

Additive For Film/plastic



Anti-Blocking for Film

Anti-Glare for Film

Texturing for plastic surface

Characteristic of Diasphere[®] for Additives

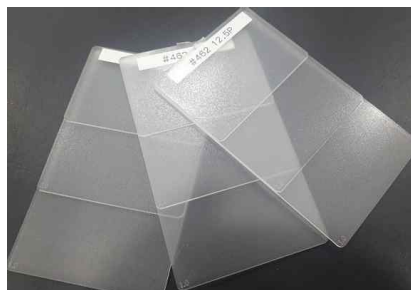
Functions

- Anti-blocking(Coefficient of friction control, Dry lubricant effect) for polyolefin films
- Anti-glare effect for various functional films
- Texturing of plastic surface for delustering unique design

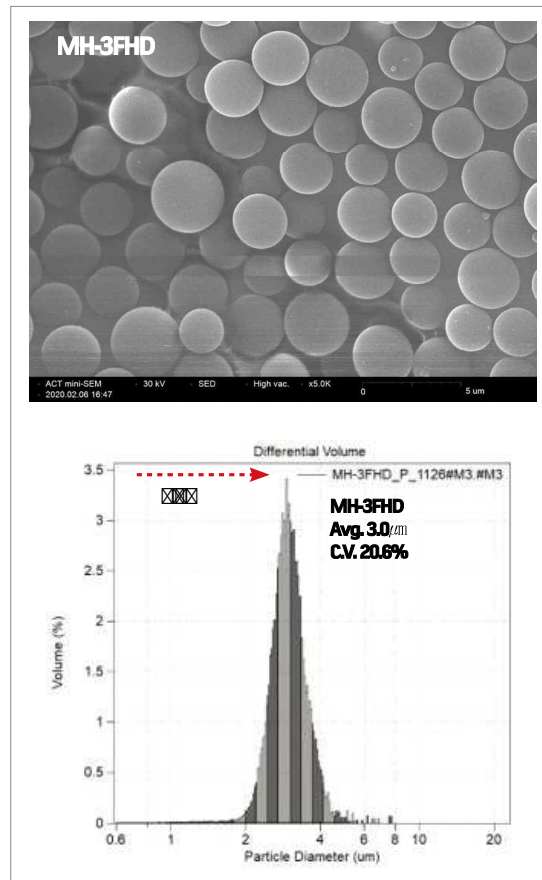
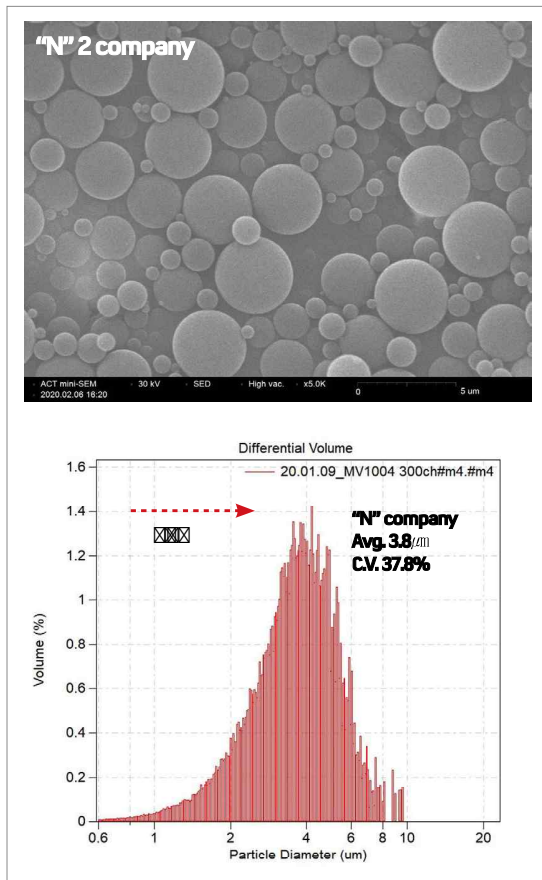
Applications

Polyolefin film(BOPP, CPP) for packaging, functional films for electronic devices and several types of plastic(PC, PS, PMMA, ABS)

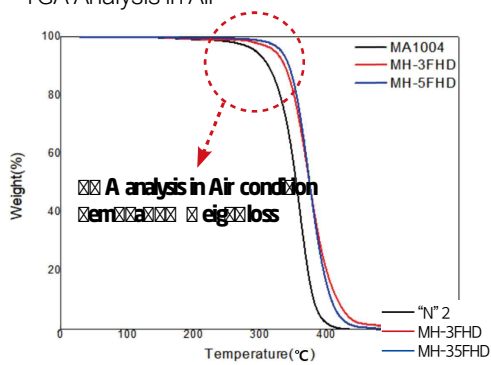
- Matting agent
- Anti blocking agent
- Anti scratch/glare agent
- Rheology control agent etc.



