

SUNJIN

Since 1978

Measurement of In-Vivo PFA test (SJ-MM-024)

- **compliance with The International PFA test method** -

For more information,

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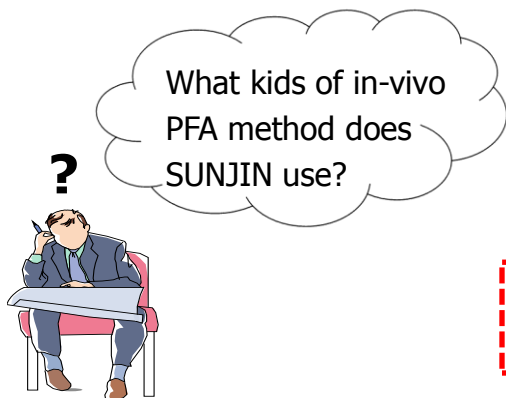
SUNJIN CHEMICAL CO.,LTD.

What kinds of in-vivo PFA test method does SUNJIN use?

Customer's Question ?

The developed countries have a in-vivo PFA test method apposite to the case of each Country.
So customers request what kinds of in-vivo PFA test method does SUNJIN use.

Customer's Question



The contract manufacturer LABORATORIOS MAGRIÑA is very interested in your formulations. As I was explaining you during this last days, they would like to reach 40SPF but with the formulation SJ-1003 they only obtain a 30 SPF. This new formulation it could be the solution for 8 customers, 8 final brands so this is the reason I contact you again, because of this potential consumption.

Could you please let CESTISA know if you could send the method, the results of the in-vivo test to CESTISA? Because our customer Magriña is using a different method.

Why does customer Question?

The developed countries have a in-vivo test method apposite to the case of each Country.
ex) JCIA, CTFA, CTFA/SA, FDA, CHINA, KFDA(KOREA)

SUNJIN complies with International in-vivo PFA test method



International method vs SUNJIN method

SUNJIN complies with International in-vivo PFA test method in all aspects (equipment, Procedure, Assessment, .. etc) except number of subjects and spreading method(Powder)

		International standard (JCIA, CTFA, CTFA/SA)	SUNJIN	
Equipment	Ultraviolet light source	Filtered Xe arc. lamp	Filtered Xe arc. lamp	
Panel selection	Number of subjects	10 ~ 20	3	
	Skin phototype	Fitzpatrick 1,2,3 or ITA value > 28°	Fitzpatrick 1,2,3	
Procedure	Test area	back (between the scapula and the waist)	back (between the scapula and the waist)	
	Applying area	30~60cm ²	30cm ²	
	Amount	2.0mg/cm ² ± 0.05mg/cm ²	2.0mg/cm ² ± 0.05mg/cm ²	
	Spreading Method	Powder	powder	Vaseline : powder = 1 : 1
		emulsion	emulsion	emulsion
	Drying time	15~30 min	15~30min	
Incremental progression of UV dose	PFA : x1.25	PFA : x1.25		
assessment	Time of assessment	2 ~ 4hr	2 ~ 4hr	

SUNJIN's in-vivo PFA test method



Equipment

SUNJIN uses PFA Testing 601-300W Multiport UV Solar Simulator and photometer/Radiometer manufactured by SOLAR LIGHT which complies with international standards.

1. PFA Testing 601-300W Multiport UV Solar Simulator >



< Ultraviolet light source >

1. Continuous, stable, uniform Filtered Xe arc. Lamp
2. UVA irradiance
 - UVA II (320~340nm) : equal or exceed 20% of the total UV
 - UVA I (340~400nm) : equal or exceed 60% of the total UV
3. Total irradiance : under 160mW/cm²
4. Incremental progression of UV dose
 - PFA : x1.25

2. Photometer/Radiometer(PMA2100)



< Ultraviolet light source check>

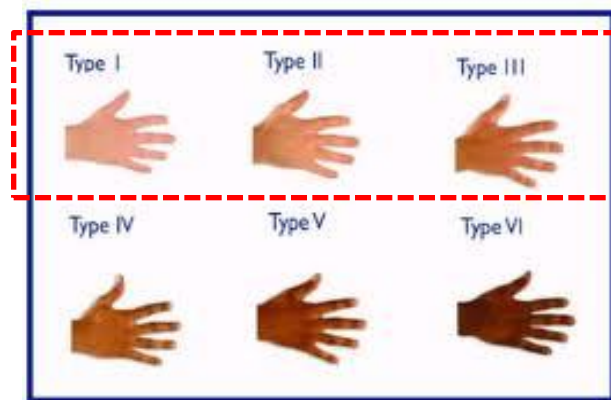
1. It checks whether Ultraviolet light source is Continuous and stable.
2. It is used when controlling Ultraviolet light source of every port

Panel selection

The skin phototype of panel included in the PFA test shall be phototypes I, II, or III according to Fitzpatrick

1. skin phototypes of Fitzpatrick

- Type 1 : always burns easily (never tans)
- Type 2 : always burns easily (tans minimally)
- Type 3 : burns moderately (tans gradually)
- Type 4 : burns minimally (always tans well)
- Type 5 : rarely burns (tans profusely)
- Type 6 : never burns (deeply pigmented)



