

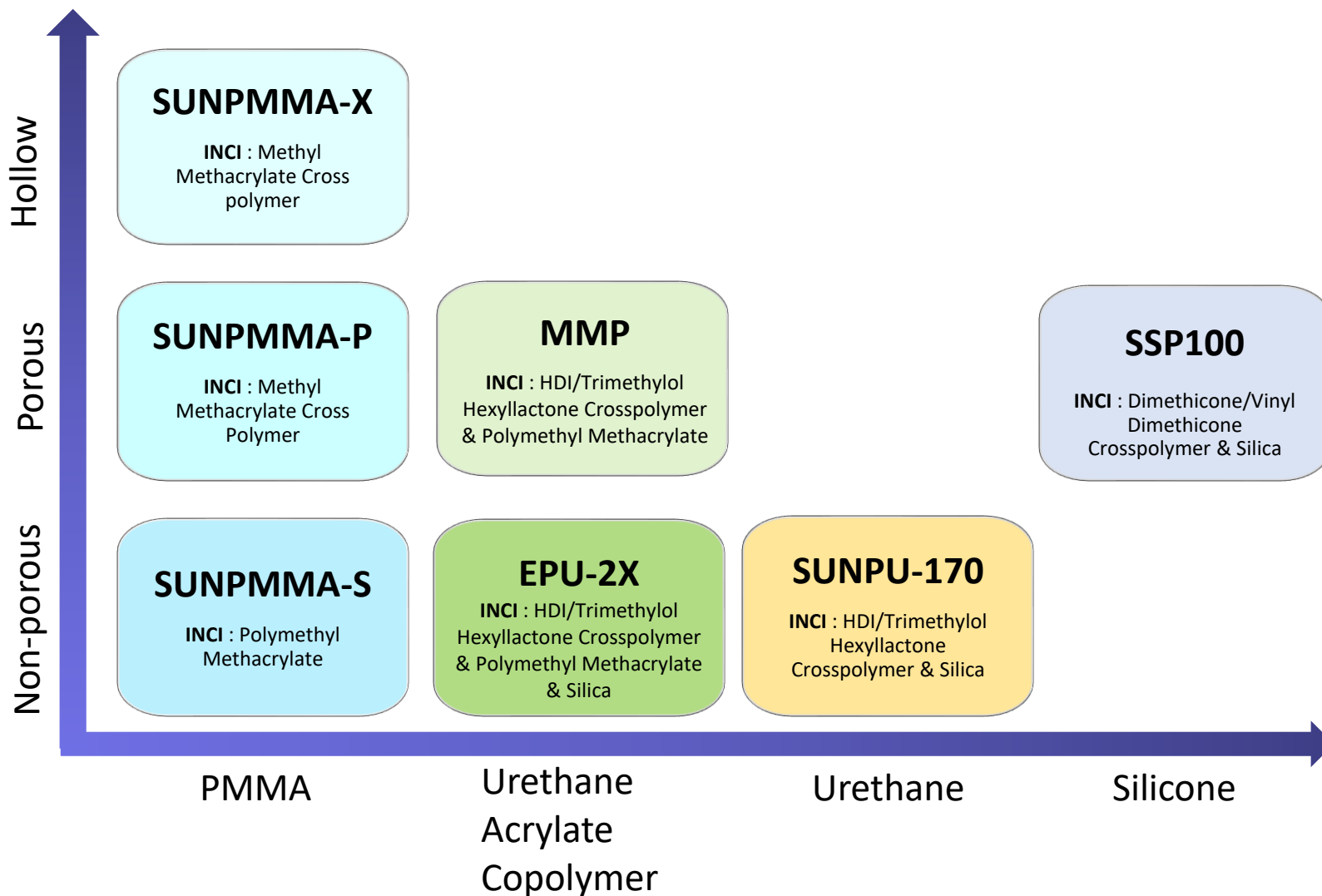
# Polymer Bead

**SUNJIN BEAUTY SCIENCE**

**MAR. 2020**

**Ver 1.0**

# Polymer Bead Overview



# Polymer Bead

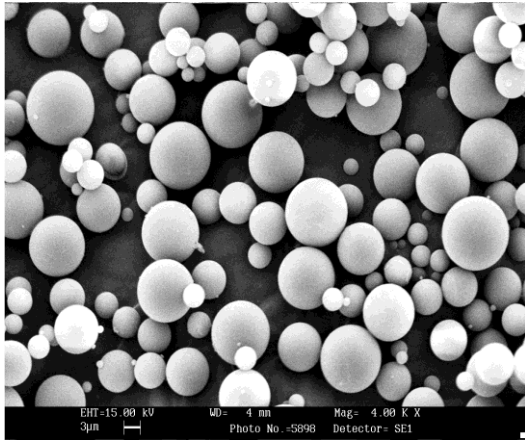
| Product                    | INCI Name  | Particle Size<br>( $\mu\text{m}$ ) | Shape     | Color | Oil Absorption |
|----------------------------|--|------------------------------------|-----------|-------|----------------|
| <b>Spherical PMMA</b>      |  |                                    |           |       |                |
| SUNPMMA-S                  | Polymethyl Methacrylate  | 7                                  | Spherical | White | 0.45           |
| SUNPMMA-S PLUS             | Polymethyl Methacrylate  | 13                                 | Spherical | White | 0.45           |
| SUNPMMA-V                  | Polymethyl Methacrylate  | 25                                 | Spherical | White | 0.45           |
| <b>Porous PMMA</b>         |  |                                    |           |       |                |
| SUNPMMA-P20                | Methyl Methacrylate Cross Polymer  | 2                                  | Spherical | White | 1.4-1.9        |
| SUNPMMA-COCO130            | Methyl Methacrylate Cross Polymer  | 8                                  | Spherical | White | 1.2-1.4        |
| SUNPMMA-COCO170            | Methyl Methacrylate Cross Polymer  | 8                                  | Spherical | White | 1.6-1.8        |
| SUNPMMA-P                  | Methyl Methacrylate Cross Polymer  | 8                                  | Spherical | White | 1.7-2.1        |
| SUNPMMA-PH                 | Methyl Methacrylate Cross Polymer  | 8                                  | Spherical | White | 2.1-2.4        |
| <b>Hemi Spherical PMMA</b> |  |                                    |           |       |                |
| SUNPMMA-X                  | Methyl Methacrylate Cross polymer  | 9                                  | Spherical | White | 2.9-3.3        |
| <b>Urethane Bead</b>       |  |                                    |           |       |                |
| SUNPU-170                  | HDI/Trimethylol Hexyllactone Crosspolymer & Silica                           | 14-20                              | Spherical | White |                |
| <b>Urethane Hybrid</b>     |  |                                    |           |       |                |
| MMP                        | HDI/Trimethylol Hexyllactone Crosspolymer & Polymethyl Methacrylate          | 7                                  | Spherical | White | 1.8-2.3        |
| EPU-2X                     | HDI/Trimethylol Hexyllactone Crosspolymer & Polymethyl Methacrylate & Silica | 5                                  | Spherical | White | 0.6-1.0        |
| <b>Silicone Powder</b>     |  |                                    |           |       |                |
| SSP 100                    | Dimethicone/Vinyl Dimethicone Crosspolymer & Silica                          | 10                                 | Spherical | White | 0.7-1.0        |

