

Crystal-Pro, TiO_2 Dispersion
In Nature Oil

Crystalpro TC60R

나노크리스탈 (주)

NANOCRYSTAL CO., LTD.

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NANOCRYSTAL CO., LTD.

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Procedure of dispersion

01 | Procedure of dispersion

Solvent & Dispersion Agent Mixing

Dispersion Assistant Mixing

Inspection & Packing

UV protector Mixing

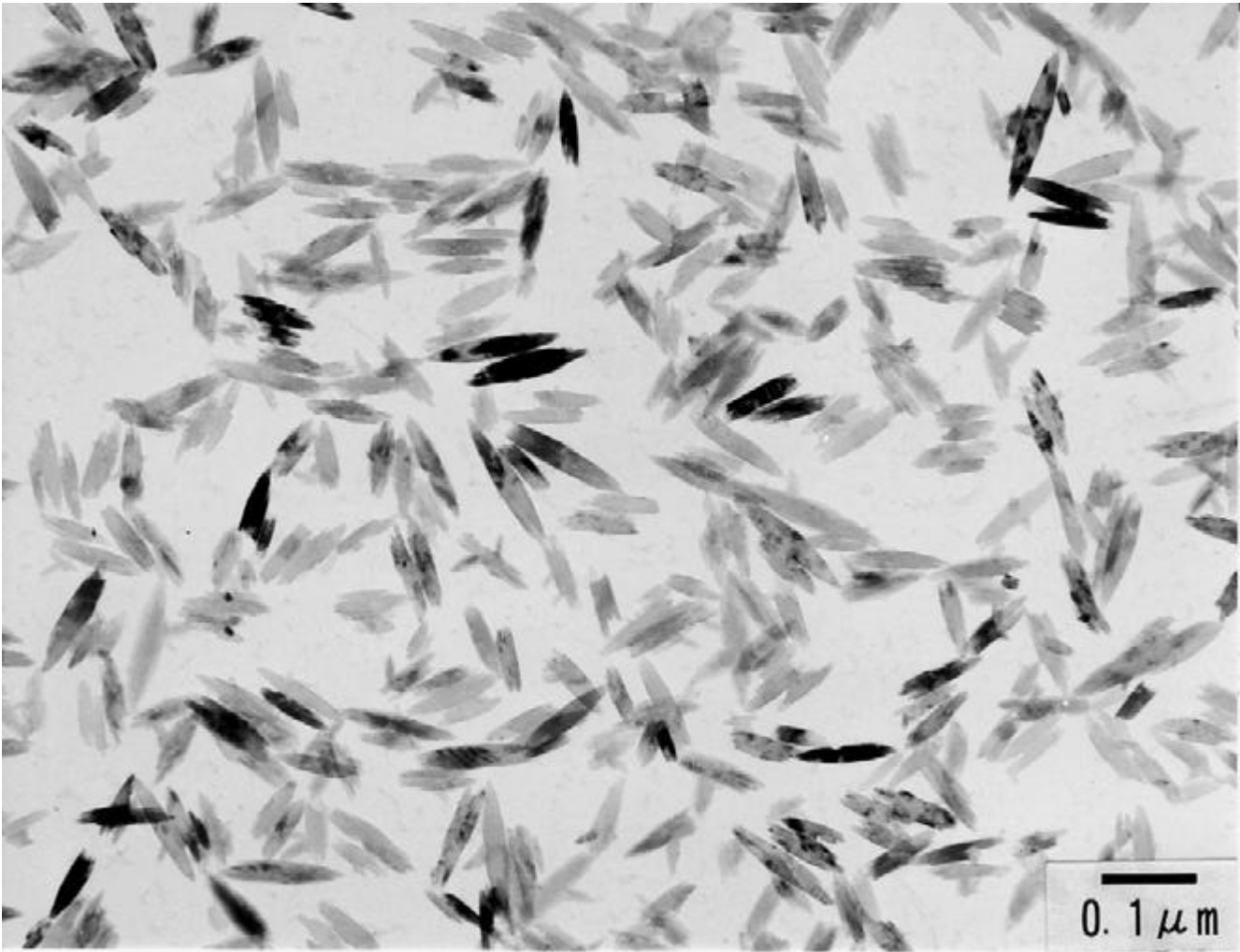
Milling & Dispersion



Composition

Trade Name	INCI Name	Content(%)
Crystalpro TC60R	Titanium Dioxide	50.4
	Aluminum Hydroxide / Stearic Acid	6.0 / 3.6
	Coco-Caprylate/Caprates	35.0
	Polyglyceryl-3 Polyricinoleate	5.0

