# Glass Technology

# Introduction

Glass is an amorphous solid usually formed by the solidification of a melt without crystallisation. It is an inorganic product of melting, which has been cooled to rigid state without crystallization. Melting is in fact the sole large scale industrial method of glass making. Glass is being used worldwide and has various applications. They are typically brittle and optically transparent. It is widely used in buildings and having industrial applications. The presence of glasses in our everyday environment is so common that we rarely notice their existence. Glass, as a substance, plays an essential role in science and industry. There are various methods of glass making other than melting for example condensation of vapours, conversion of crystals to an amorphous form using mechanical means or irradiation with fast neutrons, dehydration and sintering of gels, etc.

Silica (the chemical compound $SiO_2$) is a common fundamental constituent of glass. The properties of glass can be varied and regulated over an extensive range by modifying the composition, production techniques, or both. In any glass, the mechanical, chemical, optical, and thermal properties cannot occur separately. Instead, any glass represents a combination of properties, and in selecting an individual glass for a product, it is this combination that is important. As an architectural element, glass has become the quite essential product for your home or building. The applications of glass are limited only by your imagination; glass has many applications both internal and external that play a vital role in the function and design of your project.

Industrially produced glasses can be divided into groups according to various criteria: composition, appearance, properties, application, method of forming etc. According to their chemical composition glasses are classified as silica glass (quartz glass), water (soluble) glass or sodium silicate glass, crystal glass, heat resistant glass, low alkali glass etc. Glass is finding ever wider applications in modern technology; sealing glasses which have been in use for many years, serve in vacuum tight joining of glass to metal, especially in vacuum electronics, in nuclear technology (protection from radiation, immobilization of radioactive waste by fusion into a chemically, resistant glass, etc.), in agriculture (as carrier of fertilizers with long term effects) and a number of possible application in electronics and many more.

Some of the fundamentals of the book are structure of glass, structure of special melts and glasses, composition of glass, glass formation, crystallization and liquid, optical properties, theoretical strength of glasses, practical strengths of glasses, flaw sources and removal, viscosity of glass forming melts, theoretical principles of glass melting, chemical reactions occurring in glass melting, dissolution of solids in the melt, flow of glass in melting furnaces, physical chemical factors in sol gel processing, deposition of transparent non crystalline, metal oxide coatings by the sol gel process etc.

The present book covers different important parameters of glass technology. The book is comprehensive guide for researchers, technologists, new entrepreneurs and professionals.

# DEMAND OF GLASS

Indian packaging industry is pegged to be around $ 15 billion with a growth rate of 15 % approximately, out of which Indian container glass industry stands at $ 0.87 billion with an approximate growth rate of 12 %. The Indian float glass is estimated to be around $ 0.76 billion with growth rate of 32 % in the last fiscal year. The comparison between per capita consumption of glass in countries like the USA - 27.5 kg and Japan 10.2 kg suggests that India with a consumption of 1.4 kg has a huge scope for significant growth opportunities.

India has well developed glass container manufacturing industry, which remained rudimentary for a long period. The industry has evolved to adopt modern processes and automation in a large way. The current installed capacity of the industry is over 7,000 tons per day. Indian float glass market has an installed capacity of around 3000 tons per day.

It has grown with CAGR of 13 % over the last five years. The major source of revenue comes from Architectural - 85%, Automotive - 10% and Others - 5%.

The segments served by the glass industry, which are showing huge growth prospects are Alcobev packaging, real estate and automobile industry. The real estate is expected to grow at 30 % over the next decade, attracting foreign investments worth $30 billion.

Fuelled by growth in sectors like real estate, infrastructure, retail, automotive and food & beverages, the country's glass industry will acquire a market size worth Rs.340 billion by 2015 from Rs.225 billion at present, according to a study by industry body . Indian glass market is estimated to increase at a compound annual growth rate (CAGR) of 15% over the next three years. The Indian glass industry is pegged at $2.7 billion. Glass consumption growth is expected in construction (9 per cent), automotive (19 per cent), consumer goods (10-12 per cent) and pharmaceuticals (12-15 per cent) sectors.

The flat glass market, at present, stands at 4,500 tpd and is growing at 16 per cent year-on-year while the container glass is at 7,000 tpd and contributes 55-60 per cent to the overall glass market. Other glass (lighting, bangles, beads) market is at 1,500 tpd. Total capacity of glass manufactured in India – 5200 tonnes/day. Two upcoming capacities of 700 tonnes/day and 1000 tonnes/day till end of 2016 or beginning of 2017. Expected growth in 2016/17 will be > 12%, owing to the planned construction of around 100 smart cities. Glass imports are to the tune of 500 tonnes/day. This remains stable owing to anti-dumping on clear float glass from China, Pakistan, UAE and Saudi Arabia.