# PMMA Bead

Polymer Micro Beads  
with great compatibility  
with various Thickeners



# SUNPMMA-S series



## Chemical Name

:Polymethyl Methacrylate

## INCI Name

:Polymethyl Methacrylate

## CAS No.

:9011-14-7

## SUNPMMA-S

PMMA 100%

Particle Size  
**7  $\mu$ m**

Oil Absorption  
0.45 cc/g

## SUNPMMA-S Plus

PMMA 100%

Particle Size  
**13  $\mu$ m**

Oil Absorption  
0.45 cc/g

**Better Spread  
More Silky Feel**  
Released in 2012

## SUNPMMA-V

PMMA 100%

Particle Size  
**25  $\mu$ m**

Oil Absorption  
0.45 cc/g

**Volume up for Mascara**  
Released in 2013

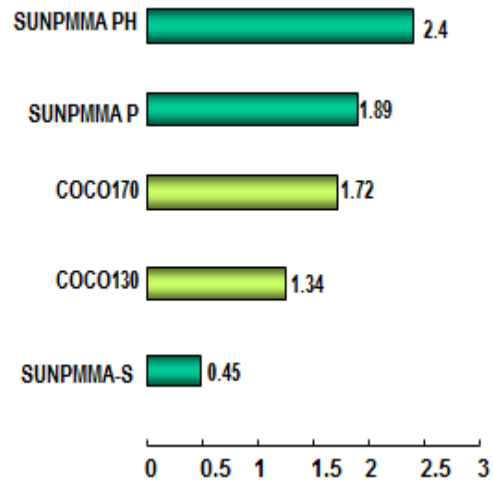
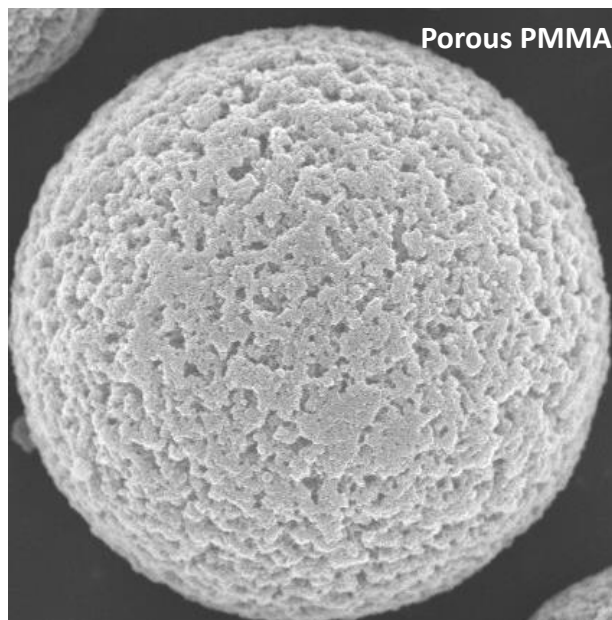
# Porous PMMA Bead

Fast Absorption  
& Selective Sebum  
Absorption



# Porous PMMA Beads

| Grade           | INCI                              | Avg. Particle size( $\mu\text{m}$ ) | Oil Absorption (cc/g) |
|-----------------|-----------------------------------|-------------------------------------|-----------------------|
| SUNPMMA-COCO130 | Methyl Methacrylate Cross Polymer | 8                                   | 1.2~1.4               |
| SUNPMMA-COCO170 | Methyl Methacrylate Cross Polymer | 8                                   | 1.6~1.8               |
| SUNPMMA-P       | Methyl Methacrylate Cross Polymer | 8                                   | 1.7~2.1               |
| SUNPMMA-PH      | Methyl Methacrylate Cross Polymer | 8                                   | 2.1~2.4               |

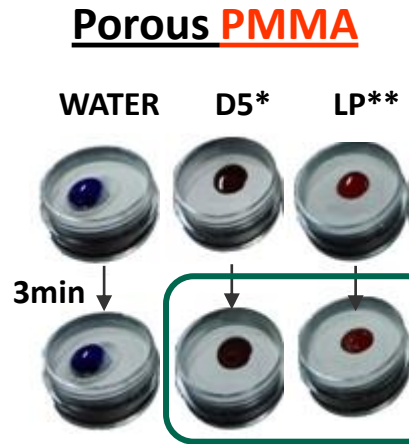


# Selective Oil Absorption

Porous PMMA,  
especially good for

- Sebum control skin care
- **Men's skin care**

For its excellent feel  
and spread **without  
skin dryness**



Porous PMMA absorbs  
oils fast but not water



Porous Silica absorbs oils  
& water fast

→ Skin feels dry

**Selective Sebum  
Absorption for  
Skin Care**

\*D5:Cyclomethicone

\*\*LP: Liquid Paraffin



# Selective Sebum Absorption

4% powder in lotion



Squalene applied skin



Aluminum Starch

Corn Starch

Rice Starch

SUNSIL-130



SUNSIL-OLEO130



SUNPMMA-P

SUNPMMA-S

Lotion Base



# SUNPMMA-X: Hemi-Spherical PMMA Beads

Pore minimizer  
For Skin Care



# SUNPMMA-X Hemi-spherical

**Particle size:**

9 $\mu$ m

**Oil absorption:**

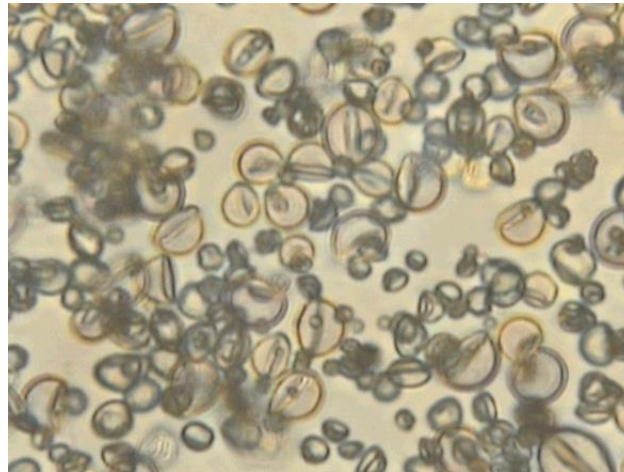
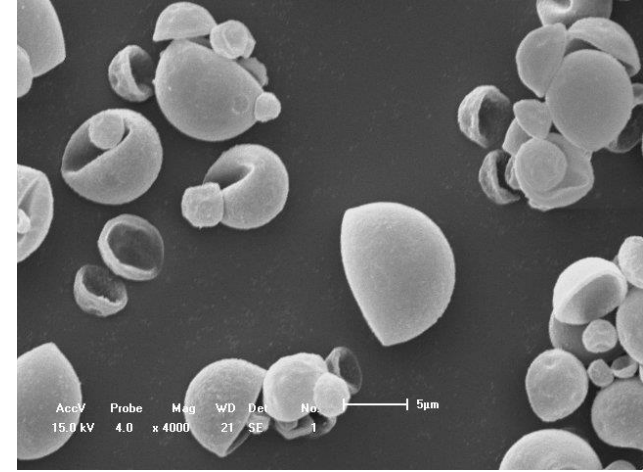
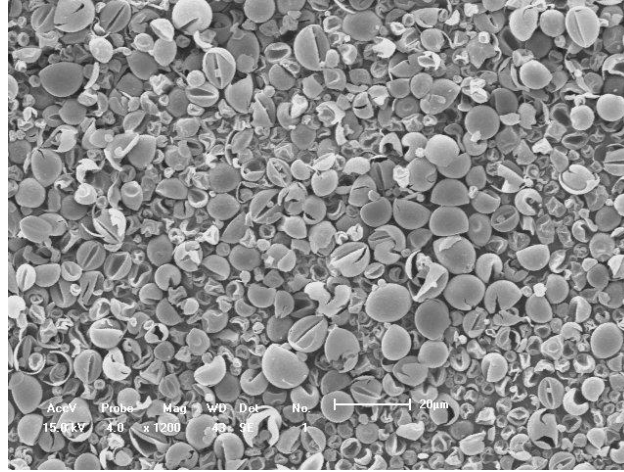
2.9~3.3cc/g

**INCI:**

Methyl Methacrylate  
Crosspolymer

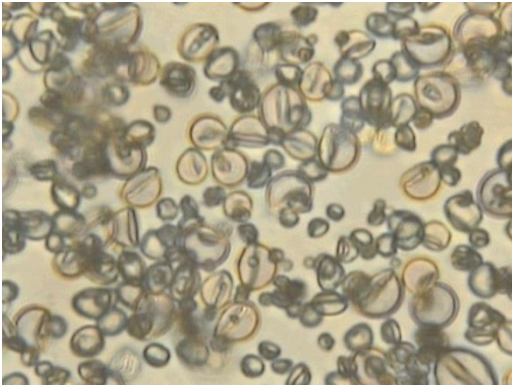
**Benefits:**

Cushion Feel  
Rolling & Skin Adhesion  
Great Pay Off  
Excellent Spreadability



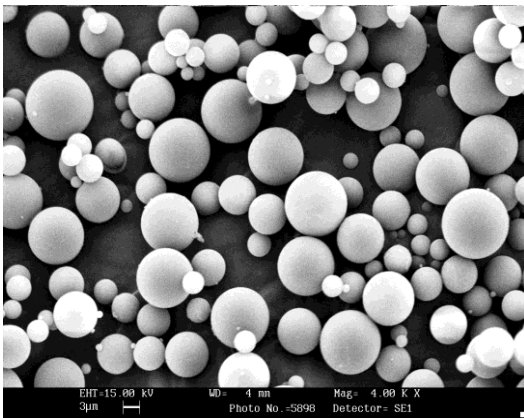
# Pore minimizer Studio test

SUNPMMA-X



Particle size: 9um  
Oil Absorption: 2.9~3.3cc/g

SUNPMMA-S



Particle size: 7um  
Oil Absorption: 0.45cc/g

2015\_Pore minimizer Primer

| Trade Name                            | %          |
|---------------------------------------|------------|
| GCM-5                                 | 60.5       |
| PS-2000                               | 5          |
| 200 Fluid, 0.65cs                     | 10         |
| 200 Fluid, 2cs                        | 15         |
| <b>SUNPMMA-X<br/>or<br/>SUNPMMA-S</b> | <b>7.5</b> |
| PMSQ                                  | 2          |