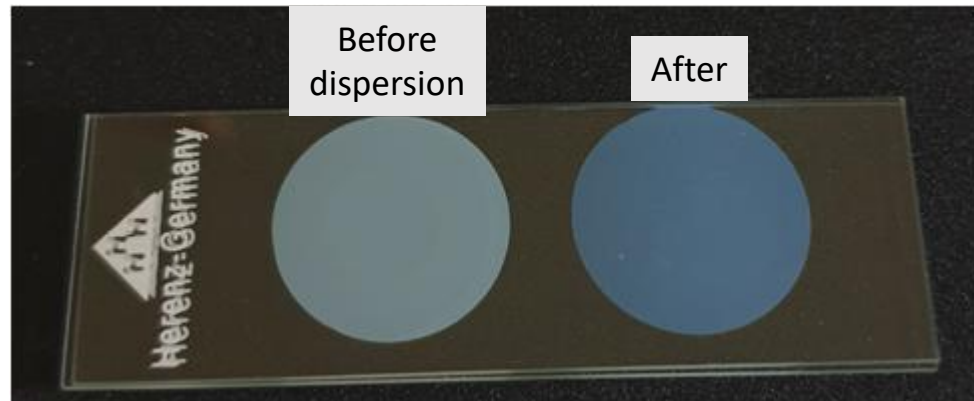
Characteristics of Titanium Dioxide



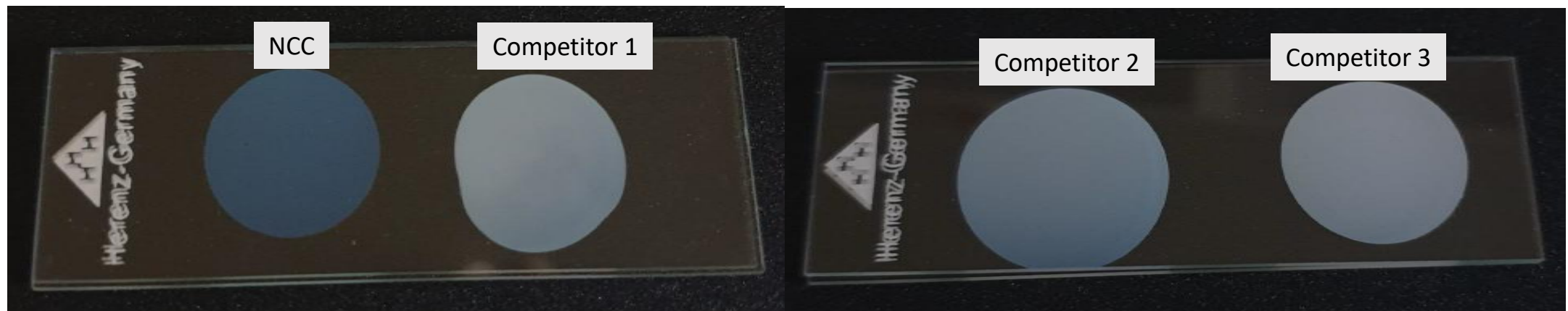
Crystal Form	Rutile
Particle Shape	spindle
Particle Size	Width 10-30nm Length 50-150nm
Titanium Dioxide Content (%)	85.5±6.5
Aluminum Hydroxide Content (%)	6.5±0.5
Stearic Acid Content (%)	6.3±0.5
Silicon Oil Absorption (g/100g)	26.5±3.5

White cast

03 | The benefit

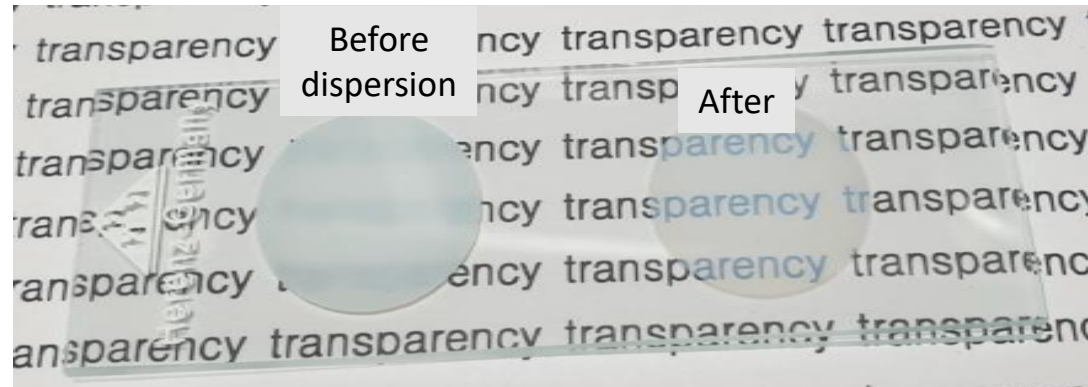


Low white cast

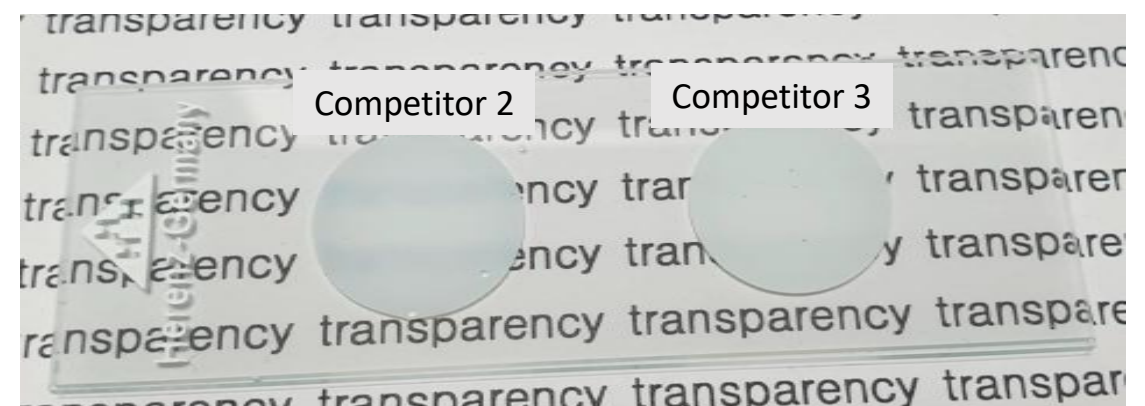
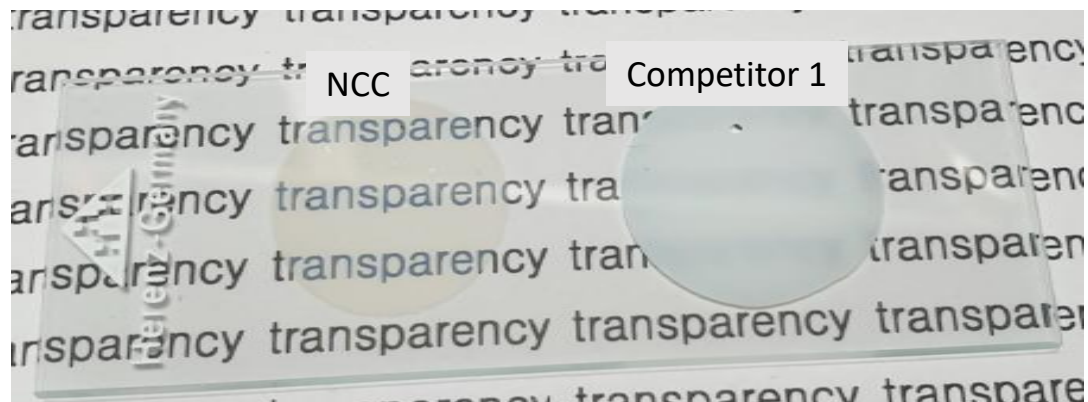


