Press release

Homemade rainbow chocolate

Neuchâtel, 15 December 2020 – CSEM has teamed up with chef and television-show host Sandro Zinggeler to develop a method for making chocolate that shimmers like a rainbow without the use of additives. Their method, which uses a food-grade nanostructured film, has just been launched on the market by local startup ChocoFoil.

The method was dreamed up by two brothers – Sandro and Marc Zinggeler – who share an avid interest in culinary art and science. Sandro is a chef and culinary artist who has worked at prestigious restaurants in the German-speaking region of Switzerland and is currently based in Zurich. Marc is a CSEM engineer conducting research at the crossroads of chemistry, biology, and microsystems engineering.

Based on a technique developed at CSEM, they came up with the idea of stamping futuristic, colorful designs on chocolate simply by changing its surface structure – without using colorants. Their method involves using a thin film of recyclable plastic that contains engraved nanometric patterns (on the scale of one-millionth of a millimeter). The film is applied to slightly melted chocolate, causing the pattern to be imprinted on its surface. The film is removed once the chocolate hardens. What's left behind is an iridescent effect that diffracts light and changes color as you move the chocolate around. No special additives, chemical compounds, or coatings are needed.

The brothers' invention is being marketed through a startup they created called ChocoFoil. While they mainly plan to target the consumer market, the method could also be customized and sold to professionals.

Inspired by dragonflies

The shimmering colors are created through light diffraction. The tiny lines engraved in the film, and subsequently the chocolate surface, are regularly spaced in such a way that they act as a prism – converting white light into a rainbow of colors. "It's the same mechanism that occurs in nature, like on the wings of dragonflies," says Marc Schnieper, who is leading the activities at CSEM, "and we can replicate these structures using modern nanofabrication technology." At the CSEM lab, located in Muttenz, near Basel, the structures can be rapidly produced "at hundreds of meters of film per day," he adds.

Technology initially intended for banknotes

Using nanostructures to generate color patterns isn't a new idea – the technology was first developed at CSEM many years ago. It was successfully applied to printed security marks on banknotes and passports before it made its way onto the chocolate. "We first presented our rainbow chocolate at a culinary event in Zurich where the theme was Artificial Intelligence," says Sandro, "and it was such a hit that we decided to market it," he recounts.

With their novel creation, the brothers hope to boost the Swiss chocolate industry, which has been hit hard by the pandemic. “We believe that by innovating and being first to the market, Switzerland can win back and keep its place at the top of the global chocolate industry,” says Sandro.

Although the production of rainbow chocolate has been demonstrated by other technology companies and research institutes, ChocoFoil is the first supplier with a product on the market using this completely new technology. “We want to explore the full potential of this method and encourage chefs to try it on foods other than chocolate,” says Sandro, “the possibilities are almost endless.”

For more information, visit https://www.chocofoil.ch/

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