New Material for Sustainable Future from ANPOLY

ANPOLY
Advanced Natural Polymer

TAPPI NANO DIVISION

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About ANPOLY

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ANPOLY

Company

Name	**ANPOLY Inc.**
CEO	**SangCheol Rho**
Date of foundation	2017.01.20
Products	Nanocellulose
Members	26 (Ph.D. 7, Master 5)
Location	Postech, Pohang-si, Republic of Korea **US incorporation (2023.3Q~)**
Website	www.anpolyinc.com

Field of Business

ANPOLY's Sectors

CNF Production	Scale-up	Applications
Re:ancel ™ T-CNF	Reproducibility	Plastic Composite
Re:ancel ™ E-CNF	Cost Down	Cosmetics
Other lines	Production Capacity	Medical/Bio

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Overseas Expansion Strategy

1. R&D joint development project with global partners

- International joint technology development with Biome Bioplastics in the UK
- International partnership development with the University of Maine, USA

2. Establishment of overseas corporation

- Establishment of US corporation (third quarter of 2023)

3. Expansion of overseas distribution channels

- Signed MOU with POSCO International for overseas export
- Distribution collaboration with ID Capital in Asia

4. Regulatory Response

- Cosmetic ICID registration
- Promotion of food GRAS, US and European substance registration

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ANPOLY's Product line

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Re:ancel ™ Products line

T-CNF	E-CNF	CM-CNF	C-CNF	A-CNF
TEMPO-Oxidized	Enzyme treated	Carboxymethylated	Cationic modified	Acetylated
High Transparency High Dispersibility	**High Thermal-stability High Surface area**	High Dispersibility	High colloidal stability	High water resistance
Cosmetic Agent Waterborne Binder	Reinforcement, Films, Coatings	Rheology modifier, Food Additives	Water Filtration, Papermaking	Composites, Films, Coating

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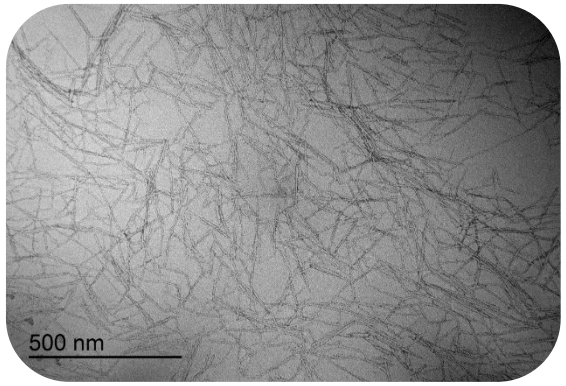
ANPOLY's Product

Re:ancel™ T-CNF



Viscosity (6rpm, 25℃)		> 70,000 cP
Zeta Potential		- 60 mV
Fiber size	Width	< 6 nm
	Length	> 500 nm
Transparency (600nm)		> 90 %
Decomposition Temperature		205 ℃

