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 Company profile
 

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# Architectural glass solutions from Viracon

*An international supplier of high-performance products, Viracon is specialised in state-of-the-art architectural glass. The company, part of US group Apogee Enterprises, believes in selling solutions. To this end, it employs technical field staff that service design professionals in every stage of project development, and has dedicated its business to offering architects and glazing firms the best glass alternatives possible.*

**Marinelle Maynard**



Fig. 1  
Pacific Design  
Centre, West  
Hollywood,  
California  
with green  
laminated  
glass and  
customer  
ceramic frit  
spandrel paint

## More than insulating glass

Twenty-seven years ago in Owatonna, Minnesota, US, a town located south of the metropolis of Minneapolis, James L. Martineau, entrepreneur, established a business

venture for the production of insulating and laminated glass. That company, known as Viracon, has since grown to become one of the largest manufacturers of high-performance architectural glass in the United States. From its single production plant, the company supplies the international industry with high-



Fig. 2  
MGM Grand  
Hotel (Las  
Vegas, US)

quality, modern building glass, ranging from tempered, silkscreened and insulating glasses, to laminated, security, privacy and high-performance coated glass. Viracon is ISO 9002-certified and was the first US glassmaker to obtain certification from SGS International Certification Services Inc. In April 1995, the glassworks' entire operation, including sales, customer service, financial service, scheduling, purchasing, production and shipping, underwent inspection for consistent quality levels and passed the examination.

It appears that from the start, Viracon's future included broad horizons that stretched well beyond its home borders. In the year of its foundation in 1970, the company was purchased by the Minneapolis-based group *Apogee Enterprises, Inc.* The acquisition resulted in Viracon becoming a part of a dynamic business group, and in particular, it became a subsidiary in Apogee's Glass Technologies division, of which two other US glass fabricators, *Viratec* and *Tru Vue*, are also a part. Today, Viracon is the largest business in the Glass Technologies segment with approximately 1,200 people in its employ.

### Gracing the world's skylines

Selling glass solutions, says Viracon, is its business. This means that all possible options

for each different step of a project are carefully considered and evaluated, with the aim of giving the client a complete package. The efficacy of this business policy is evident from the number of architectural projects worldwide for which Viracon has supplied glazing. In North America, Latin America, Europe, the Middle East, and Australasia, Viracon glass is visible in impressive modern constructions, including:

- Commercial Union building (Singapore);
- Torre Multiva (Guadalajara, Mexico);
- Jawad Commercial Complex (Bahrain, Saudi Arabia);
- Hong Kong Convention Centre;
- Petronas Twin Towers (Kuala Lumpur, Malaysia);
- New York, New York Hotel & Casino (Las Vegas, US).

In the United States, the company has supplied glazing for hospitals, hotels, libraries, convention and business trade centres. Some examples are the Mt. Sinai/Salick Cancer Centre (Miami Beach, Florida), the MGM Grand Hotel and Casino (Las Vegas, Nevada), the Los Angeles Convention Centre and the EDS Financial Trading and Technology Centre (Austin, Texas). Other building projects include the Rock and Roll Hall of Fame and Museum in Cleveland, Ohio and the San Diego, California, Hall of Justice.

Fig. 3  
New York,  
New York  
Hotel &  
Casino (Las  
Vegas, US)



## Knowing the industry

In order to stay at the forefront, suppliers must have deep understanding and knowledge of the industry they serve, and Viracon has exactly that. The company highlights the fact that it is staffed with experienced sales representatives, technical support specialists, and skilled production personnel who continuously work hard to deliver quality products and services to the customer's entire satisfaction. Viracon's field sales representatives offer their expertise in architectural glass, providing architects with design assistance, budget costing, return on investment costing and specification writing. In addition, they act as liaisons between architects, the company and glazing contractors. Viracon sales representatives work closely with glazing contractors, assisting them with initial project costs, final pricing negotiations, product information and job site inspections. Moreover, they also conduct architectural and technical educational seminars known as "box lunches".

