



Do more with glass  Asahi India Glass Ltd.

2004-05 20th Annual Report



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Forward-looking statement

In this Annual Report we have disclosed forward-looking information to enable investors to comprehend our prospects and take informed investment decisions. This report and other statements- written and oral - that we periodically make contain forward looking statements that set out anticipated results based on the management plans and assumptions. We have tried wherever possible to identified such statements by using words such as 'anticipate' 'estimate' 'expects' 'projects' 'intends' 'plans' 'believes', and words of similar substance in connection with any discussion of future performance. We cannot guarantee that these forward-looking statements will be realized, although we believe we have been prudent in assumptions. The achievement of result is subject to risks, uncertainties and even inaccurate assumptions. Should known or unknown risks or uncertainties materialize, or should underlying assumptions prove inaccurate, actual results could vary materially from those anticipated, estimated or projected. Readers should bear this in mind. We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise.

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Glass Industry ■

A serendipitous discovery by Egyptian fishermen 3000 years ago, who lit a bonfire on a beach and found shards of glass the next morning, has had a profound impact on society. Glass more than any material evokes a bonding with our human spirit to see more. In time glass became an elusive luxury. It was used by the elite and worked by craftsmen who were artists. Human history treats glass as a cultural metaphor for the potent human desire to see and discover. Both outwards and inwards. Our aspirations and our spiritualism. Books and myths have been built on this from vanity 'mirror, mirror on the wall' of Sleeping Beauty to foretelling the future through a crystal ball by many a hack. But as always Shakespeare catches its true essence when he says

"Thou art thy mother's glass, and she in thee calls back the lovely april of her prime."

Glass is about beauty, of freshness, of a promise of a better world.

- Science and technology has allowed glass to retain its magic but also move it into the prosaic world of everyday use. It is now one of the main building blocks of our material world along with steel, cement, wood, stone.
- With recent advances, its perceived weaknesses of fragility, energy wastage, noise and lack of safety have been overcome and it is rapidly substituting other building materials. No modern city today does not boast a towering glass skyline, no modern home/office is not a showroom for the versatility of glass in its use as windows, doors, furniture, mirrors, shelving, basins, shower cubicles, TV's etc. No modern automobile does not use even more glass rich with advanced features of structural strength, heat reflection and absorption, enhanced safety, sleeker design, lower drag coefficients and some with rain repellants, heads up display, etc.
- Infact it is fair to say glass has permeated every aspect of modern life; is a sine qua non of our world.
- In India too the last 5 years have seen a resurgence of glass usage. At the basic level growth has been 9% p.a., with the last 2 years averaging 12% p.a. In auto, mirror and other downstream usages the story is even better.

Our Vision ■

But we at Asahi India (AIS) feel this is the proverbial tip of the iceberg. Despite this growth our per capita consumption at 0.60 kg/person is abysmal. Forget developed countries which average 15 Kg, even compared to developing countries like China (3.5 Kg) Thailand (5 Kg) we come out even worse than proxy comparisons like steel, cement. At 4% value addition of glass, the enormous potential becomes visible.

Our vision is to be India's leading integrated glass player. We already are the largest, most profitable glass company. But the integrated part needs to be strengthened.

Our Position & New Activities ■

The areas we are addressing now :

- To provide value added products and services to the market.
- To provide glass in all its forms. To provide features in our products which give all the benefits of glass and remove its drawbacks of safety, security, energy loss and noise insulation. To use technology and market innovation to get people to use more glass in ways they want to but don't know they can. To be recognized as thought and product leaders – the experts in glass.
- We did a 100 pilot projects in offices, homes, shops and factories and not in one case did the customer settle for plain glass. She wanted more. We now want to institutionalize this initiative.
- AIS Glass Solutions is the company which will make available these user friendly products and services to the market place of architects, builders, homeowners, shops and offices.

New Brand ■

All AIS activities have been consolidated under a single umbrella brand “AIS”. This brand stands for Asahi India Solutions and covers our activities in basic glass, tinted, reflective, mirror, auto and now a feast of new products and services. It is the symbol of our vision to be an integrated player who intends to revolutionize the use of glass in the market by using innovation, technology, our time tested manufacturing excellence, to allow our customers to “See More” on their terms. AIS now adds innovations and originality through a host of new products and services.

