

Conserve resources by using
PP-Strengthened Masterbatch NS-01.

NS-01

Improve CPP sheet strength without specialized equipment. A PP-strengthened masterbatch contributes to saving resources.

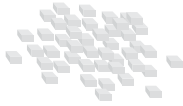
PP-strengthened masterbatch NS-01 is a pellet-shaped additive that (by dry blending with PP resin using existing equipment) can drastically increase tensile yield point and JIS (Japanese Industrial Standards) tensile rupture strength. This allows you to save materials resource and reduce transport expenses.

Results That Can Be Expected by Adding NS-01

Stage for Material Purchasing

Reduce Material Cost

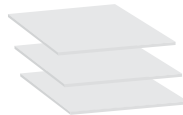
By adding NS-01 to PP resin, the tensile yield point is increased approximately 40%. By decreasing thinness in proportion to the increase in strength, material costs can be reduced.



Stage for Molding

Reduce Manufacturing Cost

In the molding process, increased productivity expected since crystallization of the material is improved.



Stage for Transportation

Reduce Transportation Cost

With the increase in strength and subsequent thinning of materials, the weight of finished products can be decreased and the energy cost of transportation can be reduced.



Stage for Disposal

Reduce Disposal Cost

As the amount of materials has been decreased, it naturally follows that the environmental load as well as the disposal costs are reduced in relation to the reduction in materials used when it comes time for disposal.



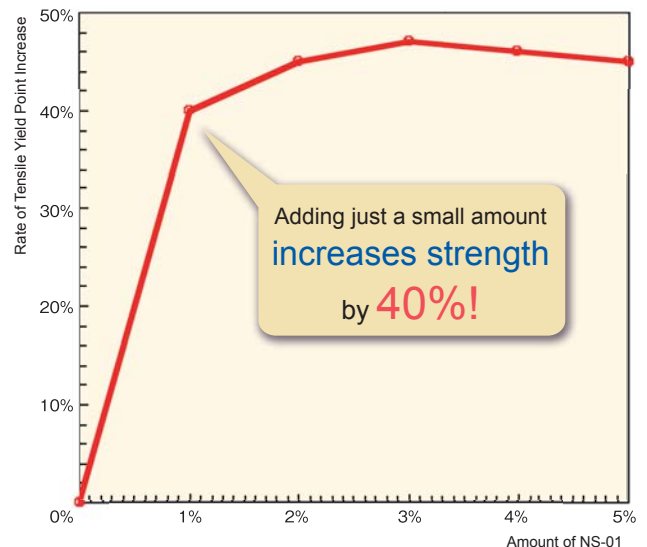
Main Characteristics

Appearance: Milky white pellets

MFR 6.0 (JIS K 7210 M)

Melting Point: 116.6°C (DSC)

Correlation Between Amount and Increased Strength



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Results That Can Be Expected by Adding NS-01

Stage for Material Purchasing

Reduce Material Cost



By adding NS-01 to PP resin, the tensile yield point is increased approximately 40%. By decreasing thinness in proportion to the increase in strength, material costs can be reduced.

The amount of materials used is reduced, decreasing CO2 emissions.

Stage for Molding

Reduce Manufacturing Cost



In the molding process, increased productivity expected since crystallization of the material is improved.

Manufacturing efficiency increases, decreasing CO2 emissions.

Stage for Transportation

Reduce Transportation Cost



With the increase in strength and subsequent thinning of materials, the weight of finished products can be decreased and the energy cost of transportation can be reduced.

The amount of energy needed for transportation is lowered, decreasing CO2 emissions.

Stage for Disposal

Reduce Disposal Cost



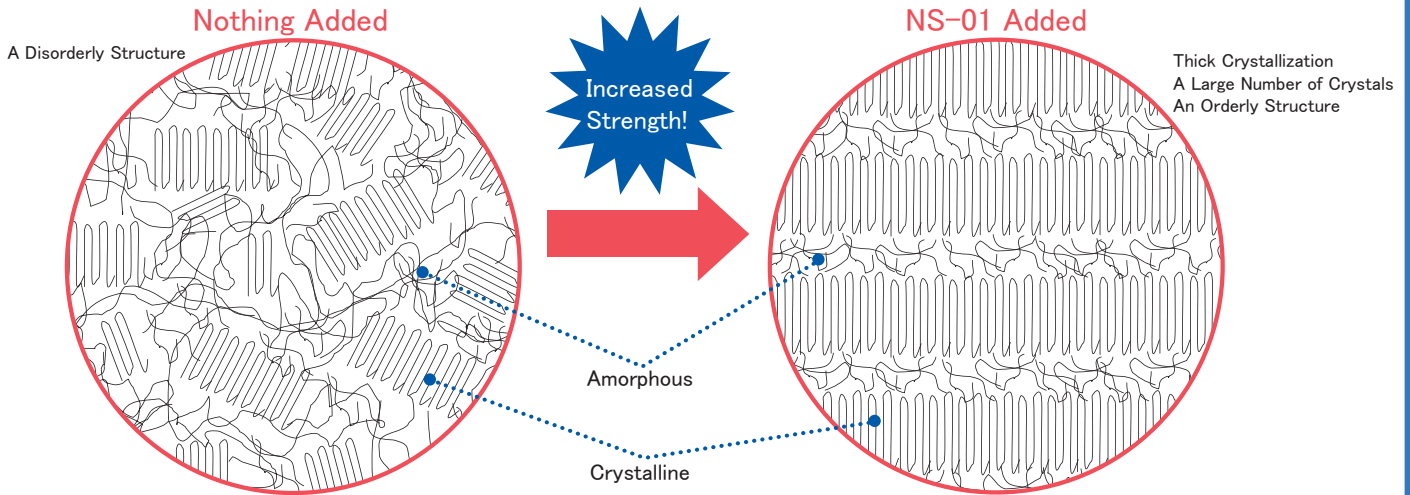
As the amount of materials has been decreased, it naturally follows that the environmental load as well as the disposal costs are reduced in relation to the reduction in materials used when it comes time for disposal.

