

Flat Glass Market – Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Technology (Clear Float Glass, Tempered Glass, Insulated Glass, Coated Glass, Annealed Glass and Laminated Glass), By Technology (Float, Rolled and Sheet), By End-Use Industry (Building & Construction, Automotive, Consumer Goods and Solar), By Region, By Competition Forecast & Opportunities, 2018-2028

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Abstracts

The Global Flat Glass Market was valued at USD 126.74 billion in 2022 and is expected to grow at a CAGR of 4.17% during the forecast period. The construction industry is a significant consumer of flat glass, utilizing it in windows and facades for both residential and commercial buildings. The growth of this industry can be attributed to factors such as rapid urbanization, globalization, government support, and a growing population. It is worth noting that the flat glass industry's growth is closely tied to the construction industry, as both industries share similar growth drivers, including increasing consumer disposable income. There is a rising demand for flat glass in both interior and exterior applications in residential and commercial buildings.

Key Market Drivers

Growing Construction and Infrastructure Development

One of the key drivers of the global flat glass market is the sustained growth in construction and infrastructure development worldwide. The construction industry serves as a significant consumer of flat glass products, employing them for various

applications such as windows, doors, facades, and interior partitions in residential, commercial, and industrial buildings. The demand for flat glass is further bolstered by infrastructure projects, including transportation systems, airports, and urban development.

The growth behind this phenomenon is multifaceted. Factors such as rapid urbanization, population growth, and rising disposable incomes in emerging economies are propelling the demand for new residential and commercial spaces. In more developed regions, the need for infrastructure upgrades and renovations remains constant. Additionally, government initiatives aimed at stimulating economic growth often involve substantial investments in construction and infrastructure, thereby fostering the demand for flat glass.

Furthermore, the global inclination towards sustainable and energy-efficient buildings is driving the demand for advanced flat glass products, such as low-emissivity (low-E) glass and solar-control glass. These products play a crucial role in enhancing energy efficiency, reducing greenhouse gas emissions, and improving the overall comfort and functionality of buildings.

Automotive Industry Demand

The automotive industry serves as a significant catalyst for the global flat glass market. Flat glass plays a vital role in vehicle manufacturing, being utilized for windshields, windows, sunroofs, and mirrors.

Increasing consumer demand for automobiles, particularly in emerging markets such as China and India, propels the surge in vehicle production. Consequently, the automotive sector witnesses a growing need for flat glass.

Automakers consistently prioritize vehicle safety, incorporating advanced glass materials that exhibit enhanced resistance to impact and shattering. Furthermore, cutting-edge flat glass technologies facilitate innovations like heads-up displays (HUDs) and augmented reality windshields.

The rising popularity of electric vehicles (EVs) and the evolution of autonomous vehicles necessitate specialized flat glass solutions. EVs may incorporate lightweight glass to enhance energy efficiency, while autonomous vehicles rely on sensor-integrated glass for navigation and safety functionalities.

Technological Advancements and Specialty Applications

Technological advancements and the development of specialty flat glass applications are fueling innovation and driving market growth. These advancements create opportunities for differentiated and higher-value products. Several key drivers in this regard include:

The emergence of smart glass technologies, such as switchable or electrochromic glass, presents new prospects in the architectural, automotive, and consumer electronics sectors. Smart glass has the ability to alter its transparency or tint based on environmental conditions or user preferences, offering enhanced functionality and improved energy efficiency.

The development of advanced coatings for flat glass, including anti-reflective coatings, low-E coatings, and self-cleaning coatings, is propelling demand in various applications. These coatings enhance energy efficiency, optical clarity, and durability, making flat glass more adaptable to specific requirements.

The consumer electronics industry relies on high-performance glass for products like smartphones, tablets, and touchscreens. As consumer demand for more durable, scratch-resistant, and high-resolution displays increases, so does the demand for specialized flat glass materials.

Flat glass finds applications in solar panels and solar thermal systems. As the world moves towards renewable energy sources, the demand for flat glass in solar applications is growing, driven by government incentives and environmental concerns.

