

Innovation in foamed plastics reinforced with CNF that achieve both weight reduction and high strength

We introduce technologies in which CNF solves challenges of foamed plastics and creates new value. By compounding CNF, increased foaming ratio, finer and more uniform cells, and suppression of shrinkage are achieved. This enables both weight reduction and higher modulus, and applications are progressing in specific products such as running shoes and stackable containers.



Achieves both weight reduction and strength improvement

Foamed plastics

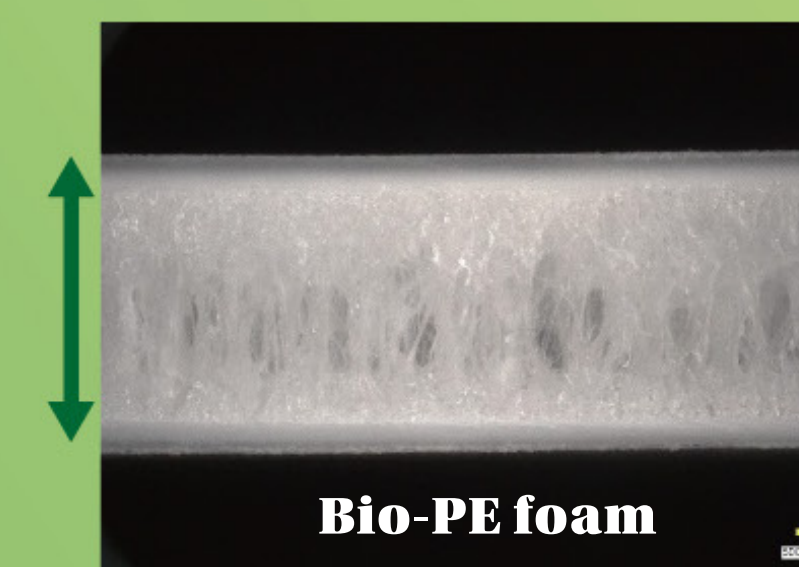
+ CNF =

Refines cells and improves moldability and strength

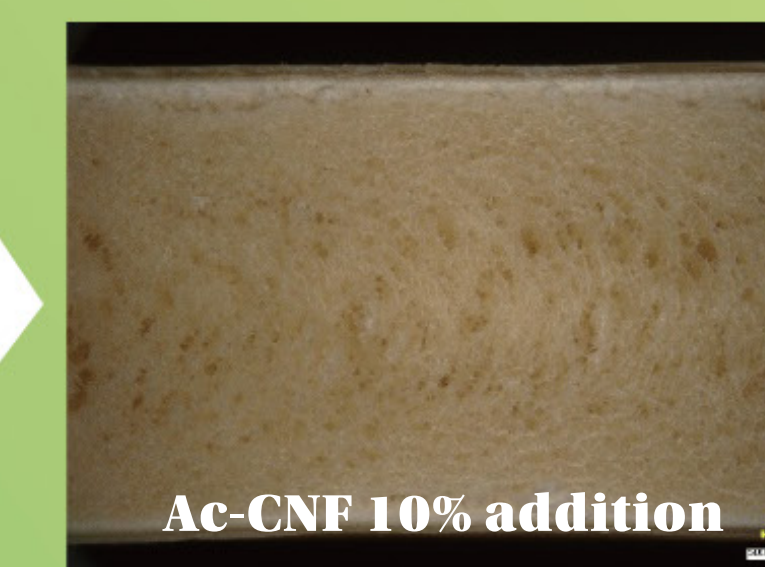
Foamed plastics are highly effective for material reduction and weight reduction of components, but they generally have the issue of decreased strength. We solved this problem by compounding CNF. By adding CNF, the cells of the foam become finer and more uniform, improving strength. It is also possible to suppress shrinkage while improving moldability.

As a result, CNF foamed plastics expand their potential as new lightweight yet high-strength materials for automotive parts, sports goods, cushioning materials, and packaging materials.

