CHRONICLE

CONFERENCE ON THE PRODUCTION OF CURVED AUTOTRANSPORT GLASS

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At the Borsk Gor'kii Glass Factory, a conference was held on the production of curved autotransport glass, called by the State Scientific Research Glass Institute together with the Gor'kovsk National Council and the Gor'kovsk Technological Council.

The conference was attended by scientific members of the Institute of Glass, its Saratovsk branch and PKB, engineer-technical workers of the Borsk Gor'kii Glass Factory and the Gusevsk Dzerzhinskii Factory, the Konstantinovsk "Avtosteklo" plant, representatives of the planning and design organizations—the institutes "Giprosteklo", Orlovsk and Moscow TSPKB (central planning bureaus) for glass machine building, and the automobile factories at Gor'kovsk, Moscow (Likhachev, Kurgansk, Kutaissk, Pavlovsk) and also representatives from the Gor'kovsk National Economic Council.

Opening the conference, the deputy director of the Institute of Glass, Comrade Sorokin, reminded those present of the complex problems facing the glass industry and scientists, particularly those of substantially increasing the output and improving the quality of curved polished and unpolished automobile glass for satisfying the growing demands of the automobile industry.

The deputy chief designer of the Gor'kovsk Autoworks, Comrade Gor, delivered a report on the future developments of automobile building in the current Seven-year Plan and the use of curved glasses.

He observed that the controlling figures for developing the national economy in the years 1959-65, taken by the 21st Congress of the CPSU, provide for an increase in automobile production by 1.5-1.7 times in comparison with 1958. New models of automobiles will possess more modern designs, better performance and technical economic characteristics.

To satisfy the requirements of the automobile industry for curved glass, there is demanded from the glass industry the organization of the continuous production with a better technology ensuring high-grade goods.

Today the glass industry cannot completely satisfy the demands of the automotive industry for curved and flat glass. Still unresolved are such questions as producing a consistent geometrical shape in curved glass with low deviation of size and curvature, reducing the thickness of the glass, obtaining flat glass polished along the radius of the edge and with apertures on the flat glass, reducing strains, excluding turbidity in the three-layer glass triplex in countries with a hot tropical climate.

To improve the technology for producing curved glasses, the persistent and intense efforts of the scientific specialized institutes and engineering-technical workers of glass factories, together with the expansion of experimental and research work, is necessary.

The head of the automobile-glass department at the Borsk Gor'kii Factory, Comrade Aleksandrov, gave a report on the state of the technology of manufacturing curved glasses by the softening method.

He satisfactorily covered the aspects of this method as used in his factory.

The first curved glasses for the "Volga" car were obtained in the second half of 1956 on experimental equipment with the help of a furnace unit with 65 kw, and in the first half of 1957 there was built a machine

for making curved, hardened glass. In 1958 the first specimens of triplex panoramic glass for the automobile "Chaika" and the lorry GAZ-52 were made.

For glasses which have a small chamber, for example, the rear glasses of "Pobeda"—35 mm, and GAZ-12—70 mm, the vertical method of forming them is used, molding the glass in presses with subsequent hardening. This method is currently being used at the Gusevsk Dzerzhinskii Factory to make curved glass for the "Moskvich" automobile.

Wind-screen glass for the "Volga" automobile has a longitudinal camber of 153.5 mm, and making it by vertical forming with a high degree of accuracy is quite difficult. Therefore at the Borsk factory for the production of curved glasses for "Volga" cars, they use the horizontal method.

In the production of hardened and three-layer curved glass they use: a single chamber electric furnace of periodic action for softening the glass with subsequent hardening. The furnace has 6 zones with independent temperature control. The standing capacity of the furnace is 174 kw, and its working capacity 125 kw; it is a double chamber, six-zoned furnace for softening the packets of fine glass for the triplex. The furnace consists of two chambers: one for softening and the other for annealing. The principal difference in the chambers for softening consists in having a smooth suspended arch and additional regulated heaters which are installed over the places where the maximum curvature is to occur in the glass. The standing capacity of the furnace is 280 kw, the working capacity is 790 kw; cup-shaped molds for softening the glass (unhinged,single- and double-hinged). The design of the mold depends on the required geometric shape of the glass and the given chamber; a blowing chamber. The apertures of the blowing network have a diameter of 4 mm distributed in a checkered order with an approximate staging of 30 for each 60 mm.

In conclusion, the reporter said that in the matter of developing the optimal technical parameters, selecting the best materials, etc., each factory had to satisfy itself. The specialized problem should be discussed and coordinated by all workers in one place. A special research group should be created under the auspices of the laboratory or a branch of the Institute of Glass with the Borsk factory, which will be occupied with developing new methods of producing curved automobile glass. It is necessary to improve sharply the equipping of factories with special materials and machinery (high-alloyed, slag resistant and refractory steel for the softening molds, air blowing at pressures of 1500 mm water pressure, etc.). The Institute of Glass should develop a method of controlling the strains in hardened, curved glass, a method for producing colored hardened glass, and publish special information for producing curved glass.

Comrade Anokhim, head of a section of GSPKB, discussed the machinery used for making panoramic automobile glasses, developed by GSPKB at the Orlovsk National Economic Council.

