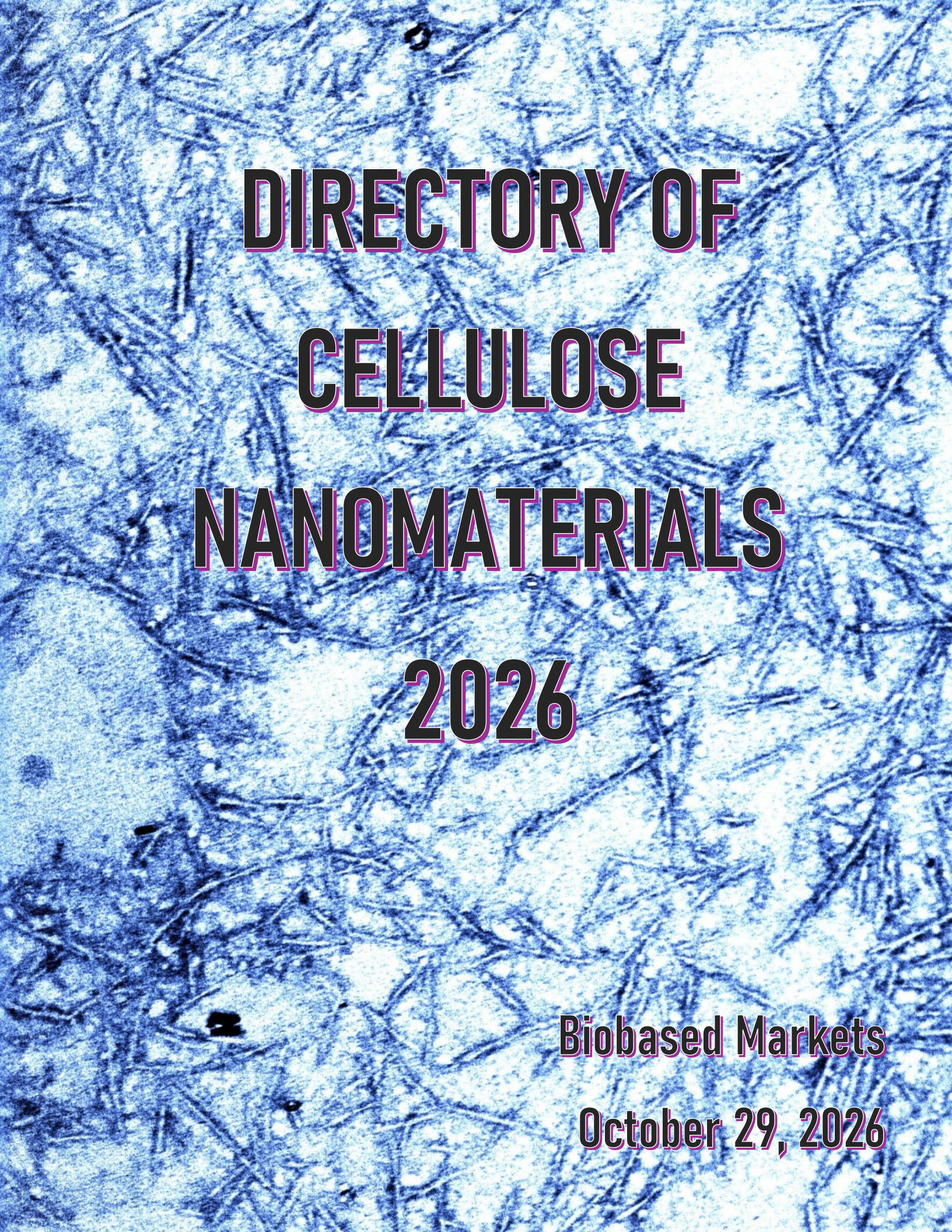


DIRECTORY OF CELLULOSE NANOMATERIALS 2026

Biobased Markets

October 29, 2026



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Contact: Valida@sappi.com

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On the Cover

Thanks to Dr. Akira Isogai of the Laboratory of Cellulose Chemistry, Department of Biomaterial Sciences, The University of Tokyo for the TEM image of TEMPO CNCs.

Differing from the conventional CNCs with sulfate ester groups, TEMPO-CNCs have needle-like morphologies.

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Introduction

About The Directory of Cellulose Nanomaterials

Following the update of the TAPPI Nano Production Summary in 2023, Biobased Markets, TAPPI, and TAPPI's Nanotechnology Division agreed that it would be good for the industry for Biobased Markets to publish *The Directory of Cellulose Nanomaterials.*

It was agreed that *The Directory* should be free, and listings should also be free, and that *The Directory* should be funded entirely through advertising. TAPPI Publications and the TAPPI Nanotechnology Division will help distribute it, and Biobased Markets will pursue other channels as well to get the broadest possible circulation and maximum exposure for the organizations listed in *The Directory*.

While we believe *The Directory* is the world's most complete global listing of producers of nanocellulose, providers of technology related to nanocellulose, and service providers, research organizations and universities working with nanocellulose, we acknowledge that it may not be 100% complete. Industry sources report that there are one or more producers of cellulose nanomaterials who wish to stay "under the radar" and do not want their capacity listed and may be absent from The Directory as well. In addition, while The Directory is global in scope, there are some regions of the world where complete information may be difficult or impossible to obtain.

Companies and other organizations who wish to be included in any future issues of *The Directory* should contact Biobased Markets.

Feel free to distribute *The Directory* yourself, in its entirety, as you see fit.

About Biobased Markets

Market-Intell LLC was founded in 2005 by Jack Miller to provide market intelligence in paper, print, and packaging, and re-branded as Biobased Markets in 2018. Biobased Markets is now focused primarily on biobased materials, especially nanocellulose and lignin.

Market-Intell LLC and Biobased Markets have collaborated with organizations such as TAPPI, Fastmarkets RISI, and Biofuels Digest, as well as several independent associate consultants, universities, and research organizations. Services include business development, lead development, market research, support for due diligence for potential investors, and custom Webinars to provide education about lignin and nanocellulose applications and markets.

Market-Intell and Biobased Markets have served clients in North America. South America, Europe, and Asia.

Since 2005, Jack Miller has been Principal Consultant, Market-In tell LLC. Jack has served as an Associate Consultant with RISI and as a member of the Advisory Board of Sweetwater Energy, a biorefinery company. Jack was Business Development Consultant with CelluForce, Inc., from 2011 to 2013, and was Consulting Manager, Global Nanocellulose Sales, American Process, Inc. (now GranBio), in 2014 and 2015. Prior to 2005 Jack enjoyed a long career in the pulp and paper industry.

Jack is the author of:

- *The Directory of Lignin and Lignin Biomaterials*, May 2026
- *The Directory of Cellulose Nanomaterials,* Biobased Markets, May 2025
- *The Directory of Cellulose Nanomaterials,* Biobased Markets, May 2024
- TAPPI Cellulose Nanomaterials Production Summary, TAPPI, May 2024
- *The Directory of Cellulose Nanomaterials,* Biobased Markets, May 2023
- *Lignin 2021: A Pivotal Year*, published by Biofuels Digest in March 2021
- Nanocellulose: Packaging Applications and Markets published by RISI in 2019
- Nanocellulose Challenges and Opportunities: End User Perspectives, published by TAPPI in 2018
- Lignin: Technology, Applications, and Markets published by RISI in 2017
- Nanocellulose Producers, Products and Applications, A Guide for End Users, published by TAPPI in 2017
- Nanocellulose: Technology, Applications and Markets, published by RISI in 2014.

About TAPPI

TAPPI is the leading association for the worldwide packaging, paper, pulp, tissue and converting industries and publisher of *Paper360° Magazine*, *Tissue360° Magazine* and *TAPPI Journal*. Through information exchange, events, trusted content and networking opportunities, TAPPI helps members elevate their performance by providing solutions that lead to better, faster and more cost-effective ways of doing business. It has provided management training and networking to the industry's leaders for more than 111 years. For more information, visit www.tappi.org.

About TAPPI's International Division of Advanced Technologies for Renewable Materials (ARM)

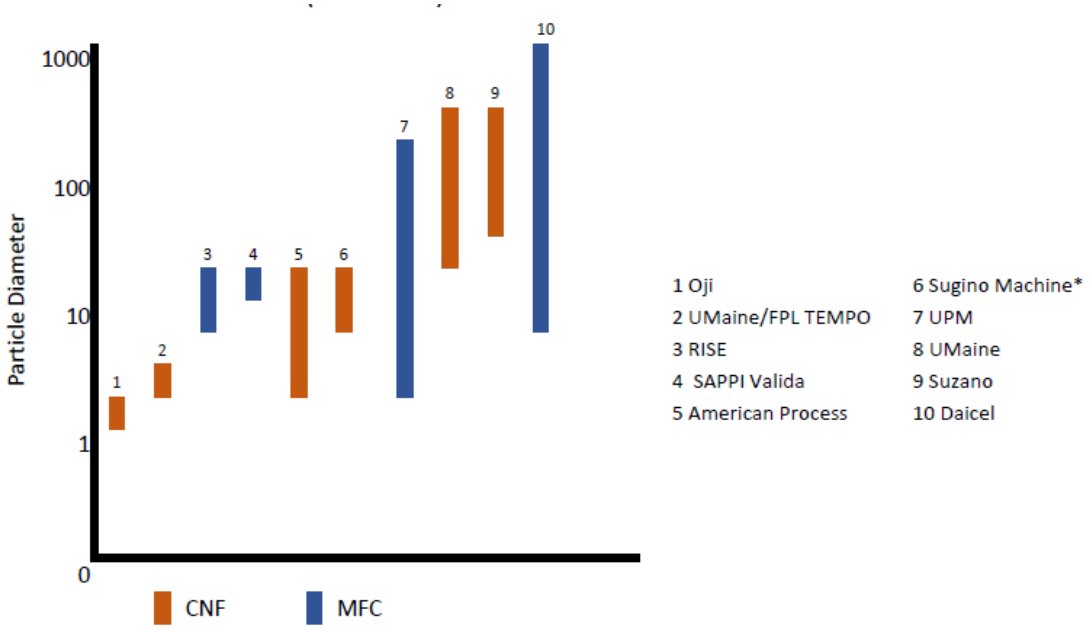
TAPPI's International Division of Advanced Renewable Materials (TAPPI ARM), formerly the International Division on Nanotechnology for Renewable Materials (TAPPI Nano), focuses on the evolving landscape of renewable materials research and industry trends. The Division is a hub for new developments in renewable materials, encouraging broader participation from experts in materials science, chemistry, and engineering. The Division's Technical Committees work together throughout the year to solve problems, develop technical papers, plan conference sessions, and more. The Division's 2027 conference is happening 21-24 June 2027 at the State University of Campinas (UNICAMP) in Campinas, São Paulo, Brazil. For more information about the conference, the Division and how to get involved, contact Robert Davis, TAPPI Division Manager, rdavis@tappi.org or visit https://www.tappi.org/industries/Advanced-Renewable-Materials/

Overview of Cellulose Nanomaterials

It is well known that the distinction between microfibrillated cellulose or cellulose microfibrils (MFC), and nanofibrillated cellulose or cellulose nanofibrils (CNF) is not clear cut. Some materials called CNF are primarily micro-scale while some called MFC are primarily nano-scale, and some are a mix of nano- and micro-scale particles (Figure 1). Some materials included in this Directory are not nano.

Further, the distinction between MFC and "highly refined pulp" is also not clear cut. By some estimates, more than 75% of all "nanocellulose" is MFC, produced on site by mills and used in their own pulp, paper, and paperboard production, but much of this is in fact highly refined pulp. This Summary does not include "highly refined pulp" but does include what producers have reported as MFC. In this Summary, we use the terminology the producer uses. If nano or micro are not specified, the material is included under MFC.

