Where science
& creativity meet

NovaMatrix®

PRONOVA® ULTRAPURE & STERILE ALGINATES

Sandvika, Norway

PRONOVA® alginates are very versatile, well-characterized, safe and bio-compatible marine biopolymers. They have been purified for biomedical and pharmaceutical applications and have been used in commercial medical applications for over two decades.

KEY PROPERTIES

Biocompatible

Ultrapure, for medical use

Hydrogel formation in presence of divalent cations

Gelation at constant temperature

Controllable rheology and gelation

Cold / hot water solubility

Long shelf life: 3-5 years depending on product

PRONOVA® APPLICATIONS

PRONOVA® UltraPure Alginates have been used for over two decades in various commercial applications and are increasingly used in novel medical applications and many clinical developments. Alginates' unique properties and safe toxicology profile make them a polymer of choice for many medical device and drug delivery applications

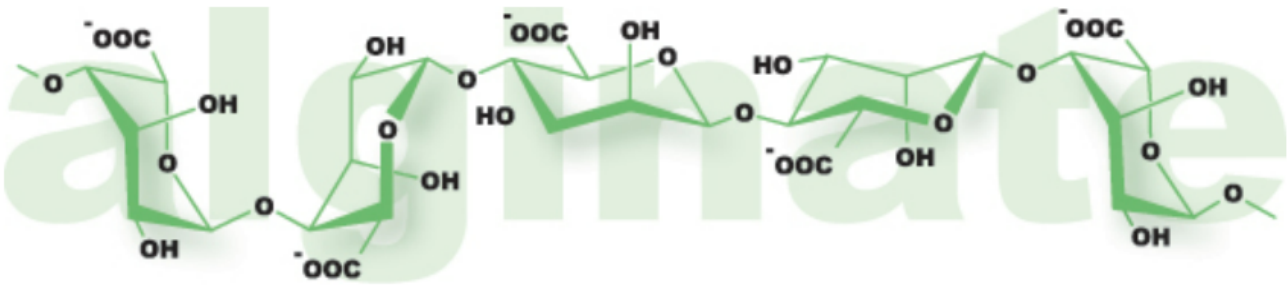
Applications

- Encapsulation of living cells and therapeutic proteins for cell therapy and advanced drug delivery
- Cryoprotection for cell and tissue
- 3D bioprinting ink and polymers
- Scaffolds, foams and cell tissue matrices
- Hydrogels for cell cultures, wound management or advanced drug delivery
- Anti-adhesion and medical device coatings
- Tissue engineering applications such as bone putty binder and matrices for reconstruction

Unique gelation properties

PRONOVA® alginates form a gel at constant temperature, in the presence of divalent cations. Acid gels may also develop at low pH. The controllable viscosity and gel strength, and the option of in-situ gelling allow for unique uses of our alginates.

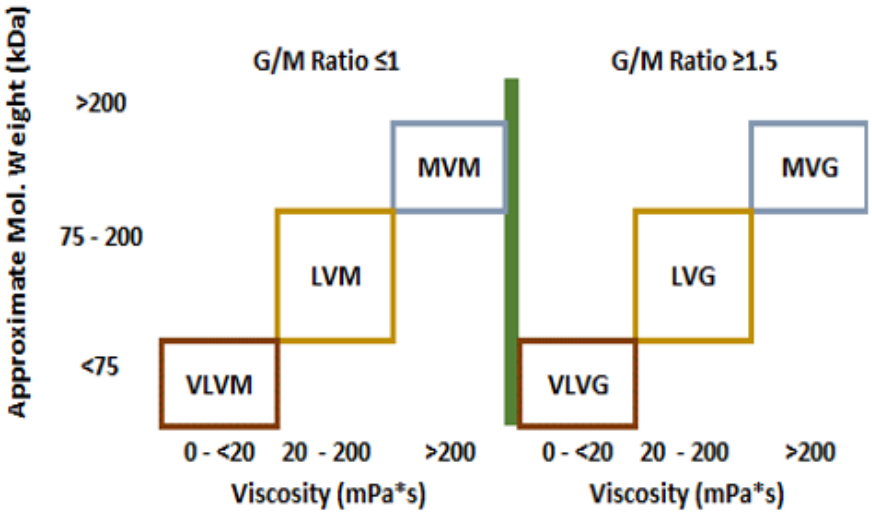
For more information about the Alginates Gelation Process, please refer to our website www.novamatrix.biz or reach out to our team via novamatrix.info@iff.com



PRODUCT SELECTION

PRONOVA® UltraPure Alginates

Viscosity and Molecular Weight



Purity

- All our PRONOVA® Ultrapure Alginates have ≤ 100 EU / g endotoxins specifications as well as ≤ 100 cfu /g total viable count
- We have Sterile Grades available
- We are able to supply PRONOVA® Ultrapure Alginates at lower endotoxins specifications, as well as tailor-made grades. Please connect with us for more information

Shelf life

We recommend refrigerated storage (2-8°C) of all PRONOVA® sodium alginates. Our stability programs show that PRONOVA™ UP Alginates can be stored at room temperature (25°C/ 60% RH) for 3-24 months without significant reduction of apparent viscosity. At normal conditions (25°C/ 60% RH), the product can be transported without the need for cold shipment.

