)
Midwest Ltd Plot No. 44/C, IDA, Patancheru Medak TG 502319	34,130	Own (built the diamond tools manufacturing plant)

Andhra Pradesh Granite (Midwest) Pvt. Ltd Sy No 55/5, RL Puram Village, Chimakurthy Rd, Chimakurthy Mandal, Prakasam, Andhra Pradesh, 523226	20,400	Leased land (the company built the granite processing plant)
Midwest Ltd La Creative Heights, Flat No 2 & 3, Road No. 12, Banjara Hills, Hyderabad, Telangana	4,500	Guest house
Midwest Ltd Padmaja Courts – I, Flat No 401, Sri Nagar colony, Hyderabad, Telangana	2,000	Guest house

Source: Midwest Ltd.

The company's reserves details are as follows:

MIDWEST GRANITE RESERVES									
DECORATIVE STONES (GRANITE)									
S.No	Rock Type	Mine Location		Proved Reserves (CBM)	Blockable Reserve (CBM)	Recovery (%)	Avg. production per month in CBM	Life of the mine (In months)	Life of the mine (In Yrs)
1	Galaxy granite (Black)	Chimakurthy	Main Pit	10,170,512	2,339,218	23	5,000	468	39
			APJV	28,514,685	6,273,231	22	6,000	1046	87
			Block-4	11,810,753	1,771,613	15	5,000	354	30
2	Black granite	Arpanapalli&Teegalaveni		7,462,588	1,417,892	19	4,000	354	30
		Yerraballigudem		1,275,592	234,203	18	500	468	39
		Gurthur		1,425,686	260,008	18	800	325	27
		Makkapeta		1,773,845	319,292	18	400	798	67
		Ramakuppam		946,412	198,747	21	700	284	24
		Kukatlapalle		3,888,094	816,500	21	2,500	327	27
3	Colour granite	Vilasagar		14,889,153	3,871,180	26	5,000	774	65
		Ilkal		1,773,845	461,200	26	5,000	92	8
4	Marble	Kadapa		3,985,046	1,036,298	26	5,000	207	17
5	Quartzite	Hanumanthunipadu		4,239,147	1,294,865	30	5,000	259	22
<b>Total</b>				<b>97,871,727</b>	<b>21,574,683</b>				

Source: Midwest Ltd.

#### Existing footprints in the granite market

- Core operations in India

Midwest at present holds 20 mining lease licenses, five leases for which mining approvals are in the process, two granite processing units, one quartz crushing and processing unit and one diamond tool manufacturing plant.

The details of the leases as on May 31, 2024, are listed below:

Name of mine/ processing unit/ plant	Location	Number of mine leases/ processing plants	Leases available: obtaining mining approvals
<b>Mines</b>			
Black galaxy granite mine	Ongole, Andhra Pradesh	3	
Absolute black granite mine	Warangal, Telangana	7	2
Absolute black granite mine	Kodad, Telangana	2	
Absolute black granite mine	Errabelligudem, Telangana	2	
Grey marble mine	Kadapa, Andhra Pradesh	1	
Tan-brown granite mine	Karminagar, Telangana	2	
Quartzite	Hanumanthunipadu, Andhra Pradesh		1
Quartz mines	Kadapa, Andhra Pradesh	3	
Quartz mine	Chejerla, Andhra Pradesh		1
Quartz mine	Hathibelgal, Andhra Pradesh		1
<b>Granite processing units</b>			
Chimakurthy	Andhra Pradesh	1	
Ongole SEZ	Andhra Pradesh	1	
<b>Diamond tool plant in Hyderabad</b>			
Diamond Rope	Hyderabad	1	
<b>Quartz crushing and processing plant in Andhra Pradesh</b>			
Ongole SEZ	Andhra Pradesh	1	

Source: Midwest Ltd.

- Midwest's global distribution network**

Midwest supplies its natural stone products across the world through its global distributor network. Despite significant waiting time and higher prices, the company has established a loyal and committed base of customers owing to the trust it has built over the years.

The distribution network across continents is as follows:

Major regions/ continents	Countries where Midwest has an established distribution network
North America	The US, Canada, Mexico, Guatemala
South America	Chile, Argentina, Brazil
Europe	Spain, Italy, Romania
Africa	East Africa, Mozambique, Zimbabwe



Major regions/ continents	Countries where Midwest has an established distribution network
Asia	India, Sri Lanka, China, Taiwan, Hong Kong, Thailand, Singapore, Maldives, Indonesia

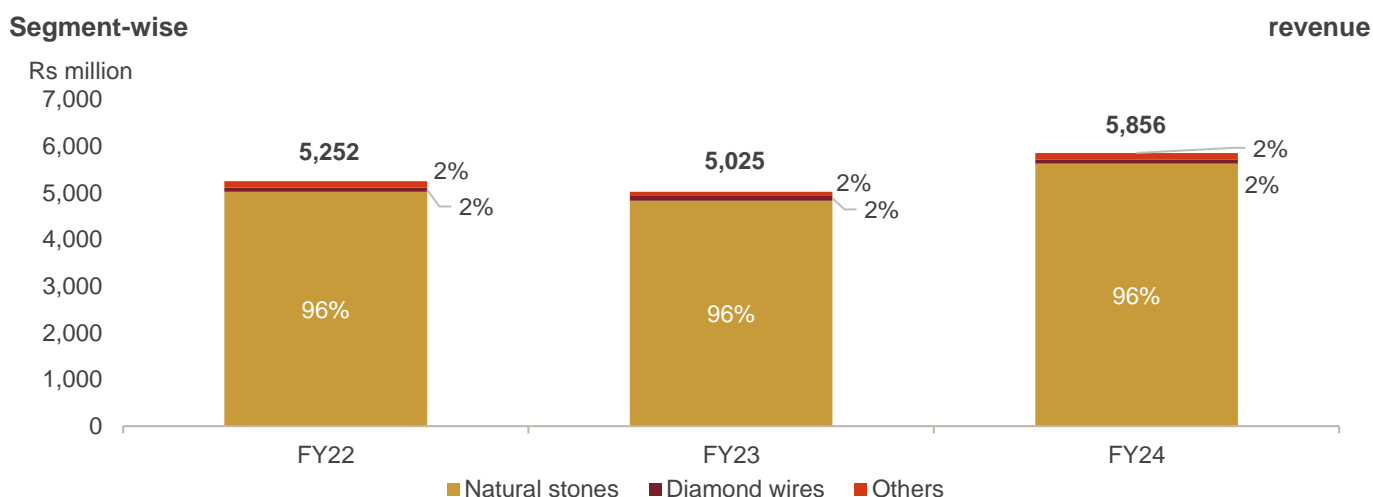
Source: Midwest Ltd.

