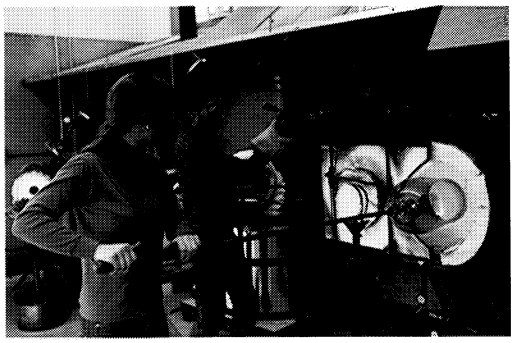
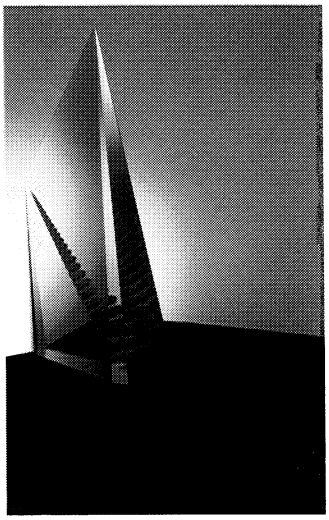
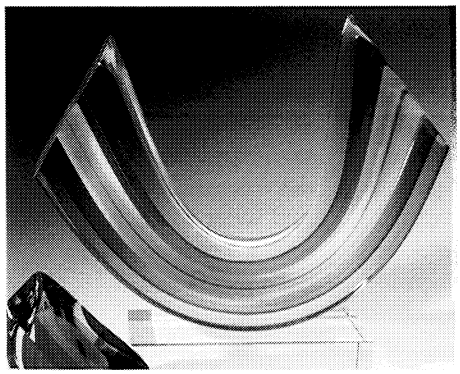
Glass Artworks

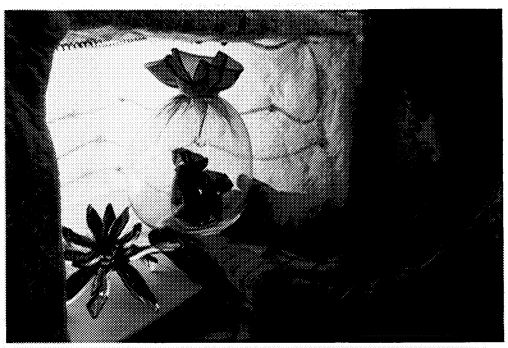


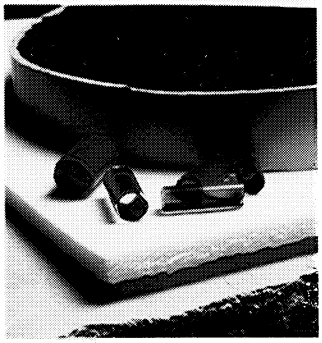
Shown below is a magnificent Rocking Combination Arc, a glass artwork by Harvey K. Littleton, father of what is known in art circles as the studio glass movement. Before Littleton, the technological demands of working hot glass dictated that such artworks be produced by skilled technicians in factories with an array of special equipment. In the 1960s, Littleton popularized the techniques that enabled an artist working alone in a studio to create high quality glass artworks. Littleton passed on his technology to groups he taught at the University of Wisconsin; many of his students formed their own university glass art programs and helped advance the technology. Today there are estimated to be more than 1,000 glass studios in the U.S.



Several NASA technologies have played a part in the growth and cost containment of studio glass art, among them a foam-type insulation developed to meet a need for a lightweight material that would reduce flame spread in an aircraft fire. The foam comes in several forms and is widely used by glass artists, chiefly as an insulator for the various types of ovens used in glass working. The principal advantage is economy; other insulating materials absorb much of the heat energy and require three to four times the amount of fuel.

