

# Ingredients

A materials project by Chris Lefteri

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# Ceramic wallpaper

From brittle crockery to flexible wallpaper, interior architect and nano-expert Sylvia Leydecker describes how nanotechnology has changed ceramic materials forever

By Sylvia Leydecker

Photography by Karin Hessman,

courtesy of 100% Interior/Sylvia Leydecker

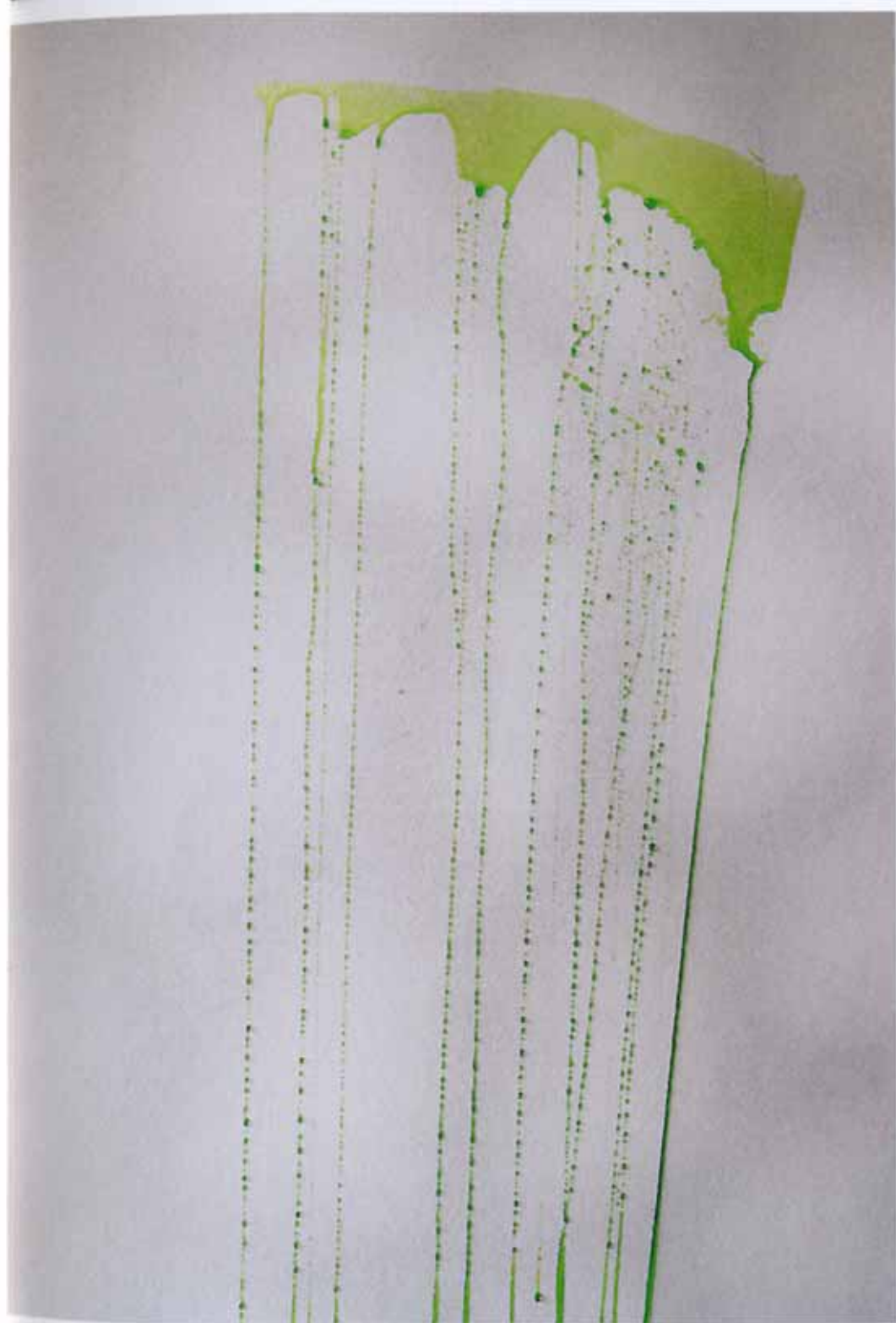
You could argue that wall coverings are often seen as a little old-fashioned, but a shift towards new materials and production techniques looks set to change that. New designs use interesting raw materials, such as glass beads, feathers and special effects pigments, as well as manufacturing processes that allow for flocking and creasing, large-scale prints and customizable surfaces, to name just a few examples. Additionally, new 'smart' technologies seem to be one of the most promising areas in wall cladding design – just think of adaptable, colour-changing surfaces based on OLEDs, organic light emitting diodes.

