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High-Performance Flat Glass

US Industry Study with Forecasts for **2017 & 2022**

Study #3034 | June 2013 | \$5100 | 302 pages

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Gains will benefit from a major rebound in building construction spending, continued improvement in motor vehicle production, and increased market share in the general flat glass market.

US demand to rise 4.4% annually through 2017

US demand for high-performance flat glass products is forecast to rise 4.4 percent per year to 910 million square feet in 2017, valued at nearly \$9.2 billion. This will represent a substantial improvement from the performance of the market over the 2007-2012 period, when demand in area terms suffered an outright decline. Going forward, gains will benefit from a major rebound in building construction spending, continued improvement in motor vehicle production, and increased market share for high-performance products in the general flat glass market. Through 2017, the architectural market for high performance flat glass is expected to rebound from low 2012 levels, while the motor vehicle market for these advanced flat glass products will post solid growth.

Solar control glass to be fastest growing segment

Value demand for solar control glass is forecast to rise at a double-digit annual rate through 2017, a significant improvement from the pace of the 2007-2012 period. Consumption of solar control glass products is largely concentrated in the architectural market and will benefit from rapid increases in new building construction. Low-emissivity (low-e) glass is the most commonly used solar control product in residential window systems, particularly in double-pane insulated glass units (IGUs). Sales of



low-e glass will see especially fast gains through 2017, benefiting from a rebound in new housing construction as well as from increased emphasis on energy efficiency. Electrochromic mirrors represent the largest application for solar control glass outside of the architectural market and account for the bulk of smart glass demand. Sales of these products will see strong growth, but will trail the average as growth in motor vehicle output trails the rapid gains in building construction. Smart window glass products -- including electrochromic windows, suspended particle device (SPD) windows, and liquid crystal device (LCD) windows -- will make strong gains but will continue to represent a minor share of the total market.

The security and safety glass segment holds the largest share of high-performance flat glass sales in value terms, accounting for over two-thirds of the total in 2012. Consumption of security and safety glass is projected to grow at an above average pace through 2017. The fastest gains are expected for laminated hurricane glass, although this will remain a regional product. In the motor vehicle market, laminated glass will increasingly be used in side and rear windows and roof applications and will continue to take market share from tempered glass.

Demand in value terms for other high-performance flat glass products will also be solid through 2017. Heads-up display windshields will post strong sales growth as these products become more common, although demand will remain largely confined to aircraft and higher-value motor vehicles. Demand for self-cleaning glass will rise at an especially rapid rate from a small 2012 base. Sales of other products, including anti-reflective glass, leaded glass, and electronics glass, will rise at a more moderate rate.

Study Coverage

This industry study, **High-Performance Flat Glass**, presents historical demand data (2002, 2007, 2012) and forecasts for 2017 and 2022 by product (e.g., security and safety glass, solar control glass) and market (e.g., vehicular, architectural). The study also considers market environment factors, evaluates company market share and profiles 30 industry competitors.

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Sample Text, Table & Chart

PRODUCTS

Electrochromic Windows: Demand for electrochromic windows is projected to increase to 1.5 billion in 2017, up from 1.2 billion in 2012. The most established opportunity is in automotive side windows, where architectural producers of electrochromic windows will devote more energies to the development of products, where such as glass thickness, which is easier to over-

**SAMPLE
TEXT**

For example, View (formerly Soladigm) produces electrochromic windows which are based on glass that has been treated with antimony and lithium alloys. The company offers electrochromic windows for the commercial buildings market via a partnership with Guardian Industries.

Electrochromic windows consist of thin, multilayer coatings deposited onto a single pane of glass, similar to sputter coated low-e glass. The two outside layers of the assembly are transparent electronic conductors. Next is a counter-electrode layer (or an "ion storage" layer) and an electrochromic layer, with an ion conductor layer in between. When a low voltage is applied across the conductors, ions move from the ion storage layer to the electrochromic layer, thus darkening the layer. Reversing the voltage causes the ions to move from the electrochromic layer back to the ion storage layer, restoring the layer to its clear state.

In addition to Gentex and Magna Mirror Systems (which produce production in the electrochromic mirror segment), other flat glass with electrochromic technologies include AGC Glass (Asahi Industries), Saint-Gobain, and Teledyne Scientific & Imaging.

Teledyne has developed "reversible electrochemical mirror technology, which is similar to conventional electrochromic

150

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TABLE IV-3

SAFETY GLASS DEMAND (million dollars)

Item	2002	2007	2012	2017	2022
Motor Vehicle Production (000)	17	17	17	17	17
sq ft safety glass/vehicle					
Safety Glass Demand (mil sq ft)					
\$/sq ft					
Safety Glass Demand					
By Type:					
Laminated Glass					
Tempered Glass					
By Market:					
Motor Vehicles					
Aerospace & Other Transport					
% safety glass					
Security & Safety Glass Demand					

**SAMPLE
TABLE**

CHART VI-1

HIGH-PERFORMANCE FLAT GLASS MARKET SHARE BY COMPANY (\$6.2 billion, 2012)