Opaque



Translucent



# Test Results



SUNPMMA-X applied



SUNPMMA-S applied



# Why Hemi-spherical?

1. Cushion Feel



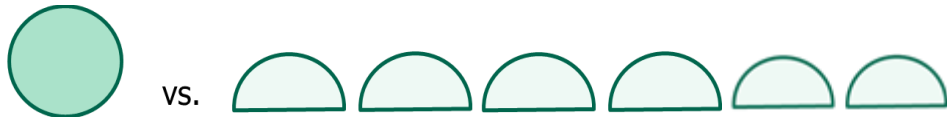
2. Rolling & Adhesion



3. Double Pay off by hemi-spherical shape



4. 6X Pay off by Bulky nature of PMMA-X



**PMMA-S**  
0.4~0.6cc/g

Oil absorption  
Capacity

**PMMA-X**  
2.9~3.3cc/g

5. Better Compressibility due to hemi-spherical shape



# Pressed Powder with 5% of [SUNPMMA-X](#)

|   | PRODUCT NAME      | #1         | #2         |
|---|-------------------|------------|------------|
| A | <b>SUNPMMA-X</b>  | 0          | <b>5.0</b> |
|   | <b>SUNPMMA-S</b>  | <b>5.0</b> | 0          |
|   | SUNTALC-AS        | 40.0       | 40.0       |
|   | SUNSERI-AS        | 22.6       | 22.6       |
|   | SUNMICA-AS        | 10.0       | 10.0       |
|   | SUNTITAN-AS       | 7.0        | 7.0        |
|   | Aluminum Stearate | 3.0        | 3.0        |
|   | SUNIOR-AS         | 0.3        | 0.3        |
|   | SUNIOB-AS         | 0.1        | 0.1        |
|   | SUNIOY-AS         | 1.0        | 1.0        |
| B | DC-200F-100cs     | 9.0        | 9.0        |
|   | DC-200F-10cs      | 2.0        | 2.0        |
|   | total             | 100%       | 100%       |



**Big Difference!**

# Why Hemi-spherical?

1. Cushion Feel



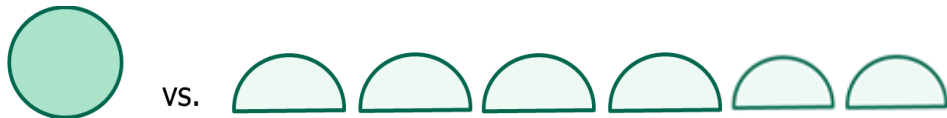
2. Rolling & Adhesion



3. Double Pay off by hemi-spherical shape



4. 6X Pay off by Bulky nature of PMMA-X



**PMMA-S**  
0.4~0.6cc/g

Oil absorption  
Capacity

**PMMA-X**  
2.9~3.3cc/g

5. Better Compressibility due to hemi-spherical shape





# SUNPU-170: Urethane Bead

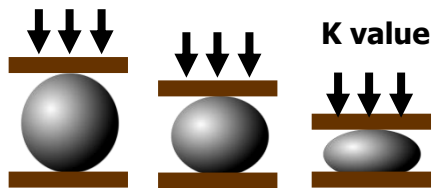
## Instant Elasticity

The most elastic polymer bead  
from SUNJIN



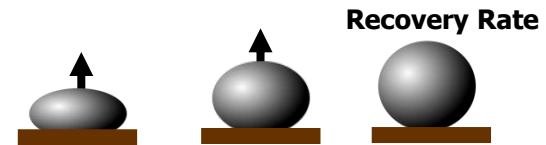
# How to measure **SOFTNESS** and **ELASTICITY** of Micro Beads?

## K value for Softness



*The lower K value,  
the softer*

## Recovery Rate for Elasticity



*The higher recovery rate value,  
the more elastic*

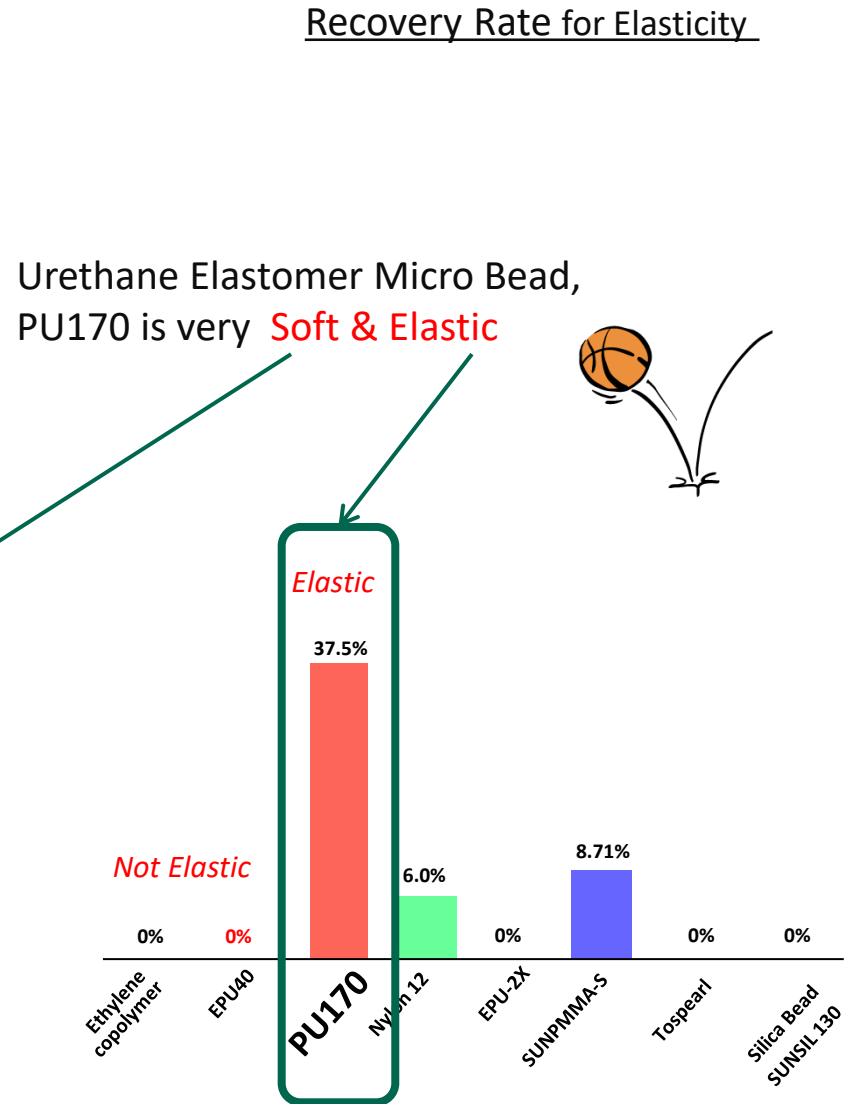
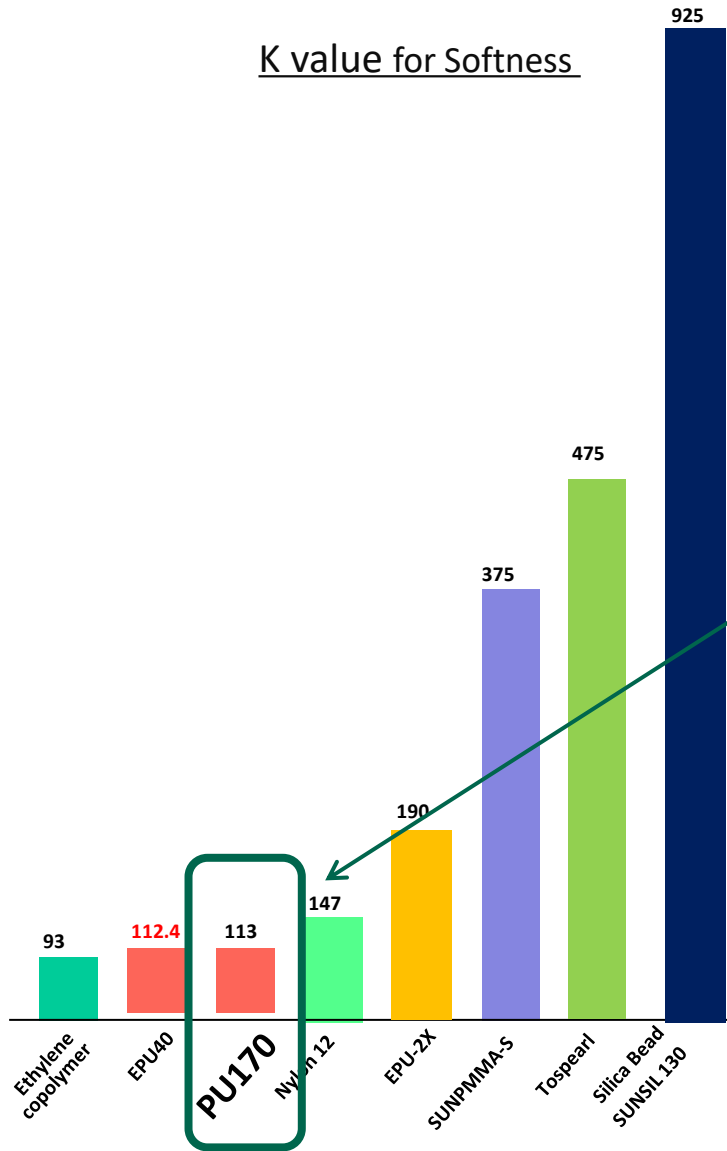


