Design for Innovative Materials

DuPont Awards Design Prizes for Engineering Plastics

DuPont, in partnership with the Design Center Stuttgart/Germany, this year organized for the first time a design competition in Germany entitled "Imagineering". Under the broadly based topic "Personal safety and protection", students, young designers and upcoming engineers were invited to submit aesthetically sophisticated but nevertheless inexpensive product designs based on engineering plastics. The designs also had to be practicable and suitable for everyday use.

The aim of the "Imagineering" design competition is to encourage the combination of creativity and technology and to improve the level of know-how of the special and highly varied properties of engineering plastics and their possible applications. According to DuPont, competitions of this kind are worthwhile and necessary because they encourage young designers and engineers to give more thought to the use of new materials for designing products and induce them to experiment and explore the many advantages of using engineering plastics.

"The subject of the competition was personal safety and protection", said Steward Daykin, Technology and Development Manager of DuPont Europe, "and there were two main reasons for this. Firstly, the subject reflects an important trend in our present-day and certainly in our future life. Secondly, it is a broad enough topic to offer plenty of scope for creativity and for deploying modern engineering plastics."

Statements . . .

During the ceremony to present the awards for the "Imagineering" design competition, Prof. George Teodorescu, head of Engineering Design at the State Academy of Art and Design in Stuttgart, called for a greater understanding for innovation in the field of plastics. He regards plastics not as a substitute for traditional materials but as a previously non-existent innovative material. Seen in this light, every new application discovers its specific plastic direction.

Gerhard Kloetgen, head of Engineering Plastics, Central Europe, at DuPont Germany, Bad Homburg/Germany, referred to the infinite range of possibilities for developing creative components with engineering plastics. The advice he gave to the young designers and engineers with regard to future developments was "think in plastic and combine several functions in one component".

The Jury

Prof. Dr.-Ing. Georg Menges,

Joachim Rönisch (K-Zeitung),

Harald Schäty (Tucker GmbH),

Dr. Kai-Uwe Scholz (Design Report),

Prof. George Teodorescu
(State Academy of Art and Design
in Stuttgart), and

Peter Theiss (Scala Design).

. . . Some of the Winners . . .

From the many entries, five were awarded prizes. The first three are described below in brief:

Alexander Duddek, an engineering student at the State Academy for Art and Design, Stuttgart, took first place with his version of a lightweight walking stick for the blind (Fig. 1), which also mechanically and electronically protects the blind person's upper body and head and makes him or her easier to recognise for other people. Whereas conventional walking sticks for blind people require a rather strenuous hand and arm position, the ergonomically designed handle of Duddek's 3D walking stick is gripped lower down and requires no effort whatsoever to hold. If the handle – as proposed – is made of a thermoplastic with a low softening point (for example from a special grade of DuPont's Surlyn), it can easily be adapted to the individual hand form of its user.

Marc Walliser, an engineering student at the State Academy of Art and Design, Stuttgart, was awarded second prize with his "AvaCol", a safety collar (Fig. 2), which blows up to form a helmet in the case of an avalanche accident to protect the casualty's head and allow him or her to breathe properly. The load-bearing structure of the helmet is formed by a pneumatic tube system which adjusts to the shape of the head. Beneath it is an impact-absorbing, protective plastic foam of the kind used in motor cycle helmets. For both components, use could also be made of the more rigid or more flexible grades of Hytrel, DuPont's thermoplastic elastomer. The mouthpiece and the holder for the gas cartridge are designed as injection mouldings of engineering thermoplastics (e.g. DuPont's glass fibre reinforced Zytel polyamide). For the collar itself, the designer suggested a textile fabric reinforced with DuPont's Kevlar.

Gerd Burchard and Tilman Walter, students at the Technical College for Design in Schwäbisch Gmünd/Germany, took third prize with their design of a fun piece of winter sports equipment. The "star turn" is an unusual sled made of engineering plastics (Fig. 3), which can be steered effectively and accurately like a pair of skis simply by shifting the weight to one side or the other. The construction – patent applied for – is based on the outstanding recovery properties, elasticity and impact strength of certain engineering plastics even at low temperatures and high alternating loads. Burchard and Walter made use of these properties for the joints of the struts which are designed as articulated levers and connect the slant of the seat with the runners. The joints are designed as integral hinges of polypropylene. The designers propose that the sled itself be made in one operation using conventional thermoplastic production processes such as injection moulding or blow moulding, and that the hinges are formed as inserts. Alternatively, they suggest the use of snap-on joints for subse-

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quent assembly if the production of individual components is preferred. For these components, they propose the use of polyacetals such as DuPont's Delrin with its steel spring-like properties.

. . . the Criteria, and what Happens Next

The main criteria for assessment were: utilization of the specific properties of the selected engineering plastics, degree of innovation, functionality and feasibility, market potential, design and aesthetics, and quality of the project presentation and technical description.

In 1999/2000, "Imagineering" was held at national level not only in Germany, but also in France, UK, Italy, Portugal and Spain. The winners of the national competitions take part in the European final organized by Du Pont de Nemours International S.A., Geneva. The results are to be announced in Autumn 2000.

Because of the outstanding response among the target group, DuPont will again be organizing the competition next year on a European basis. Under www.dupont-imagineering.com, information on "Imagineering 2001" will be available on the Internet from the Autumn.

Gudrun Klein

Fig. 1. Point, stick, handle and antenna of this walking stick for the blind are made of engineering plastics

Fig. 2. The safety collar protects the head in the case of an avalanche accident

Fig. 3. The materials used for this sled are technical thermoplastics with elastic and load-bearing properties

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