Apart from the regions listed above, the company is also present in Australia and a few countries in the Middle East.

## 5.2 Past performance review

Midwest's primary business segment is natural stones. It also earns revenue from secondary business segments such as diamond wires and other processed stones (such as polished slabs).

Over fiscals 2022-2024, 96% of its revenue came from the primary business of selling granite blocks, particularly absolute black and black galaxy granite. The secondary segments contributed 2% each.



Source: Midwest Ltd., CRISIL MI&A Consulting

Midwest's revenue increased from Rs 5,252 million in fiscal 2022 to Rs 5,856 million in fiscal 2024, clocking a CAGR of 6%. In fiscal 2023, the revenue had declined to Rs 5,025 million owing to a fall in processed stones revenue. However, the revenue rebounded strongly in the following year.

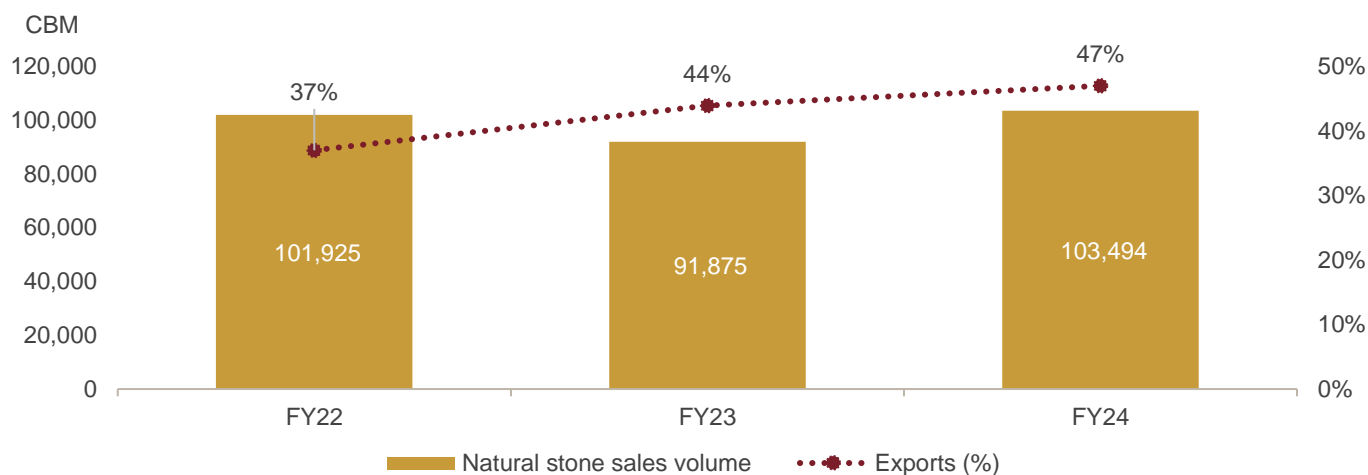
The overall revenue trend is positive, demonstrating resilience and a steady growth trajectory. Despite a minor setback in fiscal 2023, the company demonstrated its ability to recover and continue growing, driven predominantly by its core strength in the granite blocks market. The steady contributions from the secondary segments also highlight the company's diversified revenue streams, which complement its primary operations.

### Segment 1: Natural stones

Operations under this segment involve extraction, processing and sale of natural stone products, including granite, marble and other types of natural stones used in construction, decoration and various industrial applications.

#### Natural stone sales in volume terms

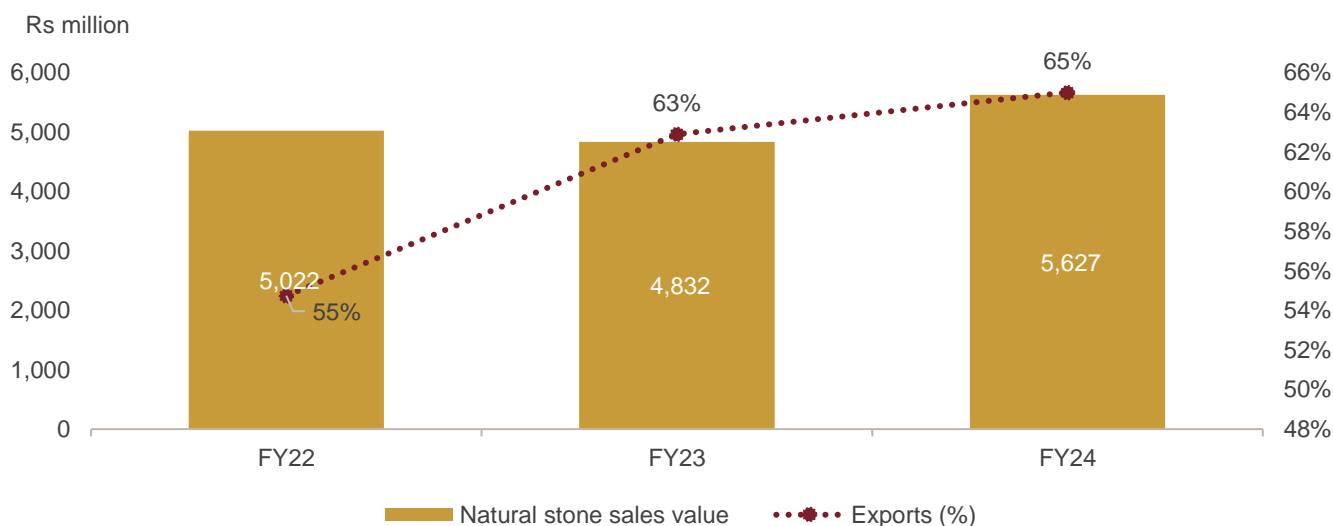




Sources: Midwest Ltd., CRISIL MI&A Consulting

The sales volume of granite increased to 103,494 cubic metre (cu m) in fiscal 2024 from 101,925 cu m in fiscal 2022. These products are sold both domestically and internationally. Exports constitute a significant portion of the company's overall granite sales volume. Share of exports in total sales has seen a steady increase from 37% in fiscal 2022 to 44% in fiscal 2023 and 47% in fiscal 2024, when it sold 48,602 cu m. The growth is a reflection of Midwest's expanding global footprint and the increasing demand for its granite products in the international markets.