In conclusion, the global flat glass market is propelled by the robust growth in construction and infrastructure development, increasing demand from the automotive industry, and ongoing technological advancements leading to specialty applications. These drivers exemplify the diverse and evolving uses of flat glass across various sectors and regions, underscoring the market's resilience and potential for continued expansion.

Key Market Challenges

Intense Competition and Market Saturation

The global flat glass market is confronted with the significant challenge of intense

competition and market saturation. Flat glass, extensively used in industries like construction and automotive, has reached a point where numerous players, both established giants and emerging companies, vie for market share. This saturation has resulted in several complications.

First and foremost, pricing pressure remains a constant concern. With multiple suppliers offering similar products, price wars often erupt, causing margins to diminish. Consequently, manufacturers face the struggle of maintaining profitability, especially in light of fluctuating raw material costs and energy expenses.

Secondly, product differentiation becomes increasingly arduous. To distinguish themselves in this crowded market, companies must innovate not only in terms of glass quality but also in functionalities such as energy efficiency, smart features, and sustainability. Developing and marketing these unique selling points requires substantial investments in research and development, which can strain the resources of smaller players and newcomers.

Lastly, market saturation can lead to overcapacity. During periods of low demand, manufacturers may produce excess glass, further intensifying price pressures and diminishing profitability. Moreover, this overcapacity can impede the industry's sustainability efforts as production processes may become less efficient due to underutilized facilities.

To navigate this challenge successfully, companies in the global flat glass market must prioritize innovation, operational efficiency, and sustainable practices. Additionally, collaborations and mergers may prove necessary to consolidate resources and reduce competition.

Fluctuating Raw Material Prices and Supply Chain Vulnerability

One of the significant challenges faced by the global flat glass market is the volatility of raw material prices and the vulnerability of supply chains. The primary raw materials used in flat glass production include silica sand, soda ash, limestone, and alumina. The prices of these inputs can experience significant fluctuations due to factors such as geopolitical tensions, trade disputes, and environmental regulations.

For example, disruptions in the supply of silica sand, a crucial component in glass manufacturing, can have a ripple effect on production schedules and costs. Moreover, as the glass industry strives to adopt more sustainable practices, it may encounter

supply chain challenges in sourcing recycled glass and alternative raw materials.

Furthermore, given the global nature of the flat glass market, supply chains can be susceptible to geopolitical events, trade barriers, and transportation disruptions. These vulnerabilities can disrupt the flow of raw materials and finished products, leading to production delays and increased costs.

To tackle these challenges, companies in the flat glass industry should consider diversifying their raw material sources and exploring alternative materials to reduce dependence on volatile inputs. Additionally, building resilient and flexible supply chains through strategic partnerships and investments in logistics infrastructure can help mitigate disruptions.

Environmental and Regulatory Pressures

The global flat glass market is confronted with escalating environmental and regulatory pressures. As concerns surrounding climate change and resource depletion intensify, governments and consumers alike are demanding increasingly sustainable and energy-efficient products. These developments carry significant implications for the flat glass industry.

First and foremost, substantial investments in research and development are required to produce glass products that adhere to stricter environmental standards. This entails the advancement of energy-efficient glass coatings, cutting-edge insulation technologies, and materials with reduced carbon footprints.

Secondly, ensuring regulatory compliance can be a complex and costly endeavor. Manufacturers must navigate a complex network of international, national, and regional regulations pertaining to emissions, waste disposal, and energy consumption. Non-compliance can lead to fines and reputational damage.

Furthermore, the industry is under pressure to embrace circular economy principles, including recycling and reusing glass products. This necessitates the development of systems for the collection and processing of used glass, as well as the integration of recycled materials into new products.

To effectively tackle these challenges, companies operating in the global flat glass market must adopt a proactive approach to sustainability. This encompasses investing in green technologies, engaging with regulators to shape favorable policies, and

educating consumers about the environmental advantages of their products. By embracing sustainability, companies can not only meet regulatory requirements but also enhance their reputation and competitiveness in an increasingly environmentally conscious market.

