

FRAUNHOFER-INSTITUT FÜR SILICATFORSCHUNG ISC

ANTI-DROP COATING FOR GLASS CONTAINER

Neatly pouring out wine from decanters and carafes is very often a challenge when it comes to avoiding drops and ugly stains. The surface of untreated glass is wetted by polar aqueous media (e.g. red wine). In order to pour cleanly, the rim of the glass should not be wetted by the liquid so that the very last drops have high contact angles and quickly move into the filling glass. This prevents droplets from trickling down the side of the emptying vessel.

A glass of no or poor wettability by polar liquids can be reached by treating the glass surface with organo (alkoxy) silanes. Fluorinated alkyl chains covalently attached to the silicon proved to be especially effective in this respect. These ultrathin coatings, however, are neither very abrasion-resistant nor dishwasher-proof.

The same effects as with a thin fluorsilane coating can be achieved with the ORMOCER® coating materials developed and adapted by Fraunhofer ISC, except that these coatings are considerably more abrasion and dishwasher resistant. This product has been industrially employed as DROP PROTECT coating by Zwiesel Kristallglas AG since 2011. Zwiesel Kristallglas AG is now even coating the pouring spouts of all the decanters and carafes they produce.

Fraunhofer ISC has an outstanding materials expertise in the material class of ORMOCER®s. These inorganic-organic hybrid polymers have been invented and further developed by Fraunhofer ISC. They are applied in numerous commercial products, such as functional coatings for ophthalmic lenses, as dental materials, or for applications in micro-optics and

micro-electronics. Starting from this material class, decorative, abrasion-resistant and dishwasher-safe coatings for glass surfaces have been developed.

ORMOCER® coatings – surfaces repelling

- aqueous media (water, wine, beer, sauces, pharmaceuticals, water varnish)
- oily media (edible oils, pharmaceuticals, sauces)

Substrates

- container glass
- crystal glass
- stainless steel, aluminum, galvanized steel

Fields of application

- food packaging
- pharmaceutical packaging
- oil industry
- semiconductor industry

Properties of the ORMOCER® coating material

- solids content: 20 bis 25 %
- viscosity: 6 - 6.5 mPas
- curing temperature: 160 °C
- adhesion: GT 0 (ISO 2409)



The formation of drops on the outside of the glass is prevented by the liquid repellent surface refinement of DROP PROTECT.

© Zwiesel Kristallglas

Fraunhofer Institute for Silicate Research ISC
Neunerplatz 2
97082 Würzburg

Contact
Karl J. Deichmann
Telefon +49 931 4100 624

Dr. Klaus Rose
+49 931 4100 626

www.isc.fraunhofer.de