GLASS FIBERS
Fiberglass/Glass Wool and Glass Fiber Reinforcements
A GLOBAL MARKET OVERVIEW
The study reviews, analyzes and projects the global market for Glass Fibers (Fiberglass/Glass Wool and Glass Fiber Reinforcements) for the period 2006-2016
Competitive materials

A wide range of materials are used for thermal and acoustical insulation around the globe. These include foamed plastics, fiberglass or glass wool, stone wool, cellulose, vermiculite etc. Rock wool has become widely used because of recent process and product improvements. Foam insulation is another alternative to fiberglass in residential walls and commercial roofs. Globally, foamed plastics occupies highest market share in insulation materials followed by glass wool. Another competing material is cellulose, which is used in attic insulation.

Glass, carbon or aramid fibers are the most common reinforcements used in composite parts and reinforcement applications. Others fibers include natural fibers such as cellulosic (jute, flax and cotton) and synthetic fibers (polyamide, polyethylene, polypropylene). Selection of a fiber for a particular application depends on the required strength, stiffness, corrosion resistance and price.

Glass fiber is the most commonly used and least expensive fiber in the market today. Carbon fiber is much costlier than glass fiber. Due to its excellent fatigue resistance, the usage of carbon fibers in aerospace and other advanced or very high-performance applications is growing steadily replacing the glass fibers. Aramid fibers have the highest strength to weight ratio compared to other fibers mentioned above. Aramid fiber exhibits similar tensile strength to glass fiber, but can have modulus at least two times as great. Aramid is very tough allowing significant energy absorption but, compared to carbon, it is lower in compressive strength and has poorer adhesion to the matrix.

Other fibers which are emerging and finding usage in several applications are:

- Ceramic fibers, offering high to very high temperature resistance, is now used as flame-resistant veil material in laminates for aircraft interiors and certain other high-heat aircraft engine applications.

- Recently developed Poly p-phenylene-2, 6-benzobisoxazole (PBO) fiber is suitable for high-temperature applications and it is currently used in protective ballistic armor, sporting goods, insulation and tire reinforcements.

- Basalt fibers exhibits better chemical and alkali resistance than glass and consider as an additional choice for use in reinforcing concrete in infrastructure applications.

- Boron fibers, five times stronger and twice as stiff as steel, used in sporting goods, such as fishing rods, golf club shafts, skis and bicycle frames and aerospace applications such as aircraft empennage skins, truss members on NASA Space Shuttles and prefabricated aircraft repair patches.
Glass Fiber Market Overview by Product Segment

Glass Fiber Reinforcements represent the fastest growing product segment in the global glass fibers market, with a forecast CAGR of ▪% over 2012-2016. Demand for the same is estimated to be ▪ million metric tons in 2012, forecast at ▪ million metric tons in 2013 and projected to reach ▪ million metric tons by 2016. Fiberglass/Glass Wool would record a comparatively slower growth rate over the corresponding period, forecast at ▪% to reach ▪ million metric tons by 2016, compared to an estimated ▪ million metric tons in 2012.


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<th>Year</th>
<th>Fiberglass/Glass Wool</th>
<th>Glass Fiber Reinforcements</th>
<th>Total Glass Fibers</th>
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% CAGR (2006-2011) ▪
% CAGR (2012-2016) ▪
% CAGR (2006-2016) ▪
Glass Fiber Reinforcements Overview by Product Forms

Chopped Strands, accounting for an estimated [X]% or [Y] million metric tons in 2012, form the largest product form of Glass Fiber Reinforcements in terms of volume. This figure is likely to post a 2012-2016 CAGR of [Z]% in reaching [A] million metric tons by 2016, thereby maintaining its dominant position. [B] is forecast as the fastest growing Glass Fiber Reinforcement product form, with a 2012-2016 CAGR of [C]% to reach [D] thousand metric tons in 2016, compared to an estimated [E] thousand metric tons in 2012. Fabrics and Continuous Filament Mat (CFM) are the other product categories expected to register CAGRs exceeding [F]% over the analysis period.