Key Market Trends

Increasing Demand for Energy-Efficient and Smart Glass

One of the prominent trends in the global flat glass market is the increasing demand for energy-efficient and smart glass solutions. With growing concerns about energy conservation and sustainability, consumers and industries are seeking innovative glass products that can help reduce energy consumption and enhance overall building or automotive performance.

Energy-efficient glass, often referred to as low-emissivity (Low-E) glass, incorporates special coatings that minimize heat transfer while allowing natural light to pass through. This technology helps regulate indoor temperatures, reducing the need for heating and cooling systems. In addition to residential and commercial buildings, energy-efficient glass is gaining popularity in the automotive sector to improve vehicle fuel efficiency.

Smart glass, on the other hand, incorporates advanced technologies like electrochromic or thermochromic materials to control light transmission and glare, providing privacy and comfort. These glass products can be electronically controlled, offering users the ability to adjust transparency and opacity. This trend aligns with the increasing adoption of smart and automated building systems, as well as the desire for more comfortable and connected vehicles.

As environmental consciousness continues to grow, the demand for energy-efficient and smart glass is expected to rise further. Manufacturers are investing in research and development to enhance the performance and cost-effectiveness of these products, making them more accessible to a broader range of consumers and industries.

Sustainable Manufacturing and Recycling Initiatives

Another significant trend in the global flat glass market is the increasing focus on sustainable manufacturing practices and recycling initiatives. Sustainability has emerged as a critical factor for both consumers and regulatory bodies, compelling glass manufacturers to embrace eco-friendly production methods and minimize their

environmental impact.

Manufacturers are investing in energy-efficient technologies and optimizing production processes to minimize energy consumption during glass manufacturing. Glass is highly recyclable, and there is a growing emphasis on collecting and recycling glass products to reduce the demand for raw materials and mitigate carbon emissions. Initiatives are underway to reduce greenhouse gas emissions and air pollutants associated with glass production. Researchers are exploring alternative materials and manufacturing techniques, such as utilizing recycled glass or developing bio-based glass, to minimize the environmental footprint of flat glass production. Companies are exploring circular economy models where glass products are designed with recycling and reuse in mind.

These sustainable practices are driven not only by environmental concerns but also by the need to meet evolving regulatory requirements and address consumer preferences. Companies that embrace sustainable practices are likely to gain a competitive advantage and enhance their brand image in the market.

Segmental Insights

Product Type Insights

The Insulated Glass segment holds a significant market share in the Global Flat Glass Market. Insulated glass plays a significant role in promoting sustainability by reducing energy consumption in buildings. With the increasing focus on environmental concerns, green building designs incorporate insulated glass to meet certification requirements like LEED (Leadership in Energy and Environmental Design). This aligns with the growing emphasis on reducing carbon footprints and conserving energy resources.

The integration of smart glass technologies within insulated glass units is an emerging trend. Smart insulated glass can dynamically adjust its transparency or opacity based on external factors such as sunlight, temperature, and user preferences. This technology enhances user comfort and reduces the reliance on additional shading or blinds. The insulated glass market is highly competitive, with both global and regional players.

Major flat glass manufacturers have dedicated product lines for insulated glass, while regional players cater to local demands and specialize in niche markets, offering customized solutions. Although insulated glass may have a higher initial cost compared to single-pane glass, the long-term energy savings and improved comfort often justify

the higher upfront investment, especially in regions with extreme weather conditions. In conclusion, the global flat glass market's insulated glass segment is experiencing steady growth, driven by energy efficiency requirements, sustainability concerns, and technological advancements.

End-Use Industry Insights

The Building & Construction segment holds a significant market share in the Global Flat Glass Market. Sustainable building practices are experiencing a significant surge, leading to the growing adoption of environmentally friendly and energy-efficient materials. In response, glass manufacturers are actively developing products that align with green building certifications like LEED (Leadership in Energy and Environmental Design).

