ALFA ROMEO “8C COMPETIZIONE”
ALL COMPOSITE BODY AND INTERIORS
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INTRODUCTION
The limited edition Alfa Romeo 8C is based on a shortened Maserati Coupe platform; it will be produced in a total of 500 cars, already totally sold out.
The car is driven by a Maserati-sourced aluminum 4.2-liter V8 engine making more than 400 horsepower. A six-speed gearbox with paddle shifters channels power to the rear wheels and can also be operated in full automatic mode.
The shape of the car comes from Alfa Romeo “Centro stile”, and the structural design has been carried out by the FIAT group Company Elasis (Pomigliano D’Arco-Naples). The car body is being manufactured by ITCA, another FIAT group company, the steel chassis in Grugliasco (Turin) ant the composite body and interiors in Colonnella (Teramo). The final assembly takes place in FIAT MIRAFIORI in Turin and in Maserati (Modena).

BODY AND INTERIORS
The car's distinctive look comes from extensive use, on the body and interior panels, of composite materials, which allows the monolithic design of large and complex components; the entire upperbody, for instance, from the windshield to the rear bumper, is one piece only. The chassis is made out of steel coming from an original Maserati car, all the rest of the “Body in White”, plus most of the interiors, is made out of carbon fiber reinforced plastics.
An exploded view of the car body outlining all the components is shown besides.
The different types of structure for the various parts (in blue in the picture) are:

- Front fenders, under door longeron covers, wheel housings, rear closure, and rear bumper (USA version only) are solid laminate
- Inner and outer door skins are solid laminate post-bonded and incorporate anti-intrusion steel bars
- Front hood is a honeycomb sandwich part
- Front and rear spoilers, and rear window support structure are closed hollow sections one shot cured with the aid of rubber tools to assure the internal pressure
- The monolithic upper body is a co-cured very complex structure, including the windshield frame, the roof and the rear body. Honeycomb sandwich and hollow structures are both present.

The design requirements of the body are mainly weight, stiffness, crashworthiness, surface appearance. To meet these requirements an extensive design work has been conducted and the most appropriate materials have been selected. The fibers selected are mainly HS fibers and the resin system is structural epoxy cured at 135°C. The manufacturing process is a well known and consolidated hand lay-up process, vacuum bagged and autoclave cured and pressure ranging from 0.2 to 0.6 Mpa. The moulds, following a very long tradition and experience of the composite manufacturing Company, are mainly made out of low temperature (60°C) epoxy resin with carbon fiber reinforcements, post cured at 180°C. The adoption of composite moulds allows the production of very accurate and dimensionally stable components. The Class A surface requirements are achieved thanks to the use of a special surface film adhesive and the epoxy primer sprayed directly onto the mould. The weight, stiffness, crashworthiness and surface targets have all been achieved.

The 8C interior designers developed center console, center tunnel, door panels, rear panel, all made from exposed carbon (carbon look). This is the main reason that attracts people and at the same time makes so difficult their manufacturing. In fact, all the customers require a high level aesthetical standard on a “hand made” product. The parts are produced with an appropriate epoxy resin system featuring a very high transparence and an excellent UV rays resistance. The autoclave process is the same of the body structural parts but with a lower curing temperature (125°C) due to the aesthetical nature of the part compared with the structural ones. The prepreg reinforcement fibers used are graphite, kevlar and glass, the mixture of which comes out from a very delicate design process as requested to meet the crash specifications. The moulds are mainly machined from solid aluminum alloys. They assure a much better surface quality, compared with composite moulds, and a longer life. For big parts, like the central console, composite moulds are obliged: aluminum would be too heavy. The “carbon look” interiors are painted to a variety of gloss finish with clear coat paint following a very complex and delicate process, which usually requires a three step operation: two primer and one paint layers, each followed by sanding and oven cycles.