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# Tags

New glass technology, Advanced Glass Technologies, glass technology India, Leading Glass Technology, Glass Science and Technology, New Innovations and Trends in Glass, Advanced Glass Technology, Liquid Glass, Great Opportunity for Startup in glass technology, making glass, Glass Manufacturing Process, How Glass is Made, glass manufacturing process raw materials, Production of glass, Glass Processing Industry in India, Indian glass industry, Step-by-step Manufacturing of Glass, Glass and Glass Product Manufacturing, Flat Glass Manufacturing Industry, New Glass Production, Glass processing India, Growth of Glass and Glass Products in India, How to start a glass production, Projects on Glass, What is the best process to manufacture Glasses, How to make glass, Glass processing technology, How to Start glass Processing Industry in India, Glass Processing Industry in India, Most Profitable glass Processing Business Ideas, Glass manufacturing Projects, Small Scale glass Processing Projects, Starting a glass Manufacturing Business, How to start a glass Production Business, Glass Based Small Scale Industries Projects, New small scale ideas in glass processing industry, NPCS, Niir, Process technology books,Business consultancy,Business consultant,Project identification and selection,Preparation of Project Profiles, Startup,Business guidance,Business guidance to clients,Startup Project for glass industry,Startup Project,Startup ideas,Project for startups,Startup project plan,Business start-up,Business Plan for a Startup Business,Great Opportunity for Startup,

Small Start-up Business Project,Start-up Business Plan for glass production,Start up India, Stand up India,Glass Making Small Business Manufacturing,Modern small and cottage scale industries,Profitable small and cottage scale industries, Setting up and opening your glass Manufacturing Business,How to start a glass industry?, How to start a successful glass business,Small scale Commercial glass making,Best small and glass making industries,Glass Business, Profitable Small Scale Manufacturing, Glass Making Small Business Manufacturing,Modern small and cottage scale industries,Profitable small and cottage scale industries,Setting up and opening your glass Manufacturing Business,How to start a glass industry?,How to start a successful glass business,Small scale Commercial glass making,Best small and glass making industries,Glass Business, Profitable Small Scale Manufacturing

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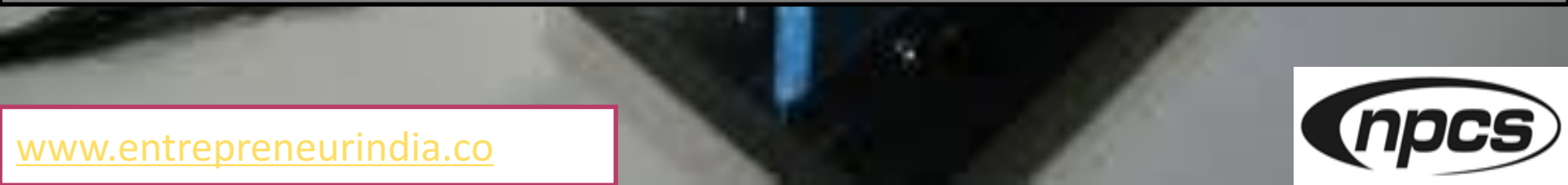

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- *One of the leading reliable names in industrial world for providing the most comprehensive technical consulting services*

- *We adopt a systematic approach to provide the strong fundamental support needed for the effective delivery of services to our Clients' in India & abroad*

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- *Business Plan*
- *Industry Trends*
- *Market Research Reports*
- *Technology Books and Directory*
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- *Laboratory Testing Services*
- *Turnkey Project Consultancy/Solutions*
- *Entrepreneur India (An Industrial Monthly Journal)*

# How are we different ?

- *We have two decades long experience in project consultancy and market research field*
- *We empower our customers with the prerequisite know-how to take sound business decisions*
- *We help catalyze business growth by providing distinctive and profound market analysis*
- *We serve a wide array of customers , from individual entrepreneurs to Corporations and Foreign Investors*
- *We use authentic & reliable sources to ensure business precision*

# Our Approach

- Requirement collection
- Thorough analysis of the project
- Economic feasibility study of the Project
- Market potential survey/research
- Report Compilation

# Who do we serve?

- *Public-sector Companies*
- *Corporates*
- *Government Undertakings*
- *Individual Entrepreneurs*
- *NRI's*
- *Foreign Investors*
- *Non-profit Organizations, NBFC's*
- *Educational Institutions*
- *Embassies & Consulates*
- *Consultancies*
- *Industry / trade associations*