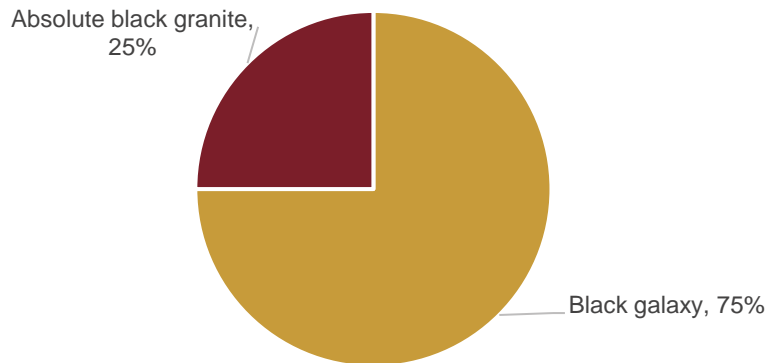
**Natural stone sales in value terms**



Source: Midwest Ltd., CRISIL MI&A Consulting

Revenue from granite sales logged a CAGR of 6% between fiscals 2022 and 2024, increasing from Rs 5,022 million to Rs 5,627 million. Exports constitute more than half of the company's total revenue, rising from 55% in fiscal 2022 to 63% in fiscal 2023 and further to 65% in fiscal 2024. Comparatively, average realisation from exports is higher when assessing revenue generated as a percentage of the volume exported. This underscores the advantageous financial impact of Midwest's exports strategy on its overall revenue growth during the period.

**Share of black galaxy and absolute-black granites in natural stones sales (by value, fiscal 2024)**



Source: Midwest Ltd., CRISIL MI&A Consulting

In fiscal 2024, black galaxy granite accounted for 75% (Rs 4,237.26 million) of the total granite sales revenue. The product had dominated sales value and volume in fiscals 2022 and 2023, too.

Black granite stands out as a premium product in overseas markets, commanding higher average realisations than in Indian markets. The realisation is higher than that of coloured or other forms of granite, too. The premium positioning makes black granite a preferred option for luxury projects where quality and aesthetics are paramount considerations. Whether used in modern architectural designs or traditional settings, black granite adds a timeless elegance and enhances the overall value of the spaces it adorns. As such, its demand remains strong in global markets, reinforcing its status as a premium choice among granite varieties.

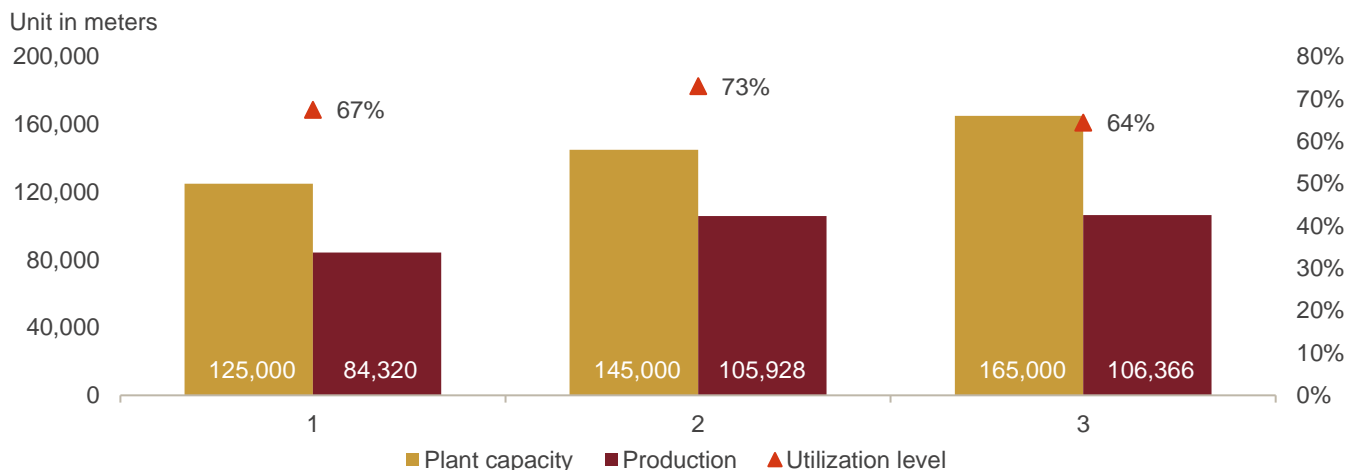
## Segment 2: Diamond wires

Midwest produces diamond wires that are used in the cutting and processing of hard materials, including natural stones, semiconductors and solar panels. The most common end-use industries where they find application are as follows:

- Stone cutting and quarrying: Diamond wires are an essential tool in the granite and natural stone industry for precise and efficient cutting of blocks, slabs and dimensional stone products. They are used for wire sawing in mining and quarrying for extracting minerals and rocks.
- Construction and infrastructure: They are used in civil engineering projects for cutting and shaping hard materials such as reinforced concrete and steel, enhancing efficiency and precision in construction processes.
- Slicing wafers and substrates in semiconductor manufacturing.

Revenue is derived by selling diamond wires to other businesses involved in the cutting and shaping of hard materials.