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Re:ancel™ T-CNF

Thickening Ability

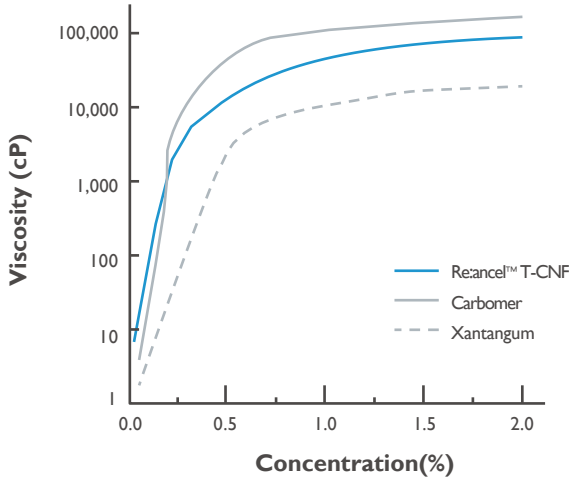

Table 1. Viscosity of various Thickners

Thixotropy

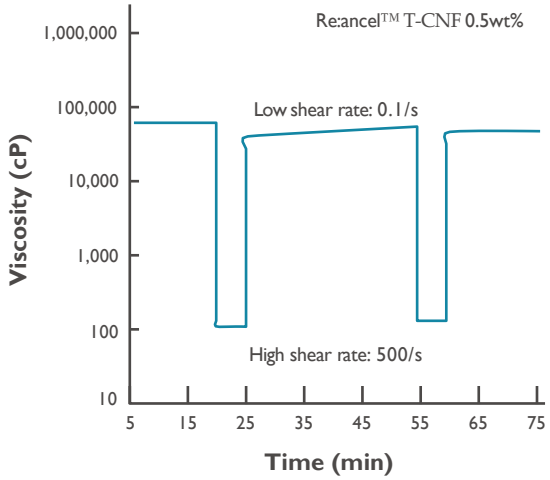

Table 2. Viscosity of T-CNF as shear rate

Dispersion Stability

Figure 1. Well Dispersed materials with T-CNF

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Re:ancel™ T-CNF

High Transparency

Figure 2. Appearance of Neat T-CNF Film

High Strength

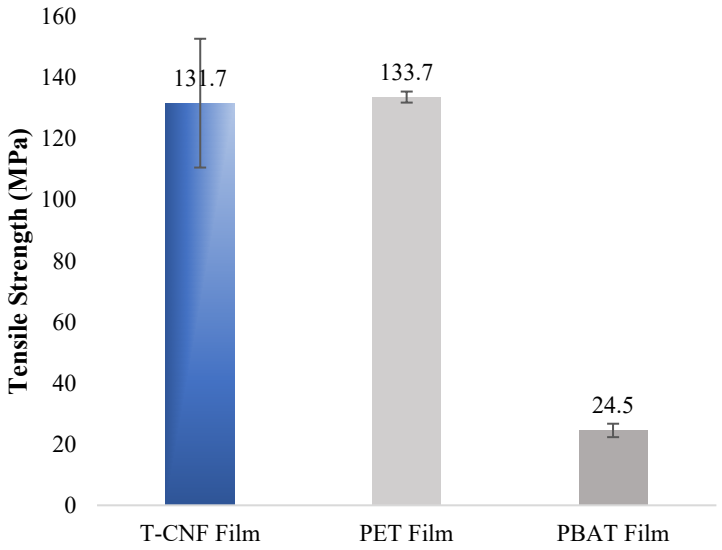

Table 3. Tensile Strength of Various Films

High Barrier Properties

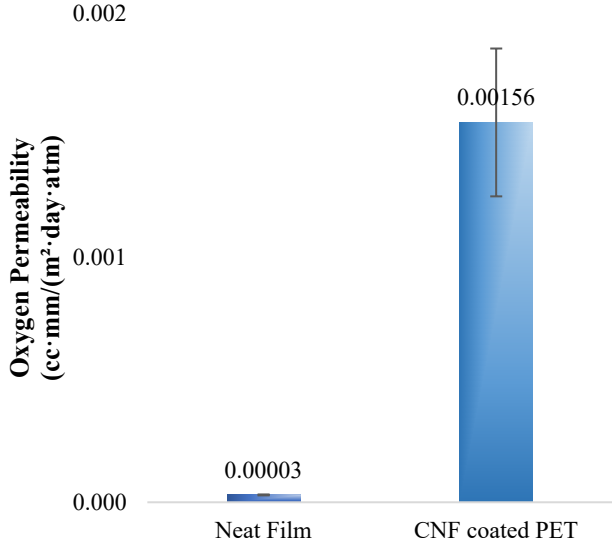