Transparency

03 | The benefit



Excellent transparency

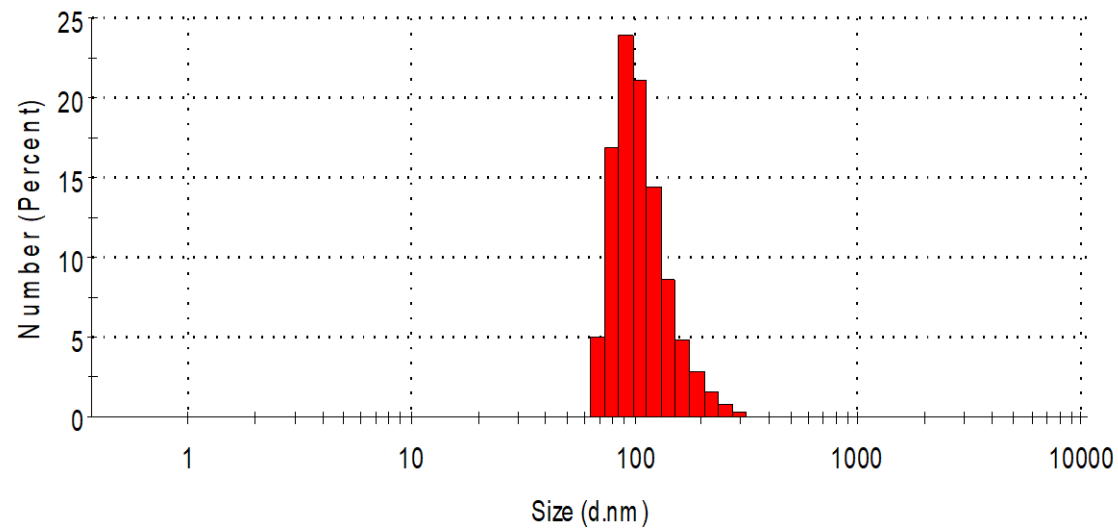


Particle size

03 | The benefit

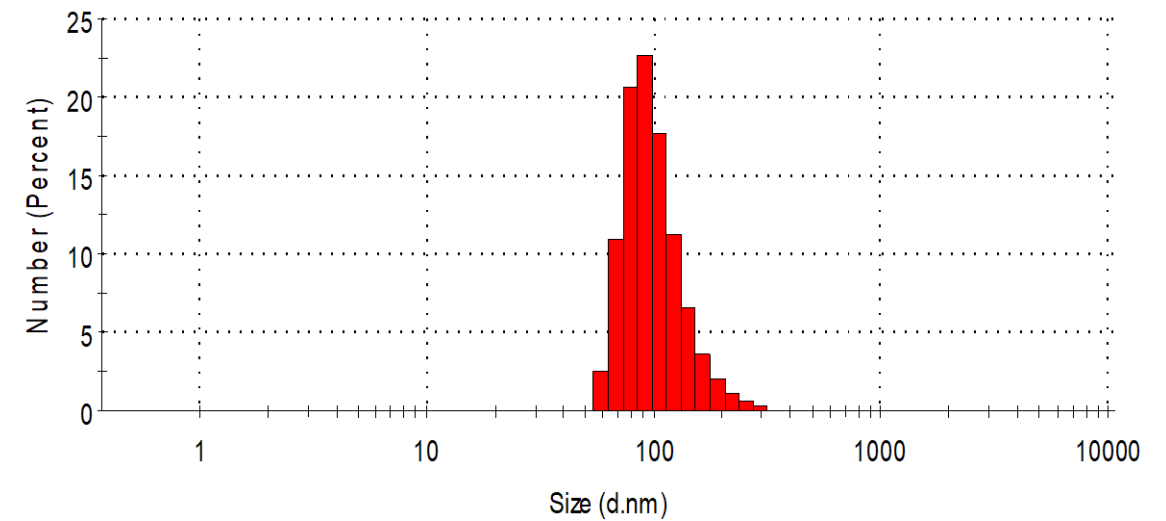
Immediately

Size Distribution by Number



3 months later

Size Distribution by Number

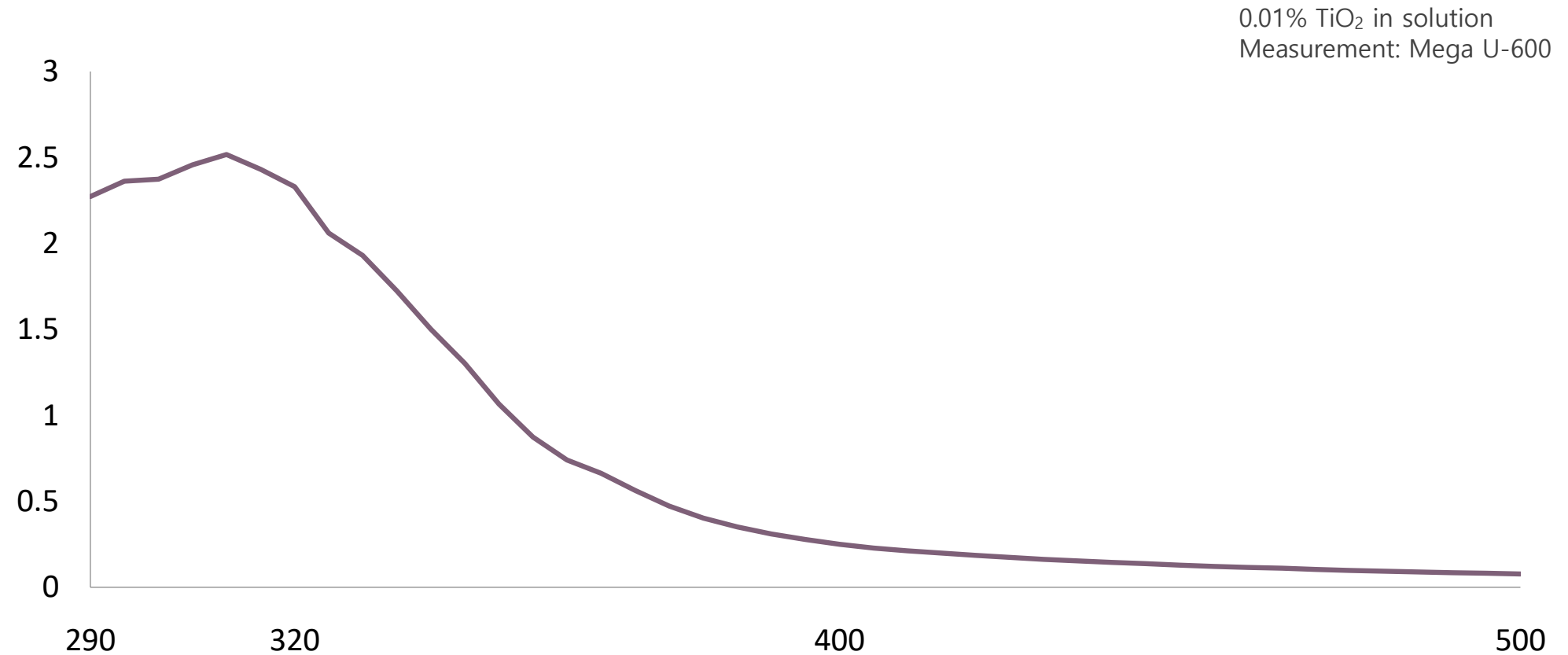


Uniformity & Stability

0.01% TiO₂ in solution
Measurement: Zetasizer Nano S90