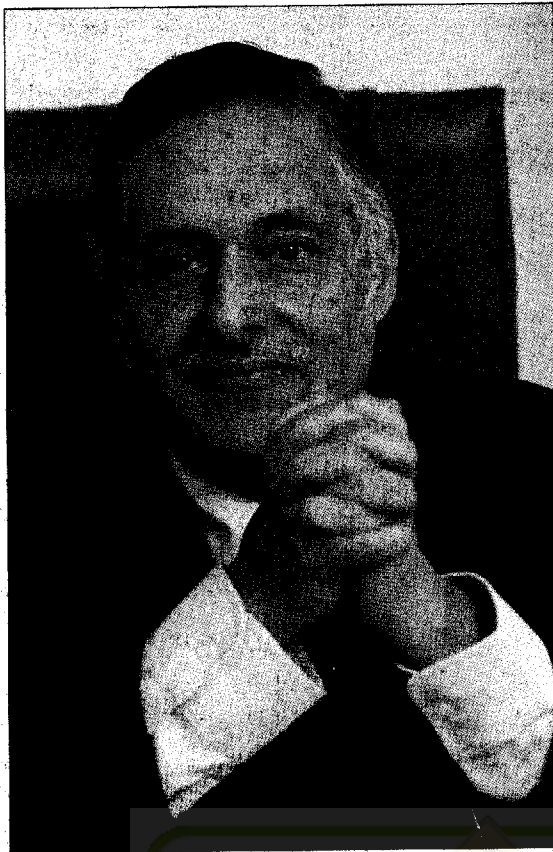
Our future will include, and improve our legacy of

- supplying over 27,000 pieces of high precision auto glasses a day to factories, depots and shops across the country.
- supplying clear, tinted, reflective, mirror glasses across the country.

In your homes, shops and offices help you use glass to see more yet prevent noise and energy loss in a safe and secure environment - tempered glass, burglar proof glass, insulating glass, glass shower cubicles, energy efficient glass are a few examples of customer friendly products being introduced.

AIS is our promise for innovations; our commitment to help you use glass to view this beautiful natural world without sacrificing your comfort and safety.

“See More” and “Do More” with glass and with AIS.



Dear Share Owners,

I am happy to inform you that your Company continued to gain momentum in the year gone by. During fiscal 2005, your Company recorded a net sale of Rs. 60414 lakhs and a net profit of Rs. 7820 lakhs as against Rs. 51271 lakhs and Rs. 7175 lakhs respectively in the year before. Net sales and net profit were up by 18% and 9% respectively. Underlying performance continued to be strong and robust, and on expected lines.

Your Company maintained its position as the largest glass Company in India. The Company maintained its leadership status in the auto glass business, with a market share of over 85% in the Indian passenger cars market, and a premier position in the architectural glass market, with over 25% share in the float glass market.

We made significant progress in fiscal 2005 in extending our value chain presence both in the automotive glass and the architectural glass segments. Your Company, with a crisp new identity – AIS – embarked upon major expansion plans for this purpose.

Your Company is making its biggest ever investment and is setting up an Integrated Glass Plant in Roorkee in the State of Uttaranchal at an estimated cost of Rs. 600 crores. This plant will be the single largest integrated glass plant in India, and will have manufacturing facilities for value-added glass and glass products, including reflective glass, mirrors, automotive safety glass, processed glass and float glass. The Integrated Glass Plant is likely to be completed and commissioned by the end of 2006.

AIS Glass Solutions came into existence as a subsidiary of your Company and commenced commercial operations in fiscal 2005. AIS Glass Solutions is the front end of our presence in the architectural glass value chain; with a focus on architectural glass processing and glass products, product development, knowledge development and glass services - to promote greater use of value-added glass.

On the automotive side, your Company completed its scheduled expansion and commenced commercial production at its Automotive Glass Plant in Chennai effective from 1st January, 2005. Besides, we augmented capacity for laminated windshield and tempered glass at the Automotive Glass Plant in Rewari mainly by debottlenecking existing capacities and installing some additional equipment.

We are now better positioned to meet growing market requirements, increase market share and grow profitably.

We are at a cross road again. We are convinced AIS needs to transform itself once again. It needs to move from being a manufacturer of world class products to a solutions provider; to move up the exciting value chain of glass - providing design, products and services to make glass more versatile, more user friendly. We have ambitious plans for each of our business areas and are taking aggressive steps to get there. In doing so, we are confident of further enhancing shareholder value, by improving overall profitability and reducing our business risks.

We are being helped by a strong economy, a resurgent automotive and housing industry, and overall a very good economic environment. The outlook in the current fiscal looks good.

There are exciting and challenging opportunities in store for AIS. It will be our responsibility to ensure that we take advantage of the economic environment to further fuel growth and create value for all our stakeholders. I am confident about the capabilities and the future prospects of AIS.