*One particle of each powder type was  
exposed to compression.  
Pressure necessary for 10% deformation of  
the particle was measured.*

*(Measuring Tool:*

*Shimadzu **Micro Compression  
Testing Machine** MCTM-500)*

# K value & Recovery Rate



# SUNPU 170 : Urethane Bead

## Particle size:

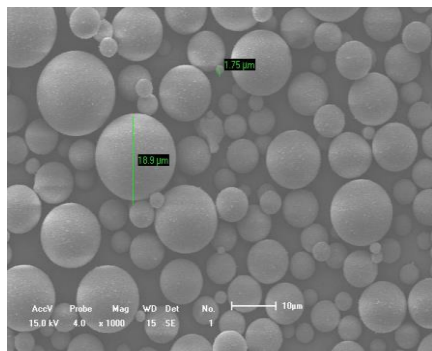
17um

## INCI:

HDI/Trimethylol Hexyllactone  
Crosspolymer & Silica

## Urethane bead for Premium skin care

Urethane Bead is an excellent choice for **skin care** application due to its unique optical blurring effect and **elegant texture**



| Grade     | Descriptions  | Avg. Particle size(μm) | Hardness |
|-----------|---------------|------------------------|----------|
| SUNPU-170 | Urethane Bead | 14~20                  | Soft     |

## Best recommend for **SKIN CARE**

### (1) Anti Wrinkle Cream

- ...Instantly see up to a 29% reduction in fine, dry lines. Skin is luminous.

### (2) Eye Care Cream

- "...The density, **elasticity** and firmness of your skin are preserved...Fine lines are smoothed out..."

### (3) Moisturizing Lotion

- ELASTICITY gives moisturizing feel
- "Skin is left feeling velvety smooth..."

### (4) Night Cream

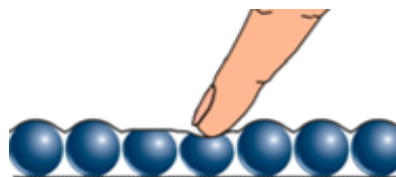
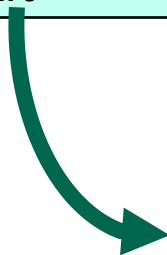
- An intensive action cream, developed to meet the special needs of the skin at night, The density, elasticity and firmness of your skin are preserved...Fine lines are smoothed out



# Urethane Bead for Skin Care

2016 W/S Wrinkle Reduction Cream ver1.0

| Phase | Trade Name          | INCI Name  | %         |
|-------|---------------------|--|-----------|
| A     | KF-995              | Cyclomethicone   | 14.5      |
|       | Gransil ORB-2       | Dimethicone & Cyclopentasiloxane & Polysilicone-11 & Nylon-12 & Silica & PEG-10 Dimethicone & Polysorbate 40 & Isohexadecane & Ammonium Polyacryloyldimethyl Taurate | 44.6      |
|       | KF-6017             | PEG-10 Dimethicone   | 0.9       |
| B     | D.I water           | Water  | 18        |
|       | 1.3 B.G             | 1,3-butylene glycol  | 4.6       |
| C     | Marsh Mallow Powder | HDI/Trimethylol Hexyllactone Crosspolymer & Polymethyl Methacrylate  | 3         |
|       | SUNSIL-20           | Silica   | 1         |
|       | JH-BLUE             | Titanium dioxide & Mica & Polymethyl methacrylate  | 0.4       |
|       | <b>SUNPU-170</b>    | <b>HDI/Trimethylol Hexyllactone Crosspolymer &amp; Silica</b>  | <b>13</b> |



**Elegant & Elastic**  
**Luxurious Texture**



## EPU-2X: Urethane Acrylate Bead

Press, pay off,  
intense color For  
eye shadow



# Trade off between Press and Pay-off

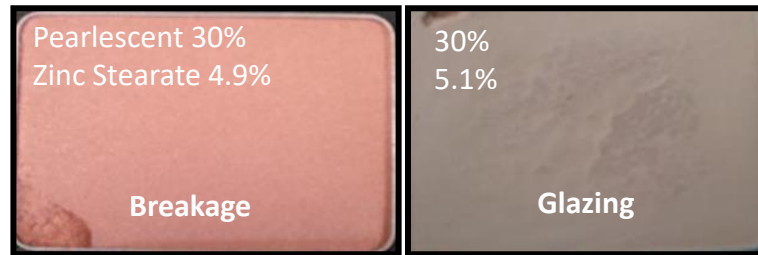
When to make pressed powders, delicate balance between press and pay off is crucial

This is typical trade-off situation



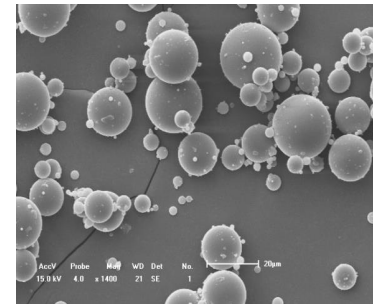
## Challenge:

“TO PRESS or TO PAY-OFF, that is the question”

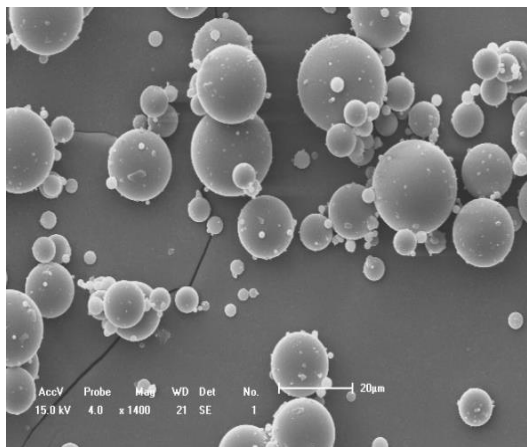


## Solution:

**EPU-2X**, micro polymer bead from SUNJIN can increase both **Pressability and Pay-off** of pressed powder **at the same time**