Comparison with competitor



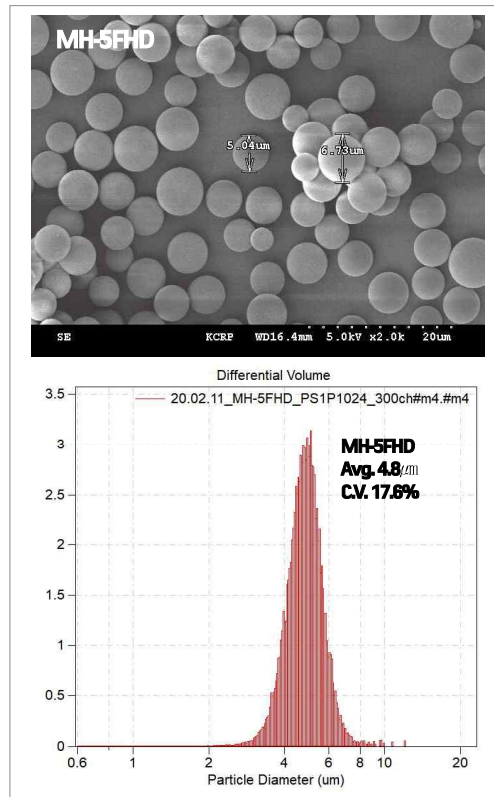
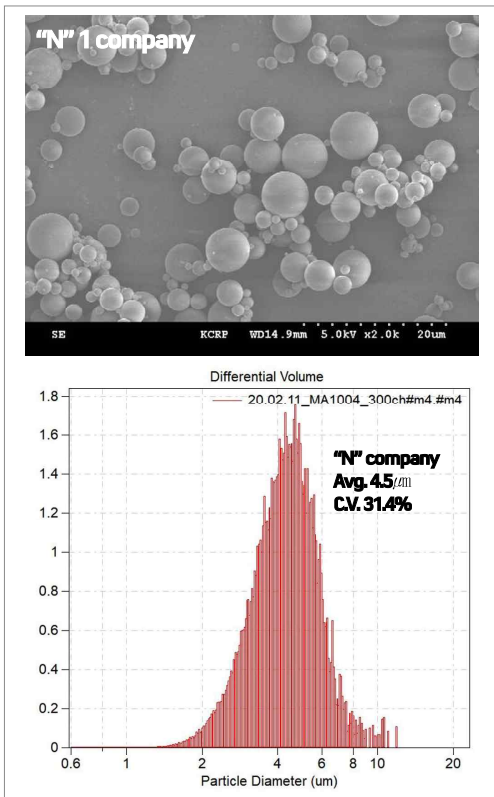
• TGA Analysis in Air