Chart 41: Global Glass Fiber Reinforcements Market Analysis (2006-2016) by Product Forms – Single-end Rovings, Multi-end Rovings, Woven Rovings, Chopped Strands, Chopped Strand Mat (CSM), Continuous Filament Mat (CFM), Fabrics and Others in Thousand Metric Tons

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<tr>
<th>Year</th>
<th>Single-end Rovings</th>
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<th>Woven Rovings</th>
<th>Chopped Strands</th>
<th>Chopped Strand Mat (CSM)</th>
<th>Continuous Filament Mat (CFM)</th>
<th>Fabrics</th>
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% CAGR (2006-2011)  
% CAGR (2012-2016)  
% CAGR (2006-2016)
ALGHANIM INDUSTRIES (KUWAIT)
Airport Road (55) at Highway 80
Opposite Kaifan Central
Shuwaikh, 13003, Kuwait
Phone: + 965 188 1111
Fax: +965 2483 2374
Website: http://www.kimmcoinsulation.com

Business Overview
Alghanim Industries, one of the largest, privately-owned companies in the Gulf region, is a multi-billion dollar conglomerate engaged in over 30 business sectors. Primary activities of the company are focused on advertising and media, automotive sales and services, consumer credit, engineering - villa solutions (home automation, air-conditioning and elevators), engineering - projects (building management and electro-mechanical solutions) fast moving consumable goods - wholesale and distribution and insurance. Alghanim Industries' Industrial Group is a leading provider of superior quality cost effective and eco-friendly building solutions, such as insulation products and steel solutions. Insulation solutions offered include reflective, acoustical and fire resistant insulation products. KIMMCO, Rockwool India Ltd., and Izocam are engaged in manufacturing rock wool and glass wool insulation products, in addition to allied products, such as EPS, XPS and nitrile rubber.

Major Subsidiaries/Joint Ventures

KUWAIT INSULATING MATERIAL MANUFACTURING CO., (KIMMCO) (KUWAIT)
P. O. Box 10042, Shuaiba 65451 Kuwait
Phone: +965 188 11 11, +965 2326 2020
Fax: +965 2326 1251 / 2326 2027
E-mail: kimmco@alghanim.com
Website: http://www.kimmcoinsulation.com

Business Overview
Founded in 1977, Kuwait Insulating Material Manufacturing Co., (KIMMCO) is one of the largest providers of insulation solutions for the Middle East, African, and Asian markets. The company, a Saint-Gobain Isover licensee, offers a range of bespoke reflective, acoustic and fire resistant insulation solutions.

Product Portfolio
- KIMMCO-Building Roll (KBR): For thermal and/or acoustic insulations of all buildings walls and roofs
- KDL-KIMMCO Duct Liner: For internal insulation of ducts and air handling equipments where sound absorption is required
- KCL-KIMMCO Clean Liner: For lining air conditioning ducts, walls and/or ceilings of acoustically sensitive areas to provide efficient sound insulation
- K 450-KIMMCO Rigid Pipe Covering: For thermal insulation of steel, copper or plastic pipes
• KAFI-KIMMCO Acoustic Floor Insulation: For floating floor with a screed of cement or reinforced concrete in multi-storey buildings such as dwellings, apartments etc
• KDIP-KIMMCO Duct Insul Plus: For thermal and acoustic Insulation (External) of HVAC equipment and Air Distribution Duct Systems
• KALINING KKL-36: A thermal-acoustical insulation system for walls of residential houses and commercial buildings
• KDI-KIMMCO Duct Insul: For external insulation of rectangular and circular air ducting and air handling equipment
• KIMMCO Building Slabs-KBS: Thermal and acoustic insulation of concrete floors
• KIMMCO Aluglass Duct System: For air distribution in HVAC system

IZOCAM TICARET VE SANAYI AS (TURKEY)
Dilovasi Mevkii, 41455 Kocaeli 41455
Turkey
Phone: +90-2627546390
Fax: +90-2627548165
Website: www.izocam.com.tr

Business Overview
Izocam is a leads Turkey and the Middle East in the supply of insulation products, operating as a Alghanim Industries and Saint-Gobain, Isover joint venture since 2006. The company was founded in 1965 as a manufacturer of glass wool and stone wool, with current annual production capacities of 55000 tons and 50000 tons respectively. Izocam also offers expanded polystyrene used for cold insulation, extruded polystyrene (Foamboard), elastomeric rubber (flexible) insulation materials, polyethylene foam "Izocam Peflex", and bituminous membranes for water insulation under Izosu brand name. The company took over Tekiz Company in 2005, which is a producer of polyurethane and mineral wool panels, corrugated sheets, and cold storage panels, with an annual panel production capacity of 2 million m2 and corrugated sheet capacity of 3 million m2.

