

The Rock Star

The world is a flat disc - at least the world of cooking. This is evidenced by the more than 180 million CERAN® glass-ceramic cooktop panels sold. They have revolutionized kitchens and cooking around the world since their launch in 1971. Discover the success story of an exceptional material that is still ready for the future, even after 50 years.

TEXT: MICHAEL THIEM

SCHOTT
CERAN®

The revolution in the kitchen continues: SCHOTT continues to push boundaries with visionary concepts such as the FUSICS® cooking table, for example.

MANY PEOPLE CONSIDERED THE NOTION OF GLASS-CERAMIC COOKTOPS TO BE “COMPLETE NONSENSE.”

Herwig Scheidler, Head of the CERAN® project team in the late-1960s.

The observer twitches involuntarily. Careful, glass! It's fragile. That is what most people think when the 535-gram steel ball is dropped onto the glass-ceramic from a height of 51.4 centimeters (20 inches). But it isn't fragile at all. A simple experiment that has not lost its seemingly magical effect even after 50 years. The same effect is achieved by placing ice cubes on a hot CERAN® glass-ceramic cooktop. It hisses and the water evaporates within seconds. Temperature shocks from +700 to -200 degrees Celsius have no effect either. So the motto must be: Attention, glass-ceramic! because it is extremely resilient and temperature stable. It doesn't age, is translucent and is suited for use with all heating technologies – including induction and gas.

Glass-ceramic represents the SCHOTT success story like hardly any other material. The brand name CERAN® has enormous appeal, is a product synonymous with high-quality and innovative glass-ceramic cooktop panels, and has been a guarantee of quality for more than 50 years. Available in black, white or transparent, every year several million pieces currently leave the CERAN® Technology Center and are installed in kitchen stoves all over the world.

“We have always pursued a clear goal: We want to bring unique, economically attractive products to the market that are suited for cooking applications and all the related requirements. Today and in the future,” says Dr. Matthias Bockmeyer, Head of Development for Cooking.

“CERAN® opens up a particularly exciting field for material development,” explains Dr. Friedrich Siebers, who has had a decisive influence on its success story since 1985. The material developer knows every tiny detail and has faced many challenges. Glass-ceramic is a demanding but reliable material due to the complex interplay of the material and the process. “If you make the right adjustments in the tenths of a weight percent range or change the parameters during process-



3x

SCHOTT CERAN® has been awarded the title “Brand of the Century” three times. Thanks to its successes in 2013, 2016 and 2019, glass-ceramic has joined the league of German brands that have become the standard for an entire industry worldwide.



The efficiency of SCHOTT CERAN® cooktop panels in combination with electric radiation is more than

70

percent, with induction more than 80 percent – depending on the output of the respective stove. Glass-ceramic is therefore extremely energy efficient.



ing, properties can be customized for the application,” Dr. Siebers emphasizes.

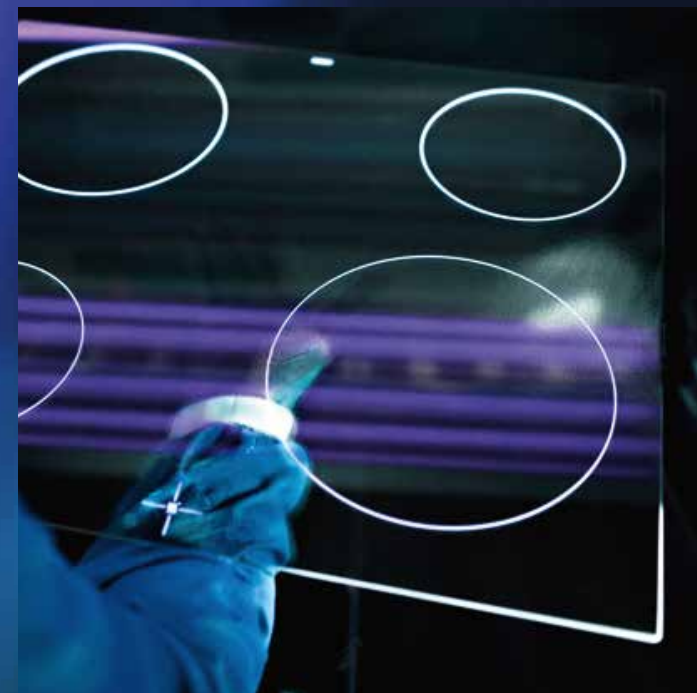
What sounds simple is actually complex in terms of the details. Even the name glass-ceramic contains a contradiction and thus the challenge becomes clear – the green glass needs to remain homogeneous during melting and shaping. If crystals were to form, they would affect the strength. In a second process, it must no longer be stable glass, but allowed to form fine crystals very quickly during ceramization. The glass that is specially mixed with seed images for this purpose is brought to ceramization in a time-temperature process. In the end, a glass-ceramic that has the desired properties is manufactured – a material for cooktops that combines the aesthetics of glass with incredibly high heat resistance and stability.