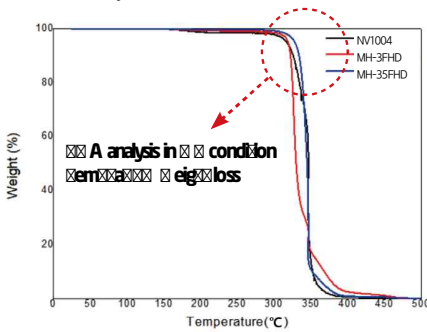
• Temp. at 3% weight loss

Grade	N ₂ (°C)	Air(°C)
"N" 1	278	
"N" 2		309
MH-3FHD	306	315
MH-5FHD	320	322

Comparison with competitor



• TGA Analysis in N₂



• Temp. at 3% weight loss

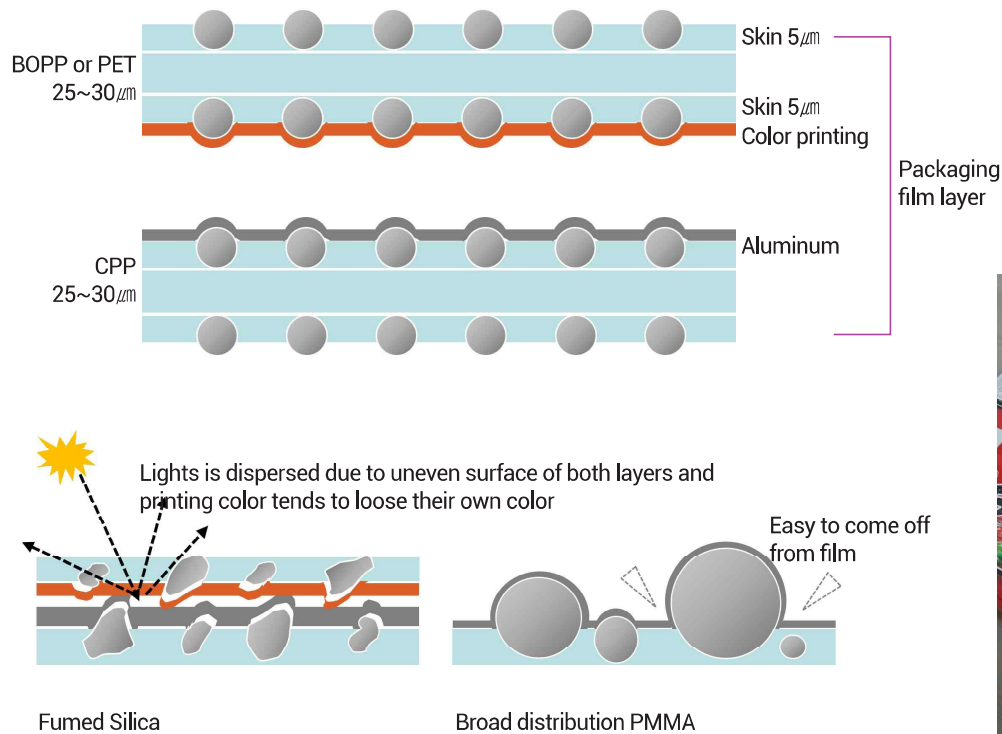
Grade	N ₂ (°C)	Air(°C)
"N" 1	278	
"N" 2		309
MH-3FHD	306	315
MH-5FHD	320	322

• Furnace test at 300°C and weight loss ratio after 10min and 20min

	Competitor "N"1	Competitor "N"2	MH-3FHD	MH-5FHD
10min at 300°C				
	1.29%	1.49%	0.6%	0.2%
20min at 300°C				
	15.45%	3.68%	1.6%	1.5%

Anti-blocking for Packaging film(BOPP and CPP)

- Very spherical polymer bead lower the static and dynamic friction value.
- Compared with competitor's PMMA and Silica, we have very narrow particle size distribution and spherical shape that leads very smooth protrusion and lower friction value.



Anti-blocking for film

- Various size and materials can be supplied for the customer's requirement.
- All of the products show the more enhanced friction coefficient.

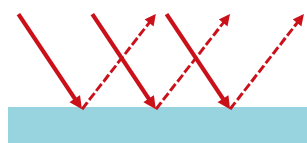
	Component	Size(μm)	Softness*	Friction**
MH-3FHD	Polymethymethacrylate	3	● 27	0.39
MH-4FHD	Polymethymethacrylate	4	● 27	0.39
MH-5FHD	Polymethymethacrylate	5	● 27	0.39
BH-5	Polybutylmethacrylate	5	○ 10.4	0.39
MS-5FHC	Polystyrene	5	● 25	0.39
KS-200C	Polymethylsilsesquioxane	2	○ 14.9	0.38
Silica	Silica	5	● 340	0.5

* Softness : Hard(●) → Soft(○), 10% compression results

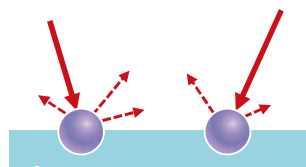
** Static friction μs (Toyoseiki, 5% dosage)

Anti-glare coating for film

- We have several types of polymer beads with different refractive index.
- Also, several size polymer beads can be used for Anti-glare effects.



Regular reflection



Diffuse reflection for **Anti glare effect**

Recommended anti-glare agent

Grade	Particle size	C.V.	Refractive index
MH-3FHD	3 μm	< 25%	1.49
MH-4FHD	4 μm	< 20%	1.49
MH-5FD/5FHD	5 μm	< 20%	1.49
MS-5FHC	5 μm	< 20%	1.56
KS-200	2 μm	< 10%	1.42
KS-300	3 μm	< 10%	1.42
KS-500	5 μm	< 10%	1.42

Texture design of plastic surface in extrusion and casting

- Uniform particle size distribution give even and controlled texture surface of plastic for interior/exterior of home appliance and car.
- Well dispersed in several types of resin and various size particles from 10 μm to 80 μm can be applied in accordance with desired design.

Recommended anti-glare agent

Grade	Particle size	C.V.	Refractive index
MH-15FD	14 μm	<25%	1.49
MH-20FD	20 μm	<20%	
MH-25FD	24 μm	<20%	
MH-30FD	30 μm	<20%	
MH-40FD	40 μm	<20%	
MH-60FD	60 μm	<20%	
MH-80FD	80 μm	<20%	