Viracon's customer support representatives provide quoting, product performance data, pricing, project coordinating, samples and mock-ups, while staff in the Architectural Technical Services Department assist with specification and design, performance and environmental analyses, windload and static



Fig. 4  
Viracon's  
new  
tempering  
line from  
Tamglass

load calculations, hurricane requirements and security threat levels. With all the various aspects of a building project covered, Viracon can boast that it offers the most comprehensive service and complete range of high-performance architectural glass products available worldwide.

## Production

For fabrication purposes, only modern equipment specially designed for high production volumes and complicated processes is employed at the glass factory. Precision machines cut glass to guarantee that each piece of glass fits together into a specified opening, and automated silkscreening equipment paints glass in geometric and artistic patterns to give the glass solar control and custom design elements. The current silkscreen capability at the factory is 76"x150" glass.

When it comes to strengthening glass, Viracon claims that it houses the largest automated architectural chemical strengthening tank in the US. During the glass strengthening process, glass sheets are lowered into a potassium nitrate solution tank at 800°F (371°C), diffusing the potassium into the glass.

As for heat soaking, glass sheets are "soaked" in ovens that reach temperatures of 530°F (276°C) for approximately 1 hour. The heat soaking technique minimises the potential for spontaneous glass breakage, thereby giving a building structure greater strength.

### PRODUCTION EQUIPMENT AT VIRACON

<b>cutting:</b>	3 <i>Bystronic</i> cutting machines
<b>grinding:</b>	2 <i>ADA</i> vertical glass edgers
<b>strengthening/ tempering:</b>	3 <i>Glasstech</i> and 1 <i>Tamglass</i> tempering furnace
<b>heat soaking:</b>	1 <i>Koch</i> heating soaking oven
<b>metal coating:</b>	3 <i>Airco</i> coaters
<b>roller coating:</b>	2 <i>Union Tool</i> automated roller coaters
<b>insulating glass:</b>	5 <i>Peter Lisec</i> IG production lines
<b>silkscreening:</b>	3 silkscreen lines

Other state-of-the-art technology utilised by Viracon is magnetron sputtering vacuum deposition technology for applying metal coatings onto glass. The company says this technology allows it to guarantee the quality of its low-emissivity glass. Viracon offers 6 different low-E coatings, 6 coloured coatings and over 70 custom coatings.

### A wide product range

In terms of volume, Viracon fabricates more than 3.1 million square metres of architectural glass annually. Only high quality clear and tinted float glass is used to make its products, which are in considerable demand. Major US float glass manufacturers such as *AFG*, *Pilkington LOF*, *Guardian* and *PPG* supply Viracon with raw float which is then cut, strengthened, tempered, laminated, coated, painted or made into IG units. Having the capability for all of these processes has allowed this glass manufacturer to offer the architectural glazing sector a wide selection of high-performance products. Viracon's production includes:

- **Acoustic glass**

To create a good sound-control glazing product, Viracon uses a combination of glass, plastic and air space. The company tests various combinations of glass types to determine sound control properties, many of which are rated by Sound Transmission Class (STC), using a comparative rating system adopted by ASTM for comparisons of interior wall panels.

- **High-performance coatings**

*Solarscreen*<sup>TM</sup> coatings, Viracon's latest technology in high-performance coatings, is said to have established a new set of standards for quality, aesthetics and performance, offering many design opportunities. Thin yet durable metal coatings are applied to 8 tinted float glass substrates, adding colour, reducing or increasing reflectivity, and enhancing solar control characteristics. In insulating glass units, *Solarscreen* coatings are applied to the second surface of the units, for low emissivity. Each

coating type provides different aesthetic and performance criteria and offers a range of transmission levels.