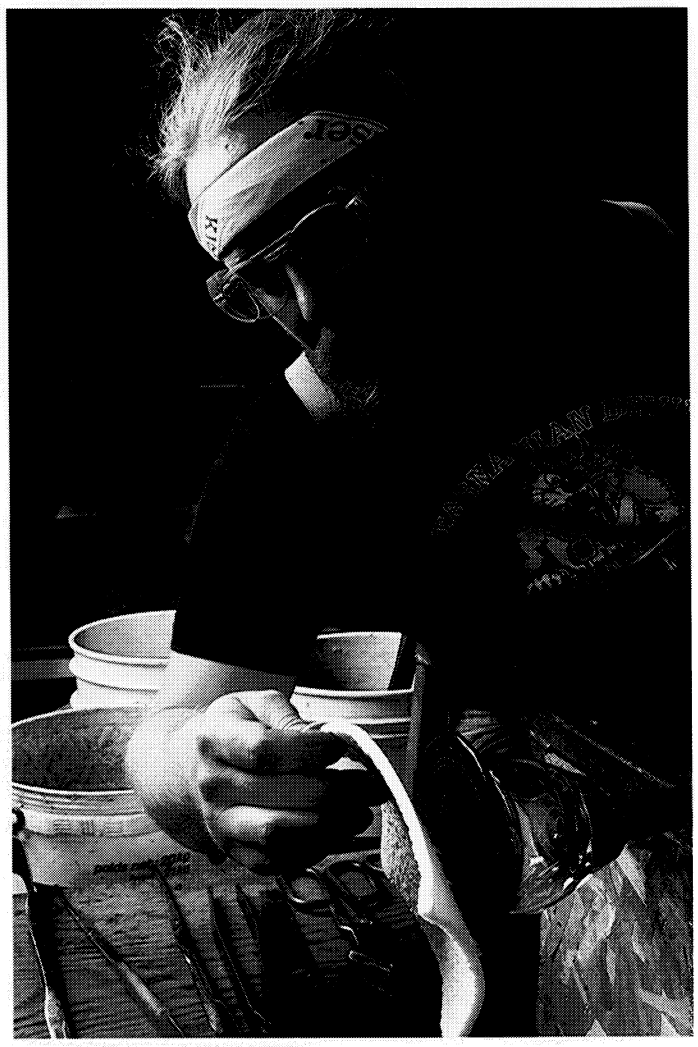






Another spinoff is the use of alumina crucibles to contain molten glass. A fabrication process for alumina crucibles was developed by Marshall Space Flight Center for use in experiments on inorganic crystals. Prior to that time, glass tanks were made of firebrick, which tended to erode under high temperature and cause impurities. The use of alumina crucibles not only improved quality but made the process more cost effective.

One more NASA technology that has found its way into glass artworking is a material known as graphite board, a special form of graphite originally developed for rocket motor applications by Great Lakes Carbon Corporation, Briarcliff Manor, New York. An example of the utility of this kind of graphite is found in the work of artist Mark Peiser, who machines it in his studio to exact compound angles and creates molds for poured-glass artworks of dramatic design. At upper left on the opposite page is a graphite mold in the foreground and the resulting artwork (cost $11,000) in the background.



At top left center, the husband-wife team of John and Kate Littleton is creating a blown glass artwork. In the left center photo, John Littleton is dipping a blowpipe into an alumina crucible inside a gas-fired oven; a new crucible is shown in front of the oven. The glass formula is melted and kept liquid for days and even weeks, throughout the production of the artwork. Once the piece is completed, it must be cooled to room temperature very slowly, only a degree per hour. This is done in an electric annealing oven such as the one (top left) in which Kate Littleton is placing a completed work. The electricity cost for the long period of cooling would be enormous except for the superinsulating qualities of the insulator lining the oven.

The top right photo illustrates another use of the foam insulator—as a base for a fused glass design. The foam is the white material set on a ceramic plate; on top of it artist Gary Beecham has arranged colored glass rods to form a desired design. The whole package is then placed inside an electric oven and heated to about 1800 degrees Fahrenheit; then the glass rods melt together into Beecham's predetermined design. At left, Beecham peels away the foam support sheet, which is easily removed and leaves no residue or impurities. ▲