The use of recycled glass and sustainable manufacturing processes is gaining momentum due to increasing environmental concerns. Moreover, safety and security considerations have prompted the utilization of laminated and tempered glass in various building applications. These types of glass offer enhanced resistance to breakage and improved safety in case of any unfortunate incidents.

Furthermore, high-security environments such as government buildings, banks, and airports are increasingly incorporating bullet-resistant and blast-resistant glass. To enhance occupant comfort and energy efficiency, smart glass solutions are being integrated into the building and construction sector. These innovative technologies allow for dynamic control of transparency and shading, reducing the reliance on traditional blinds or shades. Electrochromic, thermochromic, and photochromic smart glass technologies are gaining acceptance in both residential and commercial applications.

The building and construction segment encompasses a wide range of flat glass types, including clear, tinted, reflective, and patterned glass, each serving different purposes such as privacy and solar heat control. Glass applications in this segment include windows, doors, skylights, glass walls, balustrades, and roofing systems. In conclusion, the building and construction segment plays a crucial role in driving the global flat glass market, shaped by architectural trends, energy efficiency requirements, sustainability goals, and safety considerations. As the construction industry continues to evolve, flat glass manufacturers will remain pivotal in providing innovative solutions that meet the evolving demands of builders, architects, and property owners worldwide.

Regional Insights

The Asia Pacific region is expected to dominate the market during the forecast period. The Asia-Pacific region plays a crucial role in the global flat glass market, serving as a significant consumer and production hub. The region is currently witnessing a wave of urbanization, with a substantial influx of people from rural to urban areas. This has resulted in a surge in construction activities, driving the demand for flat glass in residential and commercial buildings.

Several countries in the Asia-Pacific region are making substantial investments in infrastructure development, including transportation networks, airports, and public buildings. These ambitious projects require substantial quantities of flat glass, further propelling market growth. There is a growing emphasis on energy-efficient buildings and sustainable construction practices. Consequently, there is a high demand for low-emissivity (Low-E) glass and other energy-efficient glass products. This trend aligns with the region's focus on sustainability and reducing energy consumption.

The adoption of smart glass solutions is witnessing an upward trajectory in the Asia-Pacific region, driven by the desire for modern and technologically advanced buildings and vehicles. Smart glass offers a range of benefits such as privacy control, glare reduction, and energy efficiency, making it increasingly popular in commercial and residential construction. Environmental concerns are prompting manufacturers to invest in sustainable practices. Recycling initiatives are gaining momentum, and some companies are exploring alternative raw materials to minimize their carbon footprint. This trend aligns with global efforts to reduce greenhouse gas emissions and preserve valuable resources.

Key Market Players

AGC Inc.

Asahi India Glass Limited

Cardinal Glass Industries Inc.

China Glass Holdings Limited

Fuyao Glass Industry Group Co., Ltd.

Pilkington Group Limited

Euroglas GmbH

Nippon Sheet Glass Co. Ltd

Taiwan Glass Industry Corporation

Compagnie de Saint-Gobain S.A.

Report Scope:

In this report, the Global Flat Glass Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Global Flat Glass Market, By Product Type:

Clear Float Glass

Tempered Glass

Insulated Glass

Coated Glass

Annealed Glass

Laminated Glass

Global Flat Glass Market, By Technology:

Float

Rolled

Sheet

Global Flat Glass Market, By End Use Industry:

Building & Construction

Automotive

Consumer Goods

Solar

Global Hazard Control Market, By Region:

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia-Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Flat Glass Market.

