Ministry of the Environment
Nano Cellulose Promotion

環境省
Ministry of the Environment

The future of high-performance plastics enabled by CNF, where just a 10% addition dramatically changes plastic performance

Please take a look at the innovative technologies enabled by CNF. By adding just 10% CNF, the stiffness of polypropylene (PP) can be doubled, aiming to reduce weight in automotive parts and decrease the use of fossil-based plastics.

We also introduce technologies that suppress thermal expansion and thermal deformation of polyvinyl chloride (PVC), enabling highly heat-resistant and high-performance window sash materials for housing.

We will show, together with concrete performance data, how CNF can transform the future of plastics.

Weight reduction and increased stiffness of automotive parts

Automotive parts

PP + CNF = Double stiffness and a 30% reduction in fossil-based plastics

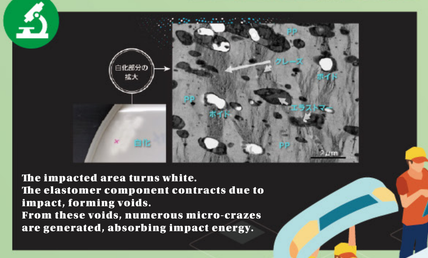
Polypropylene

Polypropylene (PP) is widely used in automotive bumpers and interior materials.By compounding with CNF, the stiffness and dimensional stability of PP are significantly improved.

Automotive door trim

Even at MFR: 3 g/10 mm, fine details can be filled

It does not break even when struck with a hammer.



The impacted area turns white.
The elastomer component contracts due to impact, forming voids.
From these voids, numerous micro-crazes are generated, absorbing impact energy.

Our goal is “One! Two! Three!”

1 One (10% addition)
Add 10% bio-based material (CNF),

2 Two (double)
Increase stiffness by a factor of two,

3 Three (30% reduction)
Improve stiffness to reduce part thickness by 20% and cut fossil-based plastic use by 30%.

Improved heat resistance and reduced thermal expansion of residential insulated window sashes

Building materials

PVC + CNF = Suppresses thermal deformation and enables high-performance sashes

Polyvinyl chloride

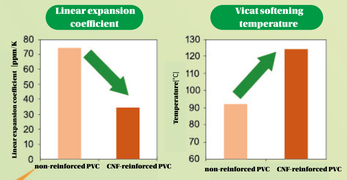
High thermal insulation of housing is essential for energy saving and decarbonization.CNF suppresses thermal expansion and contraction, enabling high-performance sash materials.

Residential insulated window sashes

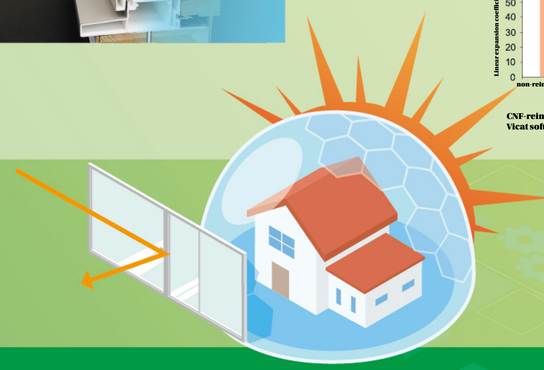
Polyvinyl chloride (PVC), commonly used for conventional window frames, has issues such as large thermal expansion and contraction and reduced strength in summer.By compounding CNF with PVC, we address these challenges.

As shown in the data, CNF-reinforced PVC significantly suppresses thermal deformation, reduces the linear expansion coefficient to about half, and increases heat resistance by 30℃.

Performance data



CNF-reinforced PVC: Linear expansion coefficient reduced to about one-half
Vicat softening temperature: Increased by 30 ℃



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