- **Hurricane-resistant glass**

Since the devastation caused by Hurricane Andrew in the 1980s in southern Florida, Dade, Broward and Palm Beach counties have enacted building codes requiring builders to use glazing that withstands strong hurricane-force winds and flying debris. In response to this requirement, Viracon has developed its own line of hurricane-resistant glass (HRG) products for protecting building interiors. One

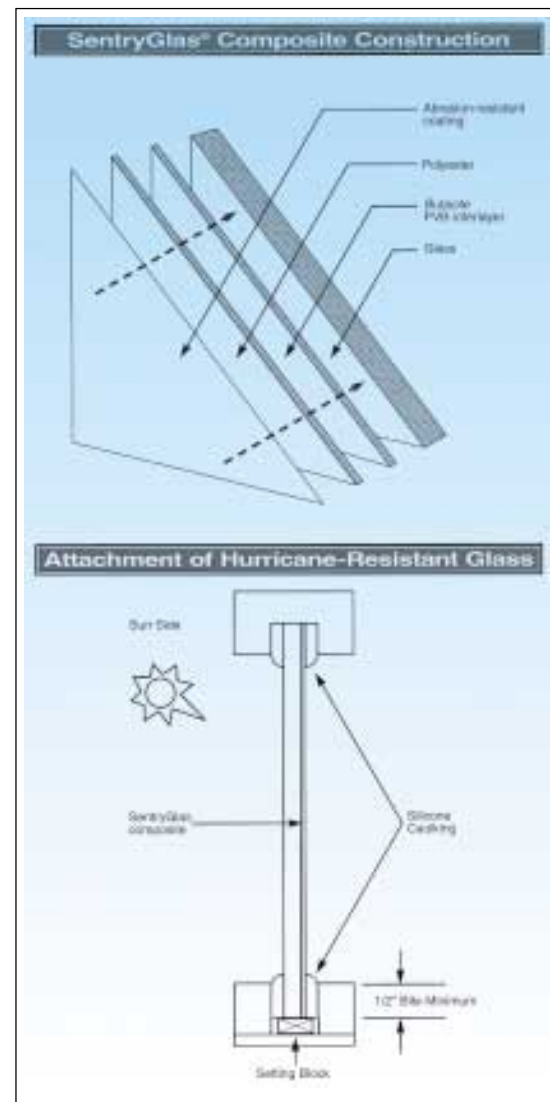


Fig. 5  
Components  
of Viracon  
Hurricane  
Resistant  
Glass

version of HRG consists of standard annealed or heat-strengthened glass laminated with US company *DuPont's SentryGlas®* composite, which combines a PVB interlayer with a strong exterior layer of clear polyester film. The film has a hard abrasion-resistant coating for long-term durability.

HRG is also resistant to burglary attempts, particularly against smash and grab thefts and, in addition to giving protection against forced penetration and entry, it is characterised by a high clarity and optical performance.

- **Laminated glass**

Laminated architectural glass from Viracon is made of tinted glass, high-performance coatings, silkscreened patterns and pigmented interlayers, combined together or alone. This type of glass features PVB from DuPont and ;

, of the US, and offers design solutions for sloped overhead, solar control, sound control and safety applications. Viracon, as part of its technical support programme, performs computer-generated glass strength analyses, heat gain comparisons and solar/optical data for any glass combination.

- **Privacy glass**

*Viracon Privacy Glass™* is a high-technology laminated glass that changes from frosted to clear in an instant, allowing total privacy or unobstructed viewing with the flip of a switch. It consists of a paper-thin film composed of electrically-sensitive liquid crystals laminated between two sheets of tinted or clear glass. This product is offered in clear, green, grey, or bronze and reduces solar heat gain in IG units, and is ideal for conference rooms, entryways and other areas where privacy is needed.

- **Security glass**

All-polycarbonate laminates, glass-clad polycarbonates and all-glass laminates are available from Viracon for special performance levels. *ViraGuard®* all-polycarbonate laminates feature a high-quality, mar-resistant coating on the exterior and multiple plies of polycarbonate bonded together with polyurethane interlayers. It offers no-spall ballistic protection and optimal physical attack resistance with no breaking or shattering.