**Capacity and production of diamond wires**



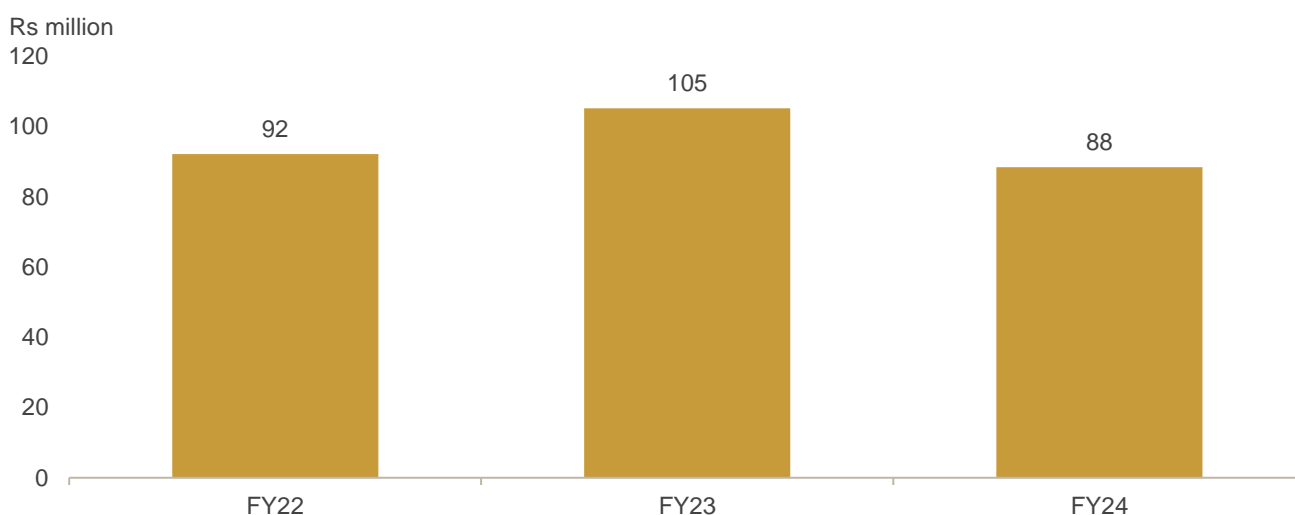
Source: Midwest Ltd., CRISIL MI&A Consulting

Midwest's initial plant capacity was 125,000 metre (m) in fiscal 2022 and steadily increased through annual additions of 20,000 m, reaching 165,000 m by fiscal 2024.

Production volume rose from 84,320 m in fiscal 2022 to 106,366 m in fiscal 2024, marking a substantial CAGR of 12%.

Capacity utilisation during the period consistently ranged between 64% and 73%. The expansion strategy reflects Midwest's proactive approach to scaling up operations to meet growing demand while maintaining efficient utilisation of its manufacturing capabilities.

**Revenue from diamond wires**



Sources: Midwest Ltd., CRISIL MI&A Consulting

Revenue from diamond wires was on a positive trajectory over fiscals 2022-2024. From Rs 92 million in fiscal 2022, it increased to Rs 105 million in 2023, indicating growth in demand and sales. Although there was a decrease to Rs 88 million in fiscal 2024, the overall trend demonstrates resilience and stability in the segment. The consistency in

performance underscores Midwest's ability to capture and maintain a significant market share in the diamond wires sector, despite fluctuations, indicating the company is well placed to tap into future growth opportunities in this specialised market.

**Segment 3: Other processed stones**

Midwest has effectively leveraged its operations by finding revenue streams from granite stones that do not meet international standards. These stones, which would otherwise be considered waste, are now processed (cut and polished) and sold in the market. This initiative not only helps utilise the by-products efficiently but also generates additional revenue for the company.

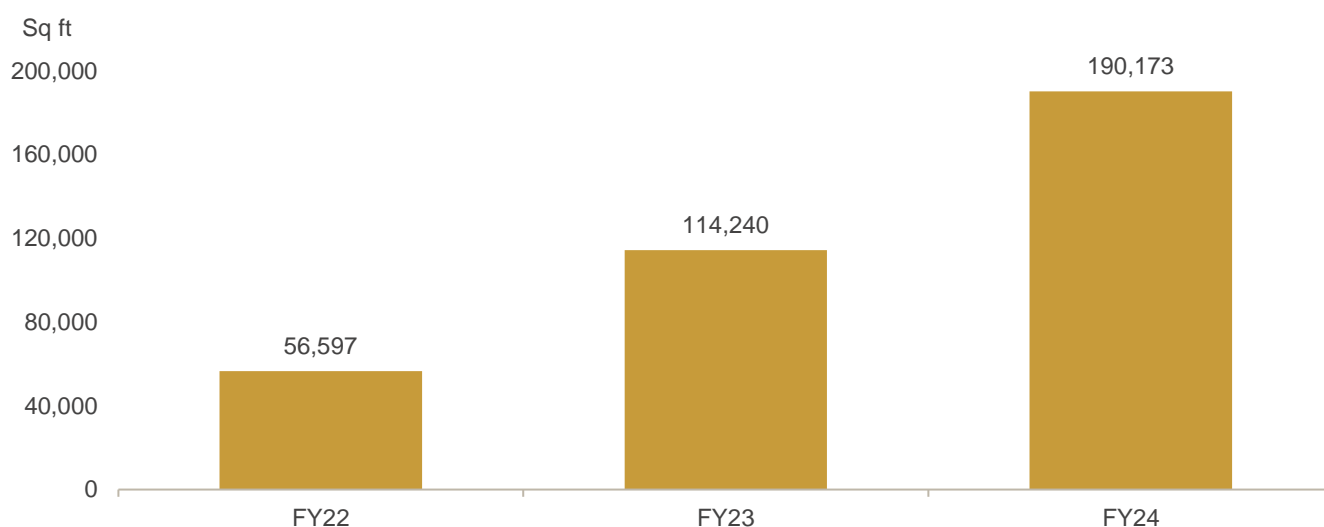
Under this segment, the company sells a variety of other processed stone products such as:

- Processed polished slabs: Finished stone slabs that are cut, polished and ready for installation in various applications such as flooring, countertops and wall cladding.