Product	5 years	3 years
PRONOVA® UP LVM, VLVG, LVG, MVG	✓	
PRONOVA® UP VLVM, MVM		✓
PRONOVA® S sterile grades	✓	

QUALITY CONTROL & ASSURANCE

Stability

NovaMatrix® conducts stability studies according to ICH guidelines for all our products. For PRONOVA® UP Alginates, the parameters monitored are:

- Solution & Dry powder appearance
- Dry matter content
- Apparent viscosity
- pH

Safety and Toxicology

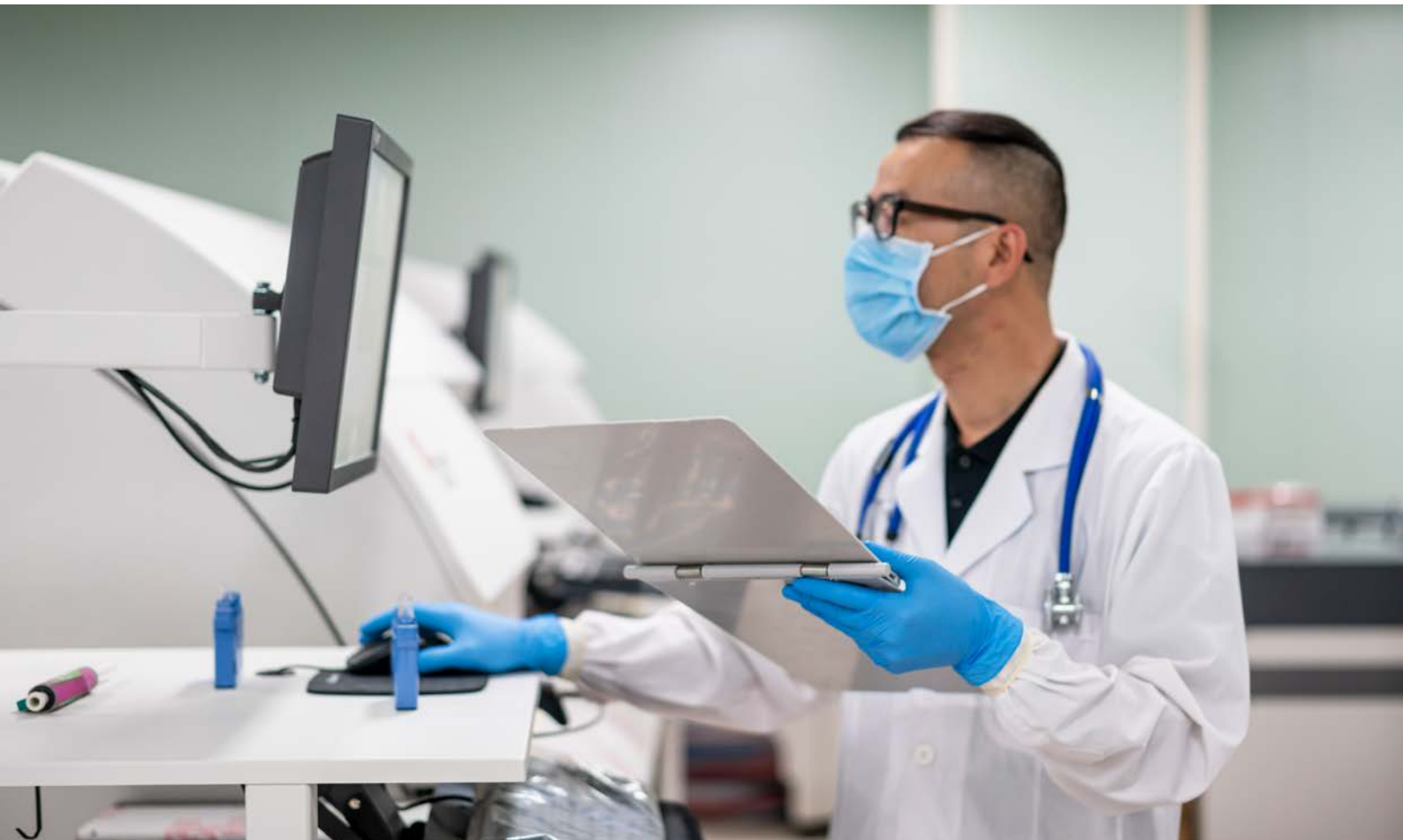
Our production facilities have cGMP certification, and comply to ISO9001:2015 and ISO 13485:2016. We hold an API manufacturing license from the Norwegian Medicine Agency (NOMA). The safety and toxicology profile of UltraPure PRONOVA® UltraPure sodium alginate is described in a Drug Master File (DMF) submitted to the US FDA. We control and measure the following properties:

- Chemical composition
- Elemental impurities
- Endotoxins
- Microbial purity
- Protein content

If you would like to receive toxicology information, please get in touch.