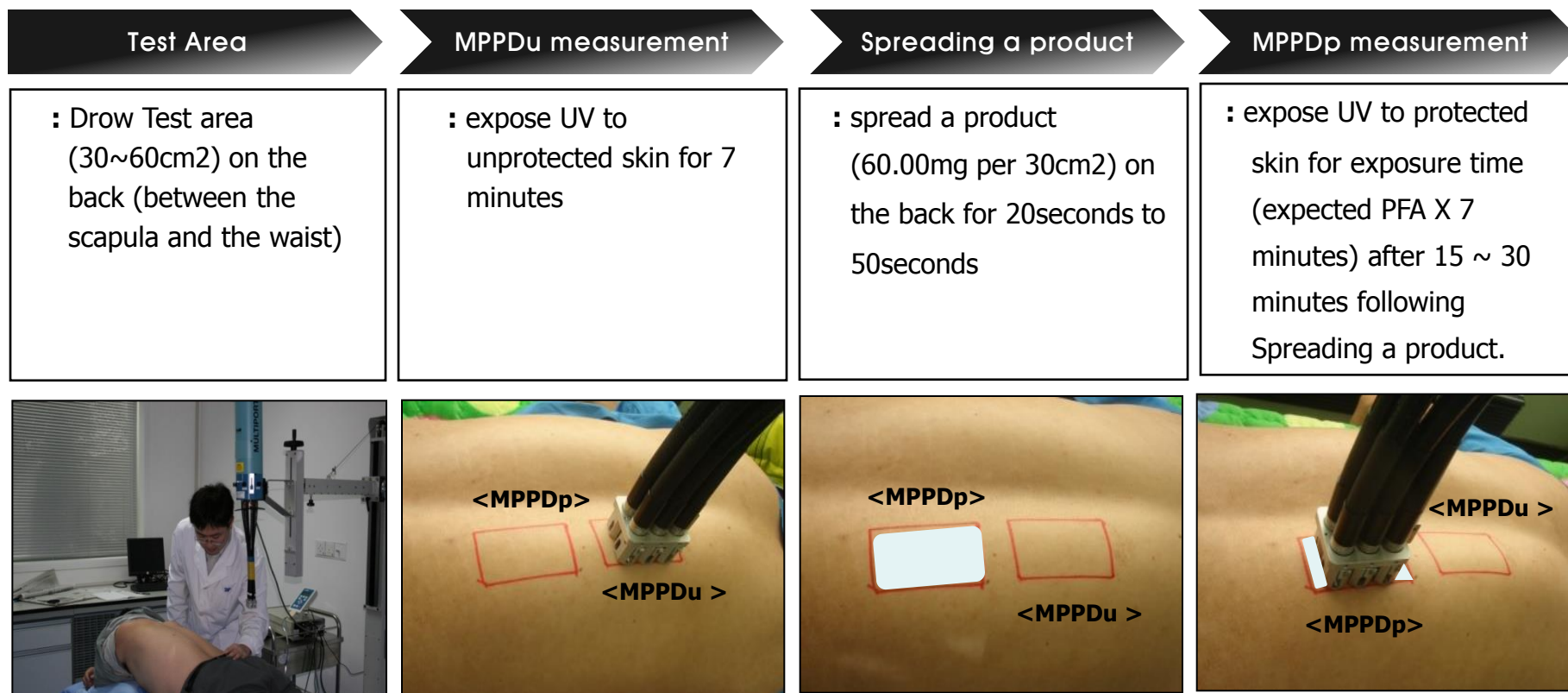
SUNJIN uses the skin phototypes I, II, or III according to Fitzpatrick.

2. Number of panel : **3 valid results / test**

< Difference with international PFA test method - number of subjects : **10 valid results / test** >

Procedure

SUNJIN follows procedure as below

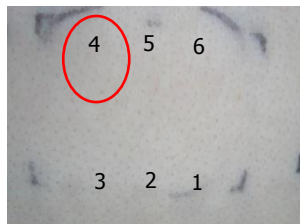
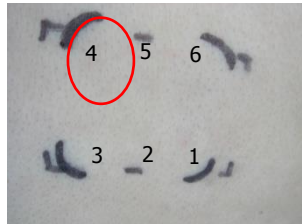


Assessment

The MPPD shall be assessed when the Darkening response is optimal, i.e. 2 ~ 4 hours after UV exposure.

For example

<MPPDu – MPPD of Unprotected skin > <MPPDp – MPPD of Protected skin >



light-intensity of each Port

1 : 16.70mw/cm² 2 : 20.88mw/cm²
 3 : 26.10mw/cm² 4 : 32.62mw/cm²
 5 : 40.78mw/cm² 6 : 51.00mw/cm²

MPPDu

: 32.62mw/cm² * 420sec * = 13700mw *
 s/cm² = 13.7/cm²

MPPDp

: 32.62mw/cm² * 420sec * 8 = 109603mw
 * s/cm² = 109.6j/cm²

Calculating Result : MPPDp / MPPDu

: 109.6j/cm² / 13.7j/cm² = 8

< assessment method >

1. The result is measured by 2 experts.
2. Number of subjects : 3 valid results / test
3. Sun protection factor : PFA = MPPDp (protected skin) / MPPDu (unprotected skin)
4. the final result : $\Sigma PFA / 3$

Ex) 8, 7.9, 8.3 → 24.2 / 3 = 8.1