# EPU-Series: Urethane Acrylate Bead



## INCI Name:

HDI/Trimethylol Hexyllactone  
Crosspolymer & Polymethyl  
Methacrylate & Silica

## EPU-2X

Urethane Acrylate  
Silica

### Particle Size

5  $\mu\text{m}$

- The most compressible Polymer Bead
- **Even better than Talc**

*Most  
compressible*

## EPU-40

Urethane Acrylate  
Silica

### Particle Size

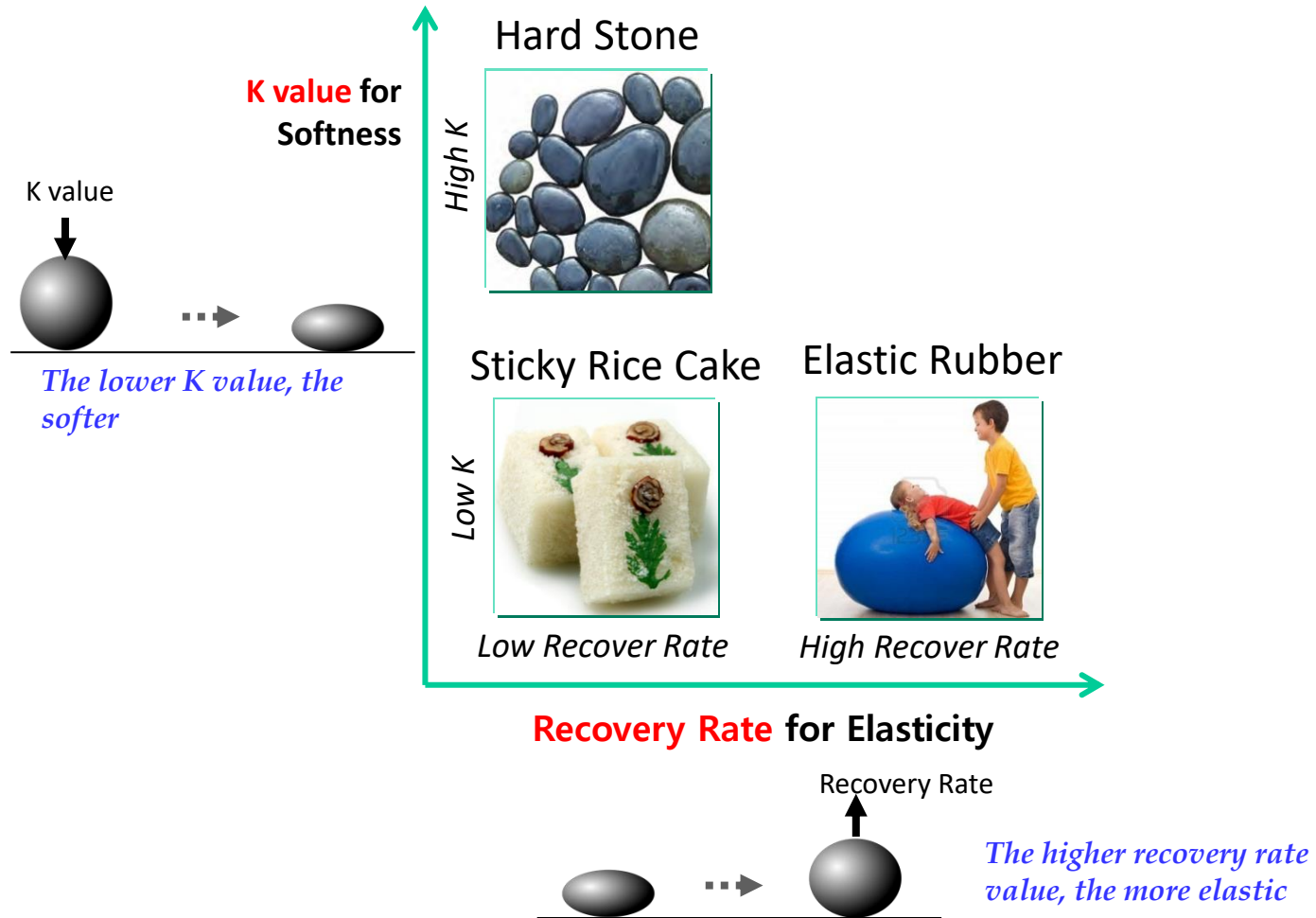
7  $\mu\text{m}$

- The softest
- Great Spread

*Creamier &  
Softer*

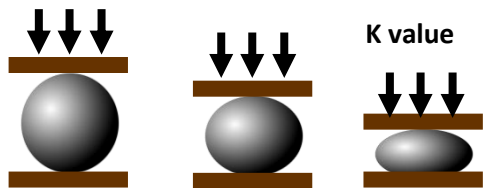


# Which one would be most compressible?

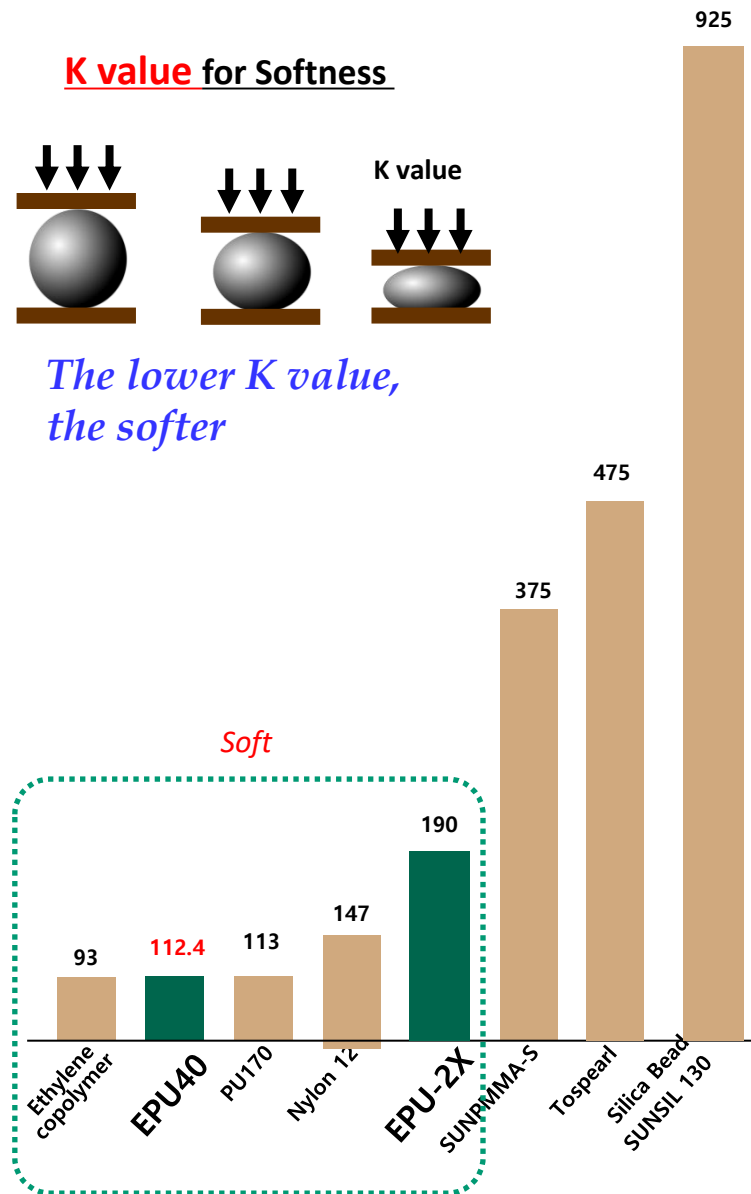


# How to measure **SOFTNESS** and **ELASTICITY** of Micro Beads?

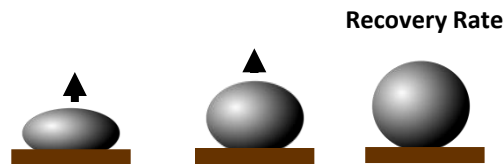
## K value for Softness



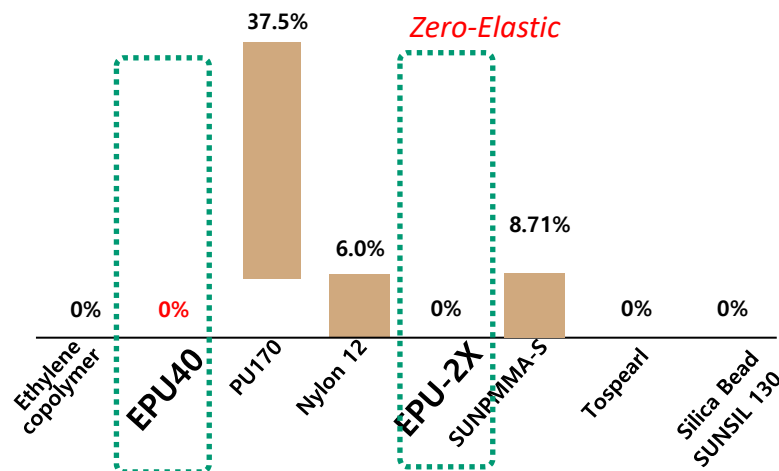
*The lower K value, the softer*



## Recovery Rate for Elasticity



*The higher recovery rate value, the more elastic*



# EPU-2X, as pressable as Talc?

## 3g of Tested Samples

1. EPU-2X
2. EPU 40
3. Ethylene copolymer
4. Nylon 12 Powder
5. Urethane Bead
6. PMMA Bead
7. SILICA Bead
8. TALC

### Pressing Condition

Pressure : 70 kg/cm<sup>2</sup>

Time : 7 sec



### Drop Test:

Height : 30cm



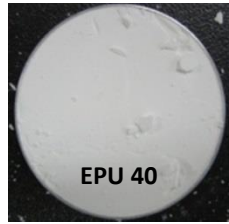
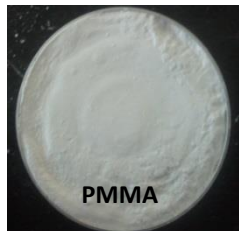
<https://www.youtube.com/watch?v=-Hx1iVTr3E0>

