



No.1 Coating Technology in the world

**Environmental consideration of
molecular gradient**

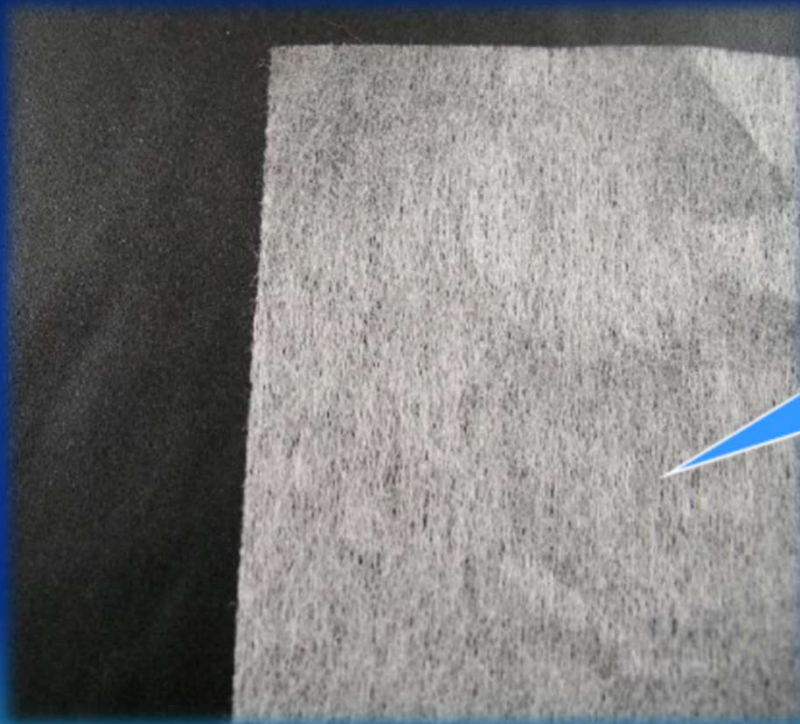
※山林200hr



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■ Conventional manufacturing method (impregnation method)

-Wet type rayon nonwoven fabric



■ We need 70 tons of water, 7 tons of steam and 3.5 tons of "fuel" impregnated adhesive resin to produce 1 t of paper.



We used a large amount of paper materials to increase the environmental burden.



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☆ How big is the environmental impact !

Domestically producing "**wet rayon nonwoven**" monthly production of 5 million square meters (60 million m² per year). In case
→ 14.5 g of paper, 1,050 L of water and 101 g of heavy oil are required for products of 1 m².

It is comparable to about 10,000 t · CO₂ emissions ✕ Forest 200 hr

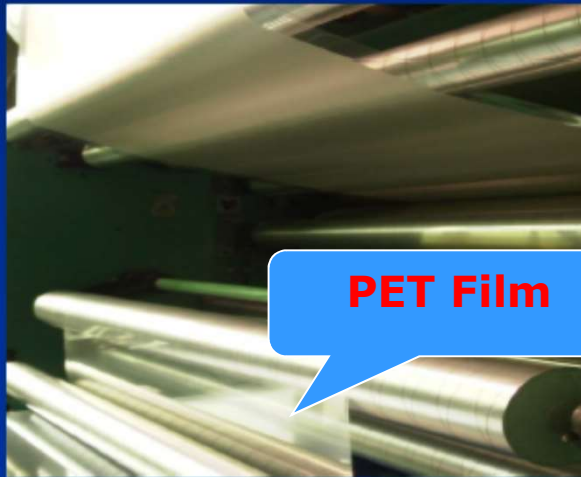


It corresponds to the amount that "700,000 cedar trees" absorb CO₂ per year.



■ "Molecular gradient film" tape is environmentally friendly product that does not use paper or water at all.

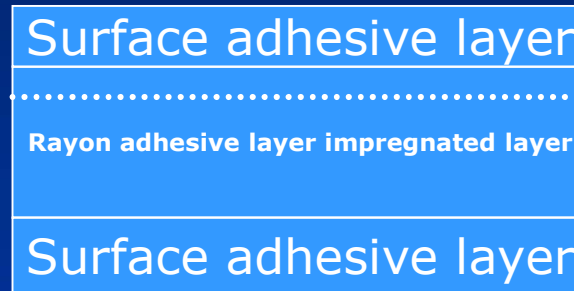
● **Transfer method**



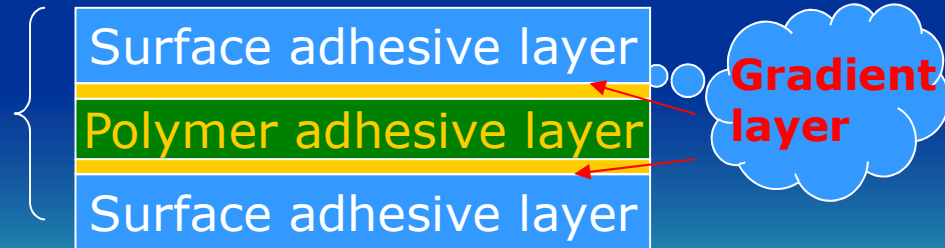
PET Film

Thickness 50 μ

○ General-purpose rayon nonwoven fabric substrate



○ Molecule Gradient Tape



Less orientation with X Y Z



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■ Characteristics of "molecular gradient"?