Before I conclude, I would like to thank you, our shareholders, for your continued support and confidence in AIS. I would also like to thank our customers, collaborators, suppliers, the AIS management team and the dedicated employees for their contribution and support.

B. M. Labroo
Chairman

Imagine for a few seconds that glass had never been discovered. Now close your eyes and think about your home. Do you see that bricks have taken up the spaces where the windows were? You are living within four walls and your contact with the world immediately outside your house has been lost. In the shopping malls there are no display windows. The glass façade of your office building has been replaced by marble. Once inside a concrete structure you can't see the trees, birds, sky or roads. Suddenly your world has become very limited and confined.

Our life just would not be possible without glass. Glass provides us the ability to "See More" and participate with the outside world on our own terms. Glass is fast replacing other building materials – not only in glazing, but also inside the building in form of shelves, partitions, table-tops, shower enclosures, and many more.

But what is this amazing substance, where does it come from and how is it made?

What is glass ■

Glass is a combination of sand and other minerals that are melted together at very high temperatures to form a material that is ideal for a wide range of uses from packaging and construction to fibre optics.

Today man has mastered the glass-making process and can make many different types of glass in infinitely varied colours formed into a wide range of products.

Glass, chemically, is actually more like a liquid, but at room temperature it is so viscous or 'sticky' it looks and feels like a solid. At higher temperatures glass gradually becomes softer and more like a liquid. It is this latter property which allows glass to be poured, blown, pressed and moulded into such a variety of shapes.

How glass is made ■

Glass is made by melting together several minerals at very high temperatures. Silica in the form of sand is the main ingredient and this is combined with soda ash and limestone and melted in a furnace at temperatures of 1500 - 1700°C. Other materials can be added to produce different colours or properties. Glass can also be coated, heat-treated, engraved or decorated.

Whilst still molten, glass can be manipulated to form packaging, car windscreens, glazing or numerous

other products. Depending on the end use, the composition of the glass and the rate at which it is allowed to cool will vary, as these two factors are crucial in obtaining the properties the glassmaker is seeking to achieve.

Glass Forming Process ■

Glass is fluid at high temperature and its fluidity decreases as the temperature is reduced. Unlike water, glass has no specific melting or freezing point but is gradually changed from a solid to a liquid as the temperature is increased. It is this property of 'variable viscosity', which is used in forming a mass of glass into articles of beauty or utility.

Flat glass – Uses & Applications ■

The main flat glass products are for high quality glazing in homes, offices, hotels, shops, vehicles public buildings and glass for horticulture; wired glasses for fire resistance; patterned glass for privacy and decoration; and a wide range of glass for environmental control and energy conservation.

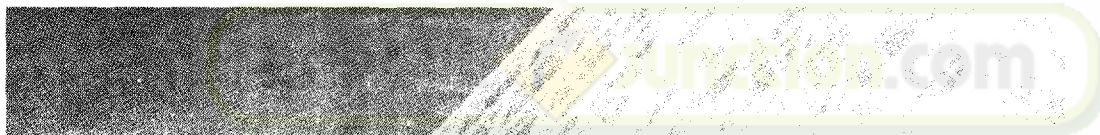
Other uses for flat glass include toughened glass doors, suspended window assemblies, cladding for the exterior of buildings, mirrors and low-reflection glass for pictures and instrument dials. The two manufacturing processes for producing flat glass are the float glass process and rolled glass process. At AIS, we are making flat glass by float process.

Making Flat glass by Float Process ■

The float process makes flat glass. This process allows the manufacture of clear, tinted and coated glass for buildings, and clear and tinted glass for vehicles.

There are around 260 float plants worldwide with a combined output of about 800,000 tonnes of glass per week. A float plant, which operates non-stop for between 11-15 years, makes around 6000 kilometres of glass a year in thicknesses of 0.4 mm to 25 mm and in widths up to 3 metres.

A float line can be nearly half a kilometer long. Raw materials enter at one end. From the other end, plates of glass emerge, cut precisely to specification, at rates as high as 6,000 tonnes a week. In between lie five highly integrated stages :

**Stage 1 : Melting & refining**

Fine-grained ingredients closely controlled for quality, are mixed to make a batch, which flows into the furnace which is heated to 1500°C. The Melting process is key to glass quality; and compositions can be modified to change the properties of the finished product.

Stage 2 : Float bath

Glass from the melter flows gently over a refractory spout on to the mirror-like surface of molten tin, starting at 1100°C and leaving the float bath as a solid ribbon at 600°C.

Stage 3 : Annealing

Despite the tranquility with which float glass is formed, considerable stresses are developed in the ribbon as it cools. Too much stress and glass will break beneath the cutter. To relieve these stresses the ribbon undergoes heat-treatment in a long furnace known as a lehr. Temperatures are closely controlled both along and across the ribbon.