Though, this adds less than 2% of the revenue, value addition is created from this approach.

The processing of such products is done in Midwest's granite processing plants at Chimakurthy and SEZ-Ongole, Andhra Pradesh, which together have a capacity to produce 2,330,382 sq ft of stone slabs per annum. This segment involves further refinement and customisation of raw stone materials into finished products that meet specific market demands. These finished and value-added stone products are sold to construction companies, retailers and end consumers.

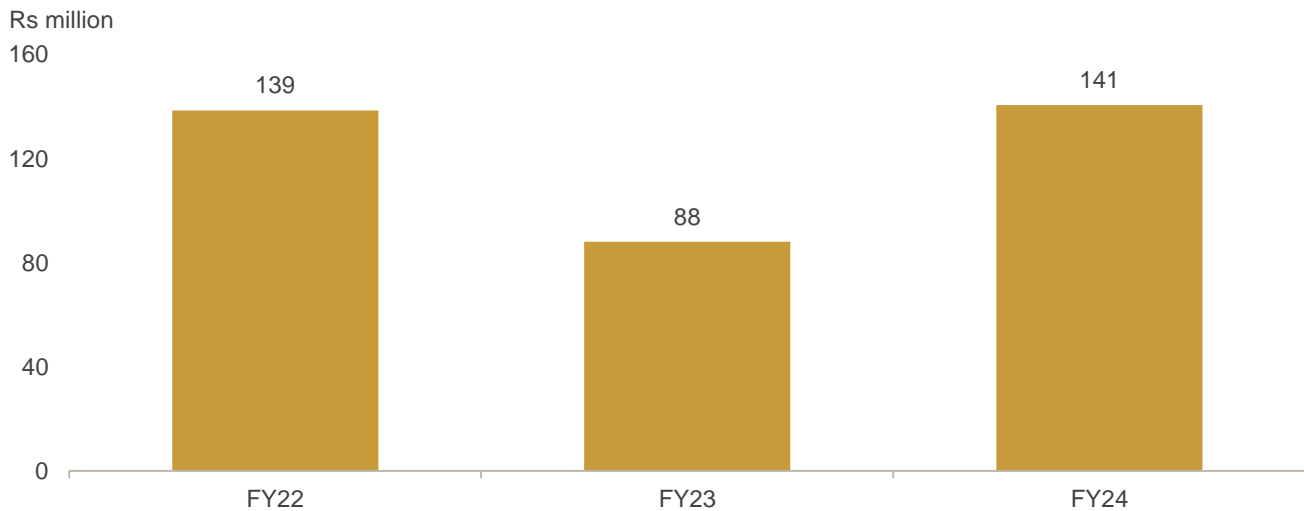
**Production of other products**



Sources: Midwest Ltd., CRISIL MI&A Consulting

The total production at Midwest's two granite processing plants grew significantly to 190,173 sq ft in fiscal 2024 from 56,597 sq ft in fiscal 2022. The impressive growth represents a multiple fold increase each year, 102% in fiscal 2023 and 180% in fiscal 2024. The substantial expansion in production capacity reflects Midwest's effective operational scaling to meet rising demand for its processed granite products. The growth not only enhances the company's output capabilities but also positions it as a strong player in the market.

**Revenue from other products sales**



Sources: Midwest Ltd., CRISIL MI&A Consulting

Revenue from sales of other processed products showed a positive trend over the fiscals 2022-2024, despite a dip in fiscal 2023. In fiscal 2022, the revenue stood at Rs 139 million, in fiscal 2023 Rs 88 million and in fiscal 2024 Rs 141 million.

**5.3 Expansion plans and tie-ups to boost sales**

**1. Quartz mining licences**

The company will add processing operations to its existing strength in mining in the quartz segment to diversify its revenue stream. It has already secured mining licences and is also in the process of acquiring new leases to boost its business prospects.

**2. Quartz processing plants**

Midwest has identified quartz as a potential sector given its experience in mining and mineral processing apart from the ability to be the organised player in an unorganised market and as part of its strategic objective. The company wants to set up quartz processing plants to initiate the next stage of integration to ensure effective utilisation of mines, increased revenue and employment generation.

The phase 1 of the project will produce 243,000 MT of quartz grit and powder per annum. The products are primarily used in engineered slabs and the glass industry.

The phase 2 will add 243,000 MTPA of quartz grit and powder. Midwest owns mines having proven high purity quartz (HPQ) resources. HPQ grit produced in the phase 2 will be used in solar and semiconductor industries.

With the operationalisation of the phase 1, the company will become one of the few players in the world that incorporate a mine-to-market integrated business model for production of quartz, i.e., offering capabilities across mining, processing, branding, bagging and distribution of quartz.

**3. Heavy mineral mining licences in Sri Lanka**

The company has obtained mineral concessions in Sri Lanka for the mining of heavy mineral sand ores to extract and produce 37,000 metric tonne per annum of minerals such as rutile, Ilmenite, zircon, garnet, sillimanite and monazite, each yielding different quantities of titanium and small quantities of rare earth elements.

In this regard, the company has incorporated two wholly owned subsidiaries in Sri Lanka — Midwest Heavy Sands (Pvt) Ltd and Trinco Mineral Sands Ltd. It has obtained four mineral concessions (exploration licences) with a potential to explore, develop and exploit the minerals mentioned above.

Ilmenite and rutile, which constitute the bulk of the ore, are used as feedstocks in the production of titanium oxide and titanium sponge and the company intends to produce intermediate products, titanium slag and titanium di-oxide pigment. Titanium di oxide pigment is used in pigments and paints and titanium sponge in the making metal and alloys. Rare earth elements are key ingredients for the manufacture of high-strength magnets and semi-conductors critical for the manufacture of electronics and medical equipment.

Monazite is a feedstock for rare earth elements that are critical for the manufacture of high-strength magnets.

Further, the company has aggressive plans to acquire more mines and leases for consolidating its granite, quartz and heavy minerals business.