Elongation Ratio Comparative

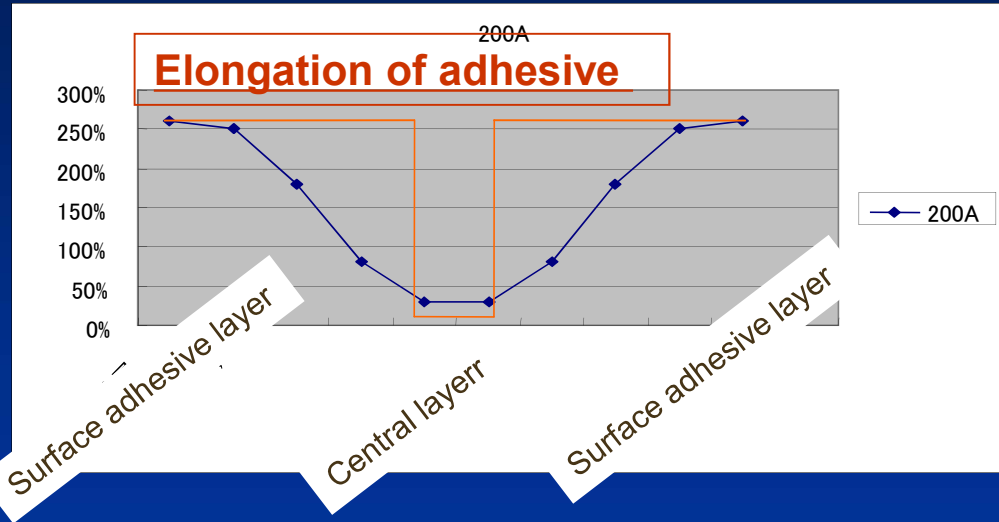
Molecular gradient tape

100(Ad): 12(Sub)

PET carrier tape

100(Ad): 0.8(Aub)

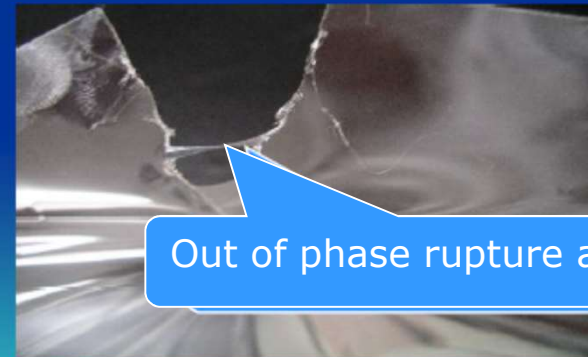
【Adhesive Layer and Substrate Layer】



Molecule Gradient Tape



PET Carrier Tape



Out of phase rupture and Bali



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【Comparison of pulling power】

Adhesive layer thickness 50 microns

The early days

19 N for 12.5 N of the previous product

52% UP

Normal condition

25 N for previous product 17.3 N

44% UP

The early days

11 N for the 6.6 N of the previous product

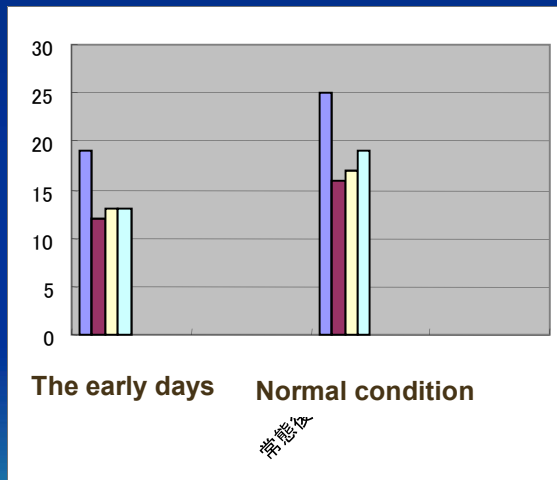
65% UP

Normal condition

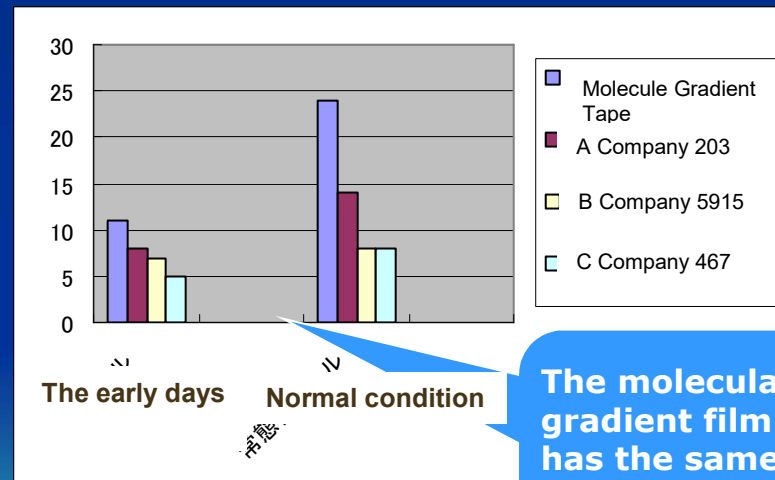
24N for 10N of previous product

140% UP

SUS



PP Film



The molecular gradient film design has the same performance as SUS for the olefin type.