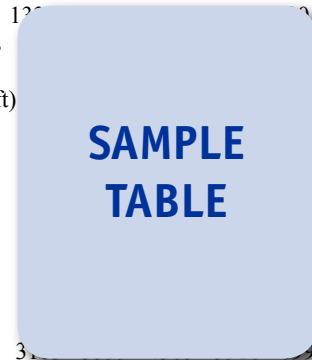


**SAMPLE
CHART**

Sample Profile, Table & Forecast

TABLE V-6
AEROSPACE & AIRCRAFT MARKET
FOR HIGH-PERFORMANCE FLAT GLASS
(million dollars)

Item	2002	2007	2012	2017	2022
Aerospace/Aircraft Shpts (bil 2005\$)	12	17	20	20	20
sq ft high-perf flat glass/mil \$ shpts	12	17	20	20	20
Aero/Aircraft H-P Flat Glass (mil sq ft)	3	3	3	3	3
\$/sq ft	3	3	3	3	3
Aero & Aircraft H-P Flat Glass	0	0	0	0	0
Security & Safety Glass	0	0	0	0	0
Solar Control Glass	5	5	5	5	5
Other High-Performance Glass	5	5	5	5	5
% aerospace & aircraft	0	0	0	0	0
Vehicular H-P Flat Glass Demand	3	3	3	3	3



COMPANY PROFILES

Armor USA Incorporated

354 McDonnell Street, Suite 14
 Lewisville, TX
 972-315-1750
<http://www.armorusa.com>

Annual Sales:
 Employment:

Key Products: security glass

Armor USA is a leading manufacturer of security glass materials, and body and vehicle armor. The Company markets its products worldwide.

The Company is involved in the US high-performance flat glass industry via the production AUGARD security glass. This glass is designed to be resistant to bullets, blasts, and burglary. AUGARD glass is engineered to provide transparent, light weight protection in military armored personnel carriers, light armored vehicles, and executive armored vehicles. This glass is produced using asymmetrical multi-layer laminated glass clad polycarbonate. AUGARD glass is designed to protect against a wide range of threat levels, including handgun and assault rifle projectiles, improvised explosive devices, and artillery fragments. Armor USA makes AUGARD privacy glass in AUGARD-I, AUGARD-II, AUGARD-III, AUGARD-IV, and AUGARD-V styles that have thicknesses of 17 millimeters (mm), 19mm, 21mm, 35 mm, and 39 mm, respectively. The Company also manufactures 52-mm thick AUGARD-VAP; and AUGARD-API, AUGARD-APII, and AUGARD-APIII, which have thicknesses of 61 to 103 mm.



“The forecast recovery in new residential construction, particularly new single-family housing, will provide the primary impetus for growth. The rebound in new housing will spark renewed demand for solar control glass, especially low-emissivity glass materials. Demand for products such as self-cleaning glass and smart glass will continue to be relatively small but such products will expand their market penetration. Hurricane glass will continue to be limited geographically, with consumption centered in Florida.”
 --Section V, pg. 196-7

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OTHER STUDIES

World Windows & Doors

Through 2017, global demand for windows and doors is expected to rise 7.1 percent annually to \$223 billion. China was the world's largest window and door market in 2012, and will see its share of global demand rise to 36 percent of the total in 2017. Plastic window and door products will see the fastest demand gains worldwide. This study analyzes the \$158 billion world window and door industry, with forecasts for 2017 and 2022 by product, material, market, world region, and for 21 countries. The study also evaluates company market share and profiles industry players.

#3039 June 2013 \$6400

World Flat Glass

World demand for flat glass is forecast to rise 7.1 percent per year through 2016 to 9.2 billion square meters. The dominant Asia/Pacific region will continue to post the fastest gains. Fabricated flat glass demand will benefit from rapid growth in sales of energy efficient products such as solar control, insulation and low-E glass. This study analyzes the 6.6 billion square meter world flat glass industry, with forecasts for 2016 and 2021 by product, market, world region and for 21 countries. The study also evaluates company market share and profiles industry players.

#2970 January 2013 \$6400

Flat Glass in China

Demand for flat glass in China is projected to increase 8.2 percent per year through 2016 to 3.4 billion square meters. Safety glass and insulating glass will be the fastest growing flat glass types. Solar energy and electronic displays will be the fastest growing markets, while the architectural market remains dominant. This study analyzes the 2.3 billion square meter flat glass industry in China, with forecasts for 2016 and 2021 by type, market and geographic region. The study also evaluates company market share and profiles industry participants.

#2930 November 2012 \$5400

World Insulation

Global insulation demand is forecast to rise 5.5 percent annually to 23.1 billion square meters of R-1 value in 2016. The Asia/Pacific region will remain the largest and fastest growing market, followed by North America. The best growth opportunities will be found in foamed plastic and fiberglass insulation. This study analyzes the 17.7 billion square meter global insulation industry, with forecasts for 2016 and 2021 by material, market, world region and for 21 major countries. The study also evaluates company market share and profiles industry players.

#2956 October 2012 \$6300

Windows & Doors

Demand for windows and doors in the US is forecast to rise 9.3 percent per year to \$34.2 billion in 2016. Aided by a rebound in construction spending, the residential market will post double-digit advances in demand. Among material types, plastic windows and doors will see the fastest gains, while metal types remain the largest segment. This study analyzes the \$18.6 billion US window and door industry, with forecasts for 2016 and 2021 by material, product, market and US region. The study also evaluates company market share and profiles industry players.

#2949 September 2012 \$5300

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