

# How Far We've Come

## The Early Beginnings of the Glass Tempering Association and the Safety Glazing Certification Council

*A conversation with Norm Nitschke, Robert Brown and Stanley Joehlin*

**O**n a recent visit to Toledo, three retired industry pioneers, Stanley Joehlin, Robert Brown and Norm Nitschke, sat down to record some of their recollections about the early history of the Glass Tempering Association (GTA), the predecessor of the present-day tempering division of the Glass Association of North America (GANA), as well as the beginning of the Safety Glazing Certification Council (SGCC). What follows is a summary of their recollection about the early, formative days of what today is the tempering division of GANA.

**SJ:** Norm, how did the GTA get its initial start?

**NN:** We really need to start with the early history of Permaglass. I met Harold McMaster [founder of Permaglass and co-founder of Glasstech] in 1948, the year Permaglass was formed, but it was 1951 before the company was large enough to pay both our salaries. That's when I joined Harold as vice president of engineering.

In those early days, we were looking to temper anything and everything to get our business started. One of the first markets was in tempering small pieces of glass used on the top of department store counters to separate the small nickel-and-dime items. The annealed glass separators were always breaking so we provided an alternative. That became a business. In fact, one of the original Permaglass shareholders helped sell glass to chain stores such as Woolworth and J.C. Penny.

Then television came along in the 1950s. We started tempering glass for TV sets with the 7-inch-diameter sets.

This rapidly increased in size up to 15- to 16-inch sets. We were able to add Dick Dooley, then head of Admiral Corp., to the Permaglass board of directors and he gave us an entry to the television set manufacturers. By 1954-55 we were selling to Admiral, Magnavox, Motorola and others.

By that time, too, other people learned enough about tempering to be able to pass the Underwriters Laboratories (UL) safety tests—which was quite an accomplishment in those early days. As purchasing agents began pushing for lower prices, the idea to develop a standard took shape as a way to gain more acceptance of tempered glass for use as a safety implosion plate in those early TV sets. This became more important as the size of TVs increased. The bigger the tube got, the more glass flew into the room when the tube imploded—which they invariably did in those early days.

Permaglass had hired Bob Kohl as marketing manager, and he, along with Sarah Levin of Hamilton Glass, Gerard Kellick of Chicago Dial and Tony Feldmeier of Marsco, led the effort. By the end of 1958, Hordis Brothers Inc., Dearborn Glass Co., Virginia Glass Products and Eagle Convex also were involved.

One of the first things we did was hunt up someone to help make the association go. We employed two women in Chicago; Muriel Collie was hired as an executive assistant . . .

**BB:** Minita Wescott was the other one. She served as executive director.

**NN:** They set up meetings at airports, mostly in Red Carpet rooms, and other places we could get four or five people together. We started an Engi-

neering Committee. Those early discussions were all about on standards for the TV implosion plates and other possible tempered glass markets.

**SJ:** So the first meetings of the initial group of GTA members were in 1958?

**NN:** Yes. My files show the bylaws were adopted May 22, 1958, and revised in March of 1959. Not long after that our membership grew and glass suppliers—PPG, St. Gobain and LOF [now Pilkington]—began to send representatives. By 1960 or 1961, Bob Kohl was elected the first president and, I believe, Tony Feldmeier was the first chair of the Standards and Engineering Committee.

**BB:** Were Shatterproof Glass and Hordis Brothers Glass involved at that time?

**NN:** Yes, Shatterproof, represented by John Hartman, was invited to join in 1960. Hordis Glass was a member back in 1958.

**SJ:** Did you lead the first technical efforts for Permaglass or did Mr. Kohl do that?

**NN:** Kohl acted as president. I went to all the meetings. We looked to Permaglass for anything in the engineering arena in those early years.

**BB:** What standards did you have, if any? You mentioned Underwriters Lab earlier.

**NN:** Well, if you were manufacturing television sets, you had to have an UL's approval to be able to sell the set. From a safety point of view, it primarily was the impact test of the bezel (the frame that held the glass in) and the tempered glass itself. As I remember, a 2- or 3-pound steel ball had to bounce off the



**Stanley Joehlin**



**Norm Nitschke**



**Robert Brown**

glass from what seemed to be incredible heights for us at that time.