## 5.4 Competition benchmarking

### Operational benchmarking

While the Indian granite and quartz industries comprises several small and medium enterprises, it is the organised players that have an edge, as they employ mechanised mining methods and automation, and have scale of operations, which lowers their cost of production. Further, mining rights covering specific areas are typically granted on an exclusive basis for a fixed period of time ranging between 1 and 30 years and establishing and operating a mine requires significant capital investment with long gestation periods to transition from the exploration stage to the production stage. Hence, those with large and established resources have a competitive advantage.

#### Prominent players in the granite as well as quartz industries

Company name		Midwest Ltd	Pokarna Ltd
Size/capacity of the plant	Number of mines and quarries	20 operating mines in Andhra Pradesh and Telangana (16 granite mines, 1 marble mine, 3 quartz mines)	Captive quarries located in Andhra Pradesh, Telangana and Tamil Nadu
	Processing plants/manufacturing units for core products	2 granite processing units in Andhra Pradesh and Telangana	2 granite manufacturing units in Telangana, and 1 quartz manufacturing unit each in Telangana and Andhra Pradesh
	Other plants/manufacturing units	1 diamond tool manufacturing plant in Hyderabad	1 apparel manufacturing unit in Telangana
Product offering		Building products: Granite and quartz	Building products: Granite, quartz (undertaken through subsidiary, Pokarna Engineered Stone Limited (PESL)); apparel business:

Company name	Midwest Ltd	Pokarna Ltd
		Distribution and retailing of men's shirts and trousers
<b>Presence</b>	Global: 30+ countries	Global: 20+ countries

Note: Pokarna Ltd. is not into Diamond wire business and the production details are not available

Source: Company websites, CRISIL MI&A Consulting

## Financial benchmarking

The profitability, liquidity and leverage parameters of Midwest have been benchmarked with Pokarna, which has comparable range of operational capabilities and similar product offerings.

### Profitability parameters

Particulars	Units	FY22	FY23	FY24
<b>Total revenue</b>				
Midwest	(Rs million)	5,252.37	5,025.17	5,856.24
Pokarna	(Rs million)	6,501.91	7,253.23	6,876.14
<b>Revenue growth</b>				
Midwest	(%)	38.23%	-4.33	16.54
Pokarna	(%)	120.38	11.56	-5.20
<b>Ebitda</b>				
Midwest	(Rs million)	1,057.41	895.87	1514.43
Pokarna	(Rs million)	1,750.03	1,700.74	2,096.67
<b>Ebitda margin</b>				
Midwest	(%)	20.13	17.83	25.86
Pokarna	(%)	26.92	23.45	30.49
<b>PAT</b>				
Midwest	(Rs million)	670.93	544.36	1,003.24
Pokarna	(Rs million)	783.00	658.11	873.63
<b>PAT margin</b>				
Midwest	(%)	12.77	10.83	17.13
Pokarna	(%)	12.04	9.07	12.71

Source: Company financials, CRISIL MI&A Consulting

- Operating profit margin comparison

Operating profit margins of both the players improved by ~5% points over fiscals 2022 to fiscal 2024, showcasing enhanced efficiency and cost management within the organization.

- **Net profit margin comparison**

Midwest has also shown strong resilience in maintaining its net profit margin (NPM) vis-à-vis peers. The company outperformed Pokarna between fiscals 2022 and 2024. Also, the rate of contraction of Midwest's NPM over fiscal 2022-2023 was shallower as compared Pokarna. The underscores Midwest's superior financial management and resilience in a challenging market environment. In fiscal 2024, its NPM improved 58% on-year.

#### Financial indicators

Particulars	Units	FY22	FY23	FY24
<b>RoCE</b>				
Midwest	%	26.29	14.39	25.00
Pokarna	%	14.12	13.77	18.31
<b>Debt-to-Equity</b>				
Midwest	times	0.35	0.45	0.29
Pokarna	times	1.15	0.89	0.66
<b>Working capital days</b>				
Midwest	No. of days	60	106	89
Pokarna	No. of days	163	165	157
<b>Interest coverage</b>				
Midwest	Times	9.73	7.51	14.11
Pokarna	Times	3.19	2.72	4.29
<b>Current ratio</b>				
Midwest	Times	1.11	1.32	1.68
Pokarna	Times	1.27	1.64	1.96
<b>RoE</b>				
Midwest	%	24.42	16.25	23.78
Pokarna	%	17.68	12.98	14.75

Source: Company reports, CRISIL MI&A Consulting

- **Return on capital employed comparison**

Midwest has consistently generated higher return on capital employed (RoCE) compared with its peers. In fiscal 2022, the company's RoCE of 26.29% was significantly than Pokarna (14.12%). Midwest maintained its lead up to fiscal 2024, with RoCE of 25.00%. During the year, Pokarna posted RoCE of 18.31%. Midwest's robust RoCE highlights its capital efficiency and superior financial management.

- **Net working capital days comparison**

In fiscal 2022, net working capital days of Midwest was 60 which got increased to 89 in fiscal 2024 . However, the company's competitor, Pokarna lagged on this metric whose net working capital days stood at 157in fiscal 2024. Net working capital days was constantly lower for Midwest when compared with its competitors,



indicating, efficiency in managing its receivables and inventory, allowing quicker conversion of assets into cash.

- **Return on equity comparison**

Midwest generated a healthy return on equity (RoE) over the years. In fiscal 2022, its RoE of 24.42%, better than Pokarna (17.68%). In fiscal 2024, while Midwest's RoE stood at 23.78%, Pokarna lagged behind by ~9% points. Midwest's RoE highlights its strong financial management and ability to generate returns for shareholders more effectively than its peers.

