

MEETING WITH THE WORLD TRADE ORGANIZATION · OCTOBER 2026



A NEW WAY TO REFRIGERATE NATURALLY

UP TO **50%** ENERGY EFFICIENCY

What had the greatest impact on us to start this business?...

Lack of energy Access, therefore, lack of refrigeration.

32%

of Colombia's population is rural.

Without constant access to energy, there is no constant access to refrigeration.

August 2018, Fusagasuga Colombia.

COOLING IS EXPENSIVE AND IS HEATING THE PLANET

THE PROBLEM

17%

of the world's
energy demand

2.95 bn

tons of CO₂ are
emitted yearly

80%

of total operative costs
in retail businesses

us \$121 Bn

Of food waste yearly due
to the cold chain breakage

This is the magic: Pseudomonas syringae

BIO-NANOTECHNOLOGY COOLANT

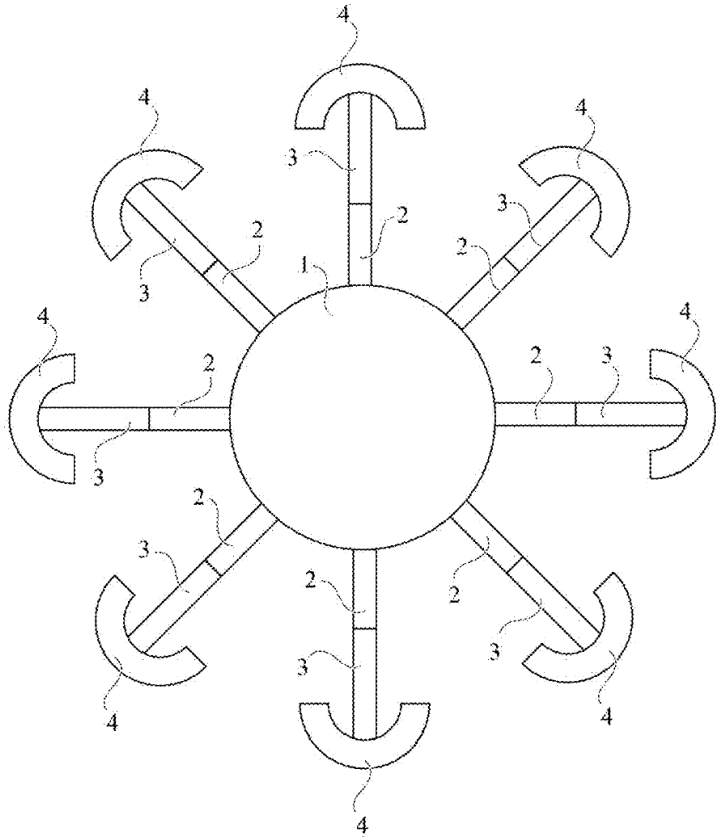
WE IMPROVE THE WATER THERMAL CONDUCTIVITY BY 20-60%, SO WE CAN SAVE ENERGY



THE SCIENCE: A BIO-NANOCOMPOUND



The patented technology inside every NanoFreeze product · US 2022/0411537 A1



Patent FIG. 1 — self-assembled bio-nanocompound

1

Metal-oxide nanoparticle core

Silicon dioxide (SiO_2), aluminum oxide (Al_2O_3) or magnetite (Fe_3O_4) particles act as the substrate.

2

Amino-organosilane linker

APTES anchors the chemistry to the particle surface.

3

Dialdehyde crosslinker

Glutaraldehyde builds a stable covalent bridge.

4

Ice-nucleation (INA) protein

From *Pseudomonas syringae*: it triggers ice formation at warmer temperatures.

Covalent immobilization protects the protein, so the coolant can be reused.

WHAT THE CHEMISTRY DELIVERS



Laboratory results reported in our patent

99.9%

immobilization efficiency of the
INA protein on silicon dioxide

-1.1 °C

