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TEST REPORT 21 39 00364

UV DEFENSE SPF 50+ POR/SOL.A.01

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LUAMED

In vitro evaluation of the resistance to washing –off by water of a sunscreen product

Study Manager:
Printed name: Yiannis Kapetanstratakis, Chemist MSc

Date : 09/11/2021

Results refer to the sample as received and analyzed on the period specified.
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In vitro evaluation of the resistance to washing –off by water of a sunscreen product

CUSTOMER	**QACS Ltd 1, Antigonis str 14451 Metamorfossi, Athens - Greece**
SPONSOR	**QACS Ltd 1, Antigonis str 14451 Metamorfossi, Athens**
SAMPLE	**21 39 00364 UV DEFENSE SPF 50+ Batch: n.p. Internal code: 4259/21-01**
REPORT DATE	**05/11/2021**
REPORT N°.	**REL/2645/2021/SPF/ST**

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Note:

The results of the test in this report is only related to the tested product/s and to the specific experimental conditions here employed. This report or parts of it cannot be duplicated without a preliminary written approval by the research staff..

1. PART ONE GENERAL INFORMATION

1.1 Customer

QACS Ltd
1, Antigonis str
14451 Metamorfossi, Athens - Greece

1.2 Sponsor

QACS Ltd
1, Antigonis str
14451 Metamorfossi, Athens - Greece

1.3 Tested sample

Sample	Internal Code	Description
21 39 00364 UV DEFENSE SPF 50+ Batch: n.p.	4259/21-01	ivory white fluid cream

1.4 Assay

In vitro evaluation of the Water Resistance of a sunscreen product

1.5 Entrusted Laboratory

ABICH S.r.l. - Via 42 Martiri, 213/B – 28924 Verbania - tel +39 (0)323 586239 fax +39 (0)323 496877

1.6 Study Dates

Start: 05/11/2021
End: 05/11/2021

1.7 Main investigator

Dr. Emiliano Ripamonti
Medical Biotechnologist
ABICH S.r.l.

1.8 Study Director

Dr. Stefano Todeschi,
Biologist, specialist in Clinical Pathology
ABICH S.r.l.

1.9 Quality assurance manager

Dr. Emanuele Caravati, PhD.
Ecology
ABICH S.r.l

2. PART TWO STUDY DESIGN

2.1 Purpose of the test

The present study evaluates the water resistance of a sunscreen product using spectrophotometric techniques. The test provides an instrumental control of the water resistance of the product after standardized washes.
UV absorbance before and after the washes is measured and the resistance is measured in terms of SPF loss.
The application of the product on the substrate simulates the application technique used *in vivo* on human volunteers, in terms of both the amount of applied product and the interaction with the substrate. The results are therefore predictive of *in vivo* water resistance performance.
The test can also provide further indications concerning the reduction of the absorbance in a specific range of the UV spectrum, and therefore in the SPF value, resulting in an estimate of the washing-off of specific Sun protection filters in the formula.
The formulator may thus check the efficacy of the product in terms of water resistance, and possibly modify the sunscreen composition in order to suit specific goals.

2.2 Materials and protocol

The substrate is a special plastic support with a high level of transmittance and roughness, complying with the ISO 24443 guideline (PMMA plates, polymethylmethacrylate Plexiglas™ 50x50 mm, roughness: 6.0).
The measurements of the UV transmittance are carried out using a Labsphere ® UV-2000S Ultraviolet Trasmittance Analyzer spectrophotometer.

The application of the correct amount of product on each plate is verified by measurements on a precision analytical scale (dose: 1.3 mg/ cm2).
The product is applied on the plate and immediately spread evenly on the entire surface following the procedure described by the ISO 24443 guidelines.
Each plate is left to dry in the dark for 30 minutes, at a temperature between 25°C and 35°C.

Once dry, the plates undergo the first spectrophotometric measurement. Each plate then undergoes two washes with water (Duration of the washes: 20' each). After each wash, the plates are left to dry for 30 minutes. After the washing cycles, the plates undergo the second spectrophotometric measurement.

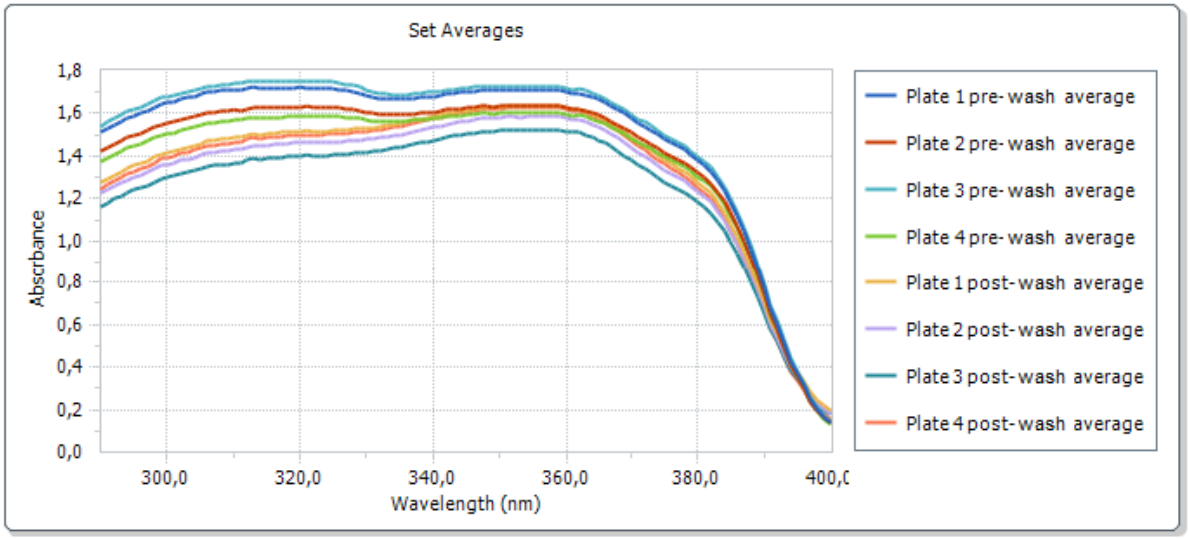
The overall washing off is determined in terms of percentage SPF loss compared to the measures performed before the washes.

$$\text{Resistance percentage} = SPF_{\text{post-wash}}/SPF_{\text{before wash}}$$

If the washing off is < 50%, the product can be considered to be *Water Resistant*

3. PART THREE RESULTS AND CONCLUSIONS

3.1 Results



Instrumental absorbance of the sample before and after the standard washing

Baseline SPF	Post wash SPF	Washing off Percentage
44,8	**29,2**	**34,3%**

Results before and after the wash procedure

The intrinsic variability of the measured SPF is ±20% of the reported average.

3.2 Conclusions

the product

21 39 00364 UV DEFENSE SPF 50+
Batch: n.p.
Internal code: 4259/21-01

Displays a water resistence percentage of: 65.70%.

It CAN therefore be considered to be resistant to water

Date: 05/11/2021

Study Director
Dr. Stefano Todeschi

ORDINE NAZIONALE DEI BIOLOGI ALBO PROFESSIONALE
DOTTORE
STEFANO
TODESCHI
N. 045258

4. REFERENCES

1. Determination of sunscreen UVA photoprotection in vitro, ISO 24443:2012(E)