



Additive For Film/Plastic

Anti-Blocking for Film
Anti-Glare for Film
Texturing for plastic surface

Characteristic of Diasphere[®] for Additives



Functions

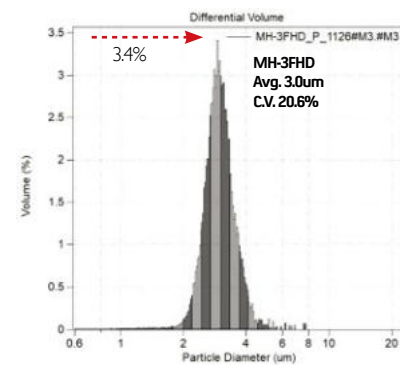
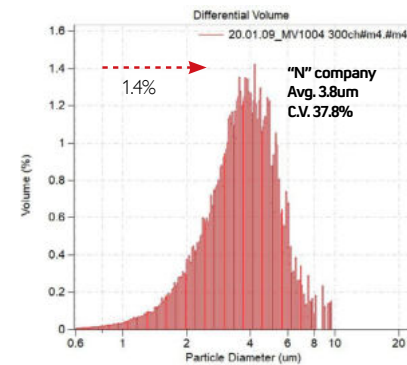
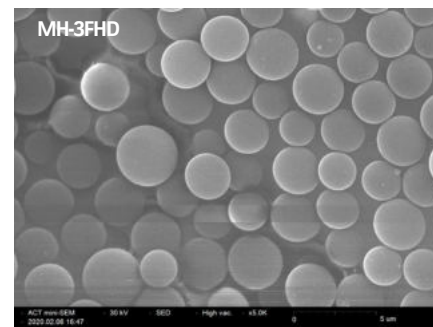
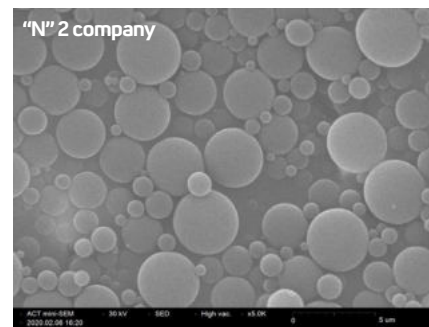
- Anti-blocking (Coefficient of friction control, Dry lubricant effect) for polyolefin films
- Anti-glare effect for various functional films
- Texturing of plastic surface for delustering unique design

Applications

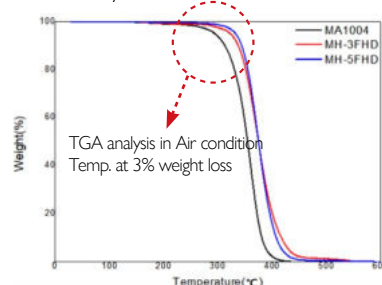
Polyolefin film (BOPP, CPP) for packaging, functional films for electronic devices and several types of plastic (PC, PS, PMMA, ABS)

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

Comparison with competitor



• TGA Analysis in Air

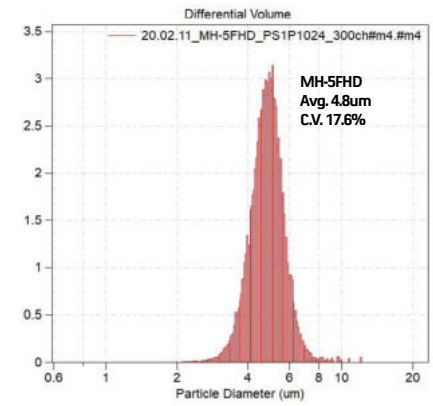
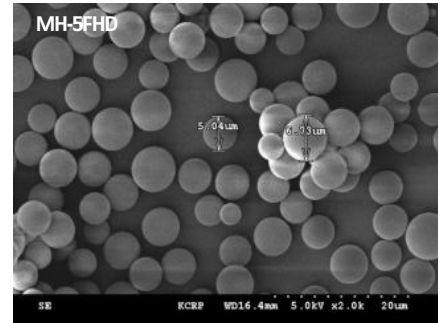
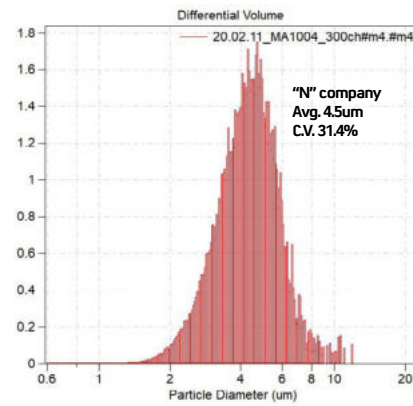
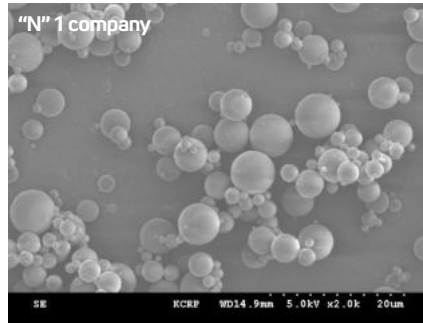


• Temp. at 3% weight loss

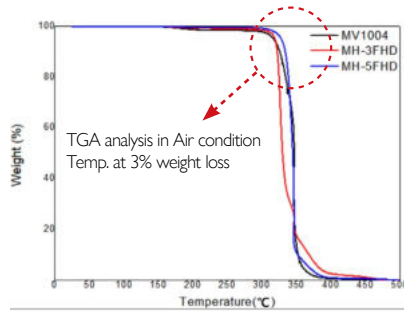
Grade	N2 (°C)	Air (°C)
"N" 1	278	
"N" 2		309
MH-3FHD	306	315
MH-5FHD	320	322