Absorbance

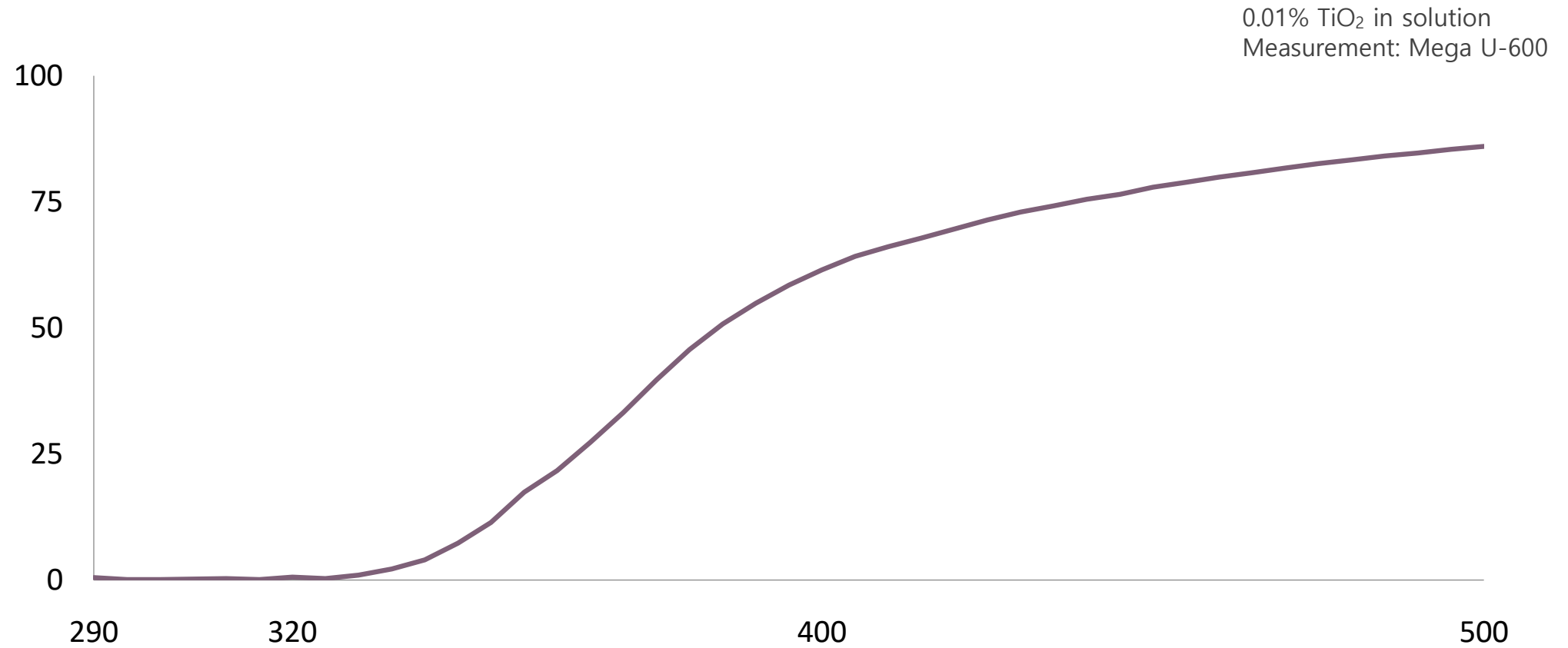
03 | The benefit



Good UV cut effect

Transmittance

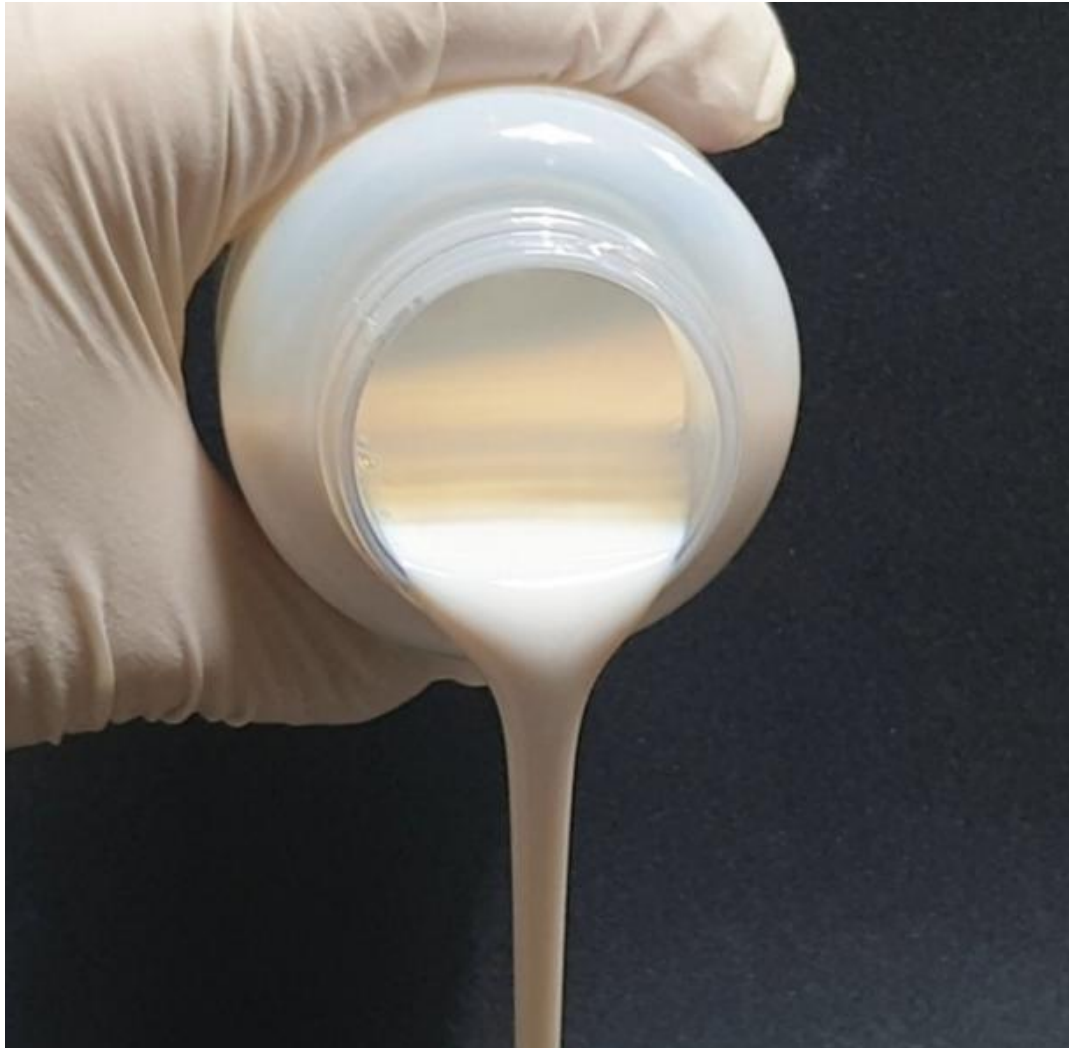
03 | The benefit



Excellent transparency

Fluidity

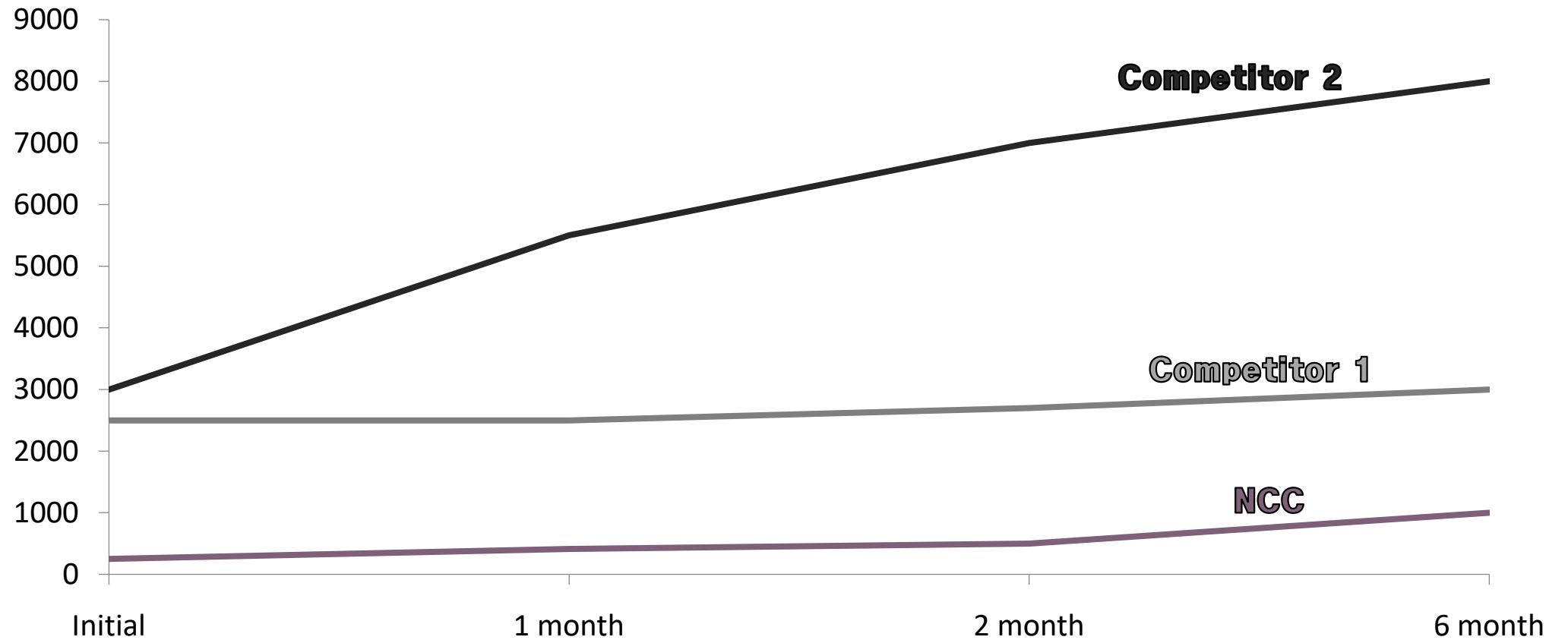
03 | The benefit



Excellent fluidity

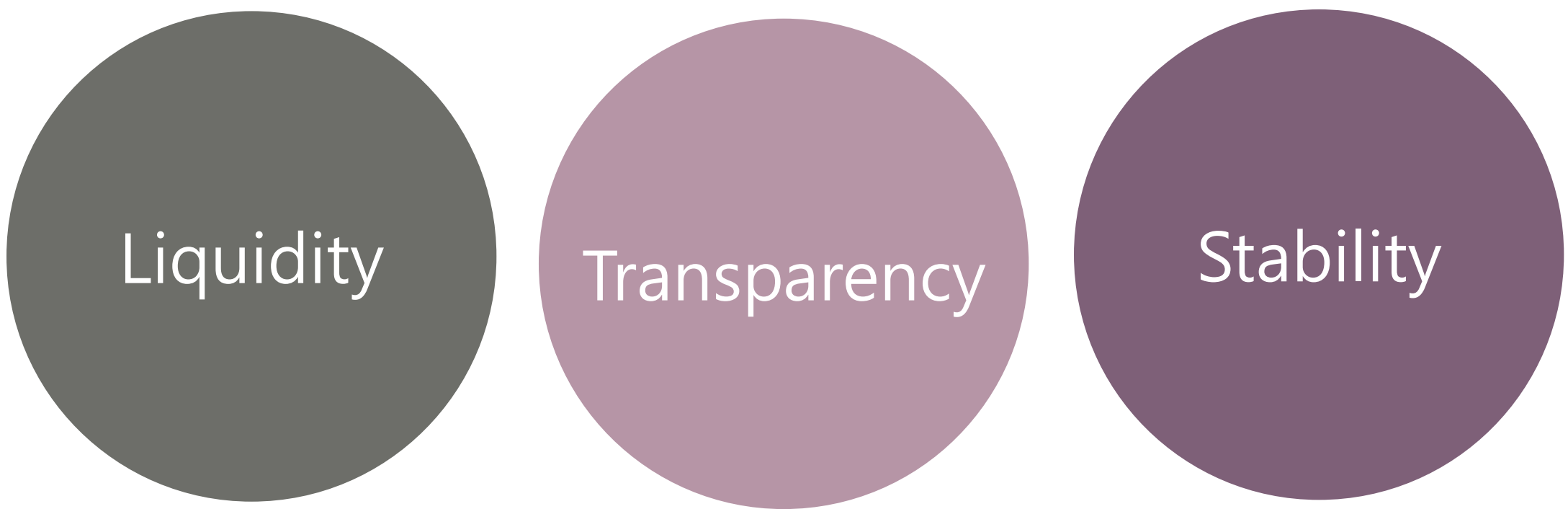
Viscosity

03 | The benefit



Low viscosity