Another product for security applications is *ViraGuard Air-Space System*. This product consists of tempered, laminated or wire glass added to the *ViraGuard* laminated polycarbonate base through the use of air-space separations, and offers the physical attack resistance of a laminated polycarbonate with the maintainability of glass.

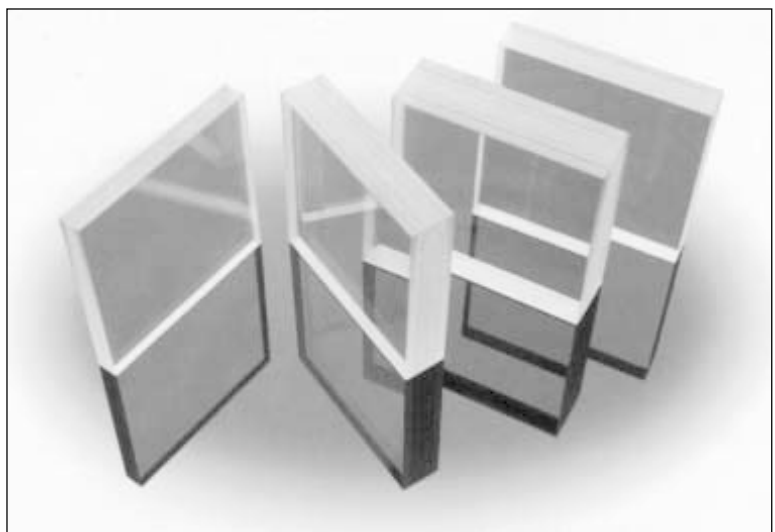
*GuardVue®* glass-clad polycarbonates, on the other hand, feature a core material that consists of single or multiple plies of polycarbonate surrounded by strengthened glass. The polycarbonate provides penetration resistance while the glass contributes to abrasion, chemical and heat resistance for long-term durability.

Laminated all-glass security products are available in bullet-resistant glass, multi-ply chemically-strengthened glass and multi-ply annealed glass. The security solutions often address thickness, weight, performance, product construction and cost considerations.

- **Decorative and spandrel glass**

Often a project may require spandrel glass to harmonise with the vision areas of a building, and Viracon has addressed this need. *Viraspan™* ceramic frit helps to achieve this look. Ceramic frit is applied to the number two surface and fired to create a permanent coating. *Viraspan* is considered a cost-effective,

Fig. 6  
GuardVue  
security  
glass

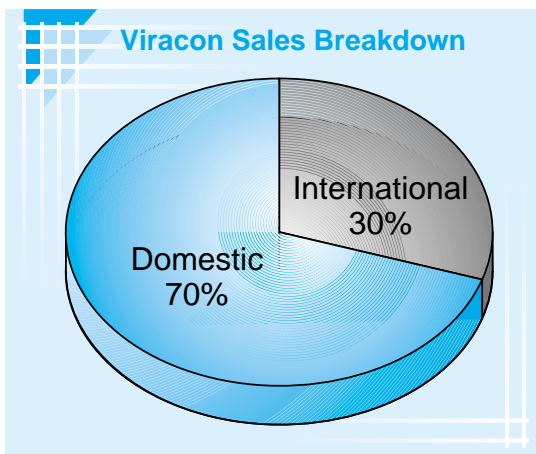


lightweight alternative to marble, granite, stone and other facade materials. It is factory-applied, fire-fused ceramic frit paint for use with monolithic or insulating glass units, which is available in 14 standard colours or in the customer's own custom colour.

If insulating glass is needed for spandrel areas, the ceramic frit is applied to create an opaque appearance. This combination creates consistency between vision and spandrel glass areas. If monolithic reflective glass is required, a polyester opacifying film to the back of the glass over the reflective coating is applied. Ceramic frit cannot be used with reflective coatings.