One of the problems the association encountered involving the use of tempered glass in the television industry was the discussion of acceptable testing methods. We had the opportunity to help form UL's opinion of what would be suitable for an implosion test in their Chicago office.

**BB:** Did you have any guidelines from the Europeans for various uses, as compared to our domestic practices at that time?

**NN:** They didn't seem to be as advanced as far as television implosion or cathode ray tube use of glass. We ran a number of implosion tests by setting up the cathode ray tube and implosion plate in front of it, and snipping off the back of the tube in the electronic gun area.

The tube would implode and the glass came out the front and back, in all directions. We did several tests at the Underwriter's Lab in Chicago and got some kind of an idea of what the degree of temper had to be to keep the glass from going out on the floor. When a larger tube (we got up to 16-, 18- or 19-inch tubes) would implode, the glass would go 30 feet into the room. It was a little disconcerting to implode without an implosion plate.

The implosion plate business decreased rapidly when Kimball Division of Owens Corning developed a metal retaining band that, when combined with a thick glass face, eliminated the need for a separate implosion plate to prevent glass from an imploding tube from flying into the room.

**BB:** Were you making automotive tempered at that point in time? When

was the beginning of the technical committee for those that were tempering?

**NN:** We had started in the automotive business in 1957. Somehow I saw the drawings of the 1957 Chrysler Imperial that had curved sidelites—the first automobile we had seen with curved sidelites. At that time PPG and LOF were working under a consent decree to settle a case with the government. I told Harold that I thought, because of the consent decree, we might be able to do some work in tempered glass in automobiles without getting our glass supply from PPG or LOF cut off.

We started looking at the requirements of the Z26 Auto Glass Standard at that time. The early Z26 standard was written in 1933. Advertising literature of both PPG and LOF flatly stated that glass less than 1/4-inch thick could not be tempered for automotive use. So the idea evolved that maybe Permaglass could do something less than 1/4-inch thick as an entry into the automotive market.

I went down to our Payne, Ohio, plant to make the test samples. I then took those one-foot squares up to the Chrysler Glass Lab to Ernie Edge, their glass lab manager. We started dropping the 1/2-pound ball. The requirement was to drop it from 10 feet and bounce it off without breakage. That first piece of glass that Ernie tested bounced off at 21 feet. They thought that was a fluke and decided to try a few more. We always came up over 15 feet with 7/32-inch sheet glass. We used 7/32-inch sheet because float was on its way but wasn't there yet. Sheet was cheaper to buy.

**BB:** Maybe a little stronger, too, at the time, with a fire-polished surface ...

**NN:** That was the reasoning on our

part. It took a couple of years, from 1957 to 1960, before all the states had agreed in their legislatures that tempered safety glass under the Z26 standard could be used in car sidelites. Between the first trial and getting the Chrysler business, we supplied all of the Studebaker Champion cars and a quarter of the American Motors sidelites. (The backlites were already tempered.)

With General Motors' support, Ohio had a real campaign to keep laminated safety glass in the sidelites. The replacement glass industry was a very large business, and there were proposals in 14 state legislatures trying to outlaw tempered glass in the sidelites. I was active in Ohio, but Ford Motor and/or Chrysler were active in all 14 states. Finally, in 1960, General Motors decided it would use tempered glass in their cars.

Being able to say to a company that there would be no change in your structure, your regulators or your door was a big advantage. We could simply replace the laminated glass. (The laminated glass was constantly falling out of the bars that were glued onto the bottom edge and needed a metal surround to keep the glass from breaking every time you slammed the door.) We could put tempered glass in the same position if we went down below the belt line and drilled a few holes instead of trying to grip it to hold it in the regulator. We didn't need the frame around the top. It was almost certain that tempered glass would be at a much lower price than you would expect laminated glass to be. That was the beginning of tempered glass in automobile sidelites.

We had to go to 48 states and get their

# How Far We've Come

*continued*

approval from each state for the product we were trying to sell. They would test it under their recognized edition of Z26. I think you will find Permaglass was the first in the country to get approval in all 48 states for  $7/32$ -inch glass. We were also the first in the country to get all 48 states to approve  $3/16$ -inch glass. PPG beat us by 2 or 3 days to get  $1/8$ -inch glass to pass the Z26 test.

