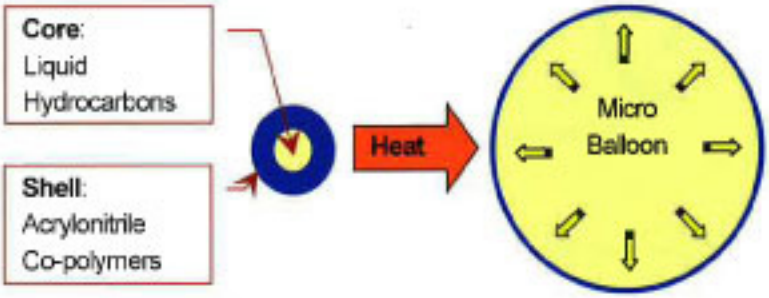
Thermoexpandable Microspheres

Microperla de México, S.A. de C.V.

Expandable Microspheres

Microperla ® are tiny thermo-expandable microspheres developed by Sekisui Chemical Company, containing a low boiling point liquid hydrocarbon inside a thermoplastic polymer shell.

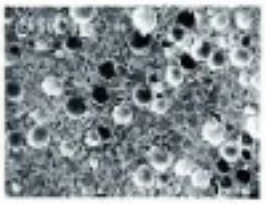
When heated, microspheres expand greatly in size; the heat softens the thermoplastic shell while the hydrocarbon boils and expands the shell.
The expanded micro-balloons form a uniform, closed-cell structure. The expansion start temperature and the cell size, etc. can be optimized by selecting appropriate grades.



	Before expansion	After expansion
Average size	15~40μm	40~150μm
Density	1.00~1.20g/cm^3	0.02~0.04g/cm^3

● Application

Microperla ®
can be used as blowing agents for inks and paints.
(Wallpaper, Structural foam, etc,
Various foams (Acrylic, PVC, Epoxy, Rubber, Silicon, etc.))

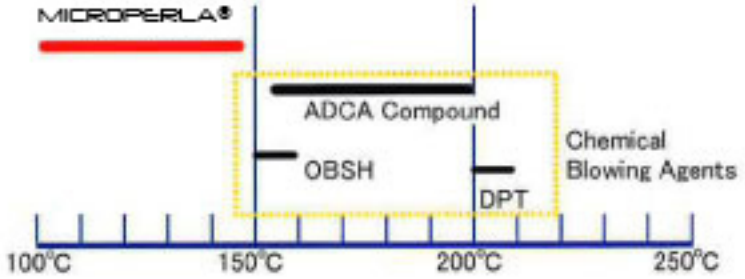


Example: Plastisol

Example: EVA-Emulsion

● Expansion Start Temperature

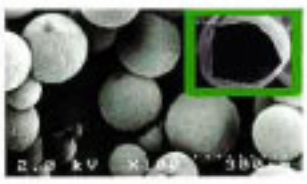
Expansion at lower temperature, i.e. 110-150°C makes it possible to lower the processing temperature of products.



● Appearance / SEM

Unexpanded

□ Cross section



Expanded

● Basic Properties

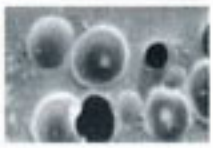
Average Diameter	15 - 40 μm
Amount of Hydrocarbon	25 %
True Density	1.00 - 1.20g/cm^3
Bulk Density	0.30 - 0.50g/cm^3
Water Content	0.8 - 3.0 %
True Density after Expansion	0.02 - 0.04g/cm^3

● Outline of Product

After expansion, MICROPERLA® becomes very low density hollow micro-balloon[*1], with the following characteristics:

- Fine, uniform, closed-cell structure
- Expandable even in low-viscosity compositions
- No surface pinholes
- Cell size can be controlled by selecting the appropriate grade.

[*1] 0.02~0.04g/cm^3

SEM Image for	Cross section	Surface
MICROPERLA® · Fine expanded cells · Closed-cell structure		
Chemical Blowing Agents · Large Expanded cells · Open-cell structure · Surface pinholes		

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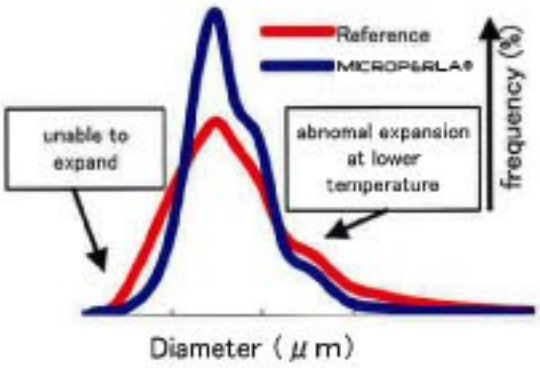

Reference

Wide spread of particle sizes results in uneven foam structure

- Foams with non-uniform cells
- Expansion loss caused by unexpended particles
- Uneven expansion leads to reduced physical properties and appearance
- Difficult to control expansion start Temperature

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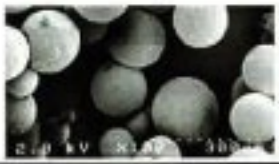
Sharp particle size distribution results in uniform expansion



