

Reports

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The New Luxury High-Tech Ceramic Material

Abstract

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While materials scientists are racking their brains about how to increase the strength and durability of new kinds of high-tech ceramics, designers of luxury products looking for fascinating, superior materials are enchanted by the brilliance and "eternal" beauty of the material. This is where the differing approaches of designers and material scientists meet, resulting in a creative and fertile field which will yield interesting products in the future.

Keywords: ceramics consulting, design, consumer, products

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Michael Bach is a graduate engineer and graduate economics engineer. He studied at the Technical College in Höhr-Grenzhausen Germany, from 1987-1990. Besides ceramics engineering he completed post-graduate courses in Economic Engineering in Zürich and Logistics in Olten Switzerland. As Product Management Director at Rado Watch Co. Ltd. (Lengnau, Switzerland) from 1994-2002, he gained experience in marketing and design management. Since January 2003 he has been owner and manager of CeCo Ltd. (Biel-Bienne, Switzerland).

CeCo is a consulting agency for reputed international companies in the fields of design, watchmaking luxury goods and materials. In the ceramics area of its business, CeCo markets top products characterized by innovations in technology and design. The company is the official distribution partner for high-tech ceramic knives and kitchen accessories made by the world market leader Kyocera.



1 Introduction

With his newly founded firm CeCo Ltd. (Biel-Bienne, Switzerland) Michael Bach is active in international consulting in the design, development and marketing of consumer products made from new materials, especially high-tech ceramics. The name CeCo is an abbreviation for the two areas of business: ceramics + consulting. From his earlier activities as Product Management Director at Rado Watch Co. Ltd. (Lengnau, Switzerland), Michael Bach remembers dealing with a well-known manufacturer from the USA. At the first meeting, the engineer's attitude towards consumer products was clearly stated: "We make missiles, not consumer goods." There was no understanding of the notion of using the manufacturer's highly-praised material - developed for rockets - in the creation of a technologically mundane watch: as a material it was far too expensive for mere time display. But when the engineers took a closer look they discovered that the tolerances and surface properties required of the watch project were considerably greater than those of the current state of rocket technology. The specifications concerning colour stability between individual batches were also new territory for the

space-technology researchers. So it was partly technological curiosity that started off new developments in the more emotional world of consumer goods - a world whose principles were initially so little understood by the technologists.

2 Consumer goods - a world of emotion

Engineers are mostly oriented towards measurable dimensions like durability toughness and hardness. Consumer goods, however, live primarily from the emotions they arouse. Such products used to be created according to the design philosophy "form follows function" but these days they are manufactured rather more in the context of "form follows emotions". Today, efficient functionality is a prerequisite for all products and on the whole it is taken for granted. So good design is much more concerned with taking over the emotional aspect, which provides for widely differing elements of satisfaction, from delight in fine materials, pleasant surfaces, tactility, striking shapes and brilliance through to pure pride of possession.

3 Perceived emotional content

A Zurich College of Design study showed that the emotional content perceived by the customer not only considerably influences the purchase of consumer goods but also plays a decisive part in choosing capital goods. Appliances today differ from one another in colour and size, while the special characteristics of one appliance in particular are mostly only to be seen from the specifications list. It boosts confidence when one appliance can be distinguished from its competitors by higher precision and when this is also recognizable from the appliance's appearance. Consumers today still regard Volvo as one of the safest automobiles. The earlier, rather lumbering bumpers, almost oversized compared with other cars, were a decisive design element that aroused a feeling of safety and trust in consumers.



Fig. 1 - Sintra "Superjubilé"
from the house of Rado, a
combination of choice diamonds
and platinumcoloured cermet

4 Design stands at the beginning of product development

Design is often wrongly regarded as modish Styling or face-lifting, done in order to conceal imperfections. But design should never be the last step it must stand at the beginning of product development Design results from the efforts of all those involved in the development of a product to bring a successful interplay of form, function, material and surface texture to aesthetic perfection. Fruitful collaboration among all the people involved is absolutely indispensable here. Unfortunately, the efficiency of communication between different departments is often restricted, and characterized by contrasting notions of value between technicians, designers and marketing personnel.

5 The fascinating qualities of high-tech ceramics

Materials play a central role in the new design philosophy "form follows emotions". High-tech ceramics have some very interesting characteristics, which are especially valued by designers and product developers:

- sensuous tactility, agreeable feel
- skin friendly, biocompatible, neutral in taste
- elegant, deep colors, enduring brilliance
- extreme hardness, scratch- and abrasion-resistance, stability of edges, years of sharpness
- non-rusting
- not electrically conductive.

6 Choice of materials

The choice of high-tech ceramics is made on the basis of the purely technological requirements (durability, toughness, hardness), the possibilities for coloration and shaping, and the polishing qualities of the material. Apart from the costs, the appropriate shaping processes depend on the geometry of the components concerned. Along with the classical powder-pressing technology, CIM (Ceramic Injection Molding-Moulding) has become more popular for complex, very small components because of the versatility in shaping that it offers. The material most used these days is certainly yttrium-stabilized zirconium oxide. At the request of marketing specialists, various manufacturers have developed a whole range of colours for zirconium oxide, although only black or white have really caught on up till now. As well as these colours, metallic colours on the basis of cermets (powder metallurgy products consisting of ceramic particles bonded with a metal) have become fashionable in the watch trade and increasingly threaten the classical hard metal. Compared with hard metal, cermets are lighter in weight. PVD coatings are used especially in order to attain bicolour effects.

