

Isopentyldiol

The multi functional ingredient for Personal Care

March 2018



- Skin feel
- Immediate hydrating effect
- Hair repair
- Easy to formulate with
- Applications
- Toxicological profile
- Regulatory
- CSR

Skin feel

Incredible silky skin feel

- ✓ Non tacky
- ✓ Non sticky
- ✓ Light filming effect
- ✓ Silky feeling
- ✓ Dry touch



Organoleptic benefits

Study protocol :

impregnated pads (1g of solution) applied 10 times to remove foundation & lipstick

	10% Isopentyl-diol	10% Propylene-glycol	10% Hexylene-glycol	10% Butylene-glycol	10% Dipropylene-glycol
Skin freshness	7	5	6	6	5
Absence of stickiness	8	8	8	6	7
Performance as makeup remover:					
Foundation	5	5	8	3	5
Lipstick	8	6	7	7	7
Appearance of the skin after makeup removal	8	8	8	8	8
Skin softness after makeup removal	8	8	8	7	7
Absence of tight feeling after makeup removal	8	8	8	8	8

○ 1 = poor ● 8 = good

Study performed by IRFAQ, France

Make up remover based on IPD showed **excellent performance** at removing lipstick while **leaving nice skin after feel**

Immediate hydrating effect

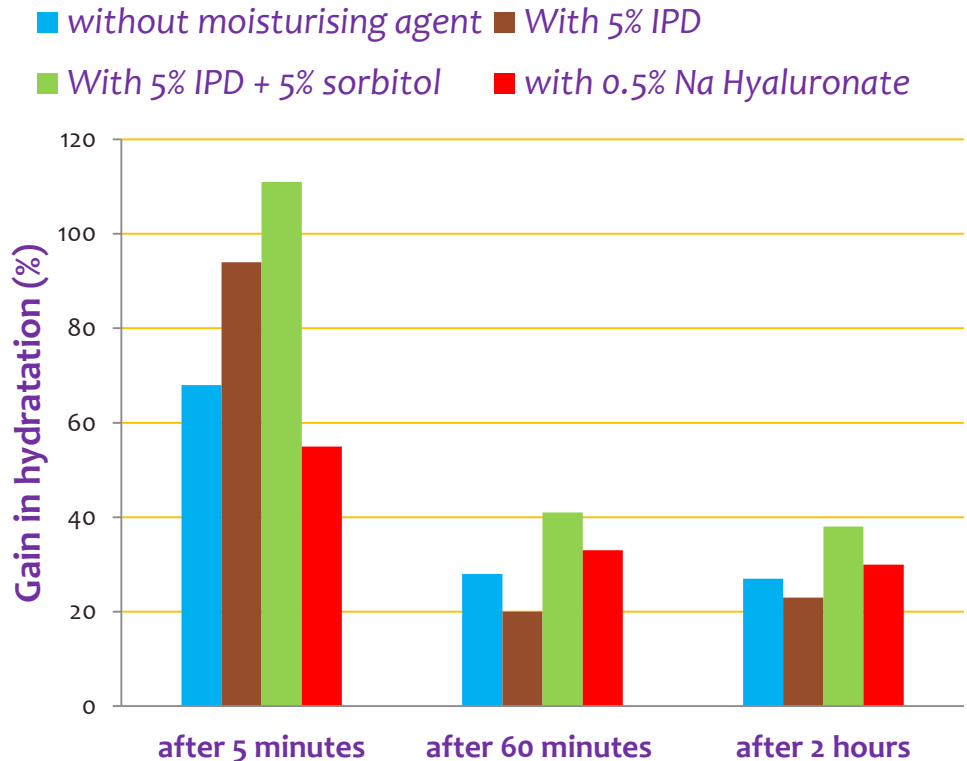
Important feature : Immediate hydrating effect

Study protocol:

5 volunteers - application on forearm - average value after 10 measurements made with a corneometer