This study was done together with Aston Chemical on August 2016



# Drop Test Result

1 Time → 2 Times → 3 Times →



12 Times →



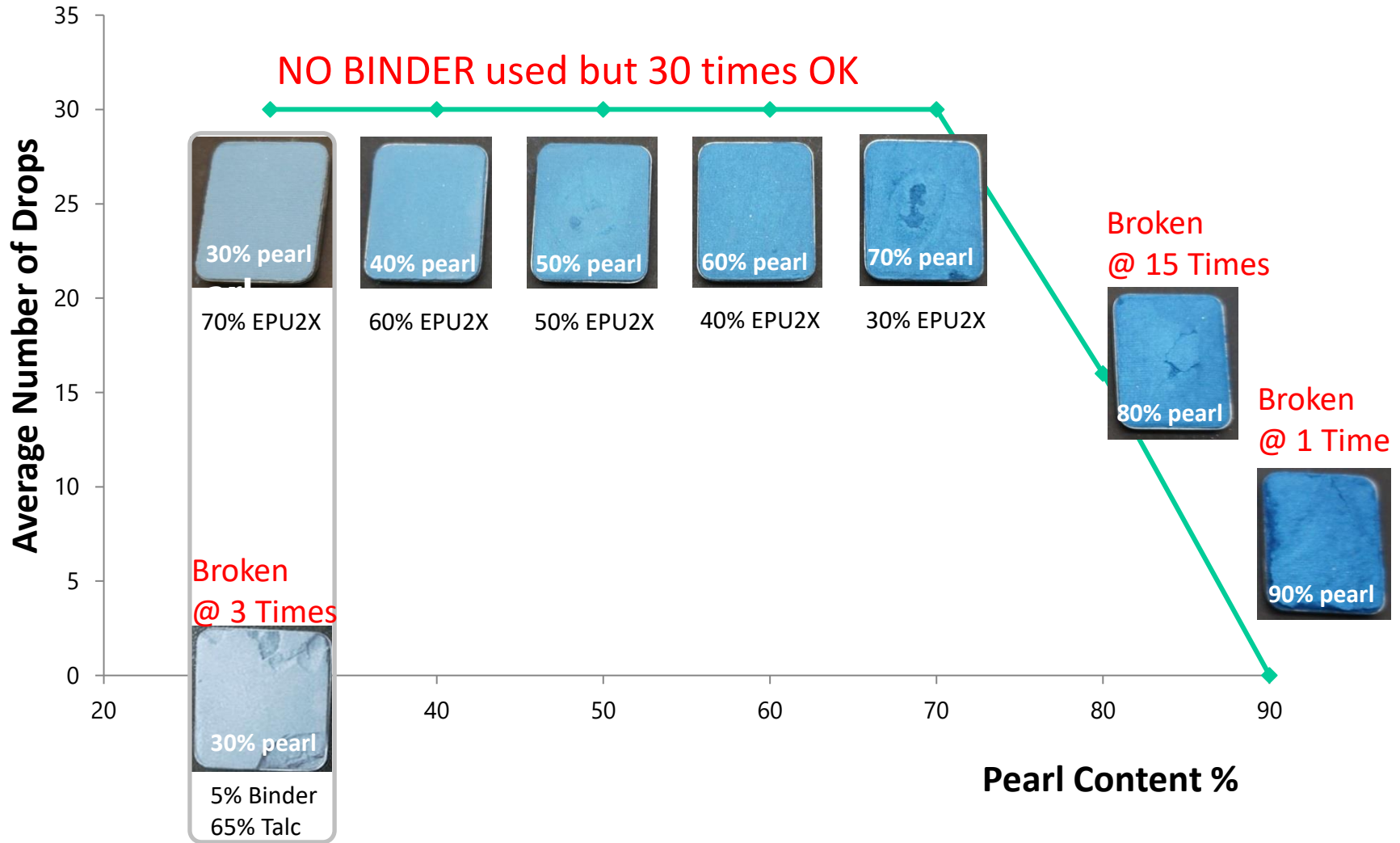
30 Times Drops still OK →



EPU-2X,  
much better than Talc

# Eye shadow 70% Pearl 30% EPU-2X

## 30 times Drop Test OK



## EPU-2X

for better color intensity @ Eye Shadow

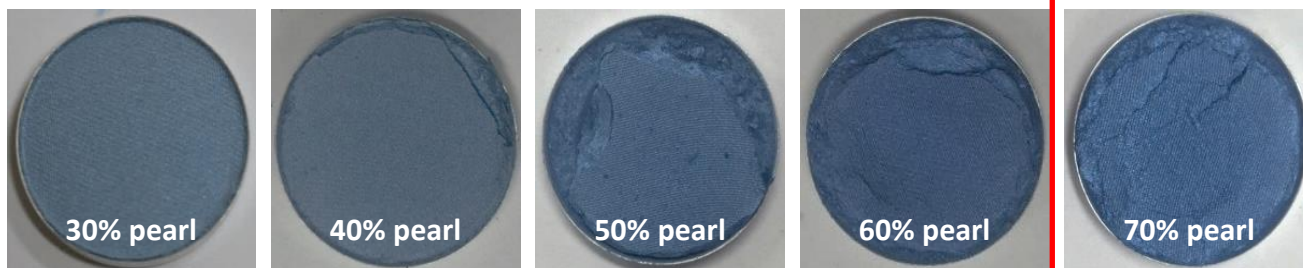


# Case Study: Eye Shadow with EPU-2X vs. Talc

**EPU-2X**



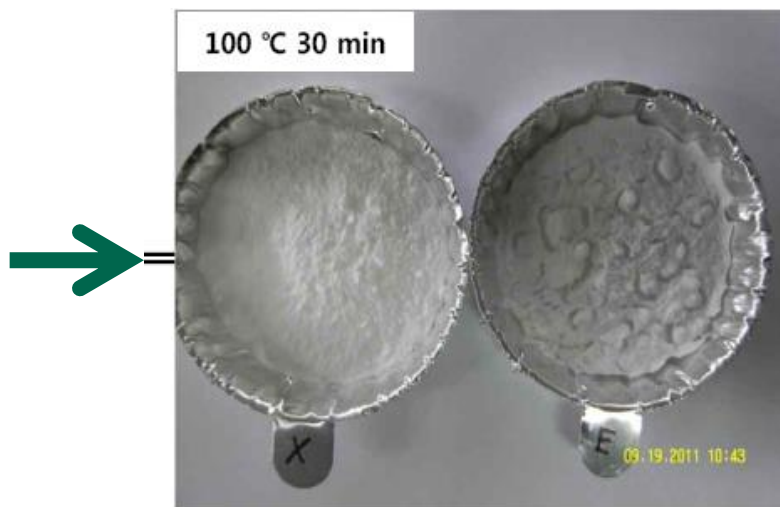
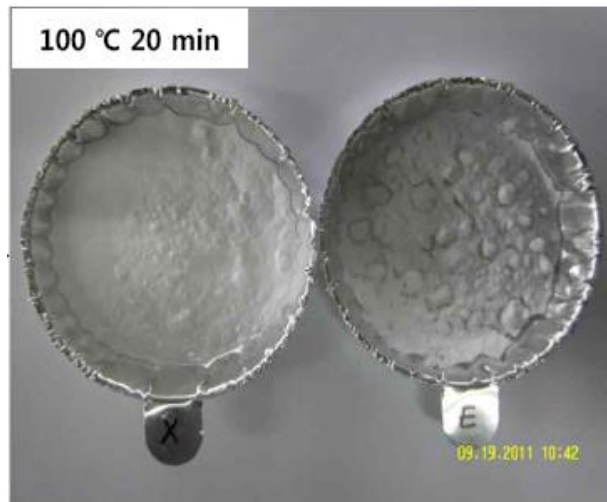
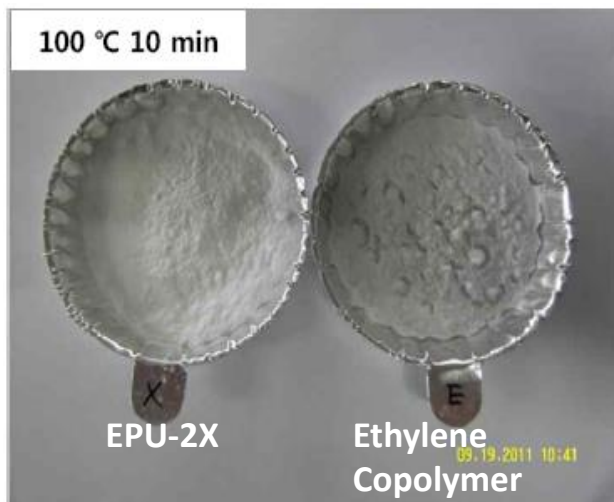
**Talc**



**Color intensity**

**Difference**

# EPU-2X Heat Stable





# Applications of EPU-2X

1

## **Pearl 40% more eye shadow**

**EPU-2X** enables you to make an eye shadow with pearlescent 40% inside



2

## **Talc Free Premium Pressed Powder**

It's almost impossible to make pressed powders without talc  
But if you take out talc, the touch of pressed powder will differ remarkably



3

## **Baked Powder(Terracotta)**

If your terracotta breaks up too often, you need **HEAT STABLE EPU-2X** to improve compressibility of baked powders



4

## **Less glazing, better pay off**

Use less metal soap or oil binder, put more EPU-2X  
Metal soap free or Oil binder free can be enabled

# Marsh Mallow Powder

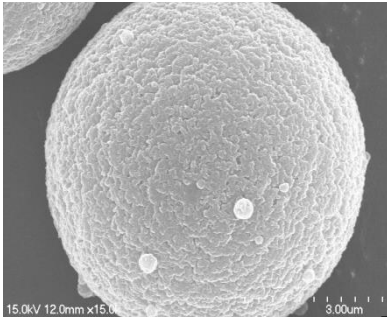