# Sectors We Cover

- *Ayurvedic And Herbal Medicines, Herbal Cosmetics*
- *Alcoholic And Non Alcoholic Beverages, Drinks*
- *Adhesives, Industrial Adhesive, Sealants, Glues, Gum & Resin*
- *Activated Carbon & Activated Charcoal*
- *Aluminium And Aluminium Extrusion Profiles & Sections,*
- *Bio-fertilizers And Biotechnology*
- *Breakfast Snacks And Cereal Food*
- *Bicycle Tyres & Tubes, Bicycle Parts, Bicycle Assembling*

# Sectors We Cover *Cont…*

- *Bamboo And Cane Based Projects*
- *Building Materials And Construction Projects*
- *Biodegradable & Bioplastic Based Projects*
- *Chemicals (Organic And Inorganic)*
- *Confectionery, Bakery/Baking And Other Food*
- *Cereal Processing*
- *Coconut And Coconut Based Products*
- *Cold Storage For Fruits & Vegetables*
- *Coal & Coal Byproduct*

# Sectors We Cover *Cont…*

- *Copper & Copper Based Projects*
- *Dairy/Milk Processing*
- *Disinfectants, Pesticides, Insecticides, Mosquito Repellents,*
- *Electrical, Electronic And Computer based Projects*
- *Essential Oils, Oils & Fats And Allied*
- *Engineering Goods*
- *Fibre Glass & Float Glass*
- *Fast Moving Consumer Goods*
- *Food, Bakery, Agro Processing*

# Sectors We Cover *Cont…*

- *Fruits & Vegetables Processing*
- *Ferro Alloys Based Projects*
- *Fertilizers & Biofertilizers*
- *Ginger & Ginger Based Projects*
- *Herbs And Medicinal Cultivation And Jatropha (Biofuel)*
- *Hotel & Hospitability Projects*
- *Hospital Based Projects*
- *Herbal Based Projects*
- *Inks, Stationery And Export Industries*

# Sectors We Cover *Cont…*

- *Infrastructure Projects*
- *Jute & Jute Based Products*
- *Leather And Leather Based Projects*
- *Leisure & Entertainment Based Projects*
- *Livestock Farming Of Birds & Animals*
- *Minerals And Minerals*
- *Maize Processing(Wet Milling) & Maize Based Projects*
- *Medical Plastics, Disposables Plastic Syringe, Blood Bags*
- *Organic Farming, Neem Products Etc.*

# Sectors We Cover *Cont…*

- *Paints, Pigments, Varnish & Lacquer*
- *Paper And Paper Board, Paper Recycling Projects*
- *Printing Inks*
- *Packaging Based Projects*
- *Perfumes, Cosmetics And Flavours*
- *Power Generation Based Projects & Renewable Energy Based Projects*
- *Pharmaceuticals And Drugs*
- *Plantations, Farming And Cultivations*
- *Plastic Film, Plastic Waste And Plastic Compounds*
- *Plastic, PVC, PET, HDPE, LDPE Etc.*

# Sectors We Cover *Cont…*

- *Potato And Potato Based Projects*
- *Printing And Packaging*
- *Real Estate, Leisure And Hospitality*
- *Rubber And Rubber Products*
- *Soaps And Detergents*
- *Stationary Products*
- *Spices And Snacks Food*
- *Steel & Steel Products*
- *Textile Auxiliary And Chemicals*

# Sectors We Cover *Cont…*

- *Township & Residential Complex*
- *Textiles And Readymade Garments*
- *Waste Management & Recycling*
- *Wood & Wood Products*
- *Water Industry(Packaged Drinking Water & Mineral Water)*
- *Wire & Cable*

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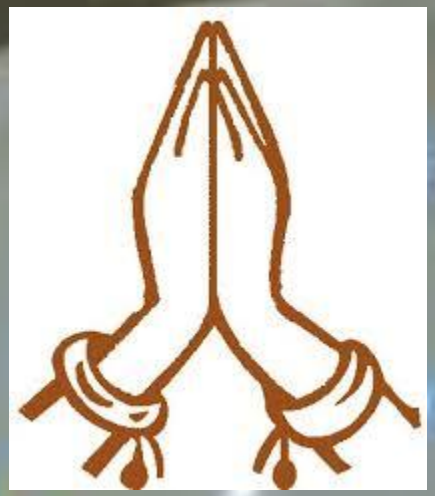

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