Available Customizations:

Global Flat Glass Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

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

Contents

1. PRODUCT OVERVIEW

- 1.1. Market Definition
- 1.2. Scope of the Market
 - 1.2.1. Markets Covered
 - 1.2.2. Years Considered for Study
 - 1.2.3. Key Market Segmentations

2. RESEARCH METHODOLOGY

- 2.1. Objective of the Study
- 2.2. Baseline Methodology
- 2.3. Key Industry Partners
- 2.4. Major Association and Secondary Sources
- 2.5. Forecasting Methodology
- 2.6. Data Triangulation & Validation
- 2.7. Assumptions and Limitations

3. EXECUTIVE SUMMARY

4. VOICE OF CUSTOMERS

5. GLOBAL FLAT GLASS MARKET OUTLOOK

- 5.1. Market Size & Forecast
 - 5.1.1. By Value
- 5.2. Market Share & Forecast
 - 5.2.1. By Product Type (Clear Float Glass, Tempered Glass, Insulated Glass, Coated Glass, Annealed Glass and Laminated Glass)
 - 5.2.2. By Technology (Float, Rolled and Sheet)
 - 5.2.3. By End-Use Industry (Building & Construction, Automotive, Consumer Goods and Solar)
 - 5.2.4. By Region
- 5.3. By Company (2022)
- 5.4. Market Map

6. NORTH AMERICA FLAT GLASS MARKET OUTLOOK

- 6.1. Market Size & Forecast
 - 6.1.1. By Value
- 6.2. Market Share & Forecast
 - 6.2.1. By Product Type
 - 6.2.2. By Technology
 - 6.2.3. By End Use Industry
 - 6.2.4. By Country
- 6.3. North America: Country Analysis
 - 6.3.1. United States Flat Glass Market Outlook
 - 6.3.1.1. Market Size & Forecast
 - 6.3.1.1.1. By Value
 - 6.3.1.2. Market Share & Forecast
 - 6.3.1.2.1. By Product Type
 - 6.3.1.2.2. By Technology
 - 6.3.1.2.3. By End Use Industry
 - 6.3.2. Canada Flat Glass Market Outlook
 - 6.3.2.1. Market Size & Forecast
 - 6.3.2.1.1. By Value
 - 6.3.2.2. Market Share & Forecast
 - 6.3.2.2.1. By Product Type
 - 6.3.2.2.2. By Technology
 - 6.3.2.2.3. By End Use Industry
 - 6.3.3. Mexico Flat Glass Market Outlook
 - 6.3.3.1. Market Size & Forecast
 - 6.3.3.1.1. By Value
 - 6.3.3.2. Market Share & Forecast
 - 6.3.3.2.1. By Product Type
 - 6.3.3.2.2. By Technology
 - 6.3.3.2.3. By End Use Industry

7. ASIA-PACIFIC FLAT GLASS MARKET OUTLOOK

- 7.1. Market Size & Forecast
 - 7.1.1. By Value
- 7.2. Market Share & Forecast
 - 7.2.1. By Product Type
 - 7.2.2. By Technology
 - 7.2.3. By End Use Industry