Study performed by IRFAQ, France

Test formula (white cream)	
Active	0 or x %
Ultrez 10 (carbomer)	0.75%
Lanette 16 (cetyl alcohol)	1%
Cithrol GMS (Glyceryl stearate/PEG 100 stearate)	3%
Parrafin oil AAB2 (Paraffinum liquidum)	3%
Triethanolamine	0.6%
Germaben II	0.7%
Deionised water	qsp 100%



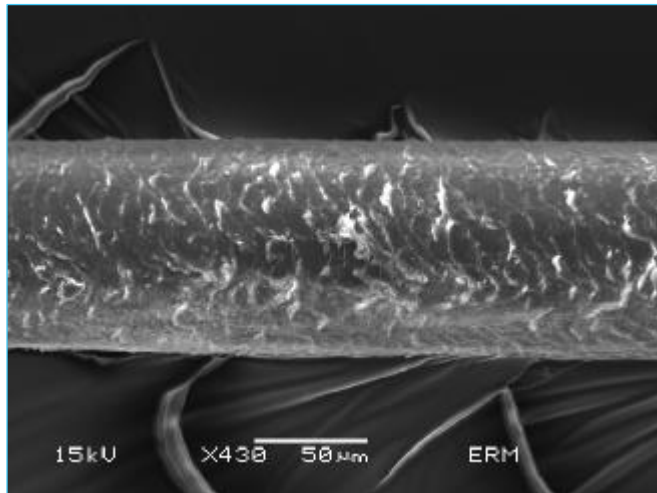
Hair repair - shiny effect - hair smoothness
color retention - hair strenghtening - anti-frizz

Repair effect clearly visible by SEM for **shiny hair**

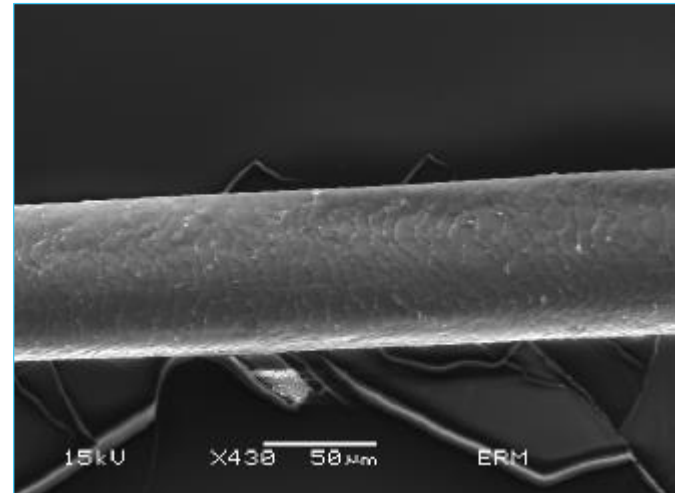
Study protocol :

Damaged hair treated with IPD + Sorbitol in water
Natural brown hair (from Secher Fesnoux).