Waste is reduced, decreasing CO2 emissions.

Amount of NS-01

Mechanism of Increased Strength by adding NS-01

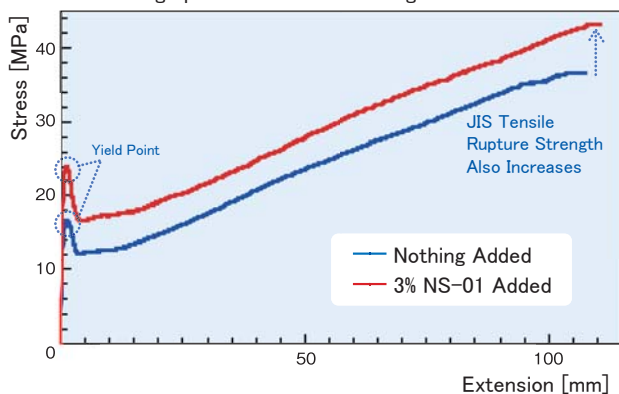
Illustration Showing the Crystalline Structure When NS-01 is Added



By promoting crystallization of the resin, an orderly structure is formed. Even with the increased crystallization, the transparency of the film does not change.

● **The rate of Increased strength by adding NS-01**

The graph shows Tensile Strength at the Measurement



● **Performance**

	3% NS-01	1% NS-01	Without NS-01
Rate of Tensile Elasticity [MPa]	633	616	444
Tensile Yield Point [MPa]	24.9	23.8	17.0
Resilience [MJ/m ²]	4.54	4.37	3.47
Tensile Rupture Strength [MPa]	47.0	47.3	42.0
Toughness [MJ/m ²]	679	668	573
Crystallization [%]	31.5	30.5	28.0
Crystallization Temperature [°C]	116.1	115.5	106.0
Sheet Permeability [%]	91.1	91.3	92.0
Sheet Contraction Ratio [%]	3.2	0.8	—

Rate of Tensile Elasticity: During the initial application of tension, stress and strain create a proportional slope. The material becomes harder the greater the stress and softer the less stress there is.
Tensile Yield Point: Applying a greater load than this causes damage to the macromolecular structure.
Resilience: A unit of how much energy can be applied until the material is damaged (until the yield point is reached).
Toughness: A unit that indicates the amount of energy necessary to rupture the material. A numerical value of viscosity.

Please follow the laws and standards and use this product carefully by reviewing the following instruction.

- **How to add**
 - The particular optimum manufacturing conditions for production depend on the PP resin grade and equipment.
 - Please be aware that high-temperature liquid resin can cause burns.
 - We recommend that in order to reduce the amount of NS-01 used, the pre-blend masterbatch should be mixed to a highly uniform dispersion.
- **How to save and handle**
 - Please read the Material Safety Data Sheets (MSDS) when using.
 - Please clean up immediately to prevent slips and falls when pellets spill.
 - This material is combustible. Please store away from sources of fire.
 - If this material should combust, there is a danger of harmful gasses being released.
 - Please wear appropriate protective gear and take other suitable precautions.
 - There is a possibility of adverse affects to the environment. Please make sure not to leak into rivers, oceans, or other natural areas. Please make all efforts to prevent leaks and recover waste.
 - Please dispose of this product properly and follow all local laws.

The data recorded in this document concerns CPP sheets test-manufactured using our company's testing equipment and under the following conditions. These are actual measurements. They are not a guarantee.

- Sheet thickness: 200 μm
- Extrusion temperature: 220° C
- Cooling roll temperature: 30° C
- PP grade used: Novatec PP EG-8B (Japan Polychem Corporation)