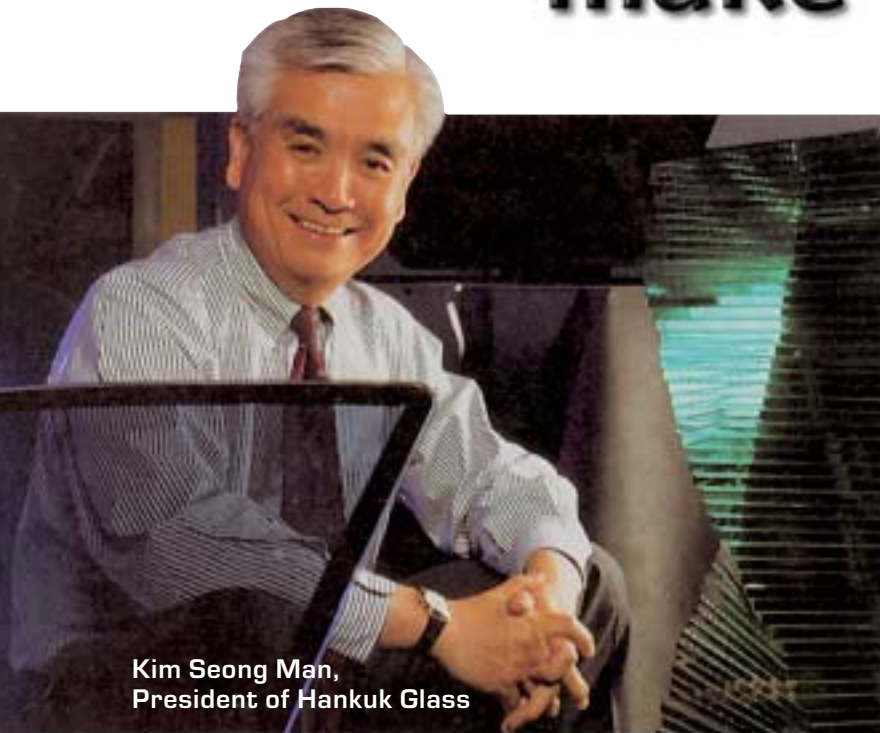


Smart windows make the move



Kim Seong Man,
President of Hankuk Glass

BusinessWeek is taking a further look at Far East businesses and industries and at how they are coping with the continuously evolving world markets. One of these, Hankuk Glass Industries, has always had and exploited its own particular standpoint - focusing on its own

Moon Ihlwan

knowledge and avoiding risks. Leader in its field of windows, car windshields and safety glass, the company may now be ready to undergo the changes that Hankuk's second generation, educated in the United States, would like to make. At present the company is preparing to expand its suspended particle devices (SPD) to the film format, which it can also sell abroad.

Over the years, Hankuk Glass Industries, Inc.'s business model has been simple and staid: take no risks, and stay focused on the industry you know. In Hankuk's case, that is making windows, car windshields, and safety glass. Hankuk's steady-as-she-goes philosophy did not stop it from growing into Korea's largest glassmaker; a US\$ 450 million-a-year group with 11 subsidiaries and customers from Hyundai Motor Co. to Sharp Corp.. But Hankuk Glass - founded in 1957 by

three conservative Christian Korean families - never managed to shed its reputation as a slow mover. "The company is too conservative," says Kang Kwan Woo, a corporate analyst at Samsung Securities Co. "It is too slow in a fast-changing world."

If the United States-educated second generation now running the company gets its way, that will change. In April this year, Hankuk announced ambitions to manufacture and sell globally "smart windows" that, at the turn of a knob, can be adjusted to change the amount of light passing through them. Hankuk is betting some of its future on the new technology, which, it projects, will bring in more than 10 per cent of revenues by 2005.

A new strategy is overdue. Hankuk badly needs to move up the value chain as competitors in Korea and China begin to eat into its market share. It must also replace business lost in the wake of a slowdown in Korea's construction and auto industries. As it is, Hankuk expects 2001 sales to drop to US\$ 426 million, down from US\$ 447 million last year.

In smart-window technology, the company seems to have an edge. Hankuk holds patents on a thin-film version of the technology that can be affixed to a variety of products - from office windows to automobile sunroofs and oven windows. The film is to be made at a new, US\$ 6.2 million plant in Incheon, 40 kilometres west of Seoul. Says company President Kim Seong Man, aged 53: "It will give a new dimension to windows in the 21st century."

Hankuk originally licensed its glass-dimming technology in 1990 from American, New York-based *Research Frontiers Inc.* The com-

HANKUK BY NUMBERS					
	1997	1998	1999	2000	2001
SALES (MILLIONS)	US\$ 333	US\$ 313	US\$ 362	US\$ 447	US\$ 426
DEBT/EQUITY RATIO	143%	95%	61%	38%	31.3%
RETURN ON INVESTMENT	-3.5%	0.4%	7.5%	6.0%*	9.2%

*2000 ROI was 11.9 per cent before hefty depreciation costs to reduce taxes
Data: Hankuk Glass Industries, Inc.

pany's suspended particle devices (SPD) use electrical current to control the light passing through glass. When the power is off, the windows go dark; gradually increasing luminosity gives higher transparency. Under the original deal, Hankuk could make and market smart windows only in Korea. By the mid-1990s, however, the company had devised the film format, which it can now sell abroad.

SPD is a breakthrough, because the user can determine exactly how much light gets through. By contrast, the photochromic technology used to cut glare in sunglasses is activated only when exposed to ultraviolet rays - and is not adjustable. What is more, SPD is far cheaper than rival technologies that control light and shade. A pair of battery-powered electrochromic sunglasses costs US\$ 1,200. By contrast, a square metre of Hankuk's smart glass costs about US\$ 400.

The demand for smart-window technology is expected to soar. A recent survey by United States-based Townsend Research expects dimming technology to control 3.6 per cent of the North American residential window market by 2005. Research Frontiers figures just a two per cent share of the residential and commercial markets will amount to US\$ 9 billion



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annually in four years. The American company will get 5 to 10 per cent of net sales.

Hankuk is also hoping to get major automakers interested. Already, a leading European carmaker is testing its SPD film. The company also plans to sell to ship and aircraft makers, as well as manufacturers of refrigerators and ovens.

Hankuk has spent years preparing for its global push. As part of a mid-1990s restructuring, the company formed a strategic partnership with France's *Saint-Gobain Group*, selling the European glass giant a 35.2 per cent stake in Hankuk Glass. Hankuk also raised US\$ 85 million by selling off non-core businesses, and used the money to buy out two-thirds of its 6,000 staff. While Hankuk is expecting a high return on its investment in smart glass, it is keeping its projections conservative, at just US\$ 60 million in annual sales in five years. If smart

HANKUK GLASS SETS UP SPD UNIT

In January this year, Hankuk and Research Frontiers announced the formation of a separate subsidiary to be devoted exclusively to the mass production and sale of suspended particle device (SPD) light-control film, and a wide variety of end-products using SPD film. Hankuk expected to have a majority holding in this new company, which is to be called *SPD, Inc.*, and intended to contribute approximately US\$ 6.4 million, including Won 6 billion in equity, to its creation.

windows take off, Hankuk may shed its dowdy image - and teach its critics that it knows how to be bold without being reckless.

This article was first published in *BusinessWeek*, 30 April 2001

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BI-MONTHLY INTERNATIONAL MAGAZINE FOR GLASS MANUFACTURING

YEAR 14 - ISSUE NO. 3/2001 - MAY/JUNE

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