Study performed by IRFAQ, France



*Untreated
damaged hair*



*Dipped for 30 minutes
in a IPD /Sorbitol solution
(5% each)*

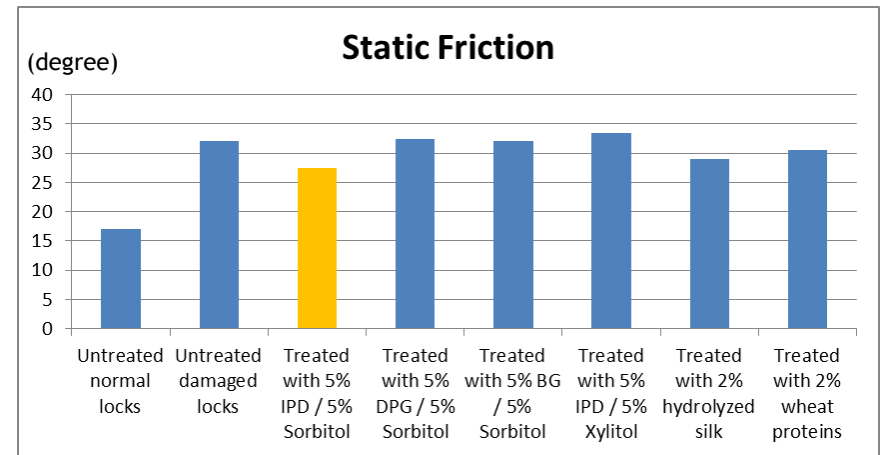
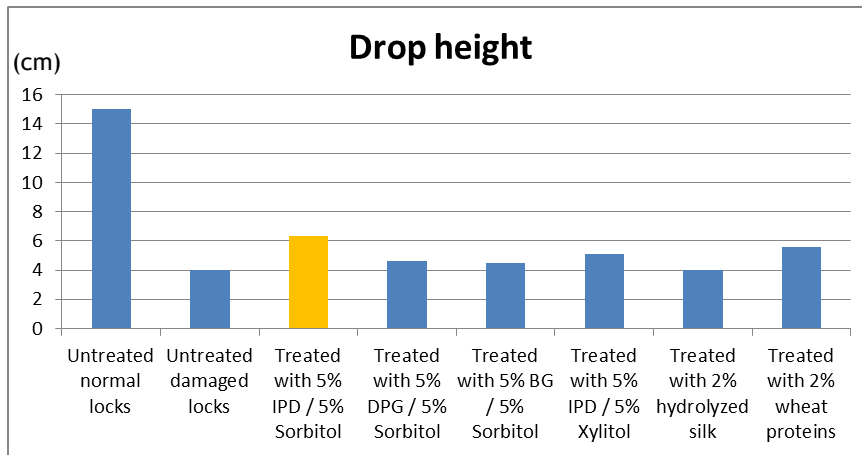
Effect on damaged hair

Study protocol :

Damaged hair treated with IPD + Sorbitol in water.

Natural brown hair (from Secher Fesnoux).

Smoothness effect is evaluated by drop height (*ring test*) & coefficient of static friction (*sliding angle test*).



Study protocol :

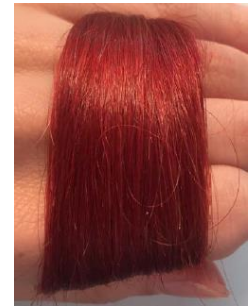
Cleansing and rinsing the strands, blow drying

Apply red dyeing preparation activated by oxidizing cream :

one preparation with 5% IPD,

one without (STD)

Blow dry the strands



→ 15 washing cycles, with shampoo including 2,5% IPD and without (STD).

Measurement of the color variation with a colorimeter (Minolta CR-400).

$$\Delta E = \sqrt{(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2}$$

	STD	IPD treated	
ΔE	9,82	6,52	-33%

Lower ΔE = Less color change

→ Better **color retention**

Study performed by Rigano Laboratories, Milan

IPD increases the color retention after wash cycles

Study protocol :

Cleansing and rinsing the strands

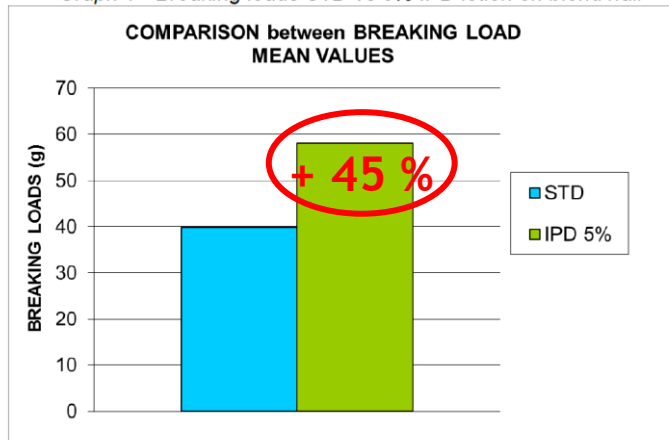
Treatment with a given solution of a standard (STD) and red colored strand :