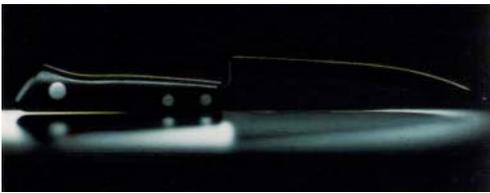


Fig. 2 - KYOTOP range from Kyocera, superb craftsmanship, riveted pakka wood handles, packed in a rosewood box



Fig. 3 - Knives from the Ergonomic range are distinguished by their ergonomic handles and elegant deep-black coloured blades

7 Success based on competence in design, manufacture and marketing

The manufacture of high-tech ceramics consumer goods involves very high investment, high costs and relatively long periods of development. This means that high-tech ceramics is not a faddish material that will appeal to short-lived trends but one that can only develop its potential based on long-term product strategy. Given the high manufacturing costs, efficient communications and good customer service are essential for success. High-tech ceramics is thus not a cheap alternative to existing materials but has excellent qualities that make it ideal for taking hold in the high-end consumer goods and luxury goods market.

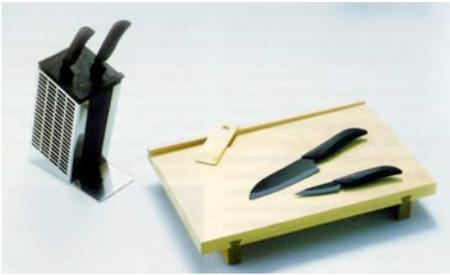


Fig. 4 - For professionals who already appreciate the advantages of high-tech ceramics there is a Professional Set with 4 ceramics knives, flexible-fiber knife block and fine maplewood cutting board



Fig. 5 - With laser engraving and special gift packaging, ceramic knives make an ideal and innovative staff or customer gift

8 High-tech ceramics in the area of high-end consumer goods - a strongly growing market

Many consumers already know and trust high-tech ceramics and enjoy the inalterable beauty of their scratchproof high-tech ceramics watches. For a long time, high-tech ceramics watches were the only consumer products in this area but now this material has become very firmly established in the area of kitchenware.



Fig. 6 Special gift packaging for high-tech ceramic knives

9 Mobile phones in gold and high-tech ceramics - the latest luxury accessory

The luxury goods branch has its very own rules. Luxury goods are less susceptible to crises than general consumer goods or capital goods. The new markets of China and Russia are giving birth to a new upper class, which is very status-conscious and unlike that of the "old world" has scarcely any inhibitions about showing off its acquired wealth with status symbols. Like watches, mobile phones have a special characteristic: these days, people always have their cellphones with them. The broad basic developments have reached maturity and the time has come to make something more than a functional device out of the mobile phone.

The first luxury cellphones from the Nokia affiliate Vertu have been launched onto the market with enormous success at a price between 8000 and 28,000 €. Exquisite design, together with gold and platinum superbly worked in combination with high-tech ceramics, has created a new product category and a new market. High-tech ceramics is used as a precious material because of its deep colours, its scratch- and abrasion-resistance, its brilliance, its agreeable feel and its non-conductive qualities.

10 High-tech ceramic watches

High-tech ceramics has been sporadically used by many watch manufacturers but really consistently by few. Hardly anyone knows that even Omega, Tissot and IWC watches have produced high-tech ceramics timepieces. But lack of expertise and consistency in product strategy has given a somewhat shadowy existence to these watches. In contrast, the Rado company understood as early as 20 years ago that the material high-tech ceramics should be integrated into the design process, that a Rado watch with its anatomically clear-lined form and large brilliant surfaces brings out the essential soul of high-tech ceramics. This is why they can create watches with individualistic product personalities (Fig. 1). Pure scratchproofness may have been at the forefront years ago, but now the agreeable feel of the material and the skin friendliness are increasingly valued by consumers. Apart from Rado, watches in high-tech ceramics are today produced by Junghans and Chanel.



Fig. 7 - Sashimi knives with polished blades, technological masterpieces for lovers of Japanese cuisine



Fig. 8 - Kitchen accessories such as peelers and universal slicers cut fruit and vegetables with razor-sharp precision without crushing the cellular structure, thus better preserving the taste

11 Ceramics knives and kitchen accessories in high-tech ceramics an enormous success in Japan

Although the ceramic knife has led a rather dormant existence in Europe up to now, it has become a real hit in Japan, the worldwide most important market for high-quality knives, where 300,000 high-tech ceramics knives are sold per year by Kyocera alone. In Japan, producers have understood the correct market positioning of the ceramic knife and how to establish it as an alternative to the hand-forged knives in Damascus steel that have till now been the best knives. As well as their years of sharpness, their neutrality of taste and lightness has made high-tech ceramic knives into professional knives for Japanese cooks.

In the meantime, Kyocera - the world market leader in high-tech ceramics - has been conquering the hearts of European knife fans with new beautifully shaped and superbly worked ceramic knives coloured elegantly in deep black. Exquisitely worked with riveted wooden handles elegant deep-black, zirconium-oxide blades (manufactured by Hot Isostatic Pressing (HIP) where the blade is moulded and fired simultaneously), packed in a rosewood box, the knives of the Kyotop range have become exclusive technological masterpieces (Figs. 2-7).

In addition to the existing high-tech ceramic implements, kitchen accessories such as peelers, universal slicers and Julienne slicers are becoming popular kitchen aids in European households because of their comfortable tactility, neutrality of taste and enduring sharpness (Fig. 8).

As well as Kyocera, ceramic knives are also offered by Böker, Kräsan, Ceracut and Cerastar.

12 Conclusion

If it becomes possible to unite the technological world of material science successfully with the emotional world of consumer goods, to clarify the possibilities and limitations of materials and integrate their advantages into the design process, fascinating new products can be created and new markets opened up.