



## STEPS



# Water Resistance *In vitro* Quantitative

**A good indicator of likely performance when tested in vivo**

### Sample Preparation

Glass microscope slides are roughened using carborundum until the slides have an even, frosted appearance. The weight of each test slide is recorded before any test product is applied. 1.3 mg/sq. cm + 0.1 mg/sq.cm of test product is applied to a roughened slide using light finger pressure to obtain an even film.

A known water resistant product, COLIPA P2 High SPF Reference Product, is used as a comparator. The slides with applied products are allowed to dry at 35°C for two hours,

which is sufficient for the product film to have dried to a constant weight. At the end of the two hours, the slides are reweighed with the dried product film. For each test slide, the weight of the original slide without product applied is subtracted to obtain the weight of the dried film pre immersion.

### Product Immersion

The test slides are then clipped into a modified dissolution pot, which is then immersed in a Sotax dissolution apparatus. Each pot, which can hold up to three samples, is then filled with water until the slides are completely immersed. The apparatus temperature is set at 34°C, with the motor speed set to 15 rpm and allowed to stir for the required duration of the test.

### Post Immersion

At the completion of the test, the

dissolution pot is removed from the apparatus and emptied. The test slides are then carefully removed to avoid disturbing the product film and allowed to dry at 35°C for two hours and reweighed. The weight of the original slide without product applied is subtracted to obtain the weight of the dried film post immersion.

### Test Results

The percentage weight loss of the film is determined by:

$$\frac{(\text{Pre immersion weight} - \text{Post immersion weight}) \times 100}{\text{Pre immersion weight}}$$

If the weight loss of the test product is less than that of the water resistant comparator, the test product is likely to be water resistant in-vivo. A greater weight loss means the test product is less likely to be water resistant in-vivo. This should always be confirmed via in-vivo testing.

### References

COLIPA Method for the in-vitro Determination of UVA Protection Provided by Sunscreen Products Guideline 2007.  
DESOP - 096 Quantitative Evaluation of in-vitro Water Resistance of Sunscreens

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