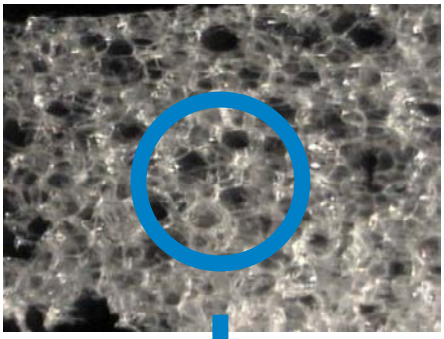
Delivery and Storage

All PRONOVA® UP sodium alginates are delivered in a closed polyethylene container. During storage, the lid of the container should be kept closed



TECHNICAL HIGHLIGHT

PRONOVA® Alginate Foam



Key properties

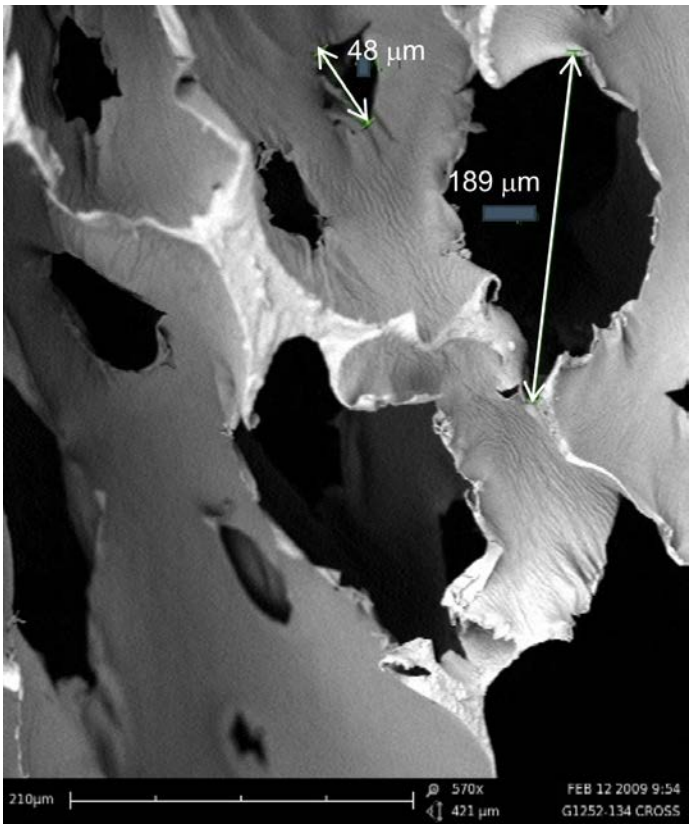
- Highly porous structure
- Controllable foam characteristics
- Controllable degradability
- Uniform cell immobilization
- Can be incorporated with NovaMatrix® NOVATACH™ peptide-coupled alginates for preferential cell attachment

Key applications

- 3D cell cultures for in-vitro drug testing
- Scaffolds for tissue engineering applications
- Macro-porous structure for cell protection & preservation

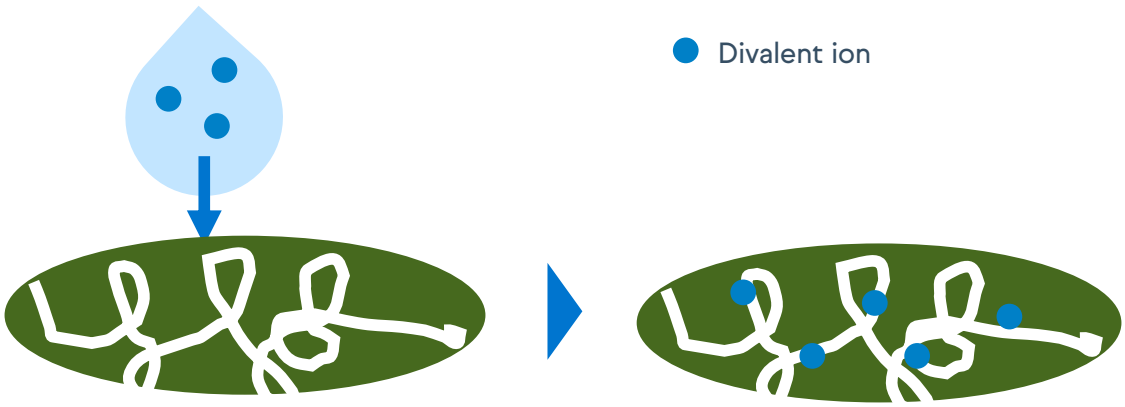
Get in touch

Our team is available to answer your questions and to discuss your needs for custom solutions. Please reach out!