Figure 1
CNF and MFC Particle Diameters
(nanometers)



Source: Nanocellulose: Producwrs, Products, and Applications, A Guide for End Users, TAPPI, 2017.
* Revised 2026

It has also become apparent that the difference between CNF and CNC (cellulose nanocrystals) is becoming blurred. CNC was originally produced primarily from bleached pulp by means of sulfuric acid hydrolysis, which essentially separates the crystalline portion of cellulose from the non-crystalline or amorphous portion. CNF was produced by primarily mechanical means, in some cases with enzymatic or chemical pretreatment to reduce energy cost. CNF and CNC were very different, and the difference was quite clear.

Now, however, biorefinery processes have emerged that produce CNF or CNC from biomass. GranBio (American Process) uses sulfur dioxide and ethanol (AVAP® Process) to fractionate biomass into lignin, hemicellulose and cellulose, and can produce either CNC or CNF, or a blend of the two.[1] More recently, Sweetwater Energy introduced its Sunburst™ reactive extrusion process, a technology acquired by Fibenol in 2023. The Sunburst process also fractionates biomass into lignin, hemicellulose and cellulose, and with further enzymatic hydrolysis can yield MCC, CNC or CNF.[2]

CNC and CNF cannot be definitively distinguished solely by particle size, crystallinity, or other metrics, though cellulose nanofibrils tend to be longer, and may be entangled, while nanocrystals tend to be more crystalline and can be presented as discrete particles.[3]

Work on standards, nomenclature, and characterization has been ongoing. In 2023 ISO issued Technical Specification ISO/TS 20477:2023. This replaces ISO/TS 20477:2017 and provides new and revised definitions. As a result, at least one company has reclassified its material and others may follow. Note, however, that the ISO standard does not provide precise numbers for what percentage can be or must be nano for a particular classification. There can also be questions about agglomerated cellulose nanomaterials or materials which contain nanomaterials that provide enhanced properties but in which the nanomaterial itself is not accessible. Environmental, Health and Safety (EHS) regulations may vary from country to country, and producers and customers should consult EHS specialists. A more detailed discussion is beyond the scope here.

In the Production Summary and The Directory listings, materials are classified as reported by the companies or other organizations.

[1] Miller, J. *Nanocellulose Producers, Products and Applications, A Guide for End Users*, TAPPI, 2017.
[2] Miller J. *Lignin 2021: A Pivotal Year*, BioFuels Digest, 2021.
[3] https://www.iso.org/obp/ui/en/#iso:std:iso:ts:20477:ed-2:v1:en

Production Summary

Recent Updates

While we believe that The Directory of Cellulose Nanomaterials is the most complete report of its kind, we acknowledge that it can not be 100% complete. Industry sources report that there are one or more producers of cellulose nanomaterials who wish to stay "under the radar" and do not want their capacity listed in the Production Summary, and may be absent from The Directory as well. In addition, while The Directory is global in scope, there are some regions of the world where complete information may be difficult or impossible to obtain.

There is a new ISO standard on CNF/MFC nomenclature. ISO 20477:2023 was updated and published this year. As a result, some production may be reclassified as MFC or CNF.

This year's directory includes two new downstream technology providers for cellulose nanomaterials, **Benz Technology International** and **Tellus Products.**

As of August 2026, **CelluComp** operates a production facility in Renville, Minnesota, USA to produce Curran® MFC. Curran is made from the leftover pulp of root vegetables, using sugar beets after the sugar has been extracted. The Renville facility currently has an annual capacity of 1,000 metric tons of fully dry Curran MFC (>90% solids) that is suitable for global distribution.

Daio Paper Corporation started commercial production of CNF composite resin in July 2025. The Mishima Plant has newly begun operating a commercial plant with an annual production capacity of 2,000 tons, making it Japan's largest CNF composite resin production facility—20 times the capacity of the previous pilot plant.[4]

Fibenol OÜ reports that current industrial demonstration-scale capacity for WoodCell™ crystalline cellulose is up to 1,000 t/y dry basis and is targeted to reach 4,000 t/y by completion of the CBE-backed WOODCELL project in 2029.

FiberLean Technologies Ltd. now offer three sizes of MFC grinders for production of MFC with a range of capacities. G125 (11-53 dry kg per hour), G175 (40-190 dry kg per hour) and G250 (96-447 dry kg per hour). This enables cost effective on-site MFC production for a variety of end users from moulded fibre producers to large paper and board mills.

Norske Skog reports that they are on track for 1,300 tons dry weight of CEBINA this year. Norske Skog also have a pilot for solvent-free CEBINA in thermoset resin carriers. Capacity is 25 tpy, with 30% CNF loading. Due to the new ISO standard, CEBINA is now reported as CNF.

[4] Daio Press Release, 29 July 2025

After more than 10 years of activity, **Performance BioFilaments** ceased operations as of February 1, 2026[5]. Resolute Forest Products, along with Mercer International, were the founding partners of Performance Biofilaments. In 2023 Paper Excellence subsidiary, Domtar, had completed the acquisition of Resolute Forest Products.

Re-Fresh Global announced the start-up of its pilot plant in Germany that enables on-demand production of 10–500 kg of tailored Re-Celloop™ for industrial trials and product development. Re-Celloop™ is a high-performance nano & micro-cellulose material produced from textile waste using proprietary enzymatic technology.

Seiko PMC is now **Chemipaz.**

In August 2025 **Spinnova** announced that the **Woodspin** joint venture agreement between Spinnova and **Suzano** will be terminated, enabling Spinnova to license technology freely.[6] Spinnova acquired the assets of Woodspin and Suzano Finland OY, and operations at Woodspin ceased temporarily but trial runs resumed in April 2026 with plans to restart production on a larger scale in 2026.[7]

Universidade Federal do Paraná (UFPR) is installing a pilot plant for production of MFC. Target date is September 2026. The plant is expected to begin operations between 2026 and 2027.

[5] https://www.performancebiofilaments.com/
[6] Binding agreements signed: Spinnova buys all Woodspin and Suzano Finland shares, and secures exclusivity rights on wood-based fibre - Spinnovagroup
[7] Spinnova begins trial runs at Woodspin demo factory and prepares to restart production | Spinnova

Cellulose Nanocrystals

CNC Capacity 2026
(tonnes per year, dry basis)

Producer	Process	Capacity
Fibenol, Estonia*	reactive extrusion	1,000
CelluForce, Canada	sulfuric acid hydrolysis	300
Anomera, Canada	Carboxylated	170
GranBio, U.S.	SO_2 fractionation	130
Navitas, Slovenia	Proprietary	50
Forest Products Lab, U.S.	sulfuric acid hydrolysis	3
Blue Goose Biorefineries, Canada	metal catalyzed oxidation	2
Innotech Alberta	sulfuric acid hydrolysis	<1
Cellulose Lab, Canada	Various	<1
ANPOLY, Inc., Korea	sulfuric acid hydrolysis	n/a
FPInnovations, Canada	sulfuric acid hydrolysis	pilot
Hangzhou Yeuha Technology Co., China	Proprietary	pilot
Nordic Bioproducts Group	from MCC	pilot
Tianjin Haojia Cellulose Co. Ltd., China	modified and unmodified	pilot

* WoodCell™ is a crystalline cellulose material bridging conventional MCC and CNC: its particle-size distribution is closer to MCC, while its properties enable use in applications typically served by CNC.

Cellulose Nanofibrils

CNF Capacity 2026
(tonnes per year, dry basis)

Producer	Process	Capacity
Daio Paper, Japan*	Composite	1,333
Norske Skog, Norway**	Mechanical	1,300
Sappi Biotech, Global	Proprietary	650
Nippon Paper, Japan	TEMPO, carboxylated	560
University of Maine, U.S.	Mechanical	260
GranBio, U.S.	SO_2 fractionation	130
Oji Paper, Japan	phosphate esterification	40
Sugino Machine, Japan	oblique collision	39
Chuetsu Pulp and Paper, Japan	aqueous counter collision	30
Chemipaz, Japan	modified hydrophobic	24
ANPOLY, Korea	TEMPO, other	20
Cellulose Lab, Canada	TEMPO, other	18
Tianjin Haojia Cellulose Co., Ltd, China	TEMPO, carboxylated	3
Dai-ichi Kogyo (DKS), Japan	TEMPO	1
U.S. Forest Products Lab, U.S.	TEMPO, mechanical	<1
NANOCEL, Spain	enzymatic, chemical, mechanical	<1
Toagosei Co., Ltd., Japan	Sodium hypochlorite oxidation	n/a
FineCell	Proprietary	pilot
ITENE, Spain	Mechanical	pilot
Nordic Bioproducts Group	from MCC	pilot
Re-Fresh Global, Germany	enzymatic treatment	pilot
VTT, Finland	chemical, enzymatic, mechanical	pilot

* 2,000 tpy of composite with 67% CNF
** Previously classified as MFC

Microfibrillated Cellulose

MFC Capacity 2026
(tonnes per year, dry basis)

Producer	Process	Capacity
Suzano, Brazil	Mechanical	20,000
FiberLean Technologies, UK	mechanical	13,000
Sappi Biotech, Global	Proprietary	6,220
Borregaard, Norway	Proprietary	1,000
Woodspin, Finland	Mechanical	1,000
Klabin, Brazil	Mechanical	350
RISE, transportable container factory	enzymatic pretreatment	200
Daicel, Japan	high pressure homogenizer	200
Weidmann Fiber Technology, Switzerland	Mechanical	150
CelluComp, UK	chemical pretreatment	100
CTP/FCBA, France	enzymatic pretreatment	25
RISE, Sweden	enzymatic pretreatment	25
Stora Enso, Finland	n/a	N/A
Empa, Switzerland	enzymatic pretreatment	pilot
InoFib, France	chemical pretreatment	pilot
ITENE, Spain	Mechanical	pilot
KCL, Finland		pilot
Re-Fresh Global, Germany	enzymatic treatment	pilot
Tianjin Haojia Cellulose, China	modified: TEMPO, other	pilot
UPM, Finland	n/a	pilot

Cellulose Filaments

Cellulose Filaments Capacity 2026
(tonnes per year, dry basis)

Producer		Capacity
Kruger, Canada	Mechanical	6,000
Tianjin Haojia Cellulose, China	n/a	n/a

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	tpa	95 - 440	340 - 1600	790 - 3900

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*G125 footprint includes electrical panel, G175 and G250 footprints refer to the grinder only.

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TALK TO THE EXPERTS

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Anomera (Canada)

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514 845 4444
https://www.anomera.ca/

Anomera Inc. manufactures carboxylated Cellulose Nanocrystals (CNC) in a patented eco-friendly method that delivers a high-performance nanomaterial. This platform product uses renewable raw materials sustainability harvested from Canadian forests to create a low energy, biodegradable alternative for formulating plastic free products in both industrial and cosmetic applications. Its pilot plant and R&D lab is based in Montreal, Quebec and its manufacturing facilities is located in Temiscaming Quebec. To request a sample or purchase a cosmetic product, contact Anomera's distributor Croda. For industrial applications, please contact Anomera directly.

Contact:
sales@anomera.ca

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https://anpolyinc.com/en

ANPOLY develops eco-friendly nanocellulose technologies that enhance product performance across industries. Its CNC and CNF are derived from discarded resources, supporting a circular economy. The company advances nanocellulose from laboratory research to real-world applications. Its ultra-fine nanocellulose enables lightweight composites, packaging, cosmetics, batteries, and biomedical materials. ANPOLY's demo plant was completed in April 2026 and currently has annual capacity of more than 1,000 tons, more than 20 tonnes dry basis.

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Tokyo 100-0006 Japan
https://www.asahi-kasei.com/

Asahi Kasei is a leading global producer of fiber products, chemicals, and electronic related materials based on its core technology of chemistry. Asahi Kasei products include Ceolus™ and Celphere™ microcrystalline cellulose, and NanoAct™ cellulose nanobeads.