5% IPD or water (without IPD) + 20% Alc. + Water

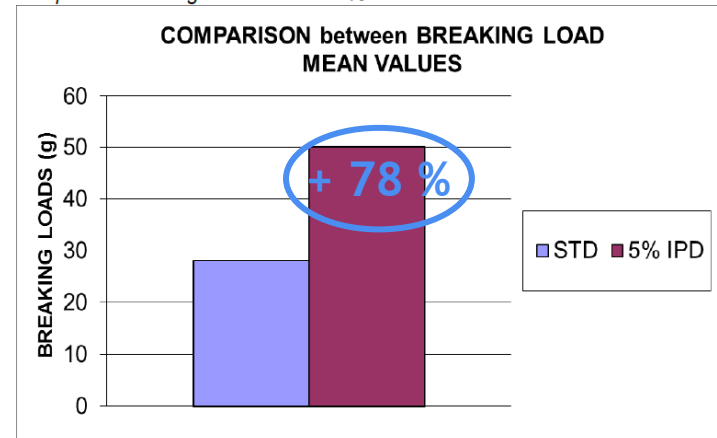
Blow dry the strands

→ 20 hairs of treated strands compared to STD strands against breakage by weight constraint applied to each hair seperately

Graph 1 - Breaking loads STD vs 5% IPD lotion on blond hair



Graph 2 - Breaking loads STD vs 5% IPD lotion on red colored hair



Study performed by Rigano Laboratories, Milan

IPD increases the hair strength

Study protocol :

Preparation of 6 strands with :

Shampoo with 2,5% IPD or without (STD)

Conditionner with 5% IPD or without (STD)

Blow dry and straightened the strands

Hang the strands in a stove @ 35 °C, 75% RH



→ Measurement of the widening of the strands in time

	T0	1 hour	2 hours	3 hours	24 hours
STD (avg)	2,50	2,78	2,87	3,04	3,12
IPD Treated (avg)	1,35	1,91	2,16	2,30	2,62
IPD treatment impact	-46%	-32%	-25%	-24%	-15%

IPD reduces frizz effect during hot and humid climat conditions

Study performed by Rigano Laboratories, Milan

Easy to formulate with

Good solubilizer of actives :

Type	Active	@ 25 °C	@ 40 °C
Lipophilic actives	Glycyrrhetic acid	2 %	2 %
	Salicylic acid	20 %	20 %
	Resveratrol	8 %	8 %
	<i>Boswellia Serrata</i> extract	20 %	20 %
Hydrophilic actives	Trimethylglycine	8 %	8 %
	Glabridin	5 %	6,5 %

Good carrier of actives for **transparent formulations** :

Hydrophilic actives → anhydrous systems

Lipophilic actives → aqueous systems

IPD + Active (%)		Max. amount of water added to the blend IPD + Active, leading to transparent solution
Lipophilic actives	Glycyrrhetic acid (2 %)	14,30 %
	Salicylic acid (20 %)	4,00 %
	Resveratrol (8 %)	3,90 %
	<i>Boswellia Serrata</i> extract (20 %)	7,90 %
IPD + Active (%)		Max. amount of Di-isopropyl sebacate (oil) added to the blend IPD + Active, leading to transparent solution
Hydrophilic actives	Trimethylglycine (8 %)	6,30 %
	Glabridin (6,5 %)	0,15 %

IPD **improves emulsion stability** by reducing the particle size :

Visible through microscope analysis of an O/W emulsion with & without IPD.

