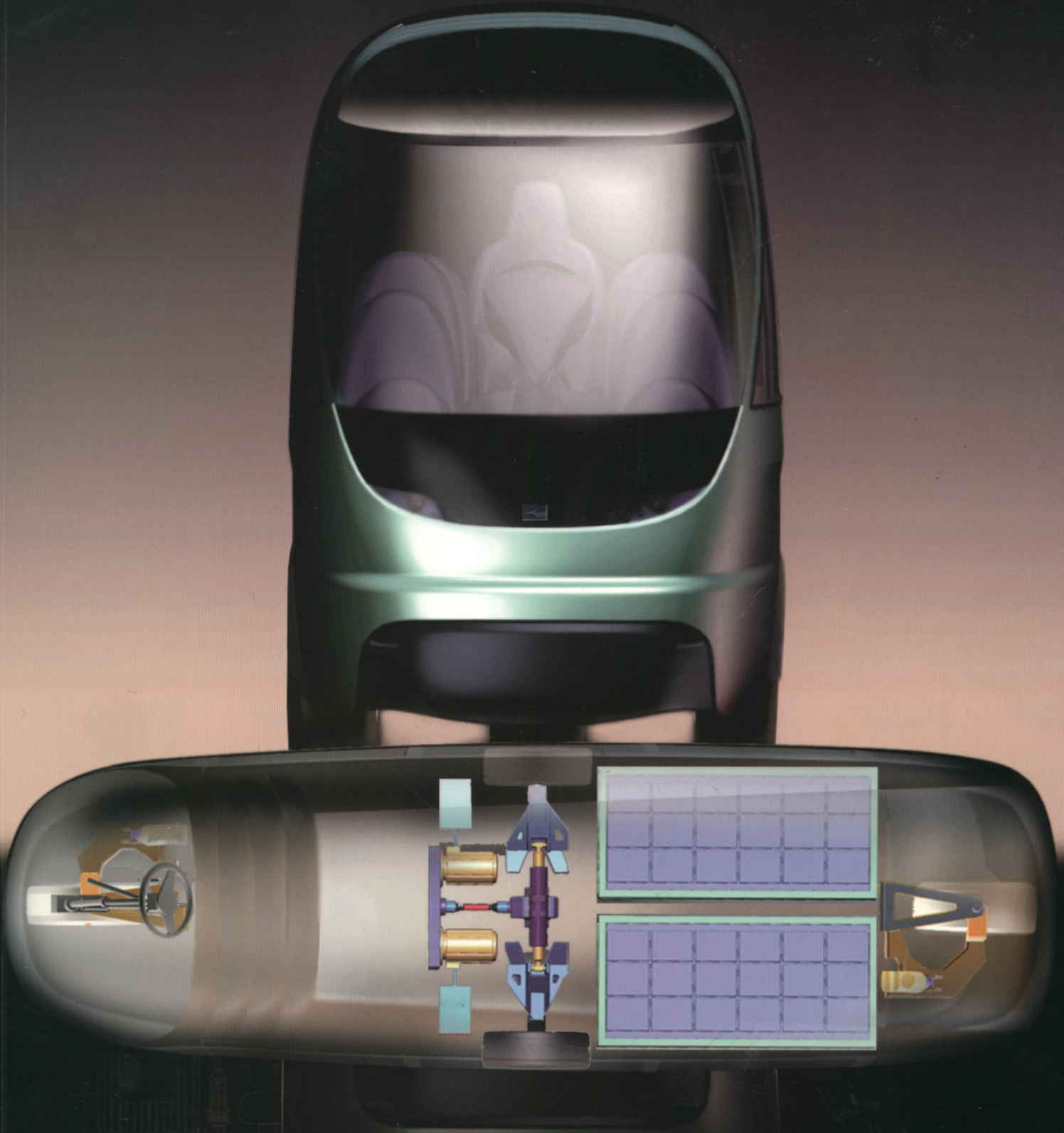
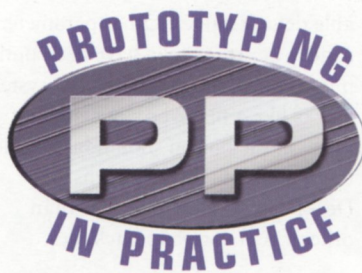


Prototyping

TECHNOLOGY INTERNATIONAL '97



The International Review of Simulation-Based Design, Rapid Prototyping & Manufacturing



Casting for SUCCESS

H EK GmbH is a member company of the 60 year old MCP Group, one of the oldest producers of low melting alloys worldwide.

Low melting point alloys were traditionally used in the USA for making quick and cheap metal components. Following its success, the concept was brought to Europe and low melt alloys were used to cast against various models (metal, gypsum, etc) to make cavities for producing quick injection mouldings for what were then termed small runs. It was just 10 years ago that the Americans started referring to this process as RP.

In the middle of the 1950s MCP developed a metal spray gun for spraying low melting point alloys. This device was subsequently sold for the next 20 years. Its biggest application was for making small run, geometrically simple injection mouldings, but the gun's popularity soared when platform polyurethane soles were being made at the beginning of the 1970s. The metal spray gun was the quickest and most efficient method of manufacturing polyurethane shoe moulds with the amount of detail, such as leather grain, that is required on this type of product. However, at the beginning of the 1980s, new, more robust metal spray equipment was integrated into the existing technology, which was sold worldwide for tooling applications. This metal spray mould system offers a fast, low-cost solution to RP tooling for a vari-

ety of moulding processes – injection, PUR-RIM, Nyrim, GMT, TSG and blow moulds – and in each case the advantages are different.