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https://www.asahi-kasei.com/contact_us/

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London, Ontario N6A 1S2
http://axcelonbp.com/

Axcelon Biopolymers Corporation (ABC) is an innovative biomaterials company focused on leveraging its unique bacterial nanocellulose (BNC) platform technology to develop high-value products for wound care, medical devices, tissue engineering, and industrial applications. Axcelon's products include Nanoderm®, a microfibrillar biosynthetic cellulose film that stimulates the skin's natural regenerative mechanism to help promote quicker wound healing with a one-time application dressing.

Contact:
Dino Mili, President & COO
dmili@axcelonbp.com

Blue Goose Biorefineries Inc. (Canada)

#104-2518 Faithfull Avenue
Saskatoon, Saskatchewan
306-280-6831
www.bluegoosebiorefineries.com

Blue Goose Biorefineries (BGB) is a wholly-owned subsidiary of Nano-Green Biorefineries Inc., a privately held Canadian company. Blue Goose's BGB Ultra™ CNC is an aqueous suspension of carboxylated cellulose nanocrystals that is produced with a transition metal catalyzed oxidative process. Samples of BGB Ultra™ are available at https://bluegoosebiorefineries.com/shop/.

Contact:
Blaine Kunkel, CEO
bkunkel@bluegoosebiorefineries.com

Borregaard ASA (Norway)

PO Box 162
1701 Sarpsborg
+47 (0) 69 11 80 00
www.borregaard.com

Borregaard, a leading biorefinery company, has produced commercially available cellulose fibrils since 2016, in Sarpsborg, Norway. Exilva is an insoluble microfibrillated cellulose, which interacts both physically through its extreme surface area and chemically through hydrogen bonding. Its novel nature gives it rheological, mechanical and barrier functionalities, which as an additive, imparts a unique combination of properties in finished product systems. Free samples of Exilva are available online.

Contact:
Chief Technology Officer, Cellulose Fibrils
hans.henrik.ovrebo@borregaard.com

CELLiCON (Netherlands)

Leemansweg 15
6827BX Arnhem
The Netherlands
+31 (6) 26 337 608

CELLiCON's proprietary G2 technology creates valuable grades of micro and nanocellulose from cellulose-containing feedstocks, such as biomass and textile waste. The innovative process is based on simple molten salt hydrates and can be operated at low cost with low energy consumption.

Contact:
https://www.cellicon.org
info@cellicon.nl

CelluComp Limited (UK)

Unit 31 West Way Business Park
West Way
Dalgety Bay KY11 9AE
United Kingdom
https://www.cellucomp.com/

CelluComp produces a patented MFC called Curran®. Curran is from root vegetables, using sugar beet pulp after the sugar is extracted. Curran is not nano and has a unique platelet structure providing technical and economic advantages. Curran binds strongly to fibers, generating both MD and CD strength, in wet and dry conditions. Curran closes porosity and improves smoothness. Curran will not gel or hornify, and the platelet structure enhances drainage. Curran is available in dry format (>90% solids), suitable for global distribution.

Contact:
enquiries@cellucomp.com

CelluForce (Canada)

2000 McGill College Avenue, 6th Floor
Montreal, Quebec, H3A 3H3
514-360-1023
www.celluforce.com

CelluForce is the world leader in the development, production and commercialization of Cellulose NanoCrystals (CNC) and formulated products. The company operates the world's largest CNC plant, capable of producing 300 tonnes per year of high-quality sulfated cellulose nanocrystals. The company's products are currently used in several applications including oil and gas completion fluids, cosmetics, paints, coatings and rubber products. CelluForce was created in 2010 and its current shareholders are Domtar, FPInnovations, Schlumberger, Suzano and Investissement Quebec.

Contact:
info@celluforce.com

Cellulose Lab (Canada)

2 Garland Court, Room 212, Enterprise Bld.
Fredericton, NB, E3B 5A3, Canada
www.celluloselab.com

Cellulose Lab has been a pioneer in nanocellulose production since 2016, offering a diverse range of nanocellulose products including CNC, CNF, and bacterial cellulose (BC), all available in various forms such as anionic, cationic, hydrophobic, and other specialized forms. CNC capacity is 1kg per day and CNF capacity is 50 kg/day.

Contact:
contact@celluloselab.com;

Centre Technique du Papier (France)

Domaine Universitaire - CS 90251
38044 GRENOBLE - Cedex 9
+33 (0) 4 76 15 40 15
https://www.webctp.com/

Centre Technique du Papier (CTP) is the French Pulp and Paper Research and Technical Centre located at the University Campus, in Grenoble. CTP, in partnership with FCBA, operates the "NaMiCell" MFC/CNF pilot plant. The plant produces up to 100 kg per day of MFC/CNF in batches of 30 kg to 70 kg in the form of a 3% gel by way of a patented protocol. TEMPO MFC/CNF can also be produced on request.

Contact:
https://www.webctp.com/fr/contact/-acces

Chemipaz (Japan)

3-3-6 Nihonbashi Honcho,
Chuo-ku, Tokyo 103-0023, Japan
+81-3-6202-7331
https://www.chemipaz.com/en/

Seiko PMC changed its name to Chemipaz in 2025, reflecting the company's aspirations for society. We partner with our customers to provide products that contribute to every aspect of each person's daily life (from A to Z).[8] Chemipaz produces papermaking chemicals and resin products.

Contact:
https://www.chemipaz.com/en/contact/

Chemkey Advanced Materials Technology (Shanghai) Co., Ltd (China)

B316, No.4226 Duzhuang Road,
Shanghai, China
021-64196821
http://chemkey.com.cn/

Chemkey can provide lab samples of cellulose nanocrystals, microfibrillated cellulose, and cellulose nanofibers:

Contact:
http://en.chemkey.com.cn/c/127.html

Chuetsu Pulp and Paper (Japan)

282 U.J., Takaoka-shi
Toyama Prefecture, 933-8533
0766 26 2401
www.chuetsu-pulp.co.jp

Chuetsu is a leading pulp and paper producer. In June 2017, Chuetsu started commercial production at Satsuma-Sendai, Kagoshima, Japan, to produce CNF using bamboo, hardwood and softwood bleached kraft pulp as its raw material. Chuetsu manufactures a unique CNF called Nanoforest® using the Aqueous Counter-Collision Method ("ACC method"). Nanoforest-S is a commercial product available as 2 wt. % and 10 wt. % solids.

Contact:
https://www.cpc-cenf.com/form.html

[8] Chemipaz press release, Feb 14, 2025. Announcement Regarding Company Name Change - CHEMIPAZ CORPORATION

Daicel (Japan)

Grand Front Osaka Tower-B, 3-1
Ofuka-cho, Kita-ku, Osaka
+81 6 7639 7171
https://www.daicel.com/en/

Daicel is a leading Japanese chemical company. Daicel produces CELISH cellulose fiber, microfibrillated by special manufacturing process, and is produced from highly refined, pure fiber raw materials. The raw material fiber is unraveled into tens of thousands of strands, and the fiber thickness is refined to between several µm and 0.01µm. Because it is refined so that it does not impair the exact basic characteristics of the cellulose raw material (physical and chemical stability etc.), high-value-added product settings are possible.

Contact:
https://www.daicelmiraizu.com/en/inquiry/index.html

Daio Paper Corporation (Japan)

Tokyo Headquarters
Iidabashi Grand Bloom, 10-2
Fujimi 2 chome, Chiyoda Ward, Tokyo 102-0071
+81 3 6856 7500
http://www.daio-paper.co.jp/en/index.html

Daio is a full range of papermaking company that manufactures and sells paper, converted paper products, and functional materials. Daio products include cost-competitive ELLEX CNF. ELLEX is available as an aqueous dispersion (capacity 100 tpy), dry powder (capacity 10 tpy), and molded sheet. Daio also produces a polypropylene masterbatch containing 64% CNF.

Contact:
https://www.daio-paper.co.jp/en/contact/form-08/

DKS Co., Ltd. (Japan)

5 Ogawara-cho, Kisshoin, Minami-ku
Kyoto 601-8391, Japan
+81-75-323-5911
www.dks-web.co.jp

DKS Co. Ltd. (DKS) focuses on chemistry for a broad range of fields, including textiles, resins, industrial materials, materials for daily living, the environment, and energy. DKS produces carboxymethyl cellulose (CMC) and TEMPO oxidized cellulose nanofibers “RHEOCRYSTA” as aqueous functional additives.

Contact:
https://www.dks-web.co.jp/english/form/inquiry/

Empa (Switzerland)

Ueberlandstrasse 129
8600 Dübendorf / Switzerland
+41 58 765 11 11
https://www.empa.ch/web/empa/

An institute of the ETH domain., Empa is the Swiss Federal Laboratories for Materials Testing and Research. Empa operates an MFC pilot plant and conducts applications research with industry partners.

Contact:
https://www.empa.ch/web/empa/contact-form

Fibenol OÜ (Estonia)

Mõisa 4, 13522
Tallinn, Estonia
+372 5323 3550
https://fibenol.com/

Fibenol produces WoodCell™ crystalline cellulose from hardwood using its proprietary Sunburst™ fractionation technology. WoodCell™ is being commercialized for plastic-free barrier/coating solutions for fibre-based packaging applications as well as for molded fibre where it can improve material performance. Through the CBE-backed WOODCELL project, Fibenol is currently scaling its production towards 4,000 dry tonnes of Woodcell™ crystalline cellulose products annually. (https://www.cbe.europa.eu/projects/woodcell)

Contact:
info@fibenol.com

FiberLean Technologies Ltd. (UK)

Trebal Refinery, Trethurgy, St Austell,
Cornwall, PL26 8YQ, UK
www.fiberlean.com

FiberLean Technologies Ltd supplies proven MFC production equipment. FiberLean MFC grinders are simple, robust and cost-effective in design, making them easy to operate with low levels of supervision. The grinder range enables on-site MFC production, with G125, G175 and G250 options available to suit different capacity requirements. Integrated production cost of MFC is approximately €150–350 per tonne of MFC, around an order of magnitude lower than merchant MFC supply.

Broad regulatory clearance for grinder produced MFC is already in place, supporting adoption across relevant paper, board and packaging applications. FiberLean also has multi-tonne MFC production available for customer trials and interim supply from its production facility in Cornwall, UK. This enables customers to validate performance, bridge initial demand and de-risk deployment before or alongside investment in dedicated on-site production capacity.

FiberLean continues to provide technical services to support customers in the production and application of MFC, including process optimisation and product development support.

Contact:
info@fiberlean.com

FineCell (Sweden)

Teknikringen 56-58
SE-114 28 Stockholm
Sweden
www.finecell.se

FineCell has developed a new way to produce dry dispersible nano-sized cellulose from cellulose pulp. The technology is fully biobased and patented globally. FineCell's cellulose has key applications in cosmetics & personal care products, and further applications are under development. The product was launched in April 2026 together with Sollice Biotech under the trade name RheoTouch®. The scaling up of the production started in 2026 with pilot operations planned for 2027.

Contact:
peter.axegard@finecell.se (CEO)
joachim.reimer@finecell.se (CTO)

Foamlab B.V.(Netherlands)

Alexander Fleminglaan 1
2613 AX Delft, The Netherlands
+31 6 160 240 61
www.foamlab.co

Foamlab develops and produces bacterial cellulose based foams and aerogels. Our aerogels have remarkable strength while being extremely lightweight. They are available as film, powder and foam in a variety of densities.