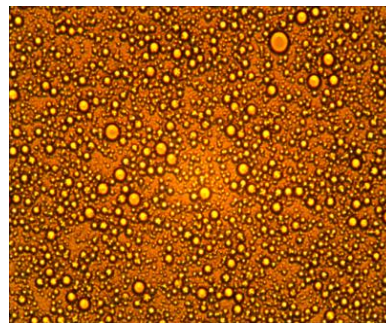
without IPD

Large oil droplets



with IPD

A finer emulsion is obtained



Study performed by Dr Luigi Rigano

O/W emulsion with or without IPD* (qsp water)	
Water	73,50%
Hydrogenated Polydecene	20,00%
Steareth 2	3,00%
Steareth 21	1,00%
Cetearyl alcohol	1,50%
Preservative	1,00%

* : 5% incorporated in the water phase

Technical advantages : formulation (1/2)

- ✓ IPD is a **stable** molecule (temperature, pH, oxidation, ...)
- ✓ IPD is fully **water soluble**
- ✓ IPD is **miscible with some emollients** in a ratio of 1:1 (adipates, sebacates, dimethicone but separated after 24h without emulsifier)
- ✓ **Good wetting** properties :
 - with FeO₂ : ratio 1/1
 - with TiO₂ : ratio 4/5
 - with ZnO₂ : ratio 3/4
- ✓ **Better dispersion** properties with silica powders (fumed and hydrated silica) than glycerin or sorbitol :

% Silica	IPD	Sorbitol	Glycerin
15%	Colorless opalescent fluid	Colorless opalescent fluid, comparable to IPD	White fluid
10%	Colorless opalescent fluid	Colorless opalescent fluid, slightly more transparent than IPD	Ice-white fluid
5%	Colorless transparent fluid	Ice-white opalescent fluid	Colorless opalescent fluid, comparable to IPD

Technical advantages formulation (2/2)

- ✓ **Helps the casting phase** of viscous foundations @ 80-85° C
- ✓ Allows to **reduce binders** amount in compact powders
- ✓ **Improves the drop test** challenge in compact powders :

Drop from 30 cm height		Breakage after fall, sdt compact powder	Breakage after fall, with 5% IPD
Sample 1	First fall Second fall Third fall	Very slight breaking Very slight breaking Breaking	None None None
Sample 2	First fall Second fall Third fall	None Slight breaking Breaking	None None None
Sample 3	First fall Second fall Third fall	None None Slight breaking	None None Slight breaking



Applications

IPD, the multi functional solution for your formulations

- ✓ Skin care,
- ✓ Hair care,
- ✓ Body care,
- ✓ Baby care,
- ✓ Colour cosmetics,
- ✓ Cleanser,
- ✓ Toiletries,
- ✓ Self tanning,
- ✓ Make-up removers...



Ecotoxicological profile

- ✓ Safe for the environment
- ✓ Safe for the skin
- ✓ Safe for the eyes
- ✓ No genotoxicity
- ✓ Quasi drug in Japan

RMID available on request

5th version, 8 April 2015.

IPD / Isopentyldiol

Raw Material Information Data

Manufacturer : KURARAY Co., Ltd.
Isoprene Chemicals Division
Fine Chemicals Marketing and Sales Department
1-1-3 Ohsachi Chiyoda-ku Tokyo 100-0115, JAPAN

1. General information	
1.1 Trade name	ISOPENTYLDIOL
1.2 Chemical name	3-Methyl-1,3-butenediol
1.3 CAS Number	2955-33-4
1.4 EC (ELINCS) Number	499-278-7
1.5 REACH status	Registered (1-10 t/y) REACH Number: 01-0000010449-02-0009
1.6 TSCA	Listed (SNIUR)
1.7 INCI name	ISOPENTYLDIOL
1.8 Japan EMC8 Number	2-240
1.9 CTFA	Listed
1.10 China (CCSC, ECIC 2014)	Listed
1.11 SWISS	Listed (28410; 20880)
1.12 Australia ACS	Listed (If you export IPD more than 15t to Australia, or a content of IPD in specific product is more than 0%, you need to notify to Australia authorities.)
1.13 Korea ECL	K2-20842
1.14 Philippines PICCS	Listed
1.15 TAIWAN	Listed
1.16 Purity(GC %)	>=99.0%