New in 2014

Soft  
Elastic  
Porous  
Like Marsh Mallow



# 3 in 1 : Marsh Mallow Powder

Marsh Mallow Powder



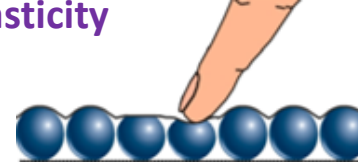
**Urethane Acrylate**

**Elastic**

**Porous**

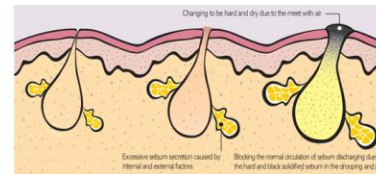
**Soft**

## Instant Elasticity



## Selective Sebum Control

only absorbs oil not moisture



## Fast Absorption Effect

Porous Polymer Bead makes cosmetic layer disappear quickly during application

INCI Name: HDI/Trimethylol  
Hexyllactone Crosspolymer &  
Polymethyl Methacrylate &  
Silica

# Marsh Mallow Powder @ UL Knowledge center

## Encourage Skin Care with Sunscreen Sensorial Modifiers

Posted on July 20, 2018 by [Lucas Portilho](#) — 5 comments



Most sunscreens leave an extremely oily sensorial effect on the skin, which does not encourage people to apply as much, or as often as they should. According to the Skin Cancer Foundation<sup>1</sup>, an ... [\[Read More...\]](#)

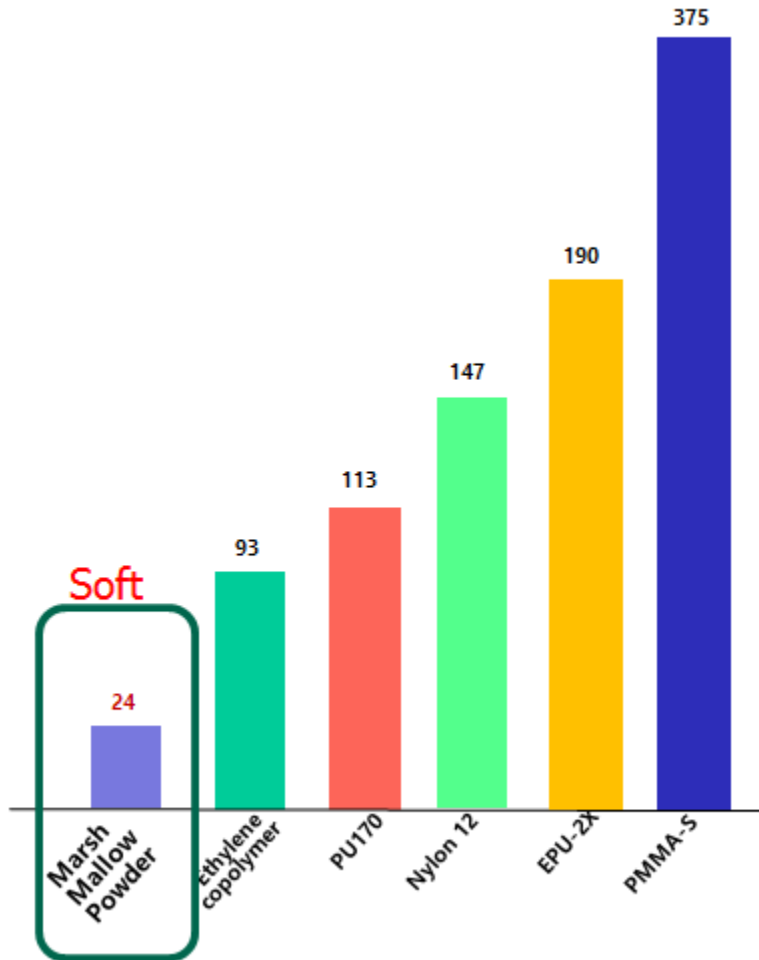
### About Lucas Portilho

Lucas Portilho is a cosmetology expert with [IPUPO](#), the union of high-level professionals who currently work in the cosmetic markets throughout Brazil. Their main objective to bring and share knowledge to enable health professionals through updated teaching methods at the highest level.