SCHOTT has continuously developed the process over the course of five decades. In order to achieve sustained success, central research and all related business departments, including Product Management and Sales and Marketing, work together very closely. The goal is to make basic research suitable for everyday use and to bring innovations to the point where they are ready for series production. Experience helps here,

and SCHOTT knows a great deal about the material. The basis for this is an empirical model that maps the product and the manufacturing process on the basis of around 40 material and process properties. “These key properties can be measured in laboratory samples in our Analytical and Application Technology departments,” Dr. Siebers explains. Thanks to the well-founded database of compositions and properties, it is possible to optimize the product according to the specifications in the requirement profile. For this purpose and to exclude later conflicts of interest, the experts use highly developed statistical methods. The quality of the data is crucial. The higher, the better. It can be used to make predictions about future properties, save development time, avoid risks in the production process and achieve the desired quality. This knowledge is protected by more than 160 patent families relating to the materials and the product. The brand name CERAN® was first registered in 1962.

Its beginnings more than 50 years ago were hardly easy. Even internally, at the end of the 1960s, many people considered the notion of glass-ceramic cooktops to be “complete nonsense,” Herwig Scheidler, who was head of a small project team at that time, recalls. The

A success story for 50 years: SCHOTT is the world's market leader with its CERAN® glass-ceramic cooktop panels.



Nearly as hard as a diamond! SCHOTT CERAN® Miradur® is the first and only scratch-resistant glass-ceramic cooktop panel in the world. This means:

95

percent fewer scratches from sand

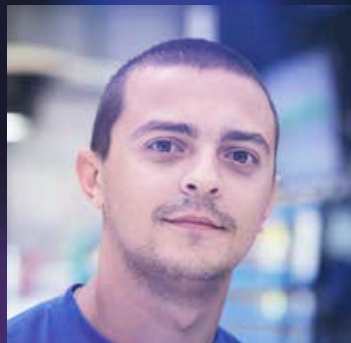
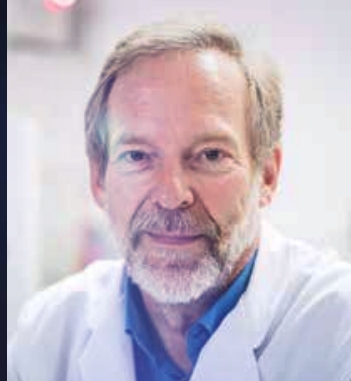
70

percent fewer scratches from abrasive sponges.

idea came from the sales expert Arno Roth (†), who discovered white plates for cooktops that a household appliance manufacturer in the US was using. But the industry was skeptical. If you want to revolutionize a conservative market, you need courage and perseverance. Pioneers need to be able to convince others – and they need the right partners. Together with the German manufacturer Imperial, SCHOTT presented the innovative cooktop solution at the “Domotechnica” home appliance trade fair back in 1971 and started serial production in Mainz, Germany, a short time later. Cooking on glass? The reactions were hesitant, the reservations large. But SCHOTT accelerated the paradigm shift in the kitchen by assisting customers with installation, performing demonstrations of the unusual material quality and the ease of cleaning. These demonstrations are still being offered today.

MARKET RESEARCH IN THE CAFETERIA

These first prototypes were manufactured in the optics division using an old melting technique. The cooktop panels were 600 by 600 millimeters in size, four millimeters thick and black. Herwig Scheidler recalls the design decision. “We gave employees in the cafeteria samples in black ▶



**“WE WANT TO BRING
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Dr. Matthias Bockmeyer, Head of Development for Cooking



GLASS-CERAMIC PRODUCTION

In accordance with the methods commonly used in glass technology, a glass melt is first produced by melting the right raw materials, purifying, homogenizing and finally hot-forming it. After cooling and stress relieving of the glassy ingot, a temperature treatment follows in which the glass is transformed into a glass-ceramic

by controlled volume crystallization. In its interior, substances already added to the melt now form crystal nuclei on which tiny crystals grow as the temperature rises. These have the property of contracting when they are exposed to heat. In this way, they counteract the thermal expansion of pure glass. Glass-ceramics from SCHOTT can thus withstand temperature shocks of +700 to -200 degrees Celsius without shattering or changing their shape even slightly.

and white, and had them vote on them. The vote was a draw. We then decided on black because the red-glowing elements were still clearly visible,” says Scheidler. The first hand-polished surfaces contained open bubbles. The iron oxide, the so-called polishing red, could be seen. For the trade fair premiere, this was hidden by using a black felt-tip pen. These were exciting times indeed. In 1973, series production on rollers started, but only three percent of the surfaces manufactured met the quality standards. The challenges were enormous, but so were the opportunities and SCHOTT quickly found the right set screws. That same year, CERAN® glass-ceramic cooktop sales numbers increased and the success story began.