During the early 1960s, the use of architectural safety glass grew gradually and we joined the technical committee of the Architectural Aluminum Manufacturers Association (AAMA) [not to be confused with the American Architectural Manufacturers Association] to promote tempered glass for use in patio doors.

Permaglass had a plant down in Ft. Lauderdale, Fla., and, about this time, we helped form the national study group to analyze injuries from patio door glass. This came about when Bob Kohl invited Bill White from the Health, Education and Welfare Department (HEW) of the federal government to stay at a house Permaglass had in Ft. Lauderdale. We talked with him about how we could get figures as to how many glass accidents there were.

The study group included the National Safety Council, HEW Department, as well as representatives of the float glass manufacturers, including PPG and LOF. The late Don Vild, then with LOF, was active in this effort. I think the resulting study disclosed that the AAMA was having problems with quality.

They had only a proposed quality requirement, but none in place at that time. Everybody wanted to make the frames for architectural doors and windows lighter and lighter. Frank Fitzgerald, then executive director of AAMA, said what they needed was a quality control standard. AAMA could make it a requirement of the organization that, in order to belong (they had 200 members at that time), members would agree to adhere to the control standards for the aluminum-gauge size.

Next, the type of safety glass came into question. Permaglass helped or-

ganize the American National Standards Institute (ANSI) Sectional Committee for Architectural Glass in 1962. I was the chair of the drafting committee charged with writing the standard for safety glass. For the next two years, everybody wanted approval. AFG [now AGC] wanted to have wired glass approved; LOF wanted to have laminated glass as an approved material; we wanted to see tempered glass material approved; and then the plastics people with acrylic bathtub enclosures, etc. wanted to have that as a safety glazing. So we went from place to place and showed the plans of what things we would do as a committee.

I remember a visit to the LOF plant (in 1963, I think) where they were going to demonstrate the car crash dummy system they had developed together with General Motors. On the way down to that meeting at the East Toledo LOF Research Lab I made a detour to an athletic store on Superior Street in Toledo where I picked up a punching bag.

The Z26 test was not only the ball test. A bag full of lead shot would drop onto the glass to show impact from a body in a car crash. While we were at LOF I asked one of their people to cut a hole in the top of the punching bag and fill it full of lead shot to see how much it weighed.

The thought was, instead of carrying it up a ladder to drop vertically as in the Z26 test, if we could determine what kind of impact this ought to be maybe a simple pendulum test against the glass supported in the design frame might reproduce the impact.

That visit had to be about 1963 when I was chair of the committee. I think it had to be in 1965 when the next meeting of this ANSI Standard Committee for Architectural Glass was held in New York. I remember Frank Fitzgerald and Bob McKinley, PPG's technical services director for architectural products, were stuck overhead in an airplane. While circling they had used a slide rule to calculate how much energy a 14-year-old boy, weighing so much and running

full speed into a patio door, would push into the glass.

So we had a starting point, but then we thought that that was a pretty high figure and it would not be likely that he would hit it all at once anyway; he would hit it with arms, elbows and head. So we came up with a lower figure, which happened to be something like this punching bag swinging on a pendulum drawn up to about four feet would produce. That became the Standard, and we had written into the standard that the tempered glass was going to be one of the safety products.

ANSI asked if the GTA would promote and sponsor a standard like that. That led to the idea of a third-party testing system in order to get all of the companies to agree to have testing done as an independent thing—not by a laminator, nor a temperer, nor wired glass companies.

Shortly after that, while I was serving as the president of the GTA, I had a call from Frank Fitzgerald at an AAMA meeting in Florida. He wanted to know if GTA would sponsor the standard and do the testing. I said yes, we would be glad to do that. I said I didn't think that was the way it was going to be but we would work with them to get the third-party test.

There were a couple laboratories we had in mind they might get to do the testing. One was down in Florida—I don't know if Bob Nance was head of that lab at the time.

**BB:** Miami Testing Lab?

**NN:** Yes, Miami Testing Lab. If they would be acceptable as an independent third party, they could write up rules and regulations about unannounced inspections and testing to this standard and give their approval.

**BB:** The first two certification programs were the tempering association program we called the GTA and the Safety Glazing Industry (SGI) formed through LOF and AFG and some of the foreign suppliers who imported safety glass. Bob Nance ran that program and ran one of the approved testing labs that did testing for the GTA program.