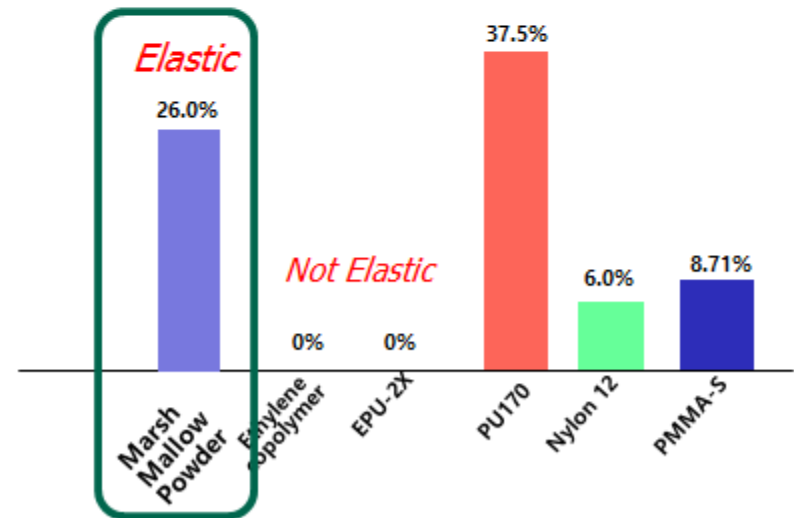
**PROSPECTOR®**

# Marsh Mallow Powder

K value for Softness

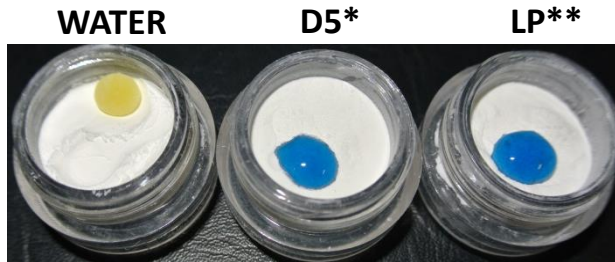


Recovery Rate for Elasticity



# Selective Sebum Absorption

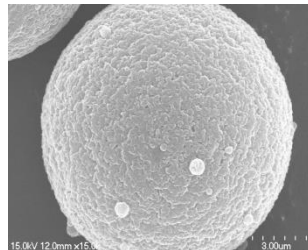
## Marsh Mallow Powder



3min



Marsh Mallow selectively absorbs oils over water



## Porous Silica



3min



Porous Silica absorbs oils & water fast

→ Skin feels dry

## Selective Sebum

## Absorption

\*D5:Cyclomethicone

\*\*LP: Liquid Paraffin

# Spreadability of MMP



SSP100

SUNJIN  
SILICONE  
POWDER





# SSP 100: Sunjin Silicone Powder

**Particle size:**

10 $\mu$ m

**Oil absorption:**

LP: 0.77 cc/g

D5: 3.77 cc/g

**INCI:**

Dimethicone/Vinyl

Dimethicone Crosspolymer &

Silica

**Benefits:**

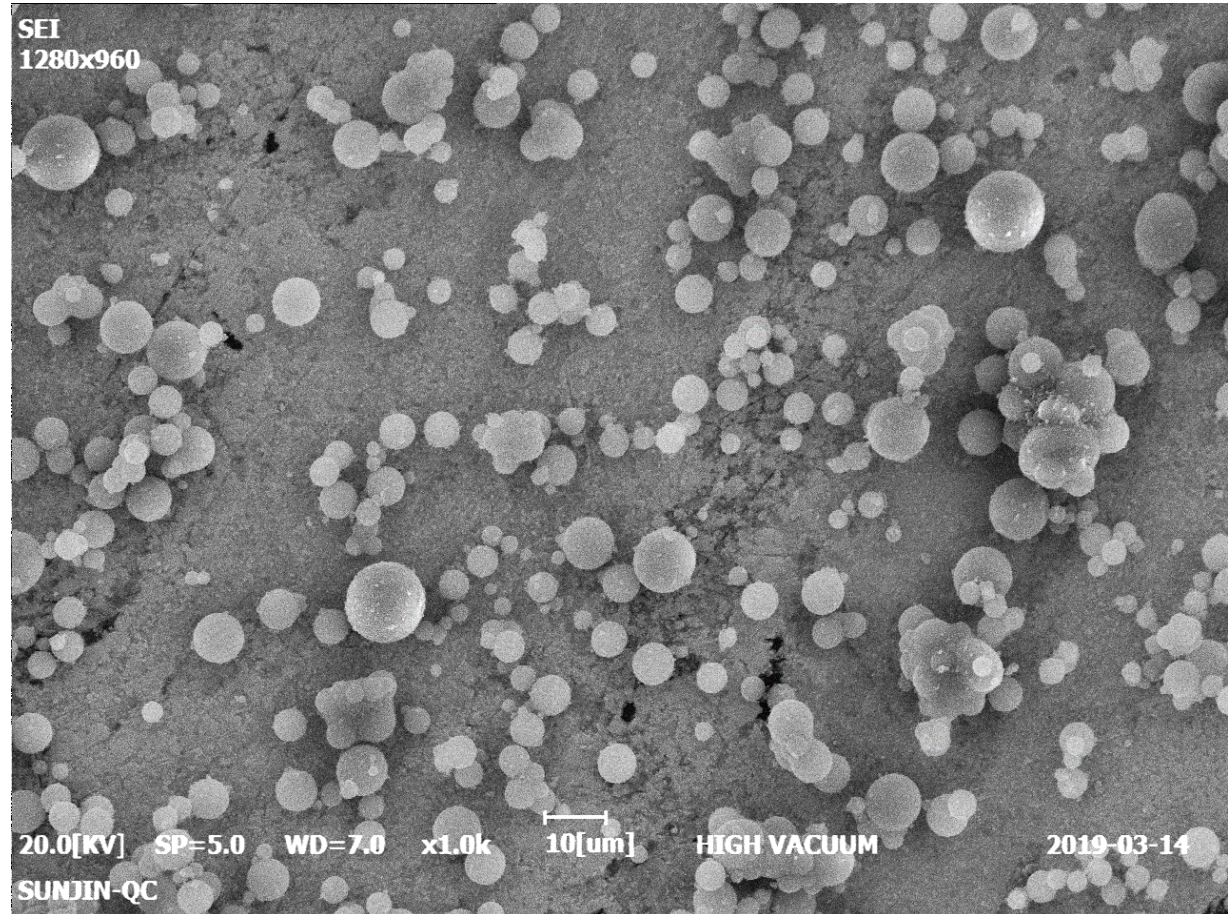
Silky skin feeling

Silicone absorbing powder

Thickening Properties

Fill in lines and pores

Matte effect



# Matte, Less Sticky from SUNJIN SPF50+ **PA4+**

## SJF-1821\_Light touch Sun Stick SPF50+ **PA++++\_ver.2.0**

| Phase | Trade Name            | INCI   | %   | Maker                  |
|-------|-----------------------|--|-----|------------------------|
| A     | SF1000N-6cst          | Dimethicone  | 20  | KCC                    |
|       | Bergacare EM-CO       | Cetyl Ethylhexanoate   | 10  | Berg+Schmidt           |
|       | Hemi-Squalane         | C <sub>13-16</sub> Isoparaffin   | 9.8 | Aprinova               |
|       | Tocopheryl Acetate    | Tocopheryl acetate   | 0.3 |                        |
|       | TPD40-AB              | C <sub>12-15</sub> Alkyl Benzoate & Titanium Dioxide & Alumina & Aluminum Stearate & Polyhydroxystearic acid | 7   | SUNJIN                 |
|       | Parsol MCX            | Ethylhexyl Methoxycinnamate  | 7   | DSM                    |
|       | Parsol EHS            | Ethylhexyl Salicylate  | 4.5 | DSM                    |
|       | Uvinul A Plus         | Diethylamino Hydroxybenzoyl Hexyl Benzoate   | 5   | BASF                   |
|       | SUNBEMT-S             | Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine   | 4   | SUNJIN                 |
|       | Performalene PL       | Polyethylene   | 9   | New Phase Technologies |
|       | Ceresin #810          | Ceresin  | 1.5 | S&P                    |
|       | Ozokerite Wax SP1020P | Ozokerite  | 3.7 | S&P                    |
|       | Bergacare SB          | Shea Butter  | 1   | Berg+Schmidt           |
| B     | <b>SSP100</b>         | Dimethicone/Vinyl Dimethicone Crosspolymer & Silica  | 5   | SUNJIN                 |
|       | Marsh Mallow Powder   | HDI/Trimethylol Hexyllactone Crosspolymer & Polymethyl Methacrylate  | 5   | SUNJIN                 |
|       | SUNSIL-OLEO130        | Silica & Cetyl alcohol   | 7   | SUNJIN                 |
| C     | Fragrance             | Fragrance  | 0.2 |                        |