## Leverage parameters

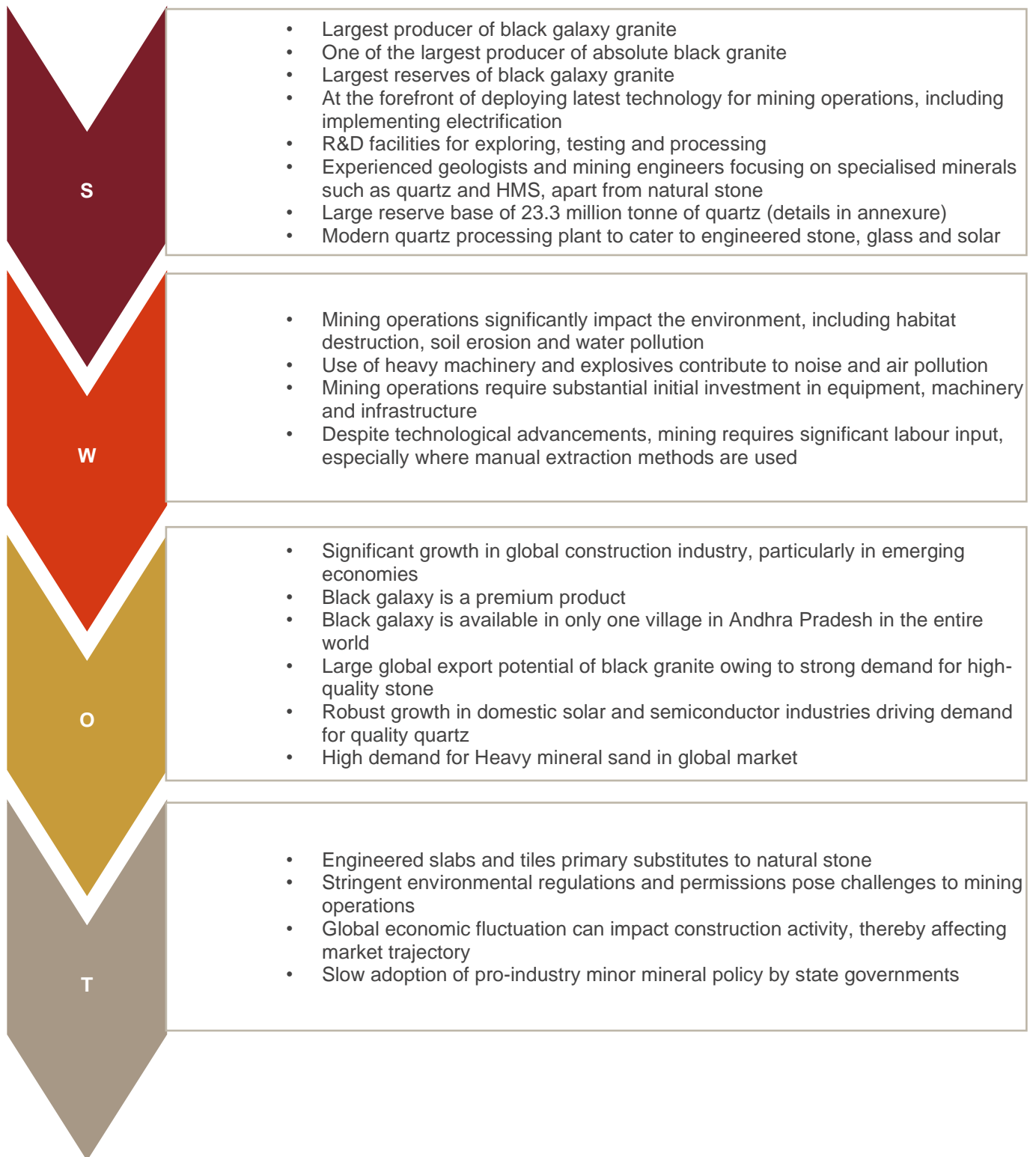
- **Debt-to-equity comparison (times)**

The debt-to-equity ratio of Midwest was 0.35 in fiscal 2022, indicating lower leverage. In fact, the ratio improved to 0.29 in fiscal 2024 from 0.45 in fiscal 2023, owing to reduction in debt during fiscal 2024 and increase in net worth. The ratio of its competitor, Pokarna, also improved to 0.66 in fiscal 2024 from 1.15 in fiscal 2022.

- **Interest coverage ratio comparison (times)**

Midwest's interest coverage ratio has been consistently above its peer over the years. In fiscal 2022, the company's ratio of 9.73 was considerably above Pokarna 3.19. It stayed strong at 14.11 in fiscal 2024, indicating Midwest's ability to comfortably cover interest expenses. During the year, Pokarna's interest coverage ratio was just 4.29. Midwest's high interest coverage highlights its ability to manage debt effectively vs industry peers.

## 5.5 SWOT analysis



Source: Midwest Ltd., Industry, CRISIL MI&A Consulting

## Key strengths

### Considerable global presence

Midwest, which has been into exploration, mining, processing, distribution, logistics, etc of granite and quartz for the past 42 years, is the largest producer and exporter of black galaxy granite and one of the largest producers in absolute black granite, which have high demand. The company also has reserves of coloured granite (tan brown), laza grey marble and celestia quartzite.

Its business is characterised by a strong track record of sustained growth and profitability, with zero-credit policy and strong sales visibility, backed by customer advances. Its operations span the entire wholesale stone granite value chain.

The company has a workforce of 1,307 across locations in Asia, Africa, Europe and the Americas, with qualified and experienced professionals, with appropriate functional responsibilities. The employee base comprises a core team of geologists, geophysicists, and mining and process engineers, and a support team of experts in logistics management, marketing, sales, supply chain, finance and other functions.

The company's key strengths are:

- **Lower manufacturing cost due to operational efficiencies**

The company's operational efficiencies have improved through the reduction in consumption of diesel and spare parts, and sourcing of captive solar power to operate machinery. The company is currently undertaking a pilot project for operating indigenous electric dump trucks to reduce logistics costs. Also, efforts are being made to reduce cycle times across production activities to achieve higher output.

- **Strong distribution network**

Midwest has a strong distribution network, supported by long-term contracts and interest-free advances secured against raw material supply. The sale of materials in different territories is through distributors.

- **Captive quarries of premium black galaxy**

The company has captive black galaxy quarries, located in Chimakurthy. Black galaxy granite is a premium stone used in premium real estate projects, monuments, mausoleums, places of worship and luxury products.