SGCC hadn't formed at that time.

There were two existing certification programs and the SGI was done specifically to take care of those who had specific needs because the original Z97 Standard covered only transparent safety glazing materials. That was the terminology and AFG, among others, had a lot of translucent or patterned glass products, as did the plastic companies. They wanted to be able to test that material so SGI, which was the industry-controlled sponsored certification program, was formed.

SGI did test translucent glass panels to the Z97 Standard but without saying that it applied sort of ignored the transparent language originally in the GTA program. This oversight in the development of the Z97.1 standard came up from time to time while the two certification programs coexisted. This prevented the testing of bath products, which of course were among the most popular uses of safety glass. In addition to the patio doors, they needed to test translucent glass. I recall that those two programs, SGI and the GTA, ultimately married to form SGCC.

**NN:** I think it was a combination of Fitzgerald promoting with the architectural aluminum manufacturers [through AAMA] and GTA agreeing to help with the SGCC. I was the first president and I stayed there seven years, from 1969 to 1976.

**SJ:** So then in the time frame, the first Z97 Standard was issued ...

**BB:** ... in 1966, I believe.

**NN:** Well, it was approved by AAMA in 1965 because we had a meeting in Las Vegas and I was there.

**BB:** Then it took a while for what they called the Board of Standards review from ANSI to say they would publish it. At least it seems to me the first one I saw was the USA Standard Z97.1, and it came out in early 1966.

**SJ:** And the SGCC initial formation was about that same time, or was that later?

**NN:** Well, by agreement with the pres-

ident of AAMA and myself, as the president of GTA, GTA's program was presented to AAMA members requiring safety glass meeting Z97.1 requirements to be installed in all patio doors. And GTA agreed to sponsor a national certification program as part of the Z97.1 specifications (this was in 1966 and 1967); this certification program eventually became the SGCC and certified 95 percent of all architectural safety glazing used in the United States to-date.

**BB:** SGI and GTA coexisted but those two certification programs had an awful lot of overlap. My employer, for one, was in both programs; there were others as well.

So it wasn't long after the first standard got published that those two certification programs were merged. PPG was a large supporter of the merger; it made sense to them even though they weren't heavily involved in translucent glasses or pattern glasses. It made financial sense to the people who were trying to participate in both certification programs.

**NN:** As I remember, almost everybody agreed to unannounced testing by Bob Nance's laboratory in the beginning. He came out with the reports. When somebody failed, they failed. There were provisions for retesting. I think they would come in, mark the glass from the production line and take it back to his lab for testing.

**BB:** That's correct.

**NN:** I think, later, LOF and maybe PPG thought they were big enough they ought to be able to self-certify. I don't know how many people self-certify now.

**BB:** The last time I checked, PPG was still in the third-party program. But you're exactly right, there was an issue that came along about the testing in plant and self-certification and it lingers yet today.

SGCC put a rule in that any time they came in and tested your product, if it failed then the test was doing what it was supposed to do. If you happened to be the producer of the product that wasn't performing

under the random sampling routine testing, it became a blemish on your record caused by the SGCC.

When Norm was president, SGCC required prepayment of your fees up front. That was wise because nobody was going to go back and pay an invoice that was due for services having been rendered if their product didn't perform to the standard to which it was being tested. That was done early on and there were some people who growled, but for the SGCC during Norm's years and my years with it, if you were in the club you paid up front. If your product performed you kept right on smiling, if it didn't there were some contingencies that permitted retesting under certain situations at an extra cost.

Failure certainly became an undesirable situation to have experienced in front of your peers. Information about failure was confidential and limited to the board and the administrator of the program (Bob Nance when SGCC originally formed, and now John Kent). The membership would get the information that there had been a failure with a number. Each individual product number of SGCC was unique; once it was decertified or removed from certification voluntarily, that number was never to be reissued.

Norm, it's amazing the accomplishments you've had and some of your people that I've been privileged to know in the industry. It's been a real gift that I had a chance to know you and work with you in the various associations we've been in and with many of your colleagues. ■

## the authors

Based on the recollections of **Norm Nitschke**, **Robert Brown** and **Stanley Joehlin**. The authors' opinions are solely their own and not necessarily those of this magazine.