In my role as an interior architect and an expert on the application of nanotechnology in this area, I was asked to come up with a range of designs for ccflex®, a wallpaper product developed by the German manufacturer Evonik Degussa. In simple terms, it can be described as a flexible ceramic sheet material, although this may sound like a contradiction in terms given the brittle and fragile nature of ceramic materials.

Available in handy rolls of 70cm width just like any other wallpaper, ccflex® is produced in a process that involves covering a flexible plastic fleece fabric with a ceramic nano-coating that gives the material outstanding properties – it is scratch-, tear- and stain-resistant (water, oil and chemicals simply roll off the surface), as well as UV-safe and breathable. ccflex® doesn't contain PVC, formaldehyde or any other so-called volatile organic compounds, or VOCs, and the material has been fire-rated according to German standards for flame-resistance, which makes it suitable for all kinds of public interiors such as offices, hotels and restaurants, not to mention domestic environments, where it can even replace bathroom tiles.

Despite being one of the oldest materials – the earliest finds of ceramic artefacts are an incredible 27,000 years old – ceramics continue to play a central role in science and engineering. The tough and impervious surface of ccflex®, is based on a so called 'easy-to-clean' surface, with superhydrophobic properties, or extreme water repellency. In order to create a surface

Opposite  
Close-up of green syrup  
rolling off the ccflex® surface







**Opposite**  
ccflex® Stardust in the 100%  
Interior office meeting room

like this, scientists manipulate the building blocks of the material on an incredibly small scale, constructing nano-structures from nano-particles. To fully understand the scale of one of these particles, think of a football in relation to planet earth.

Recognising nanotechnology's innovative value and potential applications in design, one of my designs for ccflex® won the bronze medal for product design in the 2009 edition of the German Designers Club Awards and gained a nomination for the 2010 instalment of the prestigious Design Award of the Federal Republic of Germany. Named after a NASA spacecraft that collects samples from cosmic dust in outer space, the Stardust pattern is inspired by the look of the nanoscopic structure of the material itself, magnified many times over. The subtly diffused design creates an illusion of a shadow or a projection, rather than a printed pattern, and the pattern changes depending on the viewing angle.

The licence to produce ccflex® was recently sold to the German manufacturer Marburg Wallcoverings, now working on the design collection and preparing worldwide launch of the product. In the meantime, ccflex® is unavailable despite huge interest – it can take a very long time from laboratory to design, from production to sales and marketing and finally making it available to consumers, but this is another story to be told...

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Sylvia Leydecker is the director of 100% Interior, an interior architecture consultancy based in Cologne, as well as the author of *Nano Materials: in Architecture, Interior Architecture and Design* published by Birkhauser. Sylvia is a frequent lecturer on the use of nanotechnology in architecture and design, and she has published numerous articles on the subject. For more information, please visit [www.100interior.de](http://www.100interior.de)

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ccflex® was developed by Evonik Degussa  
[www.evonik.com](http://www.evonik.com)

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ccflex® is produced and distributed by Marburg Wallcoverings  
[www.marburg.com](http://www.marburg.com)