Well-distributed



Liquidity

Transparency

Stability

UV-Cut Capacity of TiO₂

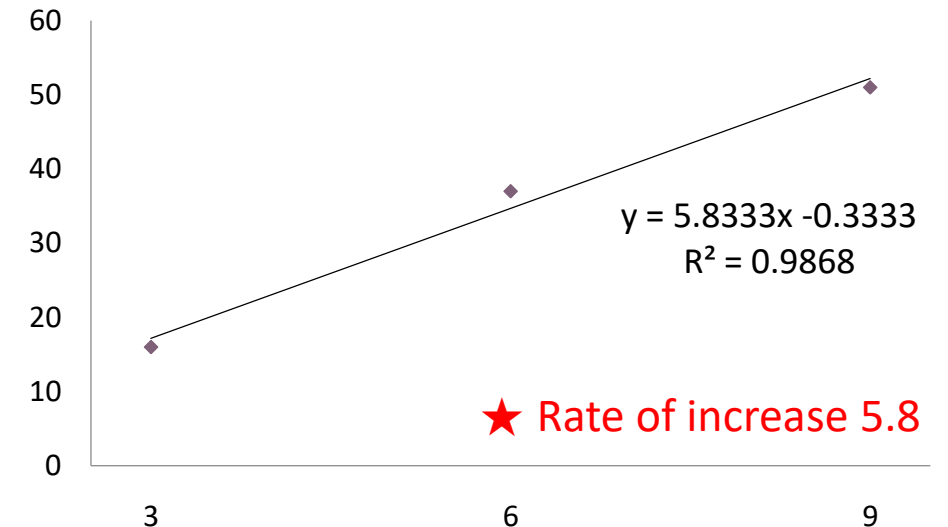
04 | Analysis

* Test formula W/O sunscreen

TiO2 content		3%	6%	9%
	Trade Name	%	%	%
A	Crystalpro TC60R	5	10	15
	EMOLID CCMB	30	25	20
	Beeswax	2	2	2
	Bentone 38	2	2	2
	KSG-16	6	6	6
	TCG-M	1	1	1
	Hexyl Laurate	2	2	2
	Dermofeel PGPR	1.5	1.5	1.5
B	1,3-Butyleneglycol	7	7	7
	NaCl	1	1	1
	EDTA 2Na	0.02	0.02	0.02
	1,2-Hexanediol	0.01	0.01	0.01
	D.I Water	42.47	42.47	42.47

Measurement: SPF analyzer SPF-290AS

Capacity	SPF	PA
3%	16	++
6%	37	+++
9%	51	++++



★ Rate of increase 5.8

High SPF

SPF/PA(in-vitro)_ Crystalpro TC60R

04 | Analysis

Sample preparation: vaseline 8.3g+ **TiO₂ 1g+ Oil 0.7g** (10% TiO₂ in dispersion)