He stated that working plans had been completed and given to the clients for the following: unit AMP-1, design for washing, drying, inspecting and final cleaning of the contacting surface of glass packets, application of the butafol film, packeting and preliminary gluing of the panoramic glass triplex for the automobile ZIL-131; machine MRP-1 for preliminary pressing of panoramic glass triplex for ZIL-131; a washer-drier machine MLS for washing and drying polished and unpolished glass plates; a furnace PMO-10 designed for softening and annealing panoramic automobile glass for ZIL-131 of the triplex type; a furnace PMZ for softening and hardening panoramic glass ZIL-130 of the stalinite type and panoramic glass for the GAZ-52 automachine.

GSPKB is committed to the development of a scheme for softening frames for glasses GAZ-52 and "Chaika".

Comrade Shabanov, scientific member of the Saratovsk branch of the Institute of Glass, discussed the production of curved automobile glass in several foreign countries. He familarized conference members with those materials which are mentioned in foreign technical and patent literature.

The reports gave rise to animated discussion and exchange of opinions.

The representative of the Moscow Likhachev Automobile Factory, Comrade Flyukov, discussed the significant growth of the output of automobiles and the conversion to the production of new and more powerful automobiles. In these new automobiles it is intended to install panoramic glasses 1700 × 440 mm in size with a camber of 325 mm. Workers in the glass industry must develop a technology for preparing this type of glass, and design and build high-production equipment so as to produce the right type of glass for ZIL-130 in 1961.

Experience in the manufacture of curved and panoramic glasses for automobiles was discussed by representatives of other organizations which have mastered the manufacture of hardened glasses for the autobus ZIL-158, including the side rear glass 555 × 535 mm with double curvature, the windscreen glass 1100 × 630 mm with a one-sided curve. These glasses are made by the method of vertical warming, pressing in metal molds and blowing.

The production of large (2000 × 560 mm) panoramic polished glasses for the ZIL-111 automobile is being organized. The output of polished glass triplex for the "Moskvich" car by softening it on controlling frames is being mastered.

In 1959 tests were made on a series of bell-shaped frames for glass ZIL-130. The best results were given by a frame of bell cross section with a central weight and this was selected for production with the development of a hardening conveyer furnace.

At present a new double-chamber furnace is being built with blowing equipment for making panoramic glasses ZIL-130, the design being based on existing furnaces at the Borsk and Gusevsk factories. In contrast to existing furnaces, it is equipped with a device for mechanical movement of the carriage from the loading position to the preheating zone and then into the softening zone, under the blower and to the discharge position. The carriages will move with the help of rollers on which the carriage is placed. Movement of the rollers is done from the external part of the furnace with the help of circuits and an electric drive.

The deputy chief designer of the Gusevsk Dzerzhinskii Glass Factory, Comrade Shvagirev, reported that the factory is producing a curved glass by the method of pressing and by softening. Softening of windscreen glasses for the autobus PAZ-652 was done on the bellshaped, hinged frames with forced curving. At present the factory is not doing research work on developing methods for producing curved glasses for new types of automobiles, since it is not yet known what glasses must be produced in the next 2-3 years.

Scientific staff member of the Institute of Glass, Comrade Amosov, discussed the nonfitting apertures of the automobile body in relation to the glass, which creates in certain cases considerable strain in the glass, and gives rise to its destruction during fitting or some time afterward. This matter should be decided by automobile designers and the corresponding apertures should be compensated by flexible components. In the planning of new types of machines it is necessary to avoid such shapes of contour and glass profile which could create considerable technical difficulties in glass manufacture. It is favorable to organize collaboration of car designers and glass workers.

Design resolutions of a number of units of nonstandard equipment for continuous mass production of triplex, discussed at the conference, should be recognized and rapidly accomplished, tested and mastered.

The requirements of the automobile industry for a heat-protective glass rest with the need for supplying a glass furnace for vertical drawing, whose schedule ensures an output of the maximum amount of glass, suitable for making automobile glasses.

The representative of the "Giprosteklo" Institute, Comrade Steshenko, noted the need for developing a single technology for producing curved glasses for all factories which would permit the laying for many projects of single, typical, nonstandard equipment.

"Giprosteklo" in January of this year held an expanded session of its technical council which discussed nonstandard equipment for making automobile glass. At the technical council were present representatives of the Saratovsk, Borsk and Gusevsk glass factories, the Institute Giprostroimekhanizatskii, the Orlovsk and Moscow GSPKB. The following projects were presented in council: equipment for softening and hardening stalinite, equipment for softening and annealing panoramic triplex, containers for preparing butafol films, a conveyer for pressing flat triplex, a washing machine for glass, autoclaves for pressing panoramic triplex, a conveyer for cutting automobile glass, a machine for treating the edges of automobile glass.

The above equipment should be concentrated on for the organization of the production of automobile glass.

A departmental head of the Saratovsk Glass Factory, Comrade Kucherova discussed the need of communicating and disseminating experience on the production of curved, hardened glasses for autotransport.

Old scientific member of the Institute of Glass, Comrade Gorshkova, presented his ideas culled from research work in the production of curved glasses.

The chief engineer at the Borsk Gor'kii Factory, Comrade Okal'nik, discussed the possibilities possessed by this factory for satisfying the demands of the automobile industry for curved glass. In this connection, he emphasized the need for rapid completion of the reconstruction and expansion of the factory.

The conference made resolutions for definite measures for further developments in the production of automobile glass and the organization of the production of new types of curved automobile glasses in 1960-65.