

Modern household appliances with touch control

Arçelik perfects the black panel display of its Tadı Var™ yogurt maker and the Beko Yoğurt Chef® with ACRYLITE® molding compounds

- Neutral gray ACRYLITE® molding compounds enable black panel effect while displaying light signals in true color
- Robust housing made from impact-resistant ACRYLITE® Resist zk5BR
- Arçelik yogurt maker wins design prize for user experience

High-quality household appliances have always been more than just practical everyday helpers: They also represent a certain lifestyle and *zeitgeist*, and reflect technical and design trends. For kitchen appliances in particular, attractive design influences purchasing decisions – after all, preparing food involves all the senses. Kitchen appliances therefore need to both look good and offer an excellent user experience. Digitalization has opened up new possibilities here and had an enormous impact on the technical features and design of kitchen appliances and white goods. Many models in the latest generation feature smart technology and black panel displays. ACRYLITE®, the brand polymethyl methacrylate (PMMA) from Röhm, offers ideal solutions for the aesthetics and function of cutting-edge household appliances.

One successful example of contemporary kitchen appliance design with ACRYLITE® molding compounds is the yogurt maker Arçelik Tadı Var™ Probiyotik Yoğurt & Kefir Makinesi, which was released at the beginning of 2023. Based in Turkey, Arçelik A.Ş. is home to 12 brands and is one of the leading household appliance manufacturers in Turkey and Europe. The company sells the identical Beko Yoğurt Chef® model under the Beko brand.

Form and function on an equal footing

The innovative yogurt maker from Arçelik is a compact device with a seamless design, shaped like a cube with highly rounded edges. Depending on the model, its body consists of matt-finished stainless steel or white plastic with a glossy black part made from ACRYLITE® molding compound on the lower third. Inside, there is a stainless steel bowl with enough room for three liters of yogurt or kefir. But the appliance's role in the household is only revealed when it is switched on: The operating panel lights up and the black area is transformed into a touch display with intuitive menu navigation.

Special ACRYLITE® molding compounds for black panel effect

This black panel effect blurs the distinction between the device's surface, menu navigation and display. Ubiquitous in smartphones, it has now also become established in displays for the automotive industry, consumer electronics and household appliances. To meet the growing demand for black panel displays, Röhm has developed special ACRYLITE® molding compounds in neutral-gray colors. Covers made from these appear black, yet are also transparent. This allows display modules to be hidden behind smooth, dark and highly glossy covers, while touch screens can be integrated into black appliance housings without any visible transition.

Darmstadt, September 20, 2023

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Strict quality requirements for function, design and user experience

Arçelik has spent years developing its smart black panel display technology to perfection. The aim was to devise a technology that could set an example for the displays of further appliances in the global household appliance and electronics corporation's brand family, e.g., for white goods such as washing machines, dishwashers or freezers.

Eren Mutlu, Senior Lead Engineer R&D at Arçelik, provides insight into the design process for the yogurt maker: "We experimented with various designs, plastics and LEDs. With this product, we ultimately achieved a black panel effect that meets our strict quality requirements in terms of function, design and user experience. The display module is hidden behind the cover. When the yogurt maker is switched off, you can only see a black surface. The technology is invisible."

The designer describes the particular challenges the team encountered when designing and manufacturing the product: "Due to the yogurt maker's integrated cooling system, the housing needs openings for ventilation. There are small, diamond-shaped ventilation openings on two opposite sides; these have a standardized structure that cannot be changed. The perforation makes it more difficult to injection-mold the component from a single cast." That is where the processing properties of ACRYLITE® molding compounds came in – thanks to its virtually unlimited moldability and good flow characteristics, the brand PMMA from Röhm is ideal for injection molding components with complex geometries.

Ball drop test passed with impact-resistant ACRYLITE® Resist

The next hurdle during product development was a usability test that household appliances have to pass before they receive market approval. One prototype failed the ball drop test due to a lack of stability. "We discussed the test data with Röhm and they recommended the impact-resistant ACRYLITE® Resist zk5BR," explains Mutlu. "When we used this material, the yogurt maker passed all the tests with flying colors."

The ACRYLITE® Resist product group encompasses various types of PMMA molding compounds modified with impact-resistant properties. "This allows the many benefits of ACRYLITE® to be used even in applications that require especially high resistance to breaking and cracking," explains İsmail Yücel, Senior Business Manager at Röhm's Molding Compounds business unit.

ACRYLITE® Resist zk5BR offers excellent optical properties and a balanced profile of characteristics, and is also available in various colors. For the yogurt maker display, Arçelik chose one of the darkest shades of gray in order to create the black panel effect. "This makes Arçelik one of a number of renowned customers in the household appliances sector that use a ACRYLITE® molding compound with this combination of properties and color," says Yücel.

Display in true color

Another feature of neutral-gray ACRYLITE® Resist zk5BR that impressed Arçelik's product designers is its true-color display of the lighting. "We use white LEDs for the operating menu. Gray covers can cause an unwanted blue tinge when combined with white light. But this doesn't happen with ACRYLITE®: The white balance was perfect," says Mutlu.

In addition, the top edge of the component features ambient lighting – an LCD display that changes color with the phases of the yogurt preparation process. When the green light appears, the dairy product is ready. “The color is displayed perfectly here, too,” adds Mutlu.

iF Design Award for user experience

The designer notes a further benefit of the display technology: The on/off function is also integrated into the operating panel, with a symbol that lights up when touched. That means that no three-dimensional mechanical switch disrupts the look and feel of the seamless design. This feature also impressed the jury of the iF Design Award 2022, which named Arçelik’s yogurt maker as a winner in the User Experience (UX) category.

[images]



The yogurt maker Arçelik Tadı Var™ stands out thanks to its elegant, seamless design. The lower section of its body is an injection-molded component made from impact-resistant ACRYLITE® Resist in a neutral-gray color devised especially for black panel displays.

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Black panels with a “secret until lit” effect are becoming increasingly popular in modern household appliances. When switched on, the glossy black surface transforms into a display with a menu of functions for preparing yogurt and kefir. Colored ambient lighting shows the current stage of preparation.

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Arçelik A.Ş. sells the identical yogurt maker Beko Yoğurt Chef® under the Beko brand, which is also manufactured with ACRYLITE® molding compound. The housing is robust and impact-resistant, withstands splashes of dairy products and is easy to clean.

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