1/7

Regulatory

INCI : Isopentyldiol

CAS Number : 2568-33-4

- | | |
|-----------------------|------------------|
| ✓ CRC-SEPA (China) | Listed |
| ✓ ECL (Korea) | Listed KE-23542 |
| ✓ ELINCS (EU) | Listed 459-270-7 |
| ✓ REACH (EU) | Registered |
| ✓ ENCS (Japan) | Listed 2-240 |
| ✓ NDSL (Canada) | Listed |
| ✓ PICCS (Philippine) | Listed |
| ✓ SWISS (Switzerland) | Listed 290800 |
| ✓ TSCA (USA) | SNUR |

kuraray

A world map is visible in the background, rendered in a light blue color. The map shows the continents and oceans, with a slightly darker blue overlay in the center where the text is located.

**Thank you
for your attention.**

Corporate Social Responsibility

- ✓ Social contribution
 - ✓ Education through culture, science
 - ✓ Environment (forest conservation, park cleaning, ...)
 - ✓ Social welfare through supporting people with disabilities

- ✓ Environmental concerns
 - ✓ Green House Gases emissions : continuous reduction targets
 - ✓ Biomass fuel replacing fuel or coal
 - ✓ ...

- ✓ Risk prevention
 - ✓ Human protection
 - ✓ Disaster prevention
 - ✓ Process (manufacturing) safety

Ask for the CRS 2017 brochure, also downloadable here :
<http://www.kuraray.com/csr/pdf/kuraray2017e.pdf>

Success stories - IPD Inside



IPD & In Cosmetics 2016

You liked In Cosmetics 2016:

Silver award to IFF for Miniporyl containing Isopentyldiol

Lucas Meyer's pore minimiser, **Miniporyl**, took home the Silver award,



IFF PLAN DU SITE ENGLISH

ACCUEIL À PROPOS **PRODUITS** FORMULATION DISTRIBUTEURS NOUVELLES ET ÉVÉNEMENTS VIDEOS CARRIÈRES CONTACT

MINIPORYL™
Réducteur de pores



PRODUITS

APERÇU

PRODUITS PAR NOM

PRODUITS PAR APPLICATION

PRODUITS PAR CATÉGORIE

CONCEPTS

Origine

Extrait de fleur de trèfle rouge

Nom INCI

isopentyldiol (and) Trifolium Pratense (Clover) Flower Extract



IPD & In Cosmetics 2017

You will love In Cosmetics 2017 :

Gold award to Lab. Expanscience for Passioline.

Isopentyldiol is into their formula for moisturizing

Active Ingredients - 2017 winners

Gold: Laboratoires Expanscience - PASSIOLINE®

PASSIOLINE® in Oils Re-Pair Oily Biphasic Serum

	EMOGREEN L15	C15-19 Alkane	53,80%
	PASSIOLINE®	Passiflora Edulis Seed Oil	1.00%
	LABORATOIRES EXPANSCIENCE		
	VIRGIN MARACUJA OIL	Passiflora Edulis Seed Oil	5.00%
	LABORATOIRES EXPANSCIENCE		
A	PREMIUM AVOCADO OIL	Persea Gratissima Oil	10.00%
	LABORATOIRES EXPANSCIENCE		
	GOLDEN JOJOBA OIL (BCE1032)	Simmondsia Chinensis Seed Oil, Helianthus Annuus Seed Oil	8.00%
	ROSAMOX	Rosmarinus Officinalis Leaf Extract	0.10%
	HE PAMPLEMOUSSE SANS FUROCOUMARINES	Parfum	2.00%
B	ISOPENTYLDIOL	Isopentyldiol	20.00%
	UNICERT RED K7057-J en solution aqueuse à 0.1%	Aqua Ci 17200	0.10%