Product Portfolio

Glass Wool
Building Blankets, Building Boards, Duct Blankets and Boards, Solar Boards & Blankets, Suspended Ceiling Board, Prefabricated Pipes, Valve Jackets, Comfort and Industrial Building Boards

Rock Wool
Building Boards, Industrial Blankets, Boards, and Pipe Sections and Marine Products
AGY and CTG/Taishan Fiberglass Enter into an Agreement

AGY and CTG/Taishan Fiberglass of China have entered into a long-term agreement for producing AGY’s new S-1 HM™ high-performance glass rovings used in wind energy turbines. These rovings would be manufactured under license from AGY and would be jointly sold by the companies on a global basis, with AGY focusing on the US and European wind energy markets and CTG/Taishan Fiberglass on the Asia-Pacific and African markets. S-1 HM™ rovings are manufactured using a proprietary glass formulation that enhances performance properties to the maximum by offering a considerably high modulus and fatigue performance, when compared to conventional E-Glass for wind turbine blades.

February 2012

Fiber Glass Industries (FGI) Takes Over Twintex Business from Owens Corning

Owens Corning, a leading manufacturer of glass fiber products, has divested its Twintex® glass thermoplastic reinforcements rovings intellectual property rights and business portfolio to Fiber Glass Industries (FGI). Twintex products, manufactured using a combination of superior performing glass and thermoplastic filaments, have a base material of direct roving that can be integrated with a polypropylene (PP) matrix, as well as a polyester (PET) resin. Amsterdam, New York based FGI has been licensing Twintex intellectual property from Owens Corning for manufacturing its GLASS POLYPRO™ roving and fabrics in the United States. This deal would help FGI in acquiring the current clientele, and global intellectual property rights for Twintex, in addition to Twintex trademark knowhow and rights. GLASS POLYPRO™ roving is ideal for filament winding, pultrusion, weaving and reinforcement of extruded profiles.

Johns Manville in an Expansion Mode in Slovakia

Johns Manville has invested an amount of over €50 million for expanding glass fiber manufacturing at its Trnava, Slovakia-based unit by replacing and enhancing a furnace at the plant. This facility offers products that are utilized for reinforcing thermoset and thermoplastic polymers. The capacity addition at this plant follows the company’s investment in direct roving and chopped strands capacity in 2004.

3B Acquired by India's Braj Binani Group

Braj Binani Group’s holding company, Binani Industries Ltd, has completely acquired Belgian glass fiber reinforcements manufacturer, 3B, for a consideration of €275 million from Platinum Equity. Mumbai, India-based Binani Industries is a part of the US$1.6 billion Braj Binani Group, engaged in providing services to a range of industries, including cement, zinc, composites and glass fibers. 3B, based in Battice, Belgium, is among the foremost European manufacturers of glass fibers used in reinforcing thermoplastic and thermoset composites, primarily for the automotive and wind energy industries. This deal, the third for Braj Binani Group over the past six years, is expected to strengthen its standing in the global fiber glass market considerably. In 2011, the Group had taken over CPI Inc, a composites manufacturer based in the United States.
GLOBAL GLASS FIBERS MARKET GROWTH: TRENDS AND OUTLOOK

Fiberglass/Glass Wool Insulation

Fiberglass or glass wool insulation growth has been moderate worldwide in 2011, chiefly because of consumption from the renovation sector in North America and Europe and under-progress new construction and industrial production activities in emerging regions, such as China, Russia and India. Though initiation of new construction activities would continue to be sluggish in the developed economies of North America and Europe, glass wool demand in North America is expected to pick up pace due a relatively faster recovery and in the European Union because of the imposition of new building energy efficiency directives for cutting down on CO₂ emissions. In EU countries, such as Germany and France, building upgradation processes are being undertaken at a frenetic pace, with strong backing from governmental programs with an aim to cut down on energy consumption by buildings. Demand for insulation remains high in regions, such as China, India and Russia because of the burgeoning construction activities and new regulation standards for sustainable buildings being put in place.


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<th>Application Area/Region</th>
<th>North America</th>
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<td>Commercial &amp; Industrial Construction</td>
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<td>Total Fiberglass/Glass Wool</td>
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