7.2.4. By Country

7.3. Asia-Pacific: Country Analysis

7.3.1. China Flat Glass Market Outlook

7.3.1.1. Market Size & Forecast

7.3.1.1.1. By Value

7.3.1.2. Market Share & Forecast

7.3.1.2.1. By Product Type

7.3.1.2.2. By Technology

7.3.1.2.3. By End Use Industry

7.3.2. India Flat Glass Market Outlook

7.3.2.1. Market Size & Forecast

7.3.2.1.1. By Value

7.3.2.2. Market Share & Forecast

7.3.2.2.1. By Product Type

7.3.2.2.2. By Technology

7.3.2.2.3. By End Use Industry

7.3.3. Japan Flat Glass Market Outlook

7.3.3.1. Market Size & Forecast

7.3.3.1.1. By Value

7.3.3.2. Market Share & Forecast

7.3.3.2.1. By Product Type

7.3.3.2.2. By Technology

7.3.3.2.3. By End Use Industry

7.3.4. South Korea Flat Glass Market Outlook

7.3.4.1. Market Size & Forecast

7.3.4.1.1. By Value

7.3.4.2. Market Share & Forecast

7.3.4.2.1. By Product Type

7.3.4.2.2. By Technology

7.3.4.2.3. By End Use Industry

7.3.5. Australia Flat Glass Market Outlook

7.3.5.1. Market Size & Forecast

7.3.5.1.1. By Value

7.3.5.2. Market Share & Forecast

7.3.5.2.1. By Product Type

7.3.5.2.2. By Technology

7.3.5.2.3. By End Use Industry

8. EUROPE FLAT GLASS MARKET OUTLOOK

- 8.1. Market Size & Forecast
 - 8.1.1. By Value
- 8.2. Market Share & Forecast
 - 8.2.1. By Product Type
 - 8.2.2. By Technology
 - 8.2.3. By End Use Industry
 - 8.2.4. By Country
- 8.3. Europe: Country Analysis
 - 8.3.1. Germany Flat Glass Market Outlook
 - 8.3.1.1. Market Size & Forecast
 - 8.3.1.1.1. By Value
 - 8.3.1.2. Market Share & Forecast
 - 8.3.1.2.1. By Product Type
 - 8.3.1.2.2. By Technology
 - 8.3.1.2.3. By End Use Industry
 - 8.3.2. United Kingdom Flat Glass Market Outlook
 - 8.3.2.1. Market Size & Forecast
 - 8.3.2.1.1. By Value
 - 8.3.2.2. Market Share & Forecast
 - 8.3.2.2.1. By Product Type
 - 8.3.2.2.2. By Technology
 - 8.3.2.2.3. By End Use Industry
 - 8.3.3. France Flat Glass Market Outlook
 - 8.3.3.1. Market Size & Forecast
 - 8.3.3.1.1. By Value
 - 8.3.3.2. Market Share & Forecast
 - 8.3.3.2.1. By Product Type
 - 8.3.3.2.2. By Technology
 - 8.3.3.2.3. By End Use Industry
 - 8.3.4. Italy Flat Glass Market Outlook
 - 8.3.4.1. Market Size & Forecast
 - 8.3.4.1.1. By Value
 - 8.3.4.2. Market Share & Forecast
 - 8.3.4.2.1. By Product Type
 - 8.3.4.2.2. By Technology
 - 8.3.4.2.3. By End Use Industry
 - 8.3.5. Spain Flat Glass Market Outlook
 - 8.3.5.1. Market Size & Forecast

- 8.3.5.1.1. By Value
- 8.3.5.2. Market Share & Forecast
 - 8.3.5.2.1. By Product Type
 - 8.3.5.2.2. By Technology
 - 8.3.5.2.3. By End Use Industry

9. SOUTH AMERICA FLAT GLASS MARKET OUTLOOK

- 9.1. Market Size & Forecast
 - 9.1.1. By Value
- 9.2. Market Share & Forecast
 - 9.2.1. By Product Type
 - 9.2.2. By Technology
 - 9.2.3. By End Use Industry
 - 9.2.4. By Country
- 9.3. South America: Country Analysis
 - 9.3.1. Brazil Flat Glass Market Outlook
 - 9.3.1.1. Market Size & Forecast
 - 9.3.1.1.1. By Value
 - 9.3.1.2. Market Share & Forecast
 - 9.3.1.2.1. By Product Type
 - 9.3.1.2.2. By Technology
 - 9.3.1.2.3. By End Use Industry
 - 9.3.2. Argentina Flat Glass Market Outlook
 - 9.3.2.1. Market Size & Forecast
 - 9.3.2.1.1. By Value
 - 9.3.2.2. Market Share & Forecast
 - 9.3.2.2.1. By Product Type
 - 9.3.2.2.2. By Technology
 - 9.3.2.2.3. By End Use Industry
 - 9.3.3. Colombia Flat Glass Market Outlook
 - 9.3.3.1. Market Size & Forecast
 - 9.3.3.1.1. By Value
 - 9.3.3.2. Market Share & Forecast
 - 9.3.3.2.1. By Product Type
 - 9.3.3.2.2. By Technology
 - 9.3.3.2.3. By End Use Industry