For the large, complicated and vastly expensive injection mould that is made by specialist craftsmen, who generally have the most demanding needs, they offer lower performance at a much lower cost. For the simple wood, plaster or GRP mould made by the hand lay-up man for his own use, whose requirements are normally fairly modest, they offer higher performance at a higher cost. In other words a general advantage of sprayed tools is that they enable the moulder himself to make metal moulds at a minimum cost and in minimum time, without the need for specialist toolmakers. Capable operators should be able to pick up the process after just a few days training.

SHEET METAL FORMING

Sheet metal forming tooling with MCP 137 low melting point alloy has been used for many years by European automotive manufacturers, such as BMW, Mercedes-Benz, and Ford. These automakers use this tool as it offers a simple, quick and inexpensive system for solving the tooling problems for small and prototype runs – for getting from the model of the sheet metal component to a sheet metal forming tool that will perform approximately 80-120 pieces, and then can be re-melted. MCP 137 has several

advantages in application. Since the alloy is 100 per cent reusable, material costs are low and production costs are reduced as no finishing work, such as matching, removing flash, polishing or planing the back of the toolset, is necessary. Blankholders, guide pins, crane slots or inserts can be cast into the tool. The alloy has no shrinkage and therefore is extremely exact and requires only one pattern.

Melting tanks range in size from one to 65 tons – a tank of 60 tons was sold to Fiat in Italy that has given it the capacity to produce a complete floor panel. This system is very flexible, people can be trained to use it within a week and there are many different methods of getting from models to finished sheet metal forming tools.

VACUUM CASTING SYSTEM

The vacuum casting system accounts for the majority of HEK's work. It is a system of producing exact and complicated prototype components in plastic materials and involves a combination of vacuum casting machines of the size required, tooling materials – usually silicon rubber – and a range of about 25 vacuum plastics (comparable to thermal plastics), so that multi-segment tools can be made overnight and cut open the next day for the prototypes to be made on the vacuum casting machine. It takes two to three days

from the SLA model coming off the RP machine and the production of 20 or 30 pieces. This has become state-of-the-art, and is now the accepted process for achieving 30 or 40 pieces for exhibition testing, functional testing and check mould design.

FUSIBLE CORE TECHNOLOGY

Fusible core technology is a modern process for producing internally undercut plastic components. The MCP 137 low melting point alloy is used for producing the cores and the cores are put into a second tool. Then, glass-filled nylon is moulded around the core and the core material is melted out as a result. It is also possible to use an alloy which has a melting temperature of under 100°C for use on the vacuum casting process to make internally undercut vacuum castings for tooling checks.

BUSINESS AREAS

HEK's largest market is automotive engineering followed by domestic appliances (washing machines, etc) and home entertainment. Another area of interest is the medical equipment sector that has traditionally been low volume. A typical project may be a heart/lung machine, which are made in fairly low numbers and are complicated, well-designed shapes for which the vacuum casting process would be used.

The company is committed to strict quality control standards, maintaining adequate stocks of equipment and materials for prompt delivery and competent technical services offering on-going training programmes for all customer personnel. Customarily training periods range from one to five days, depending on the experience and capabilities of the trainee. All participants, through technical manuals, lectures and hands-on training sessions, become thoroughly familiar with the fundamentals of the process, including maintenance, spraying and back-up techniques. Training can also be given at customers premises.

The company has recently acquired a company in Minsk, Belorussia for the Russian market, which has become an area of growing interest. One can import into Russia without any restrictions and the public are beginning to buy German and Japanese cars. Since the native car manufacturers have been making the same product for the last 30 to 40 years, their know-how of prototyping and product design is practically non-existent. HEK has the technology and experience to bring the Russian automotive manufacturing business back in line with western standards, which they must do, otherwise they may lose their business to imports. ●

Consistent
quality everytime
from **MCP**

Meeting the
world's demand
for precision
Plastic and
Sheet Metal
Rapid Prototype
Tooling Systems

Equipment

Materials Technology

Customer Training

On-going Technical Support

MCP Vacuum Casting Systems

- State of the art process for plastic prototyping.
- Extremely accurate and rapid.
- Replicate and reproduces complex shapes, fine detail and textures from any model type.
- MCP Vacuum Casting Resins formulated to various shore hardness, heat resistance, pigmentable, simulate most plastics, rubber and glass.
- 20-30 prototypes within 2-3 days.

MCP/TAFA Metal Spray Mould Technology

- Worldwide the most widely used metal spray mould system.
- Quick tooling for plastics.
- Low investment.

Sheet Metal Tooling with MCP Low Melt Alloys

- Quick and dimensionally accurate prototypes.
- Clean process-no resins, food safe.
- 100% reusable material.

Lost Core Technology

- Internally undercut injection mouldings and vacuum cast components.
- For prototypes and high volume production.

MCP Injection Moulding Machines

- Precision low-cost mouldings in engineering thermoplastics.
- 7g-200g capacity.
- Purpose built for prototypes.

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