“Back then, we jumped on a moving train.” This is how Dr. Jürgen Petzoldt († 2011), materials specialist and later the member of the SCHOTT Board of Management responsible for Research &



The word mark
CERAN® is registered
at the German Patent
and Trademark Office
under the registra-
tion number
768198
All information can
be found here:

<https://bit.ly/3aEavR>

Development, once described the situation. The company is not the inventor of glass-ceramics, but it was instrumental in driving forward and shaping industrial mass production. Petzoldt developed the glass-ceramic ZERODUR®. The first large order in 1968 was for mirror substrates of various sizes and a 3.6-meter mirror substrate for an optical telescope. “ZERODUR® has taught us a great deal in terms of technology, especially the ability to control high melting and shaping temperatures,” Dr. Siebers says.

SCHOTT is the world’s market leader with its CERAN® glass-ceramic cooktop panels. Above all, the holistic approach to the system of heated cooktop panels, which is pursued together with customers, remains a decisive success factor. The material now has Rock Star status. New developments are celebrated in the spotlight on the stages of the world together with customers. SCHOTT continues to set milestones with CERAN® regu-

larly outperforming itself. Customization also plays an important role here. “Post-processing is a source of innovation,” says Dr. Bockmeyer, “but our starting point is the overall package.” And close cooperation with customers. “We don’t want to be just a supplier of a panel, but rather as a partner, we want to help our customers use the product,” emphasizes Evelin Weiss, who, as Head of Material Development Projects, is responsible for CERAN®. “And being able to deliver a product in small batches worldwide in a very short time is an enormous advantage.”

LIGHT OPENS UP NEW DESIGN WORLDS

The basic recipe of CERAN® has been further developed at crucial points over the past decades because the knowledge has constantly grown. Major milestones included the development of a new refining technology that made it possible to dispense with adding the heavy metals arsenic and antimony, and the development of cooktop panels that not only allowed the light of red LED displays to pass through, but also enabled differently colored displays with blue or white light. SCHOTT received the 2010 German Innovation Award for CERAN HIGHTRANS® eco, the product the company developed in 2007. More than 200 tons of heavy metals are avoided each year.

Cooktops have been developing into design objects for years because kitchens are also chang-

Temperature shocks
from plus
700
to minus
200
degrees Celsius have
no consequences.

More than
5,520,000
hits result from the
Google search for the
term “Ceran.” When
one enters “glass-
ceramic,” the search
engine “only” finds
1.3 million entries.

ing and becoming open, integral components of the living area. CERAN® is becoming the material kitchen dreams are made of. CERAN CLEARTRANS® is the first step in this direction. Coated glass-ceramics allow for various color possibilities. CERAN HIGHTRANS® rubio, an important part of the CERAN EXCITE® portfolio, allows for completely new design concepts in connection with the color scheme of the user interface and the hot zone in a cooktop. SCHOTT received the renowned iF Gold Award for this in 2019.

And cooking is becoming smart. With the support of glass-ceramics, innovative lighting concepts are being created that ensure intuitive and intelligent operation. Brilliant white light, clear shapes and bright accents underscore the cooking area. Cooking is fun. “Light accompanies us every day. It determines our rhythm and our everyday life. It shows us the way, guides our eyes and hands. It gives us security and comfort. It creates fascinating experiences and is simply fun. In short: light is a highly emotional component that makes products more exciting,” says Dr. Jörn Besinger, Head of Product Management & New Business Development for CERAN®. Other milestones include CERAN Miradur®, the world’s only cooktop panel with a scratch-resistant coating, and visionary concepts such as the FUSICS® cooking table. The award-winning prototype gives a foretaste of the future that has long since begun at SCHOTT.

“There are always trends that place new demands on our material. This allows us to differentiate ourselves,” says Dr. Bockmeyer. For example, for some years now, the cooktops have been fitted with special recesses for the use of appropriate ventilation variants. And Smart Home does not stop at cooking. “There will be more and more intelligence in the cooktops, which will be networked with other household appliances,” Weiss explains. “Integrated TFT displays will lead to us not only using black glass-ceramic, but increasingly transparent ones with black coatings on the underside.” SCHOTT is striving to further increase the design variety. Weiss: “Customers from all price segments will be able to differentiate themselves in the future not only through the décor, but also through the color scheme. User interfaces via touch control combined with the display of all conceivable colors will then be possible.” Definitely a much sought-after innovation, CERAN® remains the Rock Star among the materials used in the kitchen – and is getting better and better as time passes.

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