### Measures of success

According to Viracon, the best reflection of its success is its long-lasting client relationships. However, they are not the only indicators. When it comes to financial performance, the company's annual results do not fall short. In recent years, Viracon has reported steadily increasing figures, showing its strength and leadership ability. In fiscal 1997, (the 12-month period ending on 1 March 1997) the company had solid sales and operating margins, making a significant contribution to growth in its division, which had record results. Operating income for the Glass Technologies division was up 21%, and there was an increase in sales of 28% to US\$ 192.8 million, with Viracon providing much of this growth.



#### Apogee Enterprises group

<i>Chairman, CEO and President:</i>	<i>Donald W. Goldfus</i>
<i>President and CEO, Glass Technologies:</i>	<i>Russell Huffer</i>
<i>Glass Technologies Vice-President, Finance:</i>	<i>Monte Mitchell</i>
<i>Glass Technologies Division Controller:</i>	<i>Tony Nowak</i>
<i>Glass Technologies Division Business Development Executive:</i>	<i>Ed Wegener</i>

#### Viracon

<i>President:</i>	<i>Brad Austin</i>
<i>Manager of International Sales:</i>	<i>Rick Voelker</i>
<i>Director of Sales:</i>	<i>Joe Marks</i>
<i>Director of Marketing:</i>	<i>Steve Wetzel</i>
<i>Director of Manufacturing:</i>	<i>Steve Kaffine</i>
<i>Director of Manufacturing:</i>	<i>Mike Diedrich</i>
<i>National Sales Manager:</i>	<i>Ron McCann</i>

Fig. 7 (centre) Russell Huffer, President & CEO, Glass Technologies; (left) Brad Austin, President of Viracon; (right) Rick Voelker, Viracon's Manager of International Sales

In reporting on the group's overall performance in the 1996-1997 fiscal year, Apogee's chairman and CEO Donald W. Goldfus stated that management saw potential for further growth in the Glass Technologies segment. The chief executive also added that the group expects Viracon to lead this growth, and that estimates are that the Owatonna subsidiary's net sales in fiscal 1998 will exceed US\$ 70 million.

### Growth ahead

Throughout its existence, spanning nearly three decades, Viracon has continuously expanded its facilities to allow more and more glass fabrication processes. To date, the company has spent over US\$ 20 million on expansions to allow more glass fabrication processes. The company says it is continually investing new

capital into its business to increase operating efficiency and develop new technologies.

Viracon has already experienced the difficulties of demand exceeding supply. Orders have increased steadily over the past 24 months, causing occasional delay in shipments. To overcome this demand increase, Viracon has increased its capacity significantly, some 60% in the last 3 years.

However, in the long term, this percentage increase may not be enough, and being fully aware of this, Viracon is currently studying options for further expansions.

**VIRACON SALES  
REPRESENTATIVES  
WORLDWIDE**

Argentina	Japan
Australia	Malaysia
Brazil	Mexico
China	The Netherlands
Chile	New Zealand
Costa Rica	Puerto Rico
Ecuador	Singapore
Hong Kong	South Africa
India	Taiwan
Indonesia	Uruguay
Israel	Vietnam
	Venezuela

**VIRACON GLASS  
IN THE INTERNATIONAL  
SPOTLIGHT**

*On 1 July, the world watched the passing of Hong Kong back to the People's Republic of China after 150 years under British rule, 99 of which were under the terms of a lease. The historic ceremony, which was attended by members of the British royal family, world leaders and interested spectators, was held at the Hong Kong Convention Centre, a modern construction built with several types of advanced architectural glasses from Viracon.*

*Completed in 1993, the building recently underwent expansion to accommodate the large crowd. The expansion called for the use of more than 200,000 square feet of Viracon glass, including tempered Azurlite with a painted ceramic frit, laminated Solex glass, silkscreened clear glass and white laminated glass. Because the convention centre is located near the port, all the glazing used in the project had to have, besides high aesthetic qualities, considerable resistance to strong typhoon winds. Glazing contractors, therefore, chose Viracon's highest-performance glass products to permit satisfaction of both of these requirements.*

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