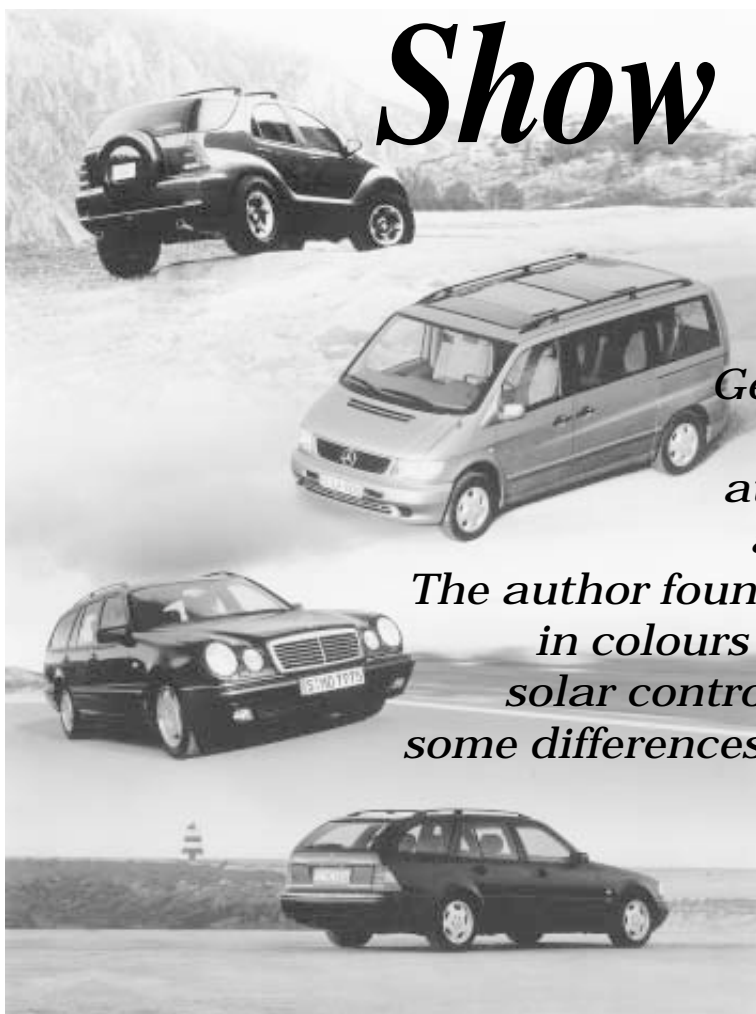


Glazing benchmarks at Geneva Motor Show '96



Glazing trends on vehicles exhibited at the Geneva Motor Show '96 were reflections of those seen at Frankfurt Motor Show '95 and Tokyo Motor Show '95.

The author found there were resemblances in colours and shapes and advanced solar control glasses in cars with only some differences in products and concepts.

Giovanni Manfrè*

MG CONSULT

Fig. 1
Mercedes V-Class vehicles with optional dark tail glass (wagon)

I

ntroduction

The annual Geneva Motor Show, held in March last year, follows the Frankfurt and Tokyo Motor Shows - biennial and in the same year. It precedes the biennial Turin Motor Show which was also last year, in April. Given its timing, the Geneva Motor Show often mirrors the ideas, concepts and car models exhibited in Frankfurt and Tokyo, shows which, in turn, may be influenced by the Detroit show (held in January). The information which can be gathered from the Geneva Show '96 must be a concentrated effort on investigating the targets, which can only be conceived as a continuation of the previously-staged shows, and thus assessing and comparing the already perceived differences between the world's auto makers.

On the basis of specific areas of interest identified before, during and after the Show, this report, concerned particularly with glazing, has been focused mostly on monovolume, family, recreational vehicles as the most innovative segments, following market demands, and on sporty cars, coupés and two-seaters as the "niche" in which the new concepts of design and products might show indications of trends.

With respect to other vehicle segments, the investigation should be, in my view, oriented towards product competition rather than towards probable innovation. Hence, the



Fig. 2
No dark tail
glazing on
the SEAT
Alhambra



objective of this report is to complete the analysis of possible innovative trends in auto glazing, commenced in articles on the Frankfurt Motor Show '95 and the Tokyo Motor Show '95 in issue numbers 1-96 and 3-96, respectively, of *Glass-Technology International*.

Finally, the approach of this paper is an extension of the comparison between Japanese and European auto companies regarding concepts and products, as well as a more profound investigation of competition in Europe among glass manufacturers, especially for extensively higher technological levels of glasses, their shaping and assembly.

Summary of Show

The prime observations on the Geneva Motor Show '96, as compared with the Frankfurt and Tokyo Motor Shows in 1995, concern the following main differences:

- No exhibition stands of glassmakers and no attention to particular glazing. The only literature on glazing was found in the

Fig. 3
Transparent
pavilion on
Volkswagen
"Beetle"





Mercedes show book. Therefore, any information about potential "targets" had to be gathered directly from the exhibition floor. It must also be kept in mind that usually auto makers and designers give minimal attention and importance to the glazing components on the vehicle, compared to that given to other parts like the engine, body, electronics, internal upholstery materials, metals, plastic and wheels. Glazing is yet to be considered a fundamental aspect of automotive vehicles.

- No products and no attention, not even literature, on:
 - variable transmission glasses;
 - head-up displays;
 - UV protection glasses;
 - hydro-repellent or anti-fog glasses;
 - coated glasses;
 - evolution of encapsulation, extrusion and assembly technologies.