Table 4. Oxygen Permeabitliy of T-CNF Films

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Re:ancel™ T-CNF

Property Control Technology

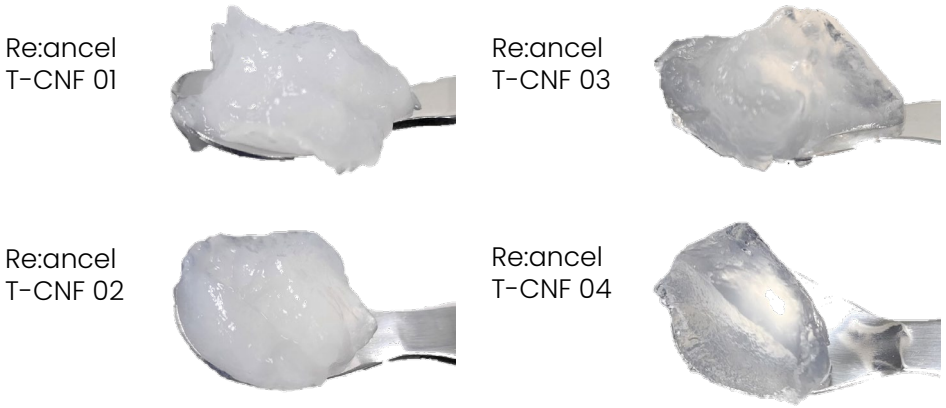

Figure 3. Apperance of a series of Re:ancel T-CNF

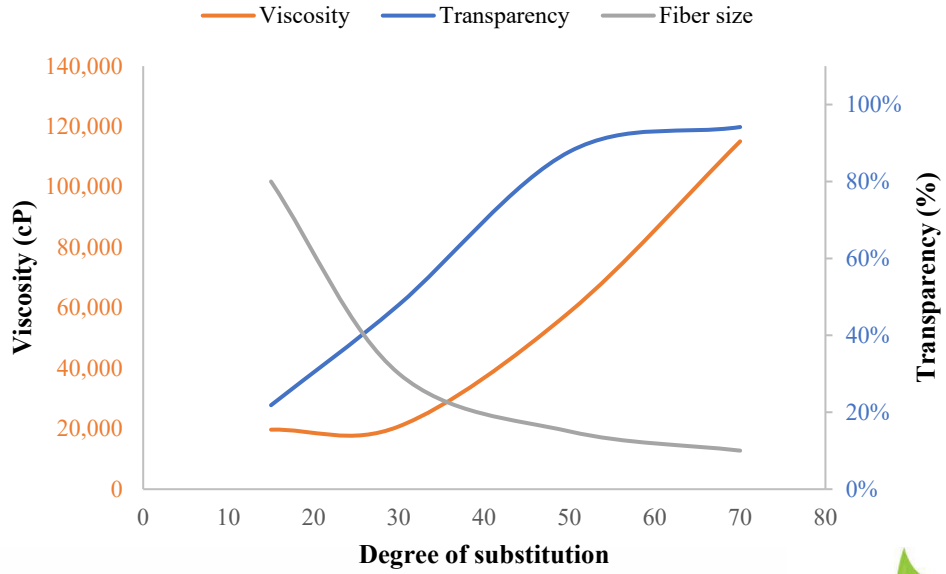

Table 5. Various Properties of Re:ancel T-CNF Series as Degree of Substitution

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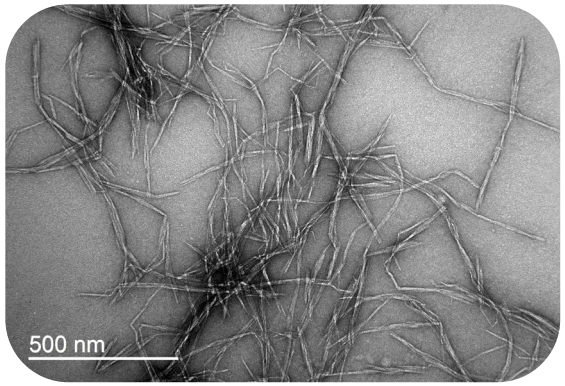
ANPOLY's Product

Re:ancel™ E-CNF



Viscosity (6rpm, 25℃)		> 10,000 cP
Zeta Potential		- 40 mV
Fiber size	Width	< 10 nm
	Length	< 500 nm
Transparency (600nm)		> 80 %
Decomposition Temperature		300 ℃