Characteristic of Diasphere® for Additives

Comparison with competitor



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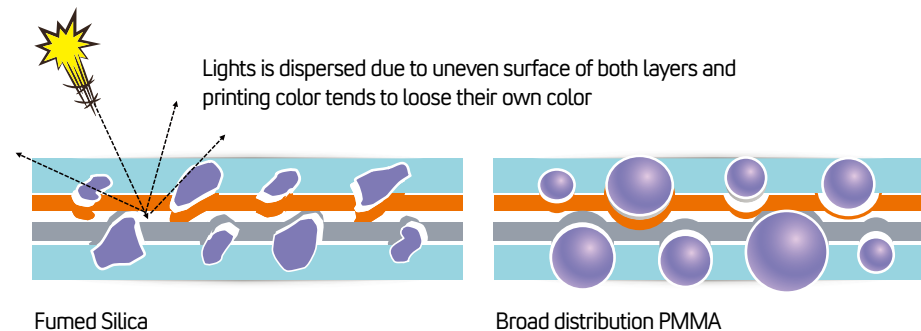
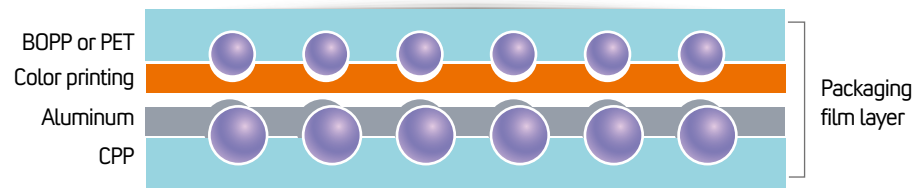
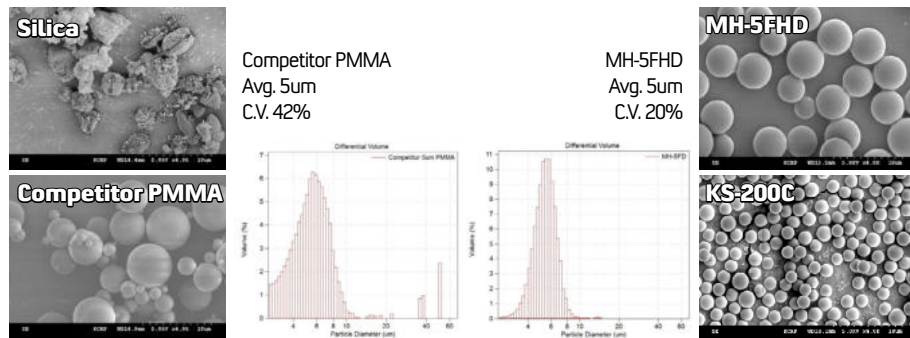
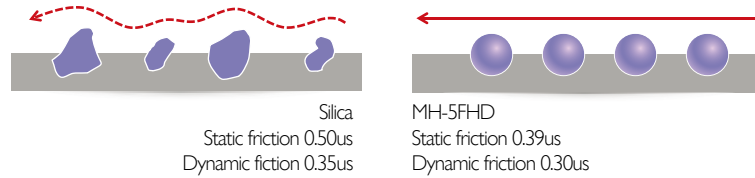
• Furnace test at 300°C and weight loss ratio after 10min and 20min

	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%

Characteristic of Diasphere® for Additives

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.



Characteristic of Diasphere® for Additives

Anti-blocking for film

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

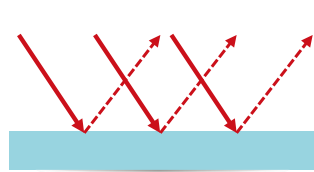
	Component	Size(um)	Softness*	Friction**
MH-3FHD	Polymethymethacrylate	3	● 27.0	0.39
MH-4FHD	Polymethymethacrylate	4	● 27.0	0.39
MH-5FHD	Polymethymethacrylate	5	● 27.0	0.39
BH-5	Polymethymethacrylate	5	○ 10.4	0.39
MS-5FHC	Polystyrene	5	● 25.0	0.39
KS-200C	Polymethylsilsesquioxane	2	○ 14.9	0.38
Silica	Silica	5	● 340	0.50

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

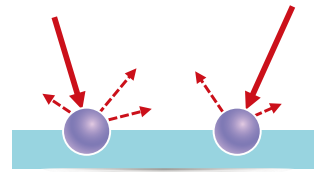
** Static friction/μs (Toyoseiki, 5% dosage)

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**

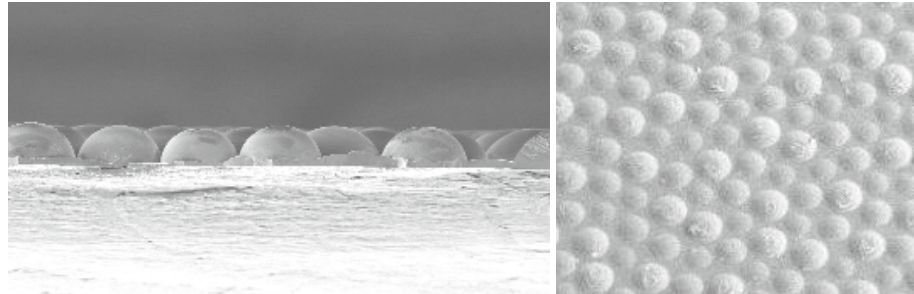
Recommended anti-glare agent

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

Characteristic of Diasphere® for Additives

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 10um to 80um can be applied in accordance with desired design.



Recommended texture design additives

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