- No use of plastic glazing, except in concept cars which were only for exhibition purposes rather than real attempts.

Therefore, in terms of benchmarking, the results of the analysis can be divided into the points listed below.

Vehicle glazings

Designers of multi-purpose, monovolume, family and recreational cars had to tackle problems related to visibility, comfort and personalisation by finding suitable glasses, colours and shapes.

Fig. 4 (below) Ford's "Flynk" concept car, with excellent transparent roof design

Fig. 5 (left) SEAT "Alhambra" with wide complex-shaped windscreen and third, front side window

Fig. 6 External mirror positioning for better rear, side and downward vision

Mercedes approached these problems and created glazings of complex-shaped windscreens and backlights, solar control and privacy glasses in its new V-class models: recreational, minivan, station wagons and family cars. However, solar control and privacy glasses have not yet strongly convinced the *Mercedes* designers. *Mercedes* V-Class cars were the only European models with privacy glass at the tail (see Fig. 1 in the cover page).

Dark tail glazing

As a matter of fact, privacy glasses in Europe have not yet convinced auto makers to use them as dark tail glazing. In order to provide a product analysis, this internal detailed report makes a broad comparison between European, Japanese and American cars. Recreational and station wagon vehicles from Japanese and American auto makers had dark tail privacy glass, while European models such as the *Audi*





A4, the new Volvo 850, the Fiat Ulisse, the Opel Sintra, and the new monovolume Alhambra from SEAT (Fig. 2) had none.

Transparent pavilion

Today, the transparent roof is not only seen in sports coupés and two-seater cars, but it is also popular in lower-line cars, such as the famous Volkswagen Beetle (Fig. 3). However, the most interesting design of a small car with a transparent roof was the concept car Flynk by Ford (Fig. 4), which can be considered a basic evolutionary step towards vehicle personalisation. The concept of this car, shown for the first time at the Geneva Motor Show '96, appears to confirm that the transparent roof is no longer an exercise in design but a real trend whereby transparent plastics might have certain roles, in addition to those of variable transmission glasses.



Figs. 7-10 (clockwise from top left) Complex-shaped backlights on the Alfa Romeo 145, Mitsubishi's EL CAPA, the Mazda 323 and the Opel Tigra

Glazing shape and visibility

Different approaches are made by Japanese, European and American auto makers regarding glazing shape and visibility. Investigative results show that attention was paid to complex shapes in relation to forward and backward vision, but it is difficult to achieve good visibility with roundish shape cars - which is a real trend - without complex shapes in windscreens and backlights, as well as suitable geometrical frames for side windows. Forward visibility with a complex-shaped windscreen can be achieved by a third side front window and a suitably positioned external mirror. European car manufacturers have achieved this, an example of which can be seen in the new monovolume "Alhambra" by SEAT (Fig. 5).

Rear visibility can be achieved by:

- continuous transparent glazing between the backlight and side rear windows, providing for smooth light transmission from the roof (vertical bending) at the top to the side windows (Fig. 6);
- the structural complex shape of the backlight, as achieved successfully in Opel's Tigra; other auto makers have followed suit (Figs. 7-10);
- the peripheral border of backlight suited to the body design (Fig. 11).

An in-depth analysis of the relationship between visibility and complex shape in





Fig. 11
Backlight
peripheral
border
matching
body design
on Volvo
V40

glazing is a key to identifying the real trend of shaping technologies which will be assumed by glass manufacturers as, for instance, in stratified and tempered glasses. The staging of the Geneva Motor Show '96 provided a floor whereby comparisons could be made between worldwide glassmakers on this subject.

Solar glass

Solar control IR absorbing glasses have been adopted for use only in some top-of-the-line cars, in blue or green, but their utilisation seems related more to fashion rather than to improving comfort or reducing fuel consumption by lower-powered air conditioners. Despite growing competition in the glass industry, glass manufacturers should make high-tech glasses a more appealing product by improving the cost:benefit ratio.

Competition in glass industry

The strong presence of newly-established glass companies in the automotive market reflects stiffening competition among European glass manufacturers. Auto makers tend to choose different glass manufacturers for each window of a vehicle, even with the recent models. Nevertheless, the increased competition



Fig. 12
Examples of
new multi-
coloured tail
lamps

regards only lower performance glasses. Therefore, in my opinion, a strategic approach for glass manufacturers should be to set benchmarks for scopes and approaches to high-technology glasses in order to gain a firmer stance over their competitors.

Special glasses

The types of special glasses and supporting literature that were present on the exhibition floor can be summarised as follows:

- antennae;
- classic heatable windscreen;
- double layer insulating glass;
- anti-theft glass with PC adhered to PV. Mercedes and BMW top-of-the-line car models have side windows with this type of glass, which is offered as an alternative to double glazing;
- stratified glass laminated with PU instead of PVB;
- automatically-activated wipers;
- panoramic roofs.

The features listed above are not innovative products but are worth mentioning because they reflect automotive evolution trends and market "niches".

Mirror and tail lamps

Important in their role regarding glazing visibility, mirrors and tail lamps on the vehicles showed that more attention has been paid to them. Principally, the "blind spot" has been reduced by spherical external mirrors, and LEDS are used in tail lamps to achieve stronger colour contrast, providing greater visual distinction between the different operational functions of the vehicle (Fig. 12).

**Technical Director
MG Consult Srl - Italy*

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