Stage 4 : Inspection

The float process is renowned for making perfectly flat, flaw-free glass. But to ensure the highest quality, inspection takes place at every stage. Occasionally a bubble is not removed during refining, a sand grain refuses to melt, a tremor in the tin puts ripples into the glass ribbon. On-line inspection does two things. It reveals process faults upstream that can be corrected. And it enables computers downstream to steer cutters round flaws. Inspection technology now allows more than 100 million measurements a second to be made across the ribbon, locating flaws the unaided eye would be unable to see.

Stage 5 : Cutting to order / size

Diamond wheels trim off selvedge – stressed edges – and cut the ribbon to size. Float glass is sold by the square metre. Automated systems translate customers' requirements into patterns of cuts designed to minimize wastages

Perceived drawbacks of glass ■

While glass offers superior aesthetic looks and flexibility in its use and applications, there are also a few perceived drawbacks of energy loss & wastage, safety, security, and noise insulation. However, with recent advances, these weakness of glass have been overcome.

Energy loss & wastage

"Is glass a good insulator?" The clear answer is No! But it could be. There are various choices available to the informed buyer to save on energy costs and get all the aesthetic and psychological benefits of glass.

Coated and tinted glass products and insulating glazing units can be used to control the flow of energy into and out of a building.

In a hot environment like India, solar control glass can be used to dramatically reduce the effect of the sun's heat, minimizing the need for air-conditioning. Solar control glass, usually either body tinted (absorbing) or coated (reflecting), is used to reduce unwanted solar radiant light and heat energy transmitted through glass. Similarly, in colder environments, low emissivity (low-e) glass can be used which reflects heat back into the building, thereby minimizing the need for heating.

Safety & Security

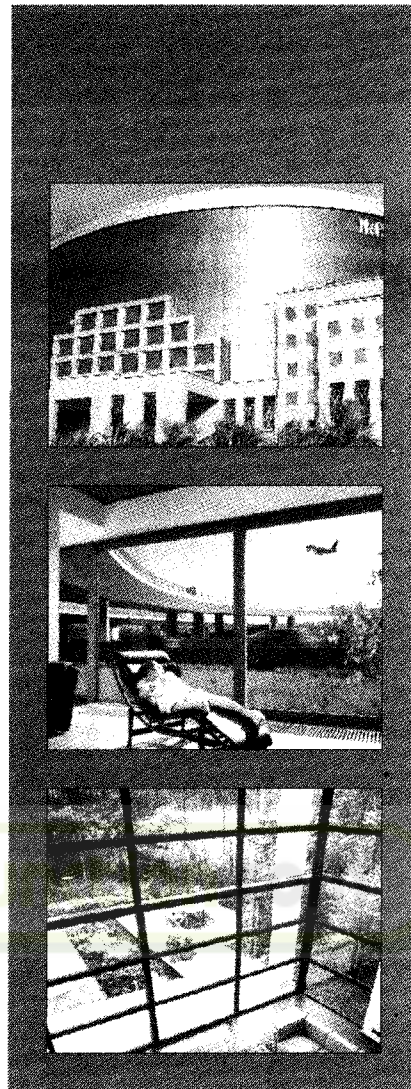
A commonly perceived notion is that glass compromises safety and security. However, continuous research and technological advances have made glass safer and stronger than it ever was.

Solutions like tempered safety glass and laminated safety glass are being widely used for the purpose of accidental protection. This ensures that glass does not shatter when hit by a cricket ball or even during natural calamities like earthquakes.

Glass can now protect your home and office from threat from burglars. A panel of multi-layered glasses or specially made thick glass can offer even higher levels of protection from bullets to blasts to burglary.

Noise control

In humans, hearing takes place whenever vibrations of frequencies from 15 hertz to about 20,000 hertz reach the inner ear. The need to restrict sound arriving from the external environment means that glass should be able to shield and insulate while satisfying more sophisticated design standards. The most common types of glass used in noise control are laminated and insulating glass (double glazed). Laminated glass



incorporates a special acoustic PVB interlayer, which absorbs some of the incident sound energy, reducing its passage. This acoustic PVB interlayer can be also utilized to reduce the noise level experienced in cars.

Better sound insulation is also achieved with double-glazed glass. Vacuum-sealed inner spaces, special selection of glass types, and some gases affect sound insulation and provide acoustic stability.

Glass-Value Addition and Processing ■

Value Addition ■

Flat glass can be value added into reflective glass and mirror through coating process.