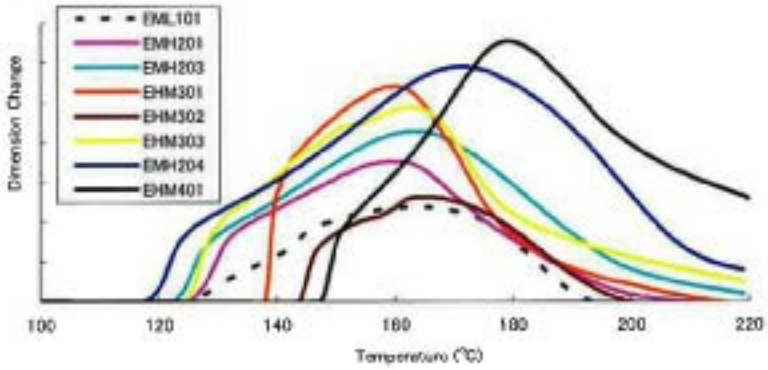
- Uniform cell structure
- Better expansion efficiency
- Uniform expansion allows consistent physical properties
- Easier to control expansion start temperature

●Grade

Code	Diameter	Start of Exp.	Maximum of Exp.	TMA-density(kg/m³)	Example of Application
EMH201	28~34μm	120~130°C	155~165°C	<14	Wallpaper, leather, expandable ink, etc
EMH203	38~44μm	120~130°C	160~170°C	<12	
EMH204	38~44μm	115~125°C	165~175°C	<12	
EML101	14~20μm	120~130°C	160~170°C	<21	Wallpaper, gloss reduction additives, molding additives, etc
EHM301	22~28μm	130~140°C	160~170°C	<18	
EHM302	18~24μm	130~140°C	160~170°C	<23	
EHM303	26~34μm	120~130°C	160~170°C	<16	
EHM401	26~34μm	140~150°C	180~190°C	<11	

All value shown to table mentioned above are not specification limit.

●Expansion (Relative [*4])



Conditions

Method: TMA
Loading: 0.1N
Ramp rate: 5°C/min from 80 to 220°C

[*4] Expansion tested using dry microspheres in air only

Actual expansion properties depend on the composition and processing parameters

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www.microperla.com

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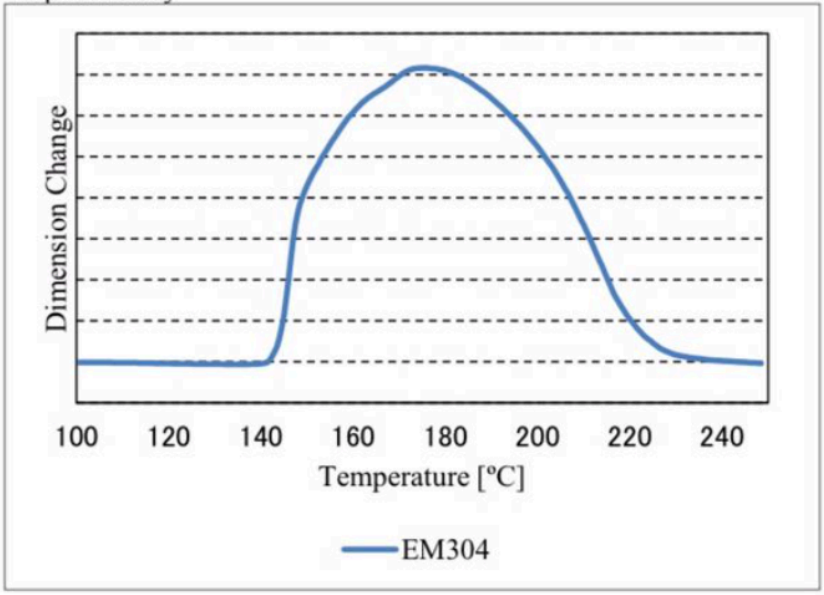
Technical Data Sheet

Item	Expandable Microspheres
Product ID	EM304
Size (μm)	20.0 - 30.0
T start (℃)	135 - 145
T max (℃)	170 - 185

Expandability



Test Method	TMA
Instrument	TA Instruments Model 2940
Loading	0.1N
Ramp rate	5℃/min

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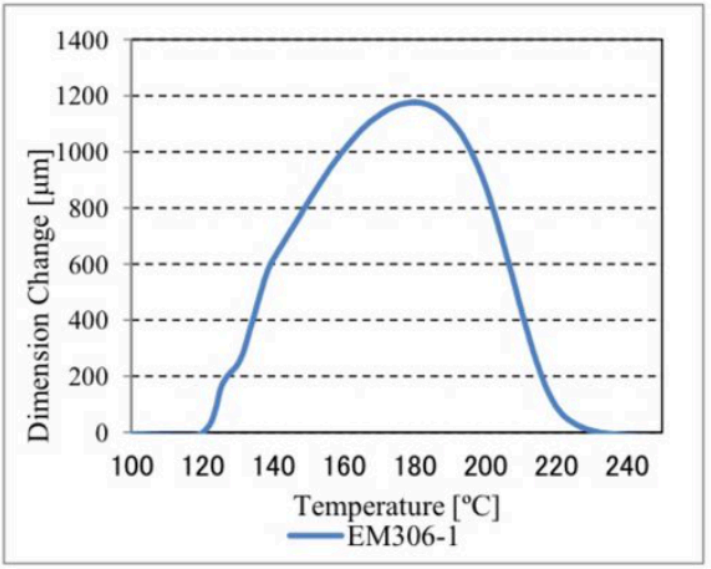
Technical Data Sheet

Item	Expandable Microspheres
Product ID	EM308
Size (μm)	39.2
T start (℃)	120.5
T max (℃)	180.5

Expandability



Test Method	TMA
Instrument	TA Instruments Model 2940
Loading	0.1N
Ramp rate	5℃/min

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