Content: 10%

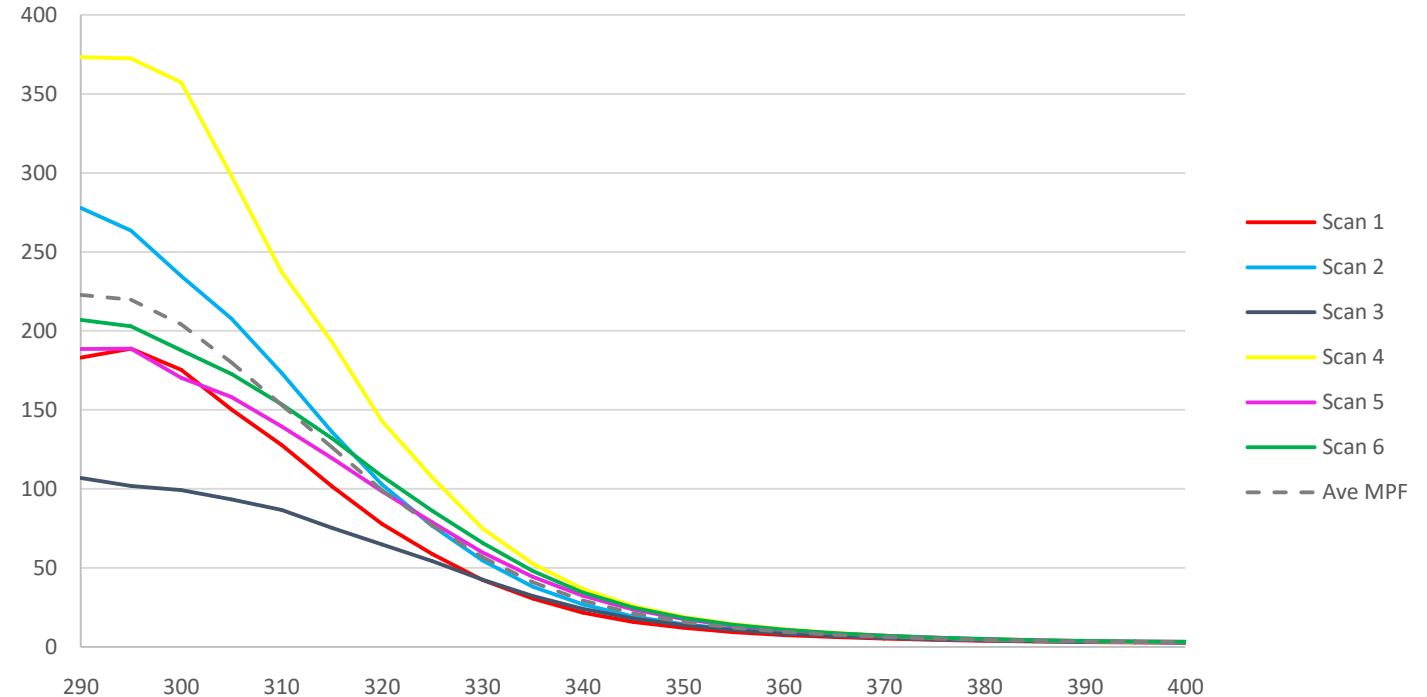
Substrate: PMMA

Measurement: SPF analyzer SPF-290S

Crystalpro TC60R

SPF 50+ / PA ++++

	Value	STDV
SPF:	61.41	14.39
UVA/UVB ratio:	0.487	0.03
Boots Star Rating (2004):	2	Moderate
UVA I/UV Ratio:	0.62	Mediur
Max. %T COV:	45.88	
Critical Wavelength:	377.1	0.45
Curve Area:	151.86	9.37
UVA PF:	23.48	5.06
Erythem UVA PF:	18.03	2.56



SPF/PA(in-vitro)_Competitor's dispersion

04 | Analysis

Sample preparation: vaseline 8g+ **TiO₂ 1g+ Oil 1g** (10% TiO₂ in dispersion)

Content: 10%

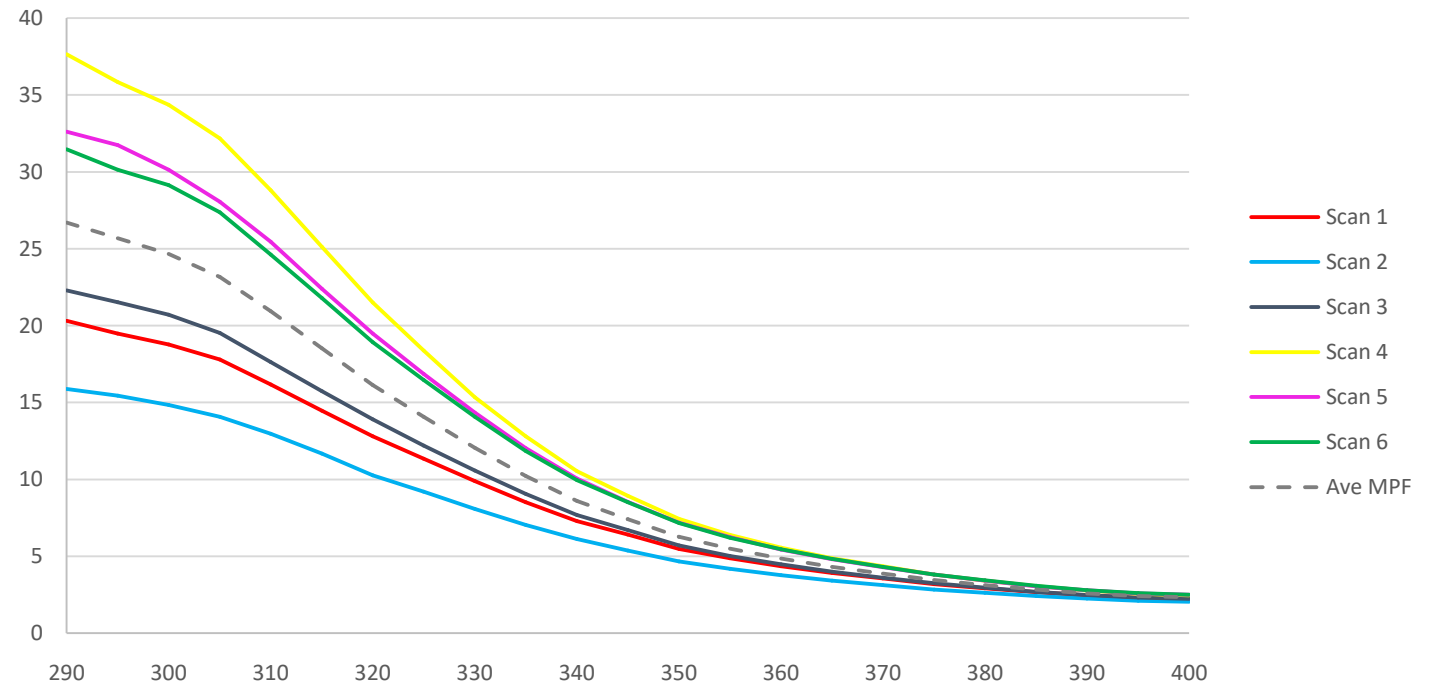
Substrate: PMMA

Measurement: SPF analyzer SPF-290S

Competitor's dispersion

SPF 16 / PA ++

	Value	STDV
SPF:	15.65	4.66
UVA/UVB ratio:	0.539	0.01
Boots Star Rating (2004):	2	Moderate
UVA I/UV Ratio:	0.68	Mediur
Max. %T COV:	33.92	
Critical Wavelength:	378.7	0.16
Curve Area:	97.16	9.94
UVA PF:	6.47	1.3
Erythem UVA PF:	7.83	1.43



Heavy Metals Test

TEST REPORT			
Test item	Unit	Regulation on safety standards	Analysis data
Lead (Pb)	µg/g	20	< 2
Arsenic (As)	µg/g	10	< 1
Antimony (Sb)	µg/g	10	< 1
Cadmium (Cd)	µg/g	5	< 1
Nickel (Ni)	µg/g	10	< 1
Mercury (Hg)	µg/g	1	< 0.05

Not detected!

Test Method : MFDS notification no. 2019-27



THANKS

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