TECHNICAL HIGHLIGHT

PRONOVA® Hydrogels



Key gelation properties

- Tunable gelation strength/ viscosity
  - » Gel strength Ba^{2+} > Sr^{2+} > Ca^{2+}
- Gelling time <1 hour
- Preparation and handling time: in situ – 10 minutes
- Minimal to mild inflammatory / foreign body response observed
- Reversible gelation

Key applications

- Wound dressings
- Soft-tissue models for implants or in-vitro models
- Advanced drug delivery or in-situ gelling

Get in touch

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TECHNICAL HIGHLIGHT

PRONOVA® Sterile Alginates

Sterile vials

- Sterile filtered, several grades available

Product	G/M ratio	Viscosity (mPa*s)	Mol. Weight (kDa)	Endotoxins (EU/g)	Total viable count (cfu/g)
PRONOVA® SLG100	>= 1.5	100-300	150-250	<=100	Sterile
PRONOVA® SLG20	>= 1.5	20-99	75-150	<=100	Sterile
PRONOVA® SLM100	<1	100-300	150-250	<=100	Sterile
PRONOVA® SLM20	<1	20-99	75-150	<=100	Sterile

Sterile solutions

- All PRONOVA® UP alginate grades are available in sterile solutions
- Alginate concentration in solution can be customized up to 2.0%
- Sterile filtered
- Easy handling of solution under sterile conditions

TECHNICAL HIGHLIGHT

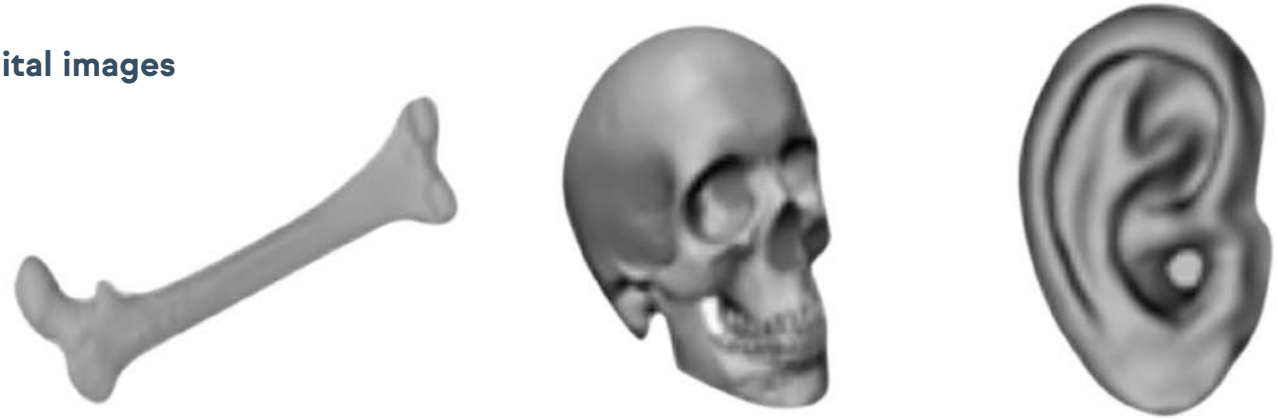
3D Bioprinting

PRONOVA® Alginates meet critical needs for biomedical 3D-printing inks

- Biocompatibility and biodegradability
- Safety & toxicity
- Tunable strength
- Cell adherence

Our NOVATACH™ peptide-coupled alginates offer unique properties to promote cell-matrix interactions

Digital images



3D printing structures

Source: O. Jeon, et al., Cryopreserved cell-laden alginate microgel bioink for 3D bioprinting of living tissues, Mater Today Chem., 2019M 12: 61-70

About our NovaMatrix® business

NovaMatrix® is a global, leading producer of ultrapure biopolymers, built on nearly four decades of polymer science expertise. Our highly skilled team in Norway combines purification know-how with regulatory expertise to deliver well-characterized biopolymers to our customers in pharmaceutical, biotechnology and biomedical industries. We leverage IFF Pharma Solutions' unrivaled polymer design manufacturing footprint to deliver custom solutions to our customers.

Get in touch

Our team is available to answer your questions and to discuss your needs for custom solutions.

Please reach out!
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