- **First to implement strong ERP system in industry**

Midwest was the first company in the industry to implement an enterprise resource planning system, SAP, integrated with sensors on machinery data in real time, thereby eliminating the need for manual intervention. The company also employs computerised diesel dispensing and monitoring methods.

- **Strong R&D, manufacturing technology and backward integration**

Strong R&D, manufacturing technology and backward integration support the development of environmentally friendly diamond tools for captive as well as industry consumption. The technology is co-developed in partnership with machinery manufacturers.

- **Major expansion in black galaxy granite**

Midwest is set for majorly expanding its black galaxy granite production via the acquisition of considerable deposits. It has created a new domestic market for black galaxy granite which do not meet export material standard, increasing the bottom line with no additional expenditure. In fiscal 2024, Midwest Ltd. held over 23% of the India's export market for black galaxy block granite in an otherwise unorganised and fragmented market. Also, the ESG regulatory environment is conducive to natural stone.

- **High barriers to entry for new players**

Entry barriers are high, with the company having old mining rights and entrenched operations.

- **Superior pricing positioning**

Midwest has the ability to fetch better market pricing through its substantial market share. Historically, demand has far surpassed supply.

- **100% renewal of mining leases**

Adherence to statutory compliances has enabled Midwest to ensure 100% renewal of mining leases in the past 3 years and garner good will for securing new leases bolstering growth potential.

## Key weaknesses

- **Heavy dependence on key customers**

Midwest depends on certain key customers for a significant portion of revenue from operations, with top 10 customers contributing 48.37%, 51.19% and 59.59% of total revenue from operations in Fiscals 2024, 2023 and 2022, respectively. Any decrease in the revenue earned from such customers could adversely affect the company's business, results of operations, cash flows and financial condition.

- **Dependence on international markets and China**

The company's revenue is substantially dependent on international operations, with a significant proportion of its revenue generated from customers based in China, a key global distribution hub for the granite industry. As a result, any unfavourable market developments or disruptions to China's ability to serve as a global hub could have a negative impact on the company's business and financial performance.

## Key opportunities

- **Growing construction industry**

The booming construction industry, particularly in emerging economies, presents significant opportunities for the granite and marble mining industry.

- **Export market expansion**

The company can explore and expand market reach by exporting granite and marble to regions with high demand and limited local supply.

- **Innovation and differentiation**

The company can offer unique products, such as specialty finishes and designs, to cater to specific market segments.

## Key threats

- **Competition from alternatives**

Granite and marble face competition from alternative materials, such as engineered stone, ceramic tiles and synthetic substitutes, which may offer similar aesthetics and durability at a lower cost.

- **Regulatory challenges**

Stringent environmental regulations and permitting processes can pose challenges to mining operations, increasing compliance costs and delaying project timelines.

- **Economic volatility**

Fluctuation in the global economy can impact construction activity and consumer spending, affecting demand for granite and marble products.

## Annexure

Midwest has won several prestigious awards and recognitions in various categories.

### Key awards given by Midwest

Award/recognition	Awarded by	Year
Model Granite Quarry Award	Federation of Indian Mineral Industries (FIMI) in association with All India Granites and Stone Association (AIGSA)	2003 2008-2009
Export Promotion Award	Development Commissioner, Visakhapatnam Special Economic Zone	2008-2009 2010-2011 2011-2012 2012-2013
Model Granite Quarry Award	FIMI in association with AIGSA	2008-2009
Export Excellence Award	Development Commissioner, Visakhapatnam Special Economic Zone	2009-2010
Export Performance Award	Export Awards for EOUs, Andhra Pradesh, Chhattisgarh, Yanam	2010-2011 2011-2012 2012-2013
Longstanding Customer	Export Credit Guarantee Corporation of India	2012
1st prize for Maintenance of Quarry Roads & Foot Paths	Safety Committee Appointed by Director of Mines Safety / Director of Mines Safety	2014
1st prize for Mine Workings & Operation & Maintenance of Machinery	Ministry of Labor and Employment through Directorate General of Mines Safety	2014
2nd prize for Registers & Records Maintenance		2017
3rd prize for Appointment of Qualified Personnel		2017
Overall 1 <sup>st</sup> prize among all mines in the sector		
One Star Export House	Ministry of Commerce and Industry (DGFT)	2015-2020
Star Export House	Ministry of Commerce and Industry (DGFT)	2013-2018
1st prize in Registers & Records Maintenance	Ministry of Labor and Employment through Directorate General of Mines Safety	2018
1st prize in Operation and Maintenance of Machinery	Ministry of Labor and Employment through Directorate General of Mines Safety	2019
1 <sup>st</sup> prize in Publicity and Propaganda of Safety Measures		
2nd prize in Appointment of Qualified Persons		
1st prize in Appointment of Qualified Persons	Ministry of Labor and Employment through Directorate General of Mines Safety	2022
2nd prize in Mine Workings		
Overall 2nd prize in total mines		
1st prize in 21st Mines Safety week celebrations- AP Midwest Granite mine	Ministry of Labor and Employment through Directorate General of Mines Safety	2023
Three Star Export House	Ministry of Commerce and Industry (DGFT)	2024

Source: Midwest Ltd.

**Key quartz resources owned by Midwest**

Location	Zone	Spread area (hectare)	Available resource ss (Mn MT)	Mining licences obtained (mn MT)	Securing mining licences (mn MT)
Chejerla	CH 1	61.9	1.4	1.4	
	CH 2	30	4.7		4.7
Gudur	NDR	5.6	0.2	0.2	
	TBD – N	14	0.8		0.8
	TBD – S	10	1.9		1.9
Badvel	MN – S	4.6	1.1	1.1	
	MN – N	1.9	0.5	0.5	
	KVD	4.7	0.5	0.5	
Kadiri	KK	24	3.5		3.5
	ORV	14	2.1		2.1
Aluru	ALU	23	6.6		6.6
<b>Total</b>		<b>198.6</b>	<b>23.3</b>	<b>3.7</b>	<b>19.6</b>

Source: Midwest Ltd.

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