10. MIDDLE EAST & AFRICA FLAT GLASS MARKET OUTLOOK

- 10.1. Market Size & Forecast
 - 10.1.1. By Value
- 10.2. Market Share & Forecast
 - 10.2.1. By Product Type
 - 10.2.2. By Technology
 - 10.2.3. By End Use Industry
 - 10.2.4. By Country
- 10.3. Middle East & Africa: Country Analysis
 - 10.3.1. Saudi Arabia Flat Glass Market Outlook
 - 10.3.1.1. Market Size & Forecast
 - 10.3.1.1.1. By Value
 - 10.3.1.2. Market Share & Forecast
 - 10.3.1.2.1. By Product Type
 - 10.3.1.2.2. By Technology
 - 10.3.1.2.3. By End Use Industry
 - 10.3.2. South Africa Flat Glass Market Outlook
 - 10.3.2.1. Market Size & Forecast
 - 10.3.2.1.1. By Value
 - 10.3.2.2. Market Share & Forecast
 - 10.3.2.2.1. By Product Type
 - 10.3.2.2.2. By Technology
 - 10.3.2.2.3. By End Use Industry
 - 10.3.3. UAE Flat Glass Market Outlook
 - 10.3.3.1. Market Size & Forecast
 - 10.3.3.1.1. By Value
 - 10.3.3.2. Market Share & Forecast
 - 10.3.3.2.1. By Product Type
 - 10.3.3.2.2. By Technology
 - 10.3.3.2.3. By End Use Industry

11. MARKET DYNAMICS

- 11.1. Drivers
- 11.2. Challenge

12. MARKET TRENDS & DEVELOPMENTS

13. COMPANY PROFILES

13.1. AGC Inc.

- 13.1.1. Business Overview
- 13.1.2. Key Revenue and Financials
- 13.1.3. Recent Developments
- 13.1.4. Key Personnel
- 13.1.5. Key Product/Services

13.2. Asahi India Glass Limited

- 13.2.1. Business Overview
- 13.2.2. Key Revenue and Financials
- 13.2.3. Recent Developments
- 13.2.4. Key Personnel
- 13.2.5. Key Product/Services

13.3. Cardinal Glass Industries Inc.

- 13.3.1. Business Overview
- 13.3.2. Key Revenue and Financials
- 13.3.3. Recent Developments
- 13.3.4. Key Personnel
- 13.3.5. Key Product/Services

13.4. China Glass Holdings Limited

- 13.4.1. Business Overview
- 13.4.2. Key Revenue and Financials
- 13.4.3. Recent Developments
- 13.4.4. Key Personnel
- 13.4.5. Key Product/Services

13.5. Fuyao Glass Industry Group Co., Ltd.

- 13.5.1. Business Overview
- 13.5.2. Key Revenue and Financials
- 13.5.3. Recent Developments
- 13.5.4. Key Personnel
- 13.5.5. Key Product/Services

13.6. Pilkington Group Limited

- 13.6.1. Business Overview
- 13.6.2. Key Revenue and Financials
- 13.6.3. Recent Developments
- 13.6.4. Key Personnel
- 13.6.5. Key Product/Services

13.7. Euroglas GmbH

- 13.7.1. Business Overview

- 13.7.2. Key Revenue and Financials
- 13.7.3. Recent Developments
- 13.7.4. Key Personnel
- 13.7.5. Key Product/Services
- 13.8. Nippon Sheet Glass Co. Ltd
 - 13.8.1. Business Overview
 - 13.8.2. Key Revenue and Financials
 - 13.8.3. Recent Developments
 - 13.8.4. Key Personnel
 - 13.8.5. Key Product/Services
- 13.9. Taiwan Glass Industry Corporation
 - 13.9.1. Business Overview
 - 13.9.2. Key Revenue and Financials
 - 13.9.3. Recent Developments
 - 13.9.4. Key Personnel
 - 13.9.5. Key Product/Services
- 13.10. Compagnie de Saint-Gobain S.A.
 - 13.10.1. Business Overview
 - 13.10.2. Key Revenue and Financials
 - 13.10.3. Recent Developments
 - 13.10.4. Key Personnel
 - 13.10.5. Key Product/Services

14. STRATEGIC RECOMMENDATIONS

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