The maximum foaming ratio improved

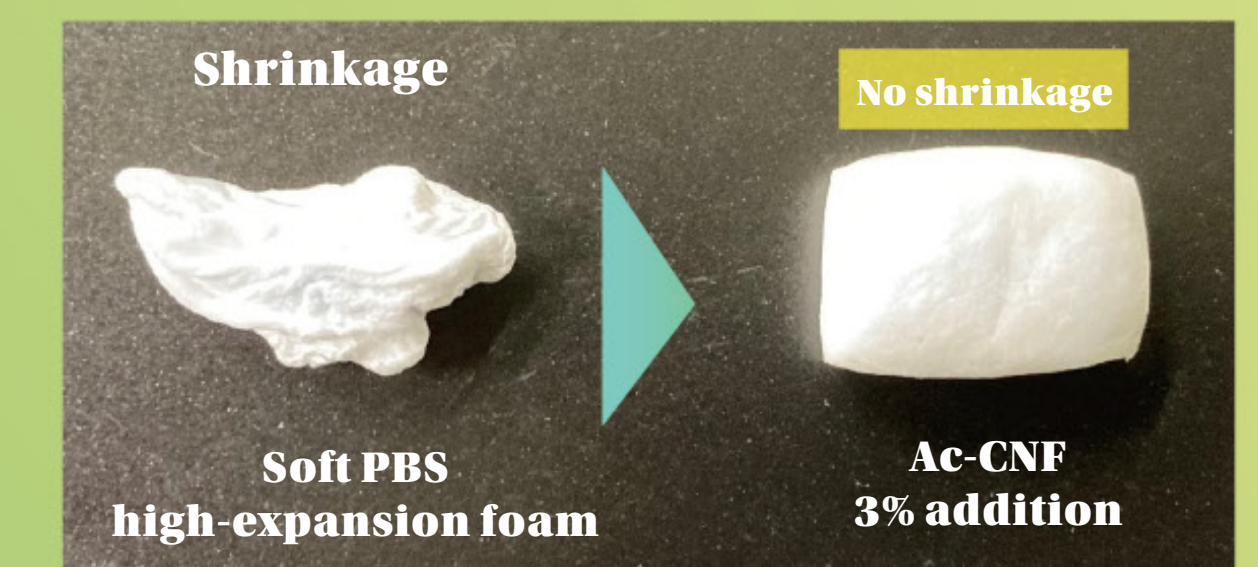


3× foamed

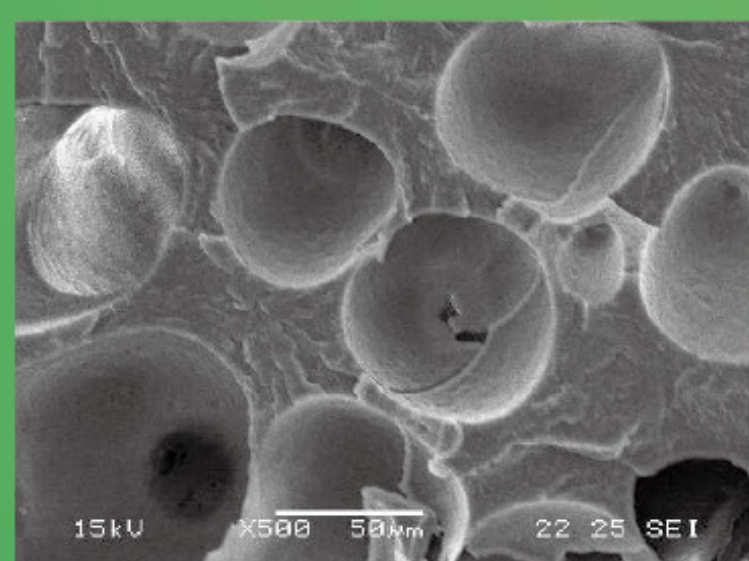


5× foamed

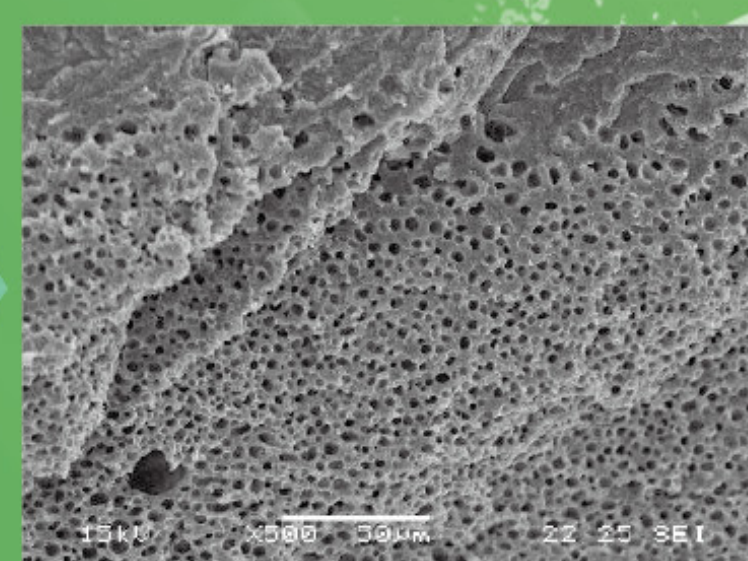
Shrinkage suppression



Cell refinement and uniformity



Polyamide(PA6)



Ac-CNF10% addition

Lightweight and high modulus

Performance data

Material	Molding method	Density (g/cm ³)	Modulus (GPa)
PA6	Non-foamed	1.13	2.47
Ac-CNF3%	2× foamed	0.75	2.56
Ac-CNF5%	2× foamed	0.72	2.81
Ac-CNF10%	2× foamed	0.71	3.41
	3× foamed	0.59	2.60

With Ac- (acetylated) CNF addition, lower density and higher modulus compared to non-foamed PA6

Practical examples

Running shoes



Used in midsoles

ASICS Corporation
achieving both weight reduction and durability

Stack-Up containers



Yoshikawa Kuni Kogyo Co., Ltd.
approximately 8% CO₂ reduction

If you are interested in CNF, please feel free to contact us.