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Re:ancel™ E-CNF

Film

Figure 4. Appearance of Neat E-CNF Film

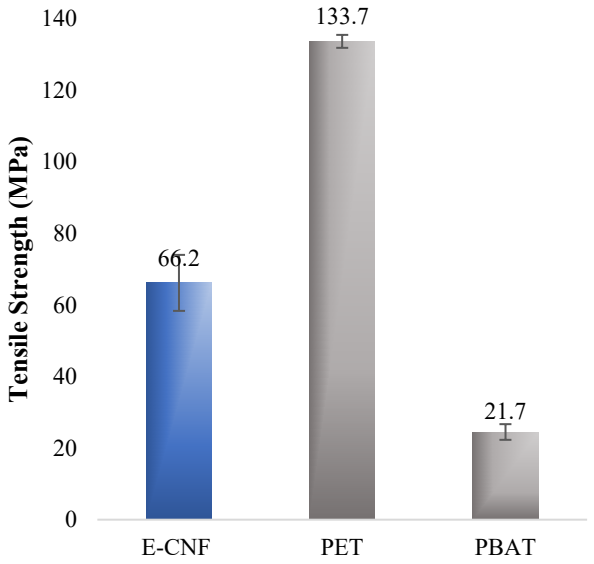
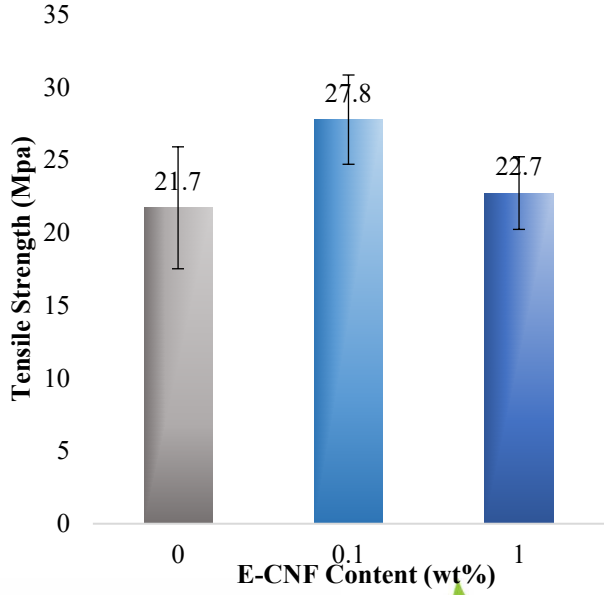


Table 6. Tensile Strength of Various Films

Composite

Figure 5. PBAT + E-CNF 0.1wt% Composite



Tabel 7. Tensile strength of Composite films

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Developing lines

CM-CNF	C-CNF	A-CNF
		
For Edible Application	**For Cationic Application**	**For Hydrophobicity**
Zeta Potential ~ – 40mV	Zeta Potential ~ + 40mV	DS 0.6
Viscosity > 30,000 cP	Viscosity > 15,000 cP	Viscosity > 40,000 cP
UV Trans 90%		UV Trans > 90%

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ANPOLY's Core technology

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Core Technology – Scale up

RECENT

2020.09.

POSTECH BOIC (4300 ft²)

Headquarters and R&D Center

2021.04.

Pohang Knowledge Industry Center

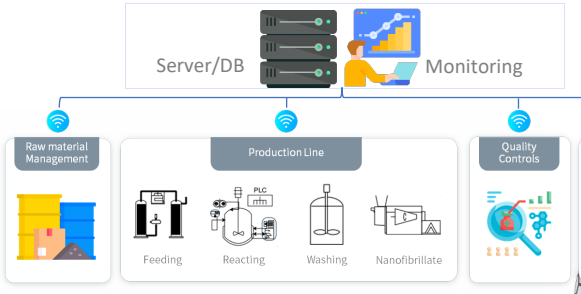
Factory (100 ton/year, 13,000 ft²)

2024.

Technology Convergence Industrial District

Mass Production Factory (46,000 ft²)

With IoT-based manufacturing system



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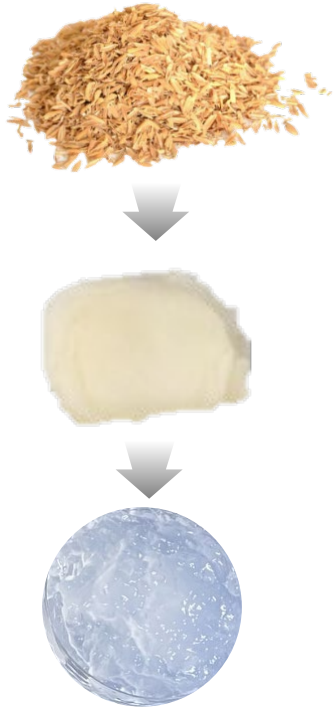
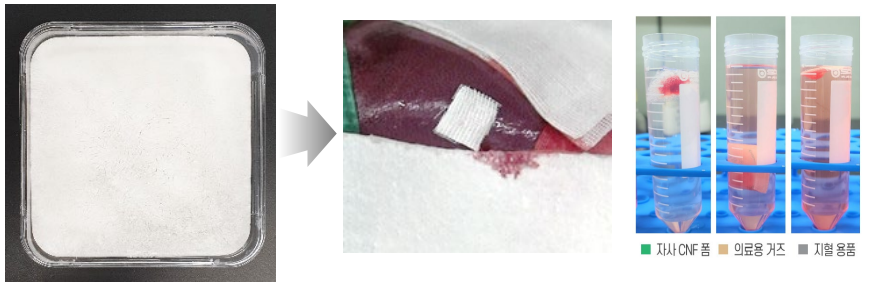
Core Technology – PoC verification of Applications

Biomass Utilization



Polymer Composite

Medical Patch

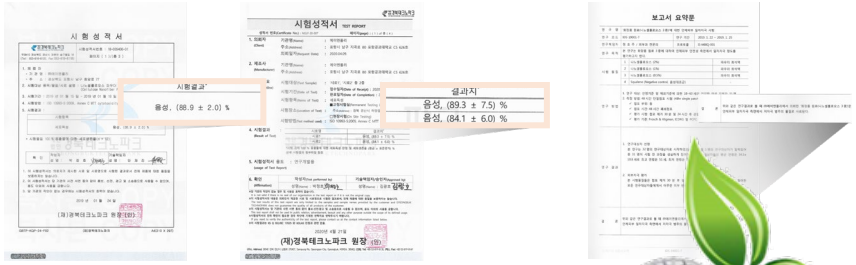


Cosmetic Formulation

Bio-Safety Test

Cytotoxicity test result: negative

Skin irritation test: Hypoallergenic



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Leaders @ ANPOLY

CEO

SangCheol Rho Ph. D.

- POSTECH Research Professor
- Institute for Basic Science (IBS)
- Researcher at KCL

CTO

DongSoo Hwang Ph.D.

- POSTECH Professor (Department of Environmental Engineering)

CFO

TaeYeon Kim

- Senior Administrative Officer at Institute for Basic Science (IBS)

Bio medical

Hyeong Choe Ph. D.

- COO at Nexus Logistics inc.
- PhD in Biomedical Engineering at The University of Iowa

New materials

MinKook Cho Ph. D.

- PhD, Bachelor in Materials Science and Engineering at POSTECH

Polymer

JunHo Jung Ph. D

- CAI Inc. (USA)
- PhD in Chemistry at The University of Massachusetts Lowell

Chemical

HeeChung Chung Ph. D.

- POSTECH Research Professor
- Research Fellow at Institute for Basic Science (IBS)
- PhD in Chemistry at Korea University

Mechanical Eng.

TaeJung Chung Ph. D.

- PhD in Mechanical Engineering at Georgia Institute of Tech.

IoT

YongHyun Lee

- Big Data Academy Completion at POSCO Youth AI,
- Researcher at Korea Institute of Science and Technology Information

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Thank you

NEW MATERIALS FOR A SUSTAINABLE FUTURE

Contact

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