Contact
info@foamlab.co

FPInnovations (Canada)

570 Boulevard St-Jean,
Pointe-Claire, Quebec H9R 3J9 Canada
+1 (514) 630-4100 or info@fpinnovations.ca
http://www.fpinnovations.ca/

Specializing in innovative scientific solutions, FPInnovations inaugurated its first CNC research facility with a state-of-the-art pilot plant in 2011. We also produced the first cellulose filaments (CF) in the laboratory and its pilot plant. Today we collaborate with many strategic research alliances, members, and partners. Using the technology developed by our research staff, industry now benefits in developing nanocellulose markets and applications. CelluForce (CNC), Kruger Biomaterials, and Performance Biofilaments (CF) are examples of our collaborations.

Contact:
jimmy.jong@fpinnovations.ca

GranBio USA (U.S.)

300 Mcintosh Parkway
Thomaston, Georgia, 30286
http://www.granbio.com.br/en/

GranBio has developed two patented BioPlus® nanocellulose production technologies for different markets, BioPlus® with AVAP® and BioPlus® with GreenBox®. Both processes are demonstrated at the scale of 1/2 tpd at GranBio Biorefinery in Thomaston, Georgia. These processes allow for the economical extraction of commercial-scale nanocellulose from any biomass with adjustable particle size and composition. Nanocellulose fibrils produced through the chemical-free GreenBox process have exceptionally low cost that enables their use in large volumes.

Contact:
Kim Nelson, CTO Nanocellulose
knelson@granbio.com

Guilin Qihong Technology Co. Ltd. (China)

12 Jiangan Road, Qixing District,
Guilin City, Guangxi Province.
156#7706#2278
http://www.qh-tech.cn/en/h-default.html

Guilin Qihong Technology Co., Ltd. focuses on research for the production and application of cellulose Nanofiber. Our products include carboxylated cellulose nanofibers (CNF), sulfate esters nanocrystals (CNC), hydrophobic nanocellulose (hydrophobic-CNC), and bacterial cellulose (BC). We own several national patents for inventions and processing technology and we are sincerely looking forward to cooperating with partners.

Contact:
Email 414328106@qq.com

Hangshi Technology Development (Hangzhou) Co., Ltd. (China)

No.168 Qianwu Road, Qingshanhu Science and Technology City,
Lin'an District, Hangzhou City, Zhejiang Province, China
+86-572-8276858
http://www.hangshitech.com/index_en.html

Led by Hangzhou Research Institute of Chemical Industry Co. with Zhejiang University Quzhou Research Institute, Hangshi Group, Jingxiu Environmental Protection, Dubai Technology, and other research institutes and enterprises, Zhejiang Biodegradable and Nano Materials Innovation Center is a new type of industry-university-research innovation alliance with the strong support of governments at all levels of the country. The Innovation Center and South China University of Technology and has built a 100kg/d micro and nano cellulose green pilot test line.

Contact:
http://www.hangshitech.com/contact_en.html

Hansol Paper (Republic of Korea)

23-24F, Tower B, 100, Eulji-ro, Jung-gu,
Seoul, Republic of Korea
https://www.hansolpaper.co.kr/eng/main

Hansol is a leading producer of paper and biomaterials. Hansol Paper has been concentrating its investment on developing nanocellulose from pulp since 2010, and set up the production system in late 2018. Hansol's goal is to advance into the material industry beyond the paper industry through nanocellulose, which has great potential for business expansion across different industries.

Contact:
https://www.hansolpaper.co.kr/eng/customer/inquiry

Holmen AB (Sweden)

PO Box 5407
SE-114 84 Stockholm
+46 8 666 21 00
www.holmen.com

One of the largest forest owners in Sweden, Holmen is a major producer of paper, paperboard and wood products, plus renewable energy from wind and water. Holmen is also a 42.4% owner of Melodea Ltd., a producer of CNC.

Contact:
https://www.holmen.com/en/contacts/

InnoTech Alberta (Canada)

250 Karl Clark Road
Edmonton, AB T6N 1E4
780-450-5111
www.innotechalberta.ca

InnoTech Alberta, a subsidiary of Alberta Innovates, is a leading research and technology organization serving the needs of industry, entrepreneurs, and public sector. Our organization's multidisciplinary expertise, cross-sector teams, and pilot-scale research facilities accelerate technology development. InnoTech Alberta operates a cellulose nanocrystals (CNC) pilot plant that can produce up to 20 kg per week of CNC from a variety of feedstocks.

Contact:
info@innotechalberta.ca.

Innotech Materials LLC (U.S.)

10437 Innovation Drive, Suite 324
Wauwatosa, WI 53226
414-488-2092
http://www.innotechmaterials.com/

Innotech Materials has developed a process for catalytic oxidation of commercial cellulose to produce hydrophobic and hydrophilic nanocellulose. Innotech products include: Oxidized Nanocellulose for applications in polymer biocomposites; Methyl Nanocellulose and Hydroxypropyl Methyl Nanocellulose for personal care, cosmetics, and pharmaceuticals; Carboxy Methyl Nanocellulose for bioadhesives; Hydrophobic Nanocellulose for bioplastic packaging.

Contact:
info@innotechmaterials.

Innovatech Engineering (U.S.)

1650 Summit Lake Dr. Suite 103
Tallahassee, FL 32317
(850) 391-2396
https://innovatech.us/

Innovatech is focused on bringing new technology to the market, specifically the commercialization of nanocellulose. Innovatech produces Nanopaper nanocellulose sheets in thicknesses from 0.012 to 0.015 millimeters. Nanopaper can be translucent, or transparent, made from TEMPO oxidized cellulose nanofibers.

Contact:
info@innovatech.us

Innventia (Sweden)

See RISE.

Klabin S.A. (Brazil)

Avenida Brigadeiro Faria Lima
3600 - 3, 4 e 5 andares, Itaim B
Sao Paulo 04.538-132
+55 11.30465800
https://www.klabin.com.br/en/home/

Klabin is Latin America's leading producer of containerboard, boxboard and packaging papers. In February 2018, Klabin acquired a minority interest in Israel-based Melodea Ltd., a producer of cellulose nanocrystals. In September 2018, Klabin announced an investment of Real 32 million for its research and development program for the construction of a Pilot Mill Complex in Telêmaco Borba (Paraná) to begin operating in 2019. The complex was developed to conduct testing and research on MFC to be incorporated into the company's paper production lines.

Contact:
https://www.klabin.com.br/general/contact-us/contact-us/

Kruger (Canada)

3285, Chemin Bedford
Montréal, Québec H3S 1G5
514-343-3100
http://bio.kruger.com/

Kruger Inc. is a major Canadian producer of tissue products, renewable energy, paper and paperboard made from recycled fibers, specialty papers for eco-friendly food packaging and labelling products, and cellulosic biomaterials. In September 2013, Kruger Biomaterials formed a strategic alliance with FPInnovations to produce and commercialize cellulose filaments, a form of cellulose nanofibrils. FiloCell is produced at 30% solids, with width of 30-500 nm, and most frequently 80-300 nm, and with length of 100-2,000 µm. Current capacity is 6,000T/y.

Contact:
https://biomaterials.kruger.com/contact-us/

Marubeni (Japan)

4-2, Ohtemachi 1-chome, Chiyoda-ku,
Tokyo 100-8088, Japan
[81] (3) 3282-2111
https://www.marubeni.com/en/

Marubeni Corporation and its consolidated subsidiaries use their broad business networks, both within Japan and overseas, to conduct importing and exporting, as well as domestic business, encompassing a diverse range of business activities across wide-ranging fields including lifestyle, ICT business & logistics, food, agri-business, forest products, chemicals, and much more. In 2022 Marubeni and Chuetsu Pulp announced new agricultural material that uses the ACC cellulose nanofiber nanoforest® manufactured by Chuetsu. See Chuetsu.

Contact:
https://www.marubeni.com/en/contact_form/

Marusumi Paper Co., Ltd. (Japan)

826 Kawanoe-cho,Shikokuchuo,Ehime,
799-0196, Japan
+81-896-57-2222
https://www.marusumi.co.jp/en/paper/cnf/

Marusumi Paper Co., Ltd. is a Japan-based company headquartered in Shikokuchuo, Ehime Prefecture, with a history dating back to 1946. It operates in forestry, paper manufacturing, and advanced materials, including nanocellulose and nanofibers. The company holds over 100 patents related to nanocellulose, nanofibers, nanocomposites, and nanomaterial. According to the *Nanocellulose Suppliers in Japan* directory, Marusumi offers sulfonized cellulose nanofibers (CNF).[9]

Contact:
https://www.marusumi.co.jp/en/

Moorim (Republic of Korea)

656 Gangnam-daero, Gangnam-gu,
Seoul, Korea
https://www.moorim.co.kr:13002/eng/main/main.php

Moorim's nanocellulose is extracted from natural virgin pulp with the technology of Korea's only integrated pulp and paper plant. It has many properties, such as renewability, biodegradability, and biocompatibility, and useful features, such as hydrophilicity and water retention, and can be used in moisturizing cosmetics, films, and food and pharmaceutical packaging.[10]

Contact:
+82. 52.240.6191
harris@moorim.co.kr

[9] marusumi nanocellulose - Search
[10] https://www.moorim.co.kr:13002/eng/product/nano.php

NANOCEL TECHNOLOGY S.L. (Spain)

Parque Empresarial de Alvedro, Calle J, Nave 25, 15180, Culleredo, A Coruña, Spain
+34 698 162 438
https://nanocel.es

NANOCEL is a technology-based company whose main activity is the technological development of the production and commercialization of new nano-scale products and biosustainable materials. The company uses various raw materials – virgin biomass such as Kraft cellulose, or recycled – for the development and sale of nanocellulose (in emulsion, dry, or modified). NANOCEL is strategically oriented towards the development of sustainable nanoparticle applications such as packaging, paper, plastics, construction, cosmetics, pharmaceuticals, food, etc.

Contact:
info@nanocel.es

Navitas d.o.o (Slovenia)

Podcerkev 1A
1386 Stari trg pri Ložu
Slovenia (EU)
+386 41 648 879
https://www.nanocrystacell.eu/

Navitas started production of Nanocrystacell CNC in 2020 in Slovenia following development beginning in 2018. Capacity is 10 tonnes per year, and the glycol-based process results in CNC with negligible sulfur content. Nanocrystacell is available as freeze vacuum dried powder or aqueous suspension. Capacity is 50 tonnes per year, dry basis.

Contact:
contact@nanocrystacell.eu

Nippon Paper Industries Co., Ltd. (Japan)

Ochanomizu Sola City
4-6, Kandasurugadai, Chiyoda-ku, Tokyo 101-0062, Japan
Tel: +81-(0)3-6665-1111
https://www.nipponpapergroup.com/english/products/cnf/

Nippon Paper is Japan's largest manufacturer of paper and paperboard, and one of the world's largest producers of CNF, with capacity of 560 tonnes. In October 2013, Nippon Paper established the first pre-commercial CNF plant in Japan at its Iwakuni Mill. Nippon Paper later started operations at the Ishinomaki Mill (TEMPO), the Fuji Mill (Kyoto Process), and the Gotsu Mill, which produces additives for food and cosmetics. Nippon Paper's work with CNF focuses on composites, cosmetics, energy storage devices, filtration, gas barrier films, and healthcare products.

Contact:
https://www.nipponpapergroup.com/english/inquire/

Nordic Bioproducts Group (Finland)

Office & BIG R&D Lab
Tietotie 1A, 02150 Espoo, Finland
https://nordicbioproducts.fi/

Nordic Bioproducts Group (NBG) is a Finnish producer of microcrystalline cellulose (MCC) at a capacity of 10,000 tonnes/year. The AaltoceII™ technology minimizes energy, chemical and water usage, as well as waste generation, resulting in MCC with a markedly reduced carbon footprint compared to the market standard. The MCC exhibits unique, tailorable properties that widen the application horizon from pharma, food and cosmetics towards high performance materials. Furthermore, NBG converts MCC into carboxylated cellulose nanomaterials at a pilot scale.

