

# Water Phase UV Filters: Hybrid PMMA series

5 $\mu$ m PMMA bead with  
UV filters 45% inside  
For Water Phase



# New Hybrid PMMA series in 2016



**Core: Chemical UV Filters**  
For UV protection

**Shell: PMMA Bead**

- 1) For Sensorial Modification
- 2) Oil soluble UV filters can be used into water phase

*New in 2016*

## Hybrid AE

### Composition

PMMA	55%
Avobenzone*	30%
EHT***	15%

### Particle Size

5  $\mu$ m

**UVA** Protection  
**UVB** Protection

*New in 2016*

## Hybrid E

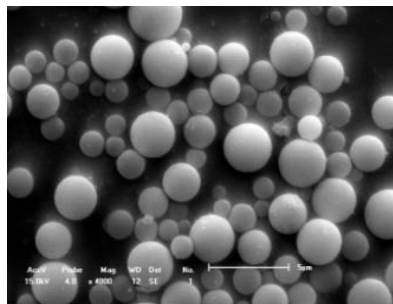
### Composition

PMMA	65%
EHT**	35%

### Particle Size

5  $\mu$ m

**UVB** Protection



\*Avobenzone: Butyl Methoxy dibenzoylmethane(BMDBM)

\*\*EHT: Ethyl Hexyl Triazone

# Hybrid AE

## Hybrid AB

### Composition

PMMA 70%  
Avobenzone\* 30%

### Particle Size

5 um

### **UVA** Protection

\*Avobenzone:  
Butyl Methoxy  
dibenzoylmethane(BMDBM)

## Hybrid EHT

### Composition

PMMA 70%  
EHT\*\*\* 30%

### Particle Size

5 um

### **UVB** Protection

\*\*\*EHT:  
Ethyl Hexyl Triazone

*New in 2016*

## Hybrid AE

### Composition

PMMA 55%  
Avobenzone 30%  
EHT 15%

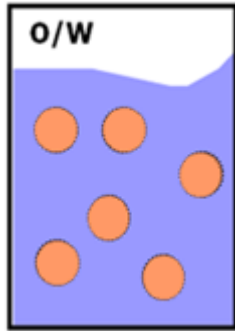
### Particle Size

5 um

**Better UVA** Protection  
UVB Protection

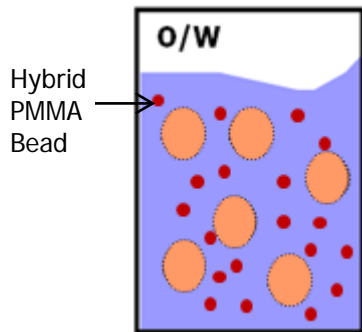


# UVA filter in water phase



Most UV filters are either oils or need to be dissolved in polar emollients. The results are highly loaded oil phases, which lead to the most common limitations in Sun Care formulations

- Reduced cosmetic elegance
- Lower flexibility to modify the sensory properties of formulations
- Suboptimal performance due to the use of filters mainly in one formulation phase



## **Hybrid PMMA, water dispersible, can be incorporated in the water phase**

The use of Hybrid PMMA allows a balanced incorporation of UV filters in the water and oil phase. Therefore, a more homogeneous distribution of the UV filters on skin can be achieved which often result in a boosting effect

Through incorporation into water phase, Hybrid PMMA offers increased formulation flexibility. Lower UV filter concentration is needed in the oil phase to achieve highest contribution to SPF and UVA-PF

# Hybrid EHT 5%

## SJF-1212-EXTRA LIGHT Daily Sun Lotion-O/W-ver2.6

Phase	Product Name	%
A	Water	47.5
	Carbomer	0.2
	1.3 BG	3.0
	Glycerin	1.5
	DC2501 WAX	1.0
	Parsol HS	1.5
B	DC 345	4.5
	ARACEL 165	1.5
	Phtassium cetyl phosphate	1.5
	Tocopheryl acetate	0.3
	BMDBM	0.0
	Parsol MCX	7.5
	Parsol 340	1.0
	Parsol EHS	5.0
	Parsol HMS	4.0
Uvinul T150	1.0	
D	SUNSIL-TIN50	0.0
	Hybrid AB	15.0
	Hybrid EHT	
E	Ethanol (98%)	5.0



%
50.5
0.2
3.0
1.5
1.0
1.5
4.5
1.5
1.5
0.3
0.0
7.5
1.0
5.0
4.0
1.0
0.0
12.0
0.0
5.0

%
45.5
0.2
3.0
1.5
1.0
1.5
4.5
1.5
1.5
0.3
0.0
7.5
1.0
5.0
4.0
1.0
0.0
12.0
5.0
5.0

**In-vivo SPF52**  
**In-vivo PA8.0**

**SPF52**  
**PA7.3**

**SPF58**  
**PA8.5**

**Surprisingly Hybrid EHT increased SPF and PA**



# The Rise of Hybrid AE

## SJF-1212-EXTRA LIGHT Daily Sun Lotion-O/W-ver2.7

Phase	Product Name	%		%
A	Water	45.5		50.5
	Carbomer	0.2		0.2
	1.3 BG	3.0		3.0
	Glycerin	1.5		1.5
	DC2501 WAX	1.0		1.0
	Parsol HS	1.5		1.5
B	DC 345	4.5		4.5
	ARACEL 165	1.5		1.5
	Phtassium cetyl phosphate	1.5		1.5
	Tocopheryl acetate	0.3		0.3
	BMDBM	0.0		0.0
	Parsol MCX	7.5		7.5
	Parsol 340	1.0		1.0
	Parsol EHS	5.0		5.0
	Parsol HMS	4.0		4.0
Uvinul T150	1.0		1.0	
D	SUNSIL-TIN50	0.0		0.0
	Hybrid AB (30%)	12.0		0.0
	Hybrid EHT (30%)	5.0		0.0
	Hybird AE (30+15%)	0.0		12.0
E	Ethanol (98%)	5.0		5.0

**In-vivo    SPF58**  
**In-vivo    PA8.5**



**SPF58**  
**PA8.5**

**Hybrid AB 12% + Hybrid EHT 5% = Hybrid AE 12%**



# When & How to incorporate Hybrid PMMA series?



## Melting point

BMDBM: 81~86 °C

BEMT: 80 °C

EHT: 123 °C

**Q: When?**

**A:** After emulsion, after cooling down emulsion, incorporate Hybrid PMMA at low temperature (i.e.  $<30^{\circ}\text{C}$ )

**Q: Why?**

**A:** As the Melting point of BMDBM is  $81\sim 86^{\circ}\text{C}$ , if Hybrid AB adds before emulsion, during the emulsion process, the emulsion temperature could go up more than  $81^{\circ}\text{C}$ , BMDBM becomes liquid and it would be leaked out from PMMA shell.

**Q: How to add?**

**A:** Polymer Micro Beads are slightly hydrophobic, it would be difficult to incorporate polymer beads directly into water especially without poly alcohols. Thus, premix polymer beads in poly alcohol solutions such as 1,3 Butylene Glycol or Propylene Glycol or Glycerin and add the premixed phase after emulsion.