

Product Information

Hydro Flex
A-2476

General Information

Hydro Flex was developed for the deposition of hydrophobic layers by evaporation in vacuum. Topcoats made of Hydro Flex on AR coated glass or plastic lenses exhibit a very low anti-wettability by water and therefore a lowered tendency to be contaminated by grease and finger prints. Water contact angle is > 105 degrees.

The product Hydro Flex comes ready to use, consisting of carrier tablets made of an oxide mixture doped with a perfluorinated silane.

Areas of Application

Hydrophobic and oleophobic topcoat for ophthalmic lenses and AR coated glass.

Thin Film Properties

Contact angle with water	$>105^\circ$
Contact angle with hexadecane	$>67^\circ$
After abrasion cotton cloth 4000 cycles	$>95^\circ$
Free surface energy	Total: 19.8 mN/m

	Dispers: 19.3 mN/m Polar: 0.5 mN/m
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The typical water contact angle of Hydro Flex should be larger than 105°.

The refractive index is about 1.4 in the visible spectral range. The change in AR functionality can be considerable if the AR coating design has not been compensated for this additional layer. We advise to compensate (reduce) the original top layer of the AR stack by the same thickness as the deposited Hydro Flex layer in order to keep the spectral performance unchanged.

No major deterioration occurs by wiping with a cloth or after boiling in salt solution (5% of sodium chloride in water) for 10 minutes. Furthermore, no delamination occurs after tape testing.

Tips for Evaporation

Evaporator Source

- Resistance heated thermal evaporator
- Electron beam evaporator (indirect)

Tablet Holder

- For resistive heating: Box type or W boat
- For indirect e-beam heating: Mo or Ta liner with perforated cover

Evaporation Temperature

- 350 - 750° C
- Recommended 450° C

QCR Settings

- Density 1.5 g/cm³, Z-Ratio 1.0

Thickness (QCR)

- 15-25 nm (depending upon tooling factor)

In general, we recommend the more moderate resistive source of heating over e-beam heating. If e-beam heating is unavoidable or preferred, the e-beam should not be focused directly on to the tablet. After opening the shutter, the boat current should be set to a low and constant value. Onset evaporation usually occurs after approximately 60 -90 seconds. The evaporated Hydro Flex will form a thin fluorinated siloxane layer on the substrate. Excess material can be wiped off. For optimum spectral stability the spectral measurement of the coating should be performed after wiping off surplus material. Maximum durability is achieved for approximately 20 nm thickness quartz crystal reading at 1.5 g/cm³ density setting.

Hydro Flex layer undergoes a ripening process post deposition at ambient conditions. Post treatment in warm and humid environment for a few hours reduces the ripening time.