Contact:
Kalle Riihinen
kalle.riihinen@nbg.fi

Norske Skog ASA (Norway)

PB 294 Skøyen
0213 Oslo, Norway
https://www.norskeskog.com/products/enesrgy-bio-products/cebina

Norske Skog installed their MFC pilot plant at Saugbrugs in 2017 and is now on track for 1,300 tonnes of dry weight Cebina CNF this year. In 2022 a unique solution for dry MFCs was announced, with a 25 tonne pilot being built in 2023. Commercial production of systems where 30 % dry weight MFCs are incorporated into epoxy resin, polyols or castor oil is ongoing. Both waterborne- and dry MFCs have been supplied to several industry-scale projects.

Contact:
CEBINA@norskeskog.com

Oji Holdings (Japan)

47-5, Ginza 4-chome
Chuo-ku, Tokyo 104-0061
+81 3 3563 1111
https://www.ojiholdings.co.jp/english/

Oji is a leading Japanese paper company. Oji produces CNF through nanofibrillation of pulp and has developed a manufacturing process using a unique chemical treatment, “phosphorylation,” which enables Oji to produce CNFs with high quality (high transparency, high viscosity, and thixotropy). Oji manufactures transparent CNF slurry and coarse CNF slurry (AUROVISCO), hydrophobic CNF powder, and CNF sheet (AUROVEIL).

Contact:
https://www.ojiholdings.co.jp/english/r_d/contact.html?frmid=29

Re-Fresh Global (Germany)

c/o B-Part Am Gleisdreieck
Luckenwalder Str. 6b
10963 Berlin
https://re-fresh.global/

Re-Fresh Global develops **Re-Celloop™,** a high-performance nano & micro-cellulose material produced from textile waste using proprietary enzymatic technology, offering a unique alternative to conventional wood- or bacteria-derived nanocellulose.

Re-Celloop™ offers customizable properties, including rheology, viscosity, texture, and formulation stability. Applications include cosmetics, coatings, and water-based formulations, with further development in packaging and lyocell fiber production.

An LCA shows up to 85% lower carbon emissions compared with selected conventional nanocellulose processes. Re-Celloop™ also offers the potential for up to 50% lower material costs compared with similar products. **video**

Contact:
community@re-fresh.global

RISE Research Institutes of Sweden AB (Sweden)

Sven Hultins plats 5, 412 58,
Gothenburg, Sweden
010-516 50 00
https://www.ri.se/en

RISE is Sweden's research institute and innovation partner. RISE Innventia, an early leader in the development of MFC, reduced energy usage in producing MFC through six generations of development, including enzymatic pretreatment. RISE operates a 100 kg/day MFC pilot plant at Innventia and a mobile demonstration plant for MFC trials at mills around the word. The mobile demo plant is able to produce highly refined fiber (HF), highly refined enzyme treated fiber (HFE), or MFC at the rate of 100 kg of dry product per hour.

Contact:
https://www.ri.se/en/about-rise/contact-us

RISH Research Institute for Sustainable Humanosphere (Japan)

Kyoto University
Gokasho, Uji City, Kyoto Prefecture, Japan. 611-0011
+774-38-3346
https://www.rish.kyoto-u.ac.jp/?lang=en

The RISH at Kyoto University is a leader in cellulose nanofibril research. Professor Hiroyuki Yano of RISH was the first in Japan to become engaged in the research of cellulose nanofibers. The Kyoto Process is based on the "Pulp Direct-Kneading Method." RISH has a pilot plant with capacity of 1 tpy of thermoplastic resins with 10 wt. % CNF. One application is the Nanocellulose Vehicle (NCV): the use of CNF in 13 components enables weight reduction of 16% compared to standard vehicles. https://www.youtube.com/watch?v=06H8wP9axjU

Contact:
Prof. Hiroyuki Yano
yano@rish.kyoto-u.ac.jp

Sappi | Valida (The Netherlands)

Sappi Biochemtech BV
Biesenweg 16 | 6211 AA Maastricht | The Netherlands
https://www.sappi.com/valida-home

Sappi is a leading global provider of everyday materials made from woodfibre-based renewable resources. As a diversified, innovative and trusted leader focused on sustainable processes and products, we are building a more circular economy by making what we should, not just what we can. Our market offerings such as dissolving pulp, wood pulp, biomaterials, timber, packaging and speciality papers, graphic papers, casting and release papers and forestry products are manufactured from woodfibre sourced from sustainably managed forests and plantations, in production facilities powered, in many cases, with bio-energy from steam and existing waste streams. Sappi Valida is a leading producer of fibrillated cellulose with naturally derived functionality for a wide range of applications including personal care, agriculture, coatings, construction additives and packaging. Sappi Valida is available in commercial volumes from a number of production facilities.

Contact:
Valida@sappi.com

ScienceK (China)

Zhejiang, China
http://www.sciencek.com

ScienceK, a pioneer in the nanocellulose industry, provides a full range of scientific research services. Science K provides CNC 5 kg/day dry power; CNF 200 kg/day, 1% by mechanical method; CNF 200kg/day 1% TEMPO plus mechanical; BC, 200 kg/day 5%.

Contact:
sciencek@qq.com

Seiko PMC Corporation (Japan)

See Chemipaz

Shengquan Group (China)

Shengquan Industrial Park,
Zhangqiu District, Jinan City, Shandong Province, China
https://e.shengquan.com

The Jinan Shengquan Group Share-Holding Co., Ltd. industrial layout includes biorefinery, high-performance resin and composites, foundry materials, health & pharmaceutical industry, new energy, etc. Shengquan 超变力 ® nanocellulose is made of plant fiber as raw material and has diameter is less than 100nm and aspect ratio not less than 200. It can be modified into anionic, cationic, silane-coupled chemical functional nanocellulose by oxidation, lipidation, silanization, and other modification technologies.

Contact:
zacktang@shengquan.com

Spinnova (Finland)

Palokärjentie 2-4
fin-40320 jyväskylä
+358 20 703 2430
https://spinnovagroup.com/

Spinnova has developed breakthrough technology for making textile fibre out of wood or waste without dissolving and harmful chemicals.[11] In 2025, Spinnova acquired the assets of Woodspin and Suzano Finland OY. Woodspin was a joint venture between Suzano and Spinnova to produce MFC on site in Finland for use in Spinnova textiles. Operations at Woodspin had ceased temporarily but trial runs resumed in April 2026 with plans to restart production on a larger scale in 2026.[12]

Contact:
info@spinova.com

Stora Enso Oyj (Finland)

PO Box 309
FI-00101 Helsinki
+358 20 46 131
http://www.storaenso.com/

Stora Enso was one of the first companies to successfully launch paperboard enhanced with MFC commercially.

Contact:
https://www.storaenso.com/en/contact-us

[11] https://spinnovagroup.com/
[12] Spinnova begins trial runs at Woodspin demo factory and prepares to restart production | Spinnova

Sugino Machine Limited (Japan)

2880 Kuriyama, Namerikawa City,
Toyama Prefecture, 936-8577, Japan
+81-76-477-2555
https://www.sugino.com/en/

Star Burst, Sugino's full line of wet jet milling devices, disperse, emulsify, pulverize, and reform surfaces of raw materials by obliquely colliding the particles pressurized up to 245 MPa at the relative velocity of Mach 4. Star Burst does not use any grinding media and can deliver homogenized particle size with minimal contamination. BiNFi-s are Sugino original nano-sized nanofibers utilizing Star Burst technology. They are biomass fibers of cellulose, chitin, chitosan, and silk with 10 to 20nm diameter and multiple micron lengths.

Contact:
kyoneda@suginocorp.com

Suzano Papel e Celulose S.A. (Brazil)

Av. Brigadeiro Faria Lima
1355 – do 6º ao 8º andar
Pinheiros
CEP 01452-919
São Paulo, SP, Brasil
www.suzano.com.br

Suzano is the largest pulp manufacturer in the world, the leader in the toilet paper segment in Brazil and one of the largest paper producers in Latin America. In Brazil, Suzano produces microfibrillated cellulose in a 700 tpy (dry basis) pilot plant. Suzano is also an equity partner in CelluForce.

Contact:
https://www.suzano.com.br/en/products-and-brands/raw-material/microfibrillated-cellulose

Tellus Products, LLC (U.S.)

37021 Gato Blvd, Belle Glade, FL 33430
914 709 8240
www.tellusproducts.com

Tellus Products LLC is a leading manufacturer of fiber-based molded products for food service and packaging applications. Our products are made from natural cellulosic fibers, micro fibrillated cellulose (MFC) and FDA-approved additives, with sustainability at the core of our approach, emphasizing biodegradability, compostability, and recyclability. We offer flexible product designs and utilize advanced technologies such as wet-end chemistry, coatings, and lamination to deliver enhanced performance, including water, oil, and grease resistance.

Contact:
Hasan.sadeghifar@tellusproducts.com
Andrew.dermont@asr-group.com

Toagosei Co. Ltd., (Japan)

1-14-1 Nishi-Shimbashi, Minato-ku, Tokyo 105-8419
TEL: +81-3-3597-7215
https://www.toagosei.co.jp/english/index.html

Taogosei produces cellulose nano fibers (CNF) from non-edible biomass. Toagosei was able to reduce the energy required for fibrillation, and achieve a lower cost through our proprietary oxidized cellulose fibrillation technology. Our Aronfibro is fibrillated into short, single nano fibers for excellent dispersion, and adding it to resins, rubbers, paints, adhesives, and other material can help improve their properties. Aronfibro is available as a paste with approximately 10% solids.

Contact:
sales@toagosei.net

TPI Chemicals FZCO (UAE)

Premises No:HD155, Floor No:25, Sheikh Rashid Tower,
Dubai World Trade Centre, Dubai, UAE
+ 90 536 561 3709
https://www.tpi-chemicals.com/

TPI Chemicals is a know-how based and technology oriented Cellulosic Polymers Developer and Supplier. MFC (Micro fibrillated Cellulose) is one of the Cellulose Derivatives TPI Chemicals develops and supplies. Please feel free to contact us for more information.

Contact:
e-mail: info@tpi-chemicals.com

University of Maine (U.S.)

The Process Development Center
5737 Jenness Hall
Orono, ME 04469
207-581-2237
https://umaine.edu/pdc/

The Process Development Center (PDC) offers a broad range of technical services and resources. The University of Maine (UMaine) Nanomaterial Pilot Plant opened in 2012 at the PDC and is a joint project with the US Forest Service. The pilot plant has capacity for 1 ton per day of CNF and is the largest CNF plant in the US. The UMaine PDC supplies cellulose nanofibrils (CNF) and cellulose nanocrystals (CNC) to academic, public, and private research groups interested in evaluating and developing applications for these materials.

Contact:
umaine.pdc@maine.edu

UPM Biomedicals (Finland)

Alvar Aallon katu 1
P.O. Box 380
00101 Helsinki, Finland
+358 204 15 111
https://www.upmbiomedicals.com/

UPM Biomedicals offers our natural biocompatible innovation, UPM Nanocellulose. UPM Nanocellulose is already used in in vitro 3D cell culture (>180 protocols available for GrowDex®), in in vivo cell transplantation, in bioinks (GrowInk™) and in CE-marked wound dressings (FibDex®, medical device class II). We already supply several companies, such as BICO AB (Cellink), with our material for formulation of their own products. UPM also offers licenses for specific application fields.

Contact:
biomedicals@upm.com

USDA Forest Service, Forest Products Laboratory (U.S.)

One Gifford Pinchot Drive
Madison, WI 53726
608-231-9200
https://research.fs.usda.gov/fpl

Established in 1910 by the U.S. Department of Agriculture Forest Service Chief Gifford Pinchot, the U.S. Forest Products Laboratory, became the first research facility focusing on study of physical properties and resource utilization of wood. The Forest Products Laboratory funded a first of its kind in the U.S. production facility for renewable, forest-based nanomaterials. The Laboratory's pilot plant produces cellulose nanocrystals (30 kg/wk) and TEMPO-based cellulose nanofibers (5 kg/wk).

Contact:
https://research.fs.usda.gov/fpl/contactus

VERDE Nanomaterials Inc. (U.S.)

California, USA
(510) 883-3258
www.verdenano.com

VERDE Nanomaterials, founded in 2022, is an innovative startup developing a cost-effective process for producing cellulose nanofibers (CNFs) from waste resources, including agricultural residues and other fiber-based byproducts. Leveraging research from the University of Washington, VERDE's core technology utilizes green chemistry principles and simple unit operations to enable a more sustainable and economically viable process to make CNFs.

Contact:
contact@verdenano.com

VTT Technical Research Centre of Finland

PO Box 1000
FI-02044 VTT
+358 20 722 111
https://www.vttresearch.com/en

VTT can make various MFC and CNF grades for application testing. These grades can be produced with varying degrees of fibrillation (coarse, medium, fine fibre size). VTT produces tailor-made samples for R&D purposes from lab to pilot scale using standard equipment such as grinders and microfluidizers, unmodified, chemically modified, and enzymatically aided at high consistency, up to 20 kg/day. VTT's services include semi-pilot scale nanocellulose barrier coating concept and MFC film pilot line, which are available for confidential customer projects.

Contact:
Jaakko Kuusisaari, Solution Sales Lead
jaakko.kuusisaari@vtt.fi
+358405015197

Weidmann Fiber Technology (Switzerland)

Neue Jonastrasse 60
8640 Rapperswil SG
Switzerland
https://weidmannfibertechnology.com/

Part of Weidmann Holding AG, Weidmann Fiber Technology operates a production plant that produces Celova® microfibrillated celluloses and cellulose powder. The purely mechanical process uses no chemical or enzymatic pretreatment. Raw materials include pulp and perennial plants. Applications include personal care, barrier and film coatings, home and industrial care, energy storage, paints and adhesives.

Contact:
https://weidmannfibertechnology.com/#Contact%20us

Woodspin (Finland)

Woodspin, a joint venture between Suzano and Spinnova, was terminated in 2025. and the assets of Woodspin were acquired by Spinnova. See Spinnova.

Zelfo Technology GmbH (Germany)

Am Wasserturm 1,
16247 Joachimsthal
UNESCO Biosphere Schorfheide-Chorin,
Brandenburg, Germany
+49 (0)33361 64931
https://www.zelfo-technology.com

We specialise in producing fibrillated macro (MaFC) micro (MFC) and nano (NFC) cellulose fibres, either as separate entities or in controlled mixtures. Zelfo Technology's experience in these fields extends to sources from pre-processed and non-processed ligno-cellulosic fibres and we aim to generate the best performance properties from all constituent parts of the source material. Engineered fibres perform as biobased binders, composites and absorbents etc.

Contact:
https://www.zelfo-technology.com/about-us-contact

Zhejiang Jinjiahao Green Nanomaterial co., ltd (China)

No.37 Venus Road, Longyou Industrial Zone,
Quzhou City, Zhejiang Province, China
0570—7566665
http://www.cnjjh.cn/

Zhejiang Jinchang Specially Paper Co., Ltd. was founded in March 2009. The company specializes in design, development, production, processing, and sale of specialty papers. Jinjiahao nanofibers allow new or improved products and processes in different applications.

Contact:
http://www.cnjcpaper.com/contacten.aspx

Equipment and Technology Providers



Aikawa Fiber Technologies Oy (Finland)

Sörnäistenkatu 1, 00580 Helsinki, FINLAND
aft-global.com

Aikawa Fiber Technologies provides comprehensive solutions and end-to-end support for MFC/CNF process development and scale-up. With decades of continuous (MFC/CNF) development and more than 15 years of supplying industrial MFC/CNF solutions, we help customers turn innovation into scalable production.

Contact:
Timo Koivisto timo.koivisto@aft-global.com
https://aft-global.com/en/contact-aft

Benz Technology International Inc. (U.S.)

2305 S Clarksville Rd
Clarksville, OH 45113
www.benz-tech.com

Agitation of lignocellulosic slurries.

Contact:
Contact Us — Benz Technology International, Inc

Betulium Oy (Finland)

Tekniikantie 2,
FI-02150 Espoo
Finland
www.betulium.com

Betulium was sold to KCL. See KCL.

Chemstone (U.S.)

18066 Ventura Blvd Encino, CA 91316
818) 757-1305
https://chemstone.com/

In 2023 Chemstone acquired HS Manufacturing Group (HSMG), a technology provider focused on biodegradable packaging solutions. PROTĒAN® is an environmentally friendly and non-toxic barrier coating and additive technology platform that can deliver critical water, oil and grease resistance properties. PROTĒAN® has been proven to provide excellent oil and grease barrier, especially when combined with wet end surface applications of MFC or CNF, and the performance can be further improved with the addition of MFC or CNF in the base sheet.

Contact:
https://chemstone.com/contact-us.html

Fibenol OÜ (Estonia)

Mõisa 4, 13522
Tallinn, Estonia
+372 5323 3550
https://fibenol.com/

In 2023 Fibenol acquired the Sunburst™ reactive extrusion process that deconstructs biomass into lignin, hemicellulose and cellulose in 20 seconds, and with further enzymatic hydrolysis can yield low-cost CNC or CNF. In March 2022 Fibenol received final acceptance of its first commercial Sunburst unit at the Sweetwoods Project in Estonia. Fibenol will consider joint product development agreements, as well as licensing and other partnership structures to continue to deploy the technology commercially. Samples can be available subject to NDA and MTA.

Contact:
info@fibenol.com

Hielscher Ultrasonics GmbH (Germany)

Oderstr. 53, 14513 Teltow, Germany
+1 (973) 532-6488
https://www.hielscher.com/ultrasonic-homogenizers-for-liquid-processing-3.htm

Hielscher Ultrasonics specializes in the design and manufacturing of high- power ultrasonic homogenizers for lab, bench-top and production level. Ultrasonic power is an effective and energy-efficient means to apply high shear and intense stress to liquids, powder/liquid mixtures and slurries. Hielscher equipment includes devices for the ultrasonication of any liquid volume, from several microliters through hundreds of cubic meters per hour.

Contact:
info@hielscher.com

KCL (Finland)

KCL Oy Keskuslaboratorio-Centrallaboratorium Ab
Tekniikantie 2
FI-02150 Espoo, Finland
+1 358 40 5227104

KCL is Europe's leading open access pilot and laboratory service provider. Services include biomaterial processing, extrusion and dispersion coating and lamination, laboratory services and more. KCL hosts the BIOHUB cluster tailored for the biomaterials sector with a dedicated space for testing, piloting, and laboratory facilities. In 2013, KCL acquired Betulium Oy, a producer of MFC from industrial side-steams such as sugar beet pulp. In addition, KCL has pilot-scale production of cationized, phosphorylated, and sulphated cellulose nanofibers (CNF).

Contact:
Dr. Antti Laukkanen, R&D director
antti.laukkanen@kcl.fi

Masuko Sangyo Co., Ltd. (Japan)

1-12-24 Honcho, Kawaguchi-city,
Saitama-pref, JAPAN 332-0012
+81-48-222-4343
http://www.masuko.com/English/index.html

In 1965, Masuko became the first manufacturer in the world to commercialize an innovative friction grinder using a grinding wheel, the "Supermasscollider" Since then, Masuko has introduced a broad range of machines that achieve ultra-fine pulverization for an expanding range of materials, including the production of cellulose nanofibrils (CNF). Masuko grinders are in commercial production of CNF at various locations globally.

Contact:
http://www.masuko.com/English/form/index.php

MetGen (Finland)

Rakentajantie 26
20780 Kaarina, Finland
+358 2 237 7077
https://www.metgen.com/

MetGen makes lignin into products that replace oil-based incumbents. Our METNIN™ platform, built on engineered enzymes, refines lignin from kraft mills and biorefineries and tailors each grade to the characteristics the application demands. METNIN Phenols and METNIN Polyols serve packaging, construction, polymer, composite and coating applications, drop-in. Asphalt, activated carbon and battery materials are separate lines.

Contact:
https://www.metgen.com/contact-us/

Microfluidics International Corporation (U.S.)

90 Glacier Drive, Suite 1000
Westwood, MA 02090
Telephone: +1 (617)-969-5452
https://www.microfluidics-mpt.com/

Microfluidics International Corporation, the manufacturer of Microfluidizer® high shear fluid processors, is a leader in the design and production of laboratory and commercial processing equipment used in the production of micro- and nano-scale materials including nanocellulose. Microfluidizer® technology is employed in the production of cellulose nano- and micro- fibrils at corporations and research centers around the globe.

Contact:
https://www.microfluidics-mpt.com/contact-us

Shibaura Machine Co., ltd. (Japan)

2-2, Uchisaiwaicho 2-Chome,
Chiyoda-ku, Tokyo 100-8503
81-(0)3-3509-0200
https://shibaura-machine.com/

Shibaura manufactures machines and high-precision machine tools, i.e., at the nanometer scale. Applications include nanocellulose. and also the semiconductor, shipbuilding, aircraft, medical, electronics, packaging and automobile industries. Shibaura and Daio Paper jointly developed a technique for uniformly and efficiently combining fine CNF, which easily retains moisture, with resin.[13]

Contact:
https://shibaura-machine.com/why-shibaura/contact-us/

Sugino Corp. (Japan)

1380 Hamilton Pkwy.
Itasca, IL 60143
888.784.4661
www.suginocorp.com

Star Burst, Sugino's full line of wet jet milling devices, disperse, emulsify, pulverize, and reform surfaces of raw materials by obliquely colliding the particles pressurized up to 245 MPa at the relative velocity of Mach 4. Star Burst does not use any grinding media and can deliver homogenized particle size with minimal contamination. BiNFi-s are Sugino original nano-sized nanofibers utilizing Star Burst technology. They are biomass fibers of cellulose, chitin, chitosan, and silk with 10 to 20nm diameter and multiple micron lengths.

Contact:
kyoneda@suginocorp.com

Technikum Laubholz GmbH

Bahnhofstraße 41 + 52
73033 Göppingen I Germany
https://technikumlaubholz.de/en/

Technikum Laubholz develops and scales cellulose processing technologies from lab to pilot scale, supporting the transfer from research into industrial applications. Facilities include equipment for application development of cellulose-based nanomaterials. Cellulose can be pre-processed in different equipment by various additional processes like fractionation, purification, chemical modification, separation technologies and relevant analytics.

Contact:
info@technikumlaubholz.de

[13] Daio Paper press release, July 29, 2025.

Valmet North America (U.S.)

3720 Davinci Court
Norcross, GA 30092
www.valmet.com

Valmet is a leading global developer and supplier of process technologies, automation, and services for the pulp, paper, and energy industries. For MFC production, Valmet has a unique, refiner-based technology. The production process combines advanced refiner and plate technology with an innovative control system designed to maximize production efficiency. Valmet MFC can use disk or conical refining technology to produce MFC in either a batch or continuous refining process. Valmet´s MFC Business Research Team has a pilot research plant in Finland and an alliance with the University of Maine Process Development Center (PDC) in the US.

Contact:
Contact us | Valmet

Vireo Advisors LLC (U.S.)

WBENC Certified Woman Owned Business
P.O. Box 51368, Boston, MA 02205 USA
https://www.vireoadvisors.com

Vireo Advisors, LLC is an international expert advising firm with significant experience supporting the commercialization of novel forms of celluloses and other biobased materials. We conduct occupational and product-specific safety evaluations and create market and regulatory documentation and roadmaps to set clear expectations, reduce business risk, and inform product design. Tapping into our broad network, we build consortia, identify opportunities, and convene key stakeholders to identify solutions to complex problems.

Contact:
https://www.vireoadvisors.com/contactus

Government, University, Research, and Consultants

Aalto University (Finland)

Aalto University
P.O. Box 11000 (Otakaari 1B)
FI-00076 AALTO
+358 9 47001
https://www.aalto.fi/en/department-of-bioproducts-and-biosystems/biobased-materials-technology

The biobased materials technology group (BIOMAT) led by Dr. Maloney carries out research in the development of next generation fiber products. The target is to develop technologies that enable renewal of the paper and board industries: nanocellulose films, nanopapers and nanostructuring of fibers for high-bulk board. Various grades of nanocellulose can be produced in our labs. Specialized methods for measuring nanocellulose quality are available. Methods for measuring nanocellulose/water interactions including water removal are especially notable.

Contact:
thaddeus.maloney@aalto.fi

AFRY Group/Industry (Finland)

AFRY Finland Oy

Jaakonkatu 3
01620 Vantaa
Finland
www.afry.com

AFRY is a global engineering, design, and advisory firm driving sustainable transformation. We deliver solutions across industrial sector, infrastructure and energy. AFRY supports project developers across all these areas with a one-stop-shop service including feasibility studies and process engineering.

Contacts:
petri.vasara@afry.com Hannele.lehtinen@afry.com elina.hakala@afry.com

Agroforestry Nanotechnology Research Group (GNanoAgro-UFPR) (Brazil)

632 Lothario Meissner Avenue
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+55 41 3360 4223
www.gnanoagro.ufpr.br

The Agroforestry Nanotechnology Research Group (GNanoAgro/UFPR), associated with LCNano/UFPR within the SisNANO Network (MCTI, Federal Government of Brazil), specializes in education, innovation, scientific and technological research, and technical consulting services for public or private institutions. Our focus includes developing new nanostructured products from natural fibers, enhancing polymeric nanocomposites, and modifying surface materials for various applications.

Contact:
https://gnanoagro.ufpr.br/contato/

Alberta Innovates (Canada)

250 Karl Clark Road
Edmonton, BC T6N1E4
780-427-1956
www.albertainnovates.ca

See InnoTech Alberta in the Producers Section.

American University (U.S.)

4400 Massachusetts Avenue, NW
Washington, DC 20016
+1 202 885-1000
https://www.american.edu/

American University engages students to create meaningful change in the world through experiential learning and student driven research. Located in Washington DC, it is known for strong international relations, public policy, and business programs. Combined with recent investments in the STEM fields, the university is well positioned to work with industry and government agencies to advance the commercialization of new biomaterials.

Contact:
Douglas M. Fox
Department of Chemistry
dfox@american.edu

Auburn University (U.S.)

Auburn, Alabama 36849
(334) 844-4000
https://www.auburn.edu/

Beijing Forestry University (China)

No. 35 Tsinghua East Road
Haidian District, Beijing, P.R. China
http://eng.bjfu.edu.cn/

BioApplied Innovation Pathways (Canada)

1 Research Drive, Suite 107
Dartmouth, NS B2Y 4M9
+1 (902) 701-9761 (office)
https://bioapplied.com/

BioApplied™ provides business services to support the circular bioeconomy. These services include ecosystem development, business research, and business development and product deployment – with deep experience commercializing nano-cellulosic materials. Since our formation in 2011, we have built an exceptional Network of Industrial, Technical, Academic, Government, Entrepreneurial, and financial expertise.
We welcome your call and will be delighted to discuss, explore, discover…

Contact:
greg.maloney@bioapplied.com
+1 (514) 497-0360 (mobile)

BioPRIA (Australia)

Monash University
15 Alliance Lane
Clayton 3800, Australia
+61 3 99053456
https://www.monash.edu/; https://www.biopria.com.au/

BioPRIA at Monash University has lab refiners, homogenisers and reactors for producing CNC, CNF and TOCN at the 10-100s of gram scale. The Institute has developed new methods for characterizing cellulose nanomaterials and can rapidly manufacture 10-200 freestanding pure and composite cellulose nanofiber films using spray coating. The Institute has a comprehensive suite of equipment for measuring nanocellulose film properties, including barrier performance.

Institute Contact:
https://www.biopria.com.au/contact/

BioProducts Institute (Canada)

See University of British Columbia.

Biorenewable Deployment Consortium LLC (U.S.)

2875 Ashton Road
P.O. Box 17182
Sarasota, FL 34276
https://biorenewabledc.com/

The Biorenewable Deployment Consortium LLC (BDC) is an international company that assists its membership with the deployment of leading-edge advanced biofuels, biochemicals, and bioproducts technologies that do not require long-term subsidy, making them more profitable and sustainable. The company identifies, performs due diligence, and promotes those processes that add value to its member companies under its brokering partnership initiatives.

Contact:
Eric.Horn@biorenewabledc.com

Center for Renewable Carbon (U.S.)

See University of Tennessee.

Centre Technique du Papier (France)

Domaine Universitaire - CS 90251
38044 GRENOBLE - Cedex 9
+33 (0) 4 76 15 40 15
http://www.webctp.com/gb/default.cfm

Centre Technique du Papier (CTP) is the French Pulp and Paper Research and Technical Centre located at the University Campus, in Grenoble. CTP, in partnership with FCBA, operates the "NaMiCell" MFC/CNF pilot plant. The plant produces up to 100 kg per day of MFC/CNF in batches of 30 kg to 70 kg in the form of a 3% gel by way of a patented protocol. TEMPO MFC/CNF can also be produced on request.

Contact:
https://www.webctp.com/en/contact/-access

CERMAV-CNRS Domaine Universitaire (France)

601 Rue de la Chimie,
38610 Gières, France
+33 (0)4 76 03 76 03
https://cermav.cnrs.fr/en/

The CERMAV, the Centre de recherches sur les macromolécules végétales, is a CNRS research unit. CERMAV is a leader in glycosciences in Europe, focused on cellulose and lignin.

Contact:
direction@cermav.cnrs.fr

CETIM (Spain)

CETIM Technological Centre
Parque Empresarial de Alvedro calle H-20. 15180 Culleredo, A Coruña, Spain
+34 881 105 624
https://cetim.es/

CETIM, a private research center based in A Coruña, Spain, has been producing MFC and CNF since 2017 at pilot scale. They have also been involved in the production of lab-scale CNC. CETIM conducts research in advanced lignocellulosic materials for polymers, textiles, adhesives, coatings, papers and other high value-added applications. CETIM produces cellulose nanoparticles from recycled paper, biomass, and other sources.

Contact:
Info@cetim.es

Chinese Academy of Forestry (CAF) (China)

Wan Shou Shan
Beijing 100091, China
+86-10-62888927 62889092
http://en.caf.ac.cn/

Contact:
http://en.caf.ac.cn/Contact_Us/Contact_Us.htm

Chinese Academy of Sciences (CAS) (China)

52 Sanlihe Rd., Xicheng District,
Beijing, China (100864)
86-10-68597521 (day)
https://english.cas.cn/

The Chinese Academy of Sciences is the linchpin of China's drive to explore and harness high technology and the natural sciences for the benefit of China and the world. Comprising a comprehensive research and development network, a merit-based academic society and a system of higher education, CAS brings together scientists and engineers from China and around the world to address both theoretical and applied problems using world-class scientific and management approaches.

Contact:
cas_en@cas.cn

CIRCOT (India)

See ICAR-CIRCOT

Donghua University (China)

Songjiang Campus 2999 North Renmin Road 201620
Yan'an Road Campus: 1882 West Yan'an Road 200051
Shanghai-ICP-05003365 China
http://www.dhu.edu.cn/

Edinburgh Napier University (Scotland)

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+44 (0)333 900 6040.
http://www.napier.ac.uk/

Empa (Switzerland)

Ueberlandstrasse 129
8600 Dübendorf / Switzerland
+41 58 765 11 11
https://www.empa.ch/web/empa/

An institute of the ETH domain., Empa is the Swiss Federal Laboratories for Materials Testing and Research. Empa operates an MFC pilot plant and conducts applications research with industry partners.

Contact:
https://www.empa.ch/web/empa/contact-form

FIBIC (Finland)

Innopoli 3, C-Building
Vaisalantie 6
02130 Espoo
Finland
www.fibic.fi

Finnish Centre for Nanocellulosic Technologies (Finland)

P.O. Box 1000, FI-02044
VTT, Finland
+358 20 722 111

See VTT.

FPInnovations (Canada)

570 Boulevard St-Jean,
Pointe-Claire, Québec H9R 3J9 Canada
+1 (514) 630-4100 or info@fpinnovations.ca
www.fpinnovations.ca

Specializing in innovative scientific solutions, FPInnovations inaugurated its first CNC research facility with a state-of-the-art pilot plant in 2011. We also produced the first cellulose filaments (CF) in the laboratory and its pilot plant. Today we collaborate with many strategic research alliances, members, and partners. Using the technology developed by our research staff, industry now benefits in developing nanocellulose markets and applications. CelluForce (CNC), Kruger Biomaterials, and Performance Biofilaments (CF) are examples of our collaborations.

Contact:
jimmy.jong@fpinnovations.ca

Fujian Agriculture and Forestry University (China)

No. 15 Shangxiadian Road
Cangshan District
Fuzhou City, Fujian Province, 350002, China
http://english.fafu.edu.cn/

Georgia Institute of Technology (U.S.)

Renewable Bioproducts Institute
North Avenue, Atlanta, GA 30332
+1 404.894.2000
https://research.gatech.edu/rbi

Georgia Tech's Renewable Bioproducts Institute (RBI), formerly the Institute of Paper Science and Technology, champions innovation in converting biomass into value-added products, developing advanced chemical and bio-based refining technologies, and advancing excellence in manufacturing processes.

Contact:
https://research.gatech.edu/rbi/contactus

Georgia Southern University (U.S.)

See Herty Advanced Materials Development Center

Grenoble Institute of Technology (INP) (France)

46 avenue Félix Viallet
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France
+33 4 76 57 45 00
www.grenoble-inp.fr

Herty Advanced Materials Development Center (U.S.)

110 Brampton Rd.,
Savannah, Georgia 31408

The Herty Advanced Materials Development Center is an applied research center of Georgia Southern University, with focuses in contract research, development, and manufacturing; and a global leader in technology development. Herty offers laboratory, pilot, and production quantities of nanocellulose and a range of nanocellulose types including nanocrystalline and nanofibrillar morphologies. Applications include pharmaceutical and cosmetics, plastics and film, filled composites, viscosity modifiers, and proppants.

Contact:
https://research.georgiasouthern.edu/herty/contact-us/

ICAR-CIRCOT (India)

Adenwala Road, Matunga (East),
Mumbai-400 019.
022-24146002

India's Central Institute for Research on Cotton Technology (ICAR-CIRCOT) is one of the premier constituent institutes of the Indian Council of Agricultural Research (ICAR). Research related to nanocellulose includes development of a chemo-mechanical process for preparation of nanocellulose from cotton linters, and development of applications such as barrier films, packaging, and paint.

Contact:
director.circot@icar.gov.in

InnoTech Alberta (Canada)

250 Karl Clark Road
Edmonton, BC T6N1E4
780-427-1956
www.albertainnovates.ca

InnoTech Alberta is a wholly owned subsidiary of Alberta Innovates. The organization's multidisciplinary, cross-sector teams offer a diversified range of scientific, engineering and technological research and testing capabilities, and the facilities to support technology scale-up. InnoTech Alberta operates a CNC pilot plant that is capable of producing up to 20 kg per week of CNC from a variety of feedstocks.

Contact:
info@innotechalberta.ca.

Innovatech Labs, LLC (U.S.)

13805 1st Ave N, Ste 100
Plymouth, MN 55441
888-740-5227
https://www.innovatechlabs.com/

Innovatech Labs, a material testing lab, specializes in unique materials analysis. Our analysts work directly with customers to determine which analytical technique(s) will obtain the data necessary to solve the problem at hand. The material testing methods include SEM, FTIR analysis, Auger, DSC, Light Microscopy, Ion Chromatography, GC/MS, Thermogravimetric analysis, and ESCA.

Contact:
info@innovatechlabs.com

INRAE (France)

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https://www.inrae.fr/en

National Research Institute for Agriculture, Food and the Environment
INRAE is France's National Research Institute for Agriculture, Food and Environment. Its mission is to carry out excellent science in order to provide innovative solutions addressing global challenges, notably climate change, biodiversity and food security while at the same time enabling the much needed agroecological, nutritional and energy transition.

Contact:
https://www.inrae.fr/en/contact

Instituto Tecnologico del Embalaje, Transporte y Logistica-ITENE (Spain)

Parque Tecnológico
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+34 96 182 00 00
http://www.itene.com/en

The Additives and Raw Materials Research Unit has expertise in research & development of cellulose nanomaterials for packaging applications. The MFC Pilot Plant can produce MFC from different sources (agricultural wastes, recycled fibres, food wastes, annual plants or common trees). MFC production is 50kg/day of aqueous suspensions (up to 3 wt.%). ITENE can also produce other cellulose nanoadditives (CNC and CNF) and can be functionalized for target applications such as barrier coatings for flexible packaging or reinforcements for biocomposites.

Contact:
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miriam.gallur@itene.com

Korea Forest Research Institute (Republic of Korea)

Korea Forest Service
Government Complex-Daejeon, Bldg. 1
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KTH Royal Institute of Technology (Sweden)

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KU Leuven (Belgium)

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Kyoto University (Japan)

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http://www.kyoto-u.ac.jp/en

See RISH Research Institute for Sustainable Humanosphere in the Producers Section.

Lakehead University, Biorefining Research Institute (BRI) (Canada)

955 Oliver Rd, Thunder Bay, Ontario
P7B 5E1, Canada
https://www.lakeheadu.ca/centre/bri

BRI is committed to the comprehensive utilization of lignocellulosic biomass, aiming for sustainable production of high value bioproducts. BRI strategically integrates diverse conversion platforms to achieve cost-effectiveness and environmental sustainability, ensuring the optimal valorization of biomaterials. Ongoing research projects encompass the development of bio-inspired nanomaterials, including cellulose nanomaterials tailored for sustainable and multifunctional nanocomposite applications.

Contact:
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Luleå University of Technology (LTU) (Sweden)

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McGill University (Canada)

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McMaster University (Canada)

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Minho University (Portugal)

Biological Engineering Department
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Portugal
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Centre of Biological Engineering / Centro de Engenharia Biológica (uminho.pt)

The Functional Carbohydrates Group at the Center of Biological Engineering investigates the use of polysaccharides for various applications, including Bacterial NanoCellulose production, processing and application: fermentation (static & stirred culture), production scale up, dry formulations for Pickering emulsions, applications in textiles, biomedicine and food.

Contact:
fmgama@deb.uminho.pt

Monash University (Australia)

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See BioPRIA.

Nanjing Forestry University (China)

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National Center for Nanoscience and Technology (NCNST) (China)

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http://english.nanoctr.cas.cn/

National Institute for Nanotechnology (NINT) (Canada)

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www.nrc-cnrc.gc.ca

National Institute of Standards and Technology (NIST) (U.S.)

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National Research Council of Canada (NRC) (Canada)

1200 Montreal Road
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North Carolina State University (U.S.)

Department of Forest Biomaterials
2820 Faucette Drive, CB 8005
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https://faculty.cnr.ncsu.edu/nathalielavoine

Lavoine research group provides technical and consulting services on research & development of cellulose nanomaterials. We can produce aqueous suspensions (up to 5 wt.%) of cellulose nanocrystals and cellulose nanofibrils/microfibrils, from different (ligno)cellulosic sources. Our lab has capabilities of producing few milliliters to liters of both materials, with different surface functionalities and performance for target applications and specifications. Also open to research/industrial partnerships and collaborations.

Contact:
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Northeast Forestry University (China)

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http://en.nefu.edu.cn/

Oregon State University (U.S.)

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Paper and Fibre Research Institute (Norway)

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Process Development Center (U.S.)

See University of Maine

Purdue University (U.S.)

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https://www.purdue.edu/

The Youngblood Group at the School of Material Engineering investigates nanotechnology, surface science, advanced processing, and biomaterials. Sustainable Nanotechnology includes CNC and CNF processing: Fiber Spinning, Roll to Roll Continuous Fabrication, and Nanocomposites. CNC has also been demonstrated as an effective additive in cementitious materials, reducing stress while increasing degree of hydration at very low dosages. This technology is being commercialized under license.

Contact:
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Renewable Bioproducts Institute (U.S.)

See Georgia Institute of Technology

Research Council of Norway (Norway)

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www.forskningsradet.no

Research Institute of Forestry New Technology (China)

http://en.caf.ac.cn/Organizational/jj7.shtml

See Chinese Academy of Forestry (CAF).

Research Institute of Wood Industry, Chinese Academy of Forestry (CRIWI) (China)

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http://criwi.caf.ac.cn/

RISE Research Institutes of Sweden AB (Sweden)

Sven Hultins plats 5, 412 58,
Gothenburg, Sweden
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https://www.ri.se/en

RISE is Sweden's research institute and innovation partner. RISE Innventia, an early leader in the development of MFC, reduced energy usage in producing MFC through six generations of development, including enzymatic pretreatment. RISE operates a 100 kg/day MFC pilot plant at Innventia and a mobile demonstration plant for MFC trials at mills around the word. The mobile demo plant is able to produce highly refined fiber (HF), highly refined enzyme treated fiber (HFE) or MFC at the rate of 100 kg of dry product per hour.

Contact:
https://www.ri.se/en/about-rise/contact-us

RISH Research Institute for Sustainable Humanosphere (Japan)

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https://www.rish.kyoto-u.ac.jp/?lang=en

The Research Institute for Sustainable Humanosphere (RISH) at Kyoto University is a leader in cellulose nanofibril research. Professor Hiroyuki Yano of RISH was the first in Japan to become engaged in the research of cellulose nanofibers that form the cell walls in plants, beginning in 1996.The Kyoto Process is based on the "Pulp Direct-Kneading Method. RISH has a pilot plant with capacity of 1 tonne per year of thermoplastic resins with 10 wt. % CNF. Seiko PMC constructed a pilot plant based on this Kyoto process in 2013, and Nippon Paper did so in 2017.

Contact:
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South China University of Technology (SCUT) (China)

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SCUT Guangzhou International Campus is a state-level campus jointly developed by the Ministry of Education, the People's Government of Guangdong Province, the People's Government of Guangzhou Municipality and South China University of Technology (SCUT). Research with nanocellulose includes preparation of CNC and CNF as well as development of applications.

Contact:
global@scut.edu.cn

TAPPI International Division of Advanced Renewable Materials (ARM) (U.S.)

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(770) 446-1400
https://www.tappi.org/industries/Advanced-Renewable-Materials/

TAPPI is the leading association for the worldwide pulp, paper, tissue, packaging and converting industries. TAPPI's **International Division of Advanced Renewable Materials (ARM),** formerly the International Division on Nanotechnology for Renewable Materials (TAPPI Nano)**,** focuses on the evolving landscape of renewable materials research and industry trends. The Division is a hub for new developments in renewable materials, encouraging broader participation from experts in materials science, chemistry, and engineering. The Division's Technical Committees work together throughout the year to solve problems, develop technical papers, plan conference sessions, and more. For more information about the Division and how to get involved, visit the ARM webpage.[27]

Contact:
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rdavis@tappi.org

Technikum Laubholz (Germany)

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https://technikumlaubholz.de/en/

The Technikum Laubholz is the first independent non-university institute for leading-edge research in Baden-Württemberg with an exclusive focus on the development of all processes and products relating to wood as a renewable raw material. Technikum Laubholz is planning and building a plant for the production of nanocellulose from beech wood fibers using fully automated technology to optimize the entire process workflow with the help of artificial intelligence. Called KlckBio, the project is part of the ERDF's Innovation and Energy Transition program.

Contact
https://technikumlaubholz.de/en/contact/

Tianjin University of Science and Technology (China)

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University of Alberta (Canada)

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https://www.ualberta.ca/

University of British Columbia (Canada)

BioProducts Institute
2385 East Mall
Vancouver, BC Canada V6T 1Z4
https://bpi.ubc.ca/

The University of British Columbia BioProducts Institute (BPI) is an innovative ecosystem of high-impact fundamental and applied researchers working on solutions to today's climate and environmental challenges. Research themes center around biocatalytic transformation and engineering of biomass, bio-nanoparticle enabled materials, bio-based polymers and carbon materials, and biorefinery and biofuels systems.

Contact:
https://bpi.ubc.ca/contact-us

University of Grenoble Alpes (France)

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Contact:
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University of Maine (U.S.)

The Process Development Center
5737 Jenness Hall
Orono, ME 04469
207-581-2237
https://umaine.edu/pdc/

The Process Development Center (PDC) offers a broad range of technical services and resources. The University of Maine (UMaine) Nanomaterial Pilot Plant opened in 2012 at the PDC and is a joint project with the US Forest Service. The pilot plant has capacity for 1 ton per day of CNF and is the largest CNF plant in the US. The UMaine PDC supplies cellulose nanofibrils (CNF) and cellulose nanocrystals (CNC) to academic, public, and private research groups interested in evaluating and developing applications for these materials.

Contact:
umaine.pdc@maine.edu

University of Tehran (Iran)

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University of Tennessee (U.S.)

Knoxville, Tennessee 37996
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https://www.utk.edu/

The UTK Center for Renewable Carbon conducts research on nanocellulose from pulp, agricultural sources and recycled cellulose. Research areas include MFC, CNF, and CNC, as well as nanocellulose composites, foams, films, coatings, suspensions and viscosity modifiers, and water absorbents. The University of Tennessee and Battelle Memorial Institute co-manage Oak Ridge National Laboratory.

Contact: Siqun Wang
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University of Tokyo (Japan)

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The University of Tokyo was established in 1877 as the first national university in Japan. The Department of Biomaterial Sciences conducts extensive research in nanocellulose characterization, preparation, performance, and applications under the direction of Dr. Akira Isogai.

Contact:
akira-isogai@g.ecc.u-tokyo.ac.

University of Toronto (Canada)

Centre for Biocomposites and Biomaterials Processing
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University of Waterloo (Canada)

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USDA Forest Service, Forest Products Laboratory (U.S.)

One Gifford Pinchot Drive
Madison, WI 53726
608-231-9200
https://research.fs.usda.gov/fpl

Established in 1910 by the U.S. Department of Agriculture Forest Service Chief Gifford Pinchot, the U.S. Forest Products Laboratory, became the first research facility focusing on study of physical properties and resource utilization of wood. The Forest Products Laboratory funded a first of its kind in the U.S. production facility for renewable, forest-based nanomaterials. The Laboratory's pilot plant produces cellulose nanocrystals (30 kg/wk) and TEMPO-based cellulose nanofibers (5 kg/wk).

Contact:
https://research.fs.usda.gov/fpl/contactus

Virginia Polytechnic Institute and State University (U.S.)

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https://vt.edu/

VTT Technical Research Centre (Finland)

PO Box 1000
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www.vtt.fi

VTT can make various MFC and CNF grades for application testing. These grades can be produced with varying degrees of fibrillation (coarse, medium, fine fibre size). VTT produces tailor-made samples for R&D purposes from lab to pilot scale using standard equipment such as grinders and microfluidizers, unmodified, chemically modified, and enzymatically aided at high consistency, up to 20 kg/day. VTT's services include semi-pilot scale nanocellulose barrier coating concept and MFC film pilot line, which are available for confidential customer projects.
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BioBased Markets

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