Survey
World Float, Rolled & Solar Glass Markets
(including Production Costs and Product Prices)

TEASER

glass global consulting GmbH
Dipl.-Ing. Hans Mahrenholtz / Dipl.-Ing. Andre Ommer

February 2011
Content

1. Flat Glass Products ............................................................................................................. 4
   (a) Overview ..................................................................................................................... 4
   (b) Automotive ................................................................................................................. 5
   (c) Construction ............................................................................................................... 5
       (i) Construction Market ............................................................................................... 5
       (ii) Flat Glass Vs Other Materials in the Construction Market ........................................ 6
       (iii) Architectural Trends ............................................................................................. 6
       (iv) Refurbishment ....................................................................................................... 6
       (v) Energy Efficiency ................................................................................................. 6
   (d) Solar ............................................................................................................................. 7
       (i) Increase in Demand from Solar Power Market ....................................................... 7
       (ii) Growing Solar Power Market ............................................................................... 7
   (e) Special ......................................................................................................................... 8
       (i) Specialty Market .................................................................................................... 8

2. Flat Glass Markets & Demand .......................................................................................... 9
   (a) Overview ..................................................................................................................... 9
       (i) Global Flat Glass Market - Market Size .................................................................. 9
       (ii) Global Demand for Flat Glass ............................................................................... 9
       (iii) Global Flat Glass Demand Growth ...................................................................... 10
   (b) Main routes to market ............................................................................................... 11
       (i) Main Routes to Market in the Flat Glass industry .................................................. 11
   (c) By region .................................................................................................................... 11
       (i) Global Flat Glass Market Segmentation ................................................................ 11
       (ii) Segmentation by Region ....................................................................................... 11
       (iii) Europe .................................................................................................................. 12
       (iv) Former Soviet Union ............................................................................................ 15
       (v) North America ...................................................................................................... 17
       (vi) Latin America ..................................................................................................... 19
       (vii) China ................................................................................................................... 22
       (viii) Japan .................................................................................................................. 25
       (ix) ROW / South-East Asia ....................................................................................... 27

3. Flat Glass Market growth projection ............................................................................... 33
   (a) Global Demand for Flat Glass..................................................................................... 33
       (i) Europe .................................................................................................................... 37
       (ii) Japan ..................................................................................................................... 37
       (iii) South East Asia .................................................................................................... 38
       (iv) North America .................................................................................................... 39
(v) South America ................................................................. ................................................... 40
(vi) China ........................................................................ 41
(vii) Former Soviet Union ......................................................... 42
(viii) India ............................................................................ 42
(ix) Middle East ........................................................................ 42
(x) South America ................................................................. ................................................... 43
(xi) Africa ............................................................................. 43
(b) Building Products .................................................................. 43
(c) Automotive Glazing Industry ..................................................... 46
   (i) Structural Trends .................................................................. 46
   (ii) Automotive Glazing Demand Drivers ............................................ 47
(d) Market Forecast .................................................................... 54

4. Flat Glass Producers ................................................................ 56
   (a) Market shares ...................................................................... 56
      (i) Flat Glass Market - Major Players .................................................. 56
      (ii) European Region .................................................................. 56
      (iii) North America ................................................................... 57
      (iv) Former Soviet Union ............................................................... 57
      (v) South East Asia ................................................................... 58
      (vi) Japan .............................................................................. 58
      (vii) China ............................................................................. 59
   (b) Top5 Profiles: Financials, locations, strategies, specials (i.e. TCO), production capacities, qualities produced, colours, thicknesses, dimensions etc. ........................................ 59
      (i) AGC ............................................................................ 59
      (ii) NSG / Pilkington ............................................................... 61
      (iii) Saint-Gobain ................................................................... 63
      (iv) Guardian ....................................................................... 65
      (v) Taiwan Glass .................................................................... 67

5. Flat Glass Cost and Prices ............................................................ 68
   (a) Overview ........................................................................ 68
   (b) Typical Investments for a Float Glass Plant ........................................ 68
   (c) Typical Investments for a Pattern Glass Plant ...................................... 69
   (d) Typical Production costs for a Float Glass Plant .................................... 70
   (e) Typical Production costs for a Pattern Glass Plant .................................. 71
   (f) Typical Flat glass prices .......................................................... 72

6. Graphic Index ............................................................................. 73
1. Flat Glass Products

(a) Overview

Among the various variants offered by the glass industry, flat glass has made a special place for itself. Flat glass covers a wide variety of products including float glass, sheet glass, figured and wired glass and polished plate glass, among others. The superior quality and distortion free nature of float glass makes it the most preferred glass over other forms of flat glasses. Float glass is extremely clear with light transmission up to 90%.

The production of glass principally involves the fusion of several inorganic substances. This fused mass is cooled to ambient temperature at a rate fast enough to prevent crystallization. Substances including silica sand, soda ash, dolomite and dolomite/limestone represent together 99% of all raw materials used in the production of glass, excluding recycled glass. Recycled glass represents on average 15% of the materials used.

Typically, there are three methods to manufacture basic glass from which all processed glass products are made.

Float

More than 85% of the global flat glass production is carried out through the float process. It is the most preferred way of making the high quality, optically clear glass.

Sheet

The sheet process of flat glass manufacturing represents approximately 8% of the global production of flat glass. This process predates, competes with and is gradually being replaced by float.

Rolled

The rolling process is used to manufacture patterned, figured and wired glass products. Semi-molten glass is squeezed between metal rollers to produce a ribbon with controlled thickness and surface pattern.
(vii) China

A major float build program has been going on in China since 2000, with the number of float lines increasing to around two hundred. This activity led to an increase in the demand and production capacity of flat glass in the country at an average annual growth rate of 16.83% and 18.52%, respectively, over the period 2000-2009. In the meanwhile, it has also resulted in a significant downturn in the capacity utilization rate to less than 85%. However, the utilization rate is expected to stabilize as the pace of capacity addition slows down. Flat glass manufacturers are likely to eliminate their outdated facilities, and concentrate over technical renovation of their current lines, rather than investing in new projects.

The demand for flat glass is expected to decline by around 16% to reach 22 million tons in 2009 from 23.25 million tons in 2008, as a result of global weak economic conditions. Additionally, the production capacity is also expected to decline by 13% to 26 million tons in 2009 from 28.25 million tons in 2008, as manufacturers curtailed there capacity seeing the falling demand. However, the capacity utilization rate is expected to improve in 2009 as a result of fall in the production capacity.

Source: Company Reports


The following graphics illustrates the location of all the existing flat glass manufacturers and processing companies in China. Detailed profiles of these companies with addresses and contact details, history etc. can be found in the additional PDF “flat_china.pdf”.

Graphic 30: China – Location of Flat glass manufacturers and Processing companies
Graphic 31: China, Hong Kong area – Location of Flat glass manufacturers and Processing companies

Graphic 32: China, Tianjin area – Location of Flat glass manufacturers and Processing companies
6. Graphic Index

Graphic 1: Flat Glass – Raw Material Composition .......................................................... 4
Graphic 2: Table: Global Automotive Glass Products Market by Sector: 2008 ..................... 5
Graphic 3: Table: Global Building Products – Flat Glass Market by Sector: 2008 .............. 6
Graphic 4: PV Solar Glass Share of World Total Glass Production: 2007-2012 ................. 7
Graphic 5: Table: Solar Cells Market - Projected Growth ............................................. 8
Graphic 6: Table: Flat Panel Display Market .................................................................. 8
Graphic 7: Global Demand for Flat Glass: 2000-2009E .................................................. 10
Graphic 8: Trend in Flat Glass Demand Growth: 1991 – 2009E ..................................... 10
Graphic 9: Routes to Market ......................................................................................... 11
Graphic 10: Regional Break-up of Flat Glass Market Production: 2008 .......................... 12
Graphic 11: Regional Break-up of Flat Glass Market Demand: 2008 ............................. 12
Graphic 14: European Trend of Production Capacity Utilization Rate: 2000 – 2009 ........ 14
Graphic 15: Turkey – Location of Float glass manufacturers and Processing companies .... 15
Graphic 18: Former Soviet Union Trend of Production Capacity Utilization Rate: 2000-2009 ............................... 16
Graphic 19: Former Soviet Union – Location of Float glass manufacturers and Processing companies ........................................................................................................... 17
Graphic 23: South American Float/Sheet Glass Capacity by Company ............................. 19
Graphic 24: South American Float Lines ........................................................................ 20
Graphic 25: South America (Brazil, Argentina, Chile) – Location of Float glass manufacturers and Processing companies ................................................................................................................................................................. 21
Graphic 26: South America (Colombia, Venezuela) – Location of Float glass manufacturers and Processing companies ........................................................................................................... 21
Graphic 30: China – Location of Float glass manufacturers and Processing companies .... 23
Graphic 31: China, Hong Kong area – Location of Float glass manufacturers and Processing companies .................................................................................................................... 24
Graphic 32: China, Tianjin area – Location of Float glass manufacturers and Processing companies .................................................................................................................... 24
Graphic 33: China, Shanghai area – Location of Float glass manufacturers and Processing companies .................................................................................................................... 25
Graphic 34: Japan: Demand for Flat Glass in Volume Terms: 2000-2009E .................... 26
Graphic 35: Japan: Production Capacity of Flat Glass: 2000-2009E ............................... 26
Graphic 36: Japan: Trend of Production Capacity Utilization Rate: 2000-2009E .............. 27
Graphic 38: South-East Asian Production Capacity of Flat Glass: 2000-2009E ............... 27
Graphic 39: South-East Asian Trend of Production Capacity Utilization Rate: 2000-2009E ............................... 28
Graphic 40: India – Location of Float glass manufacturers and Processing companies .... 28
Graphic 75: Business Revenues: 2004-2008................................................................. 62
Graphic 76: Saint-Gobain Revenues: 2004-2008......................................................... 64
Graphic 77: Guardian Revenues: 2005-2008.............................................................. 66
Graphic 78: Typical Investment of a 500 tpd float glass plant for automotive glass......... 69
Graphic 79: Typical Investment of a 200 tpd pattern glass plant for solar glass.............. 70
Graphic 80: Typical Production Costs of a 500 tpd float glass plant for automotive glass 71
Graphic 81: Typical Production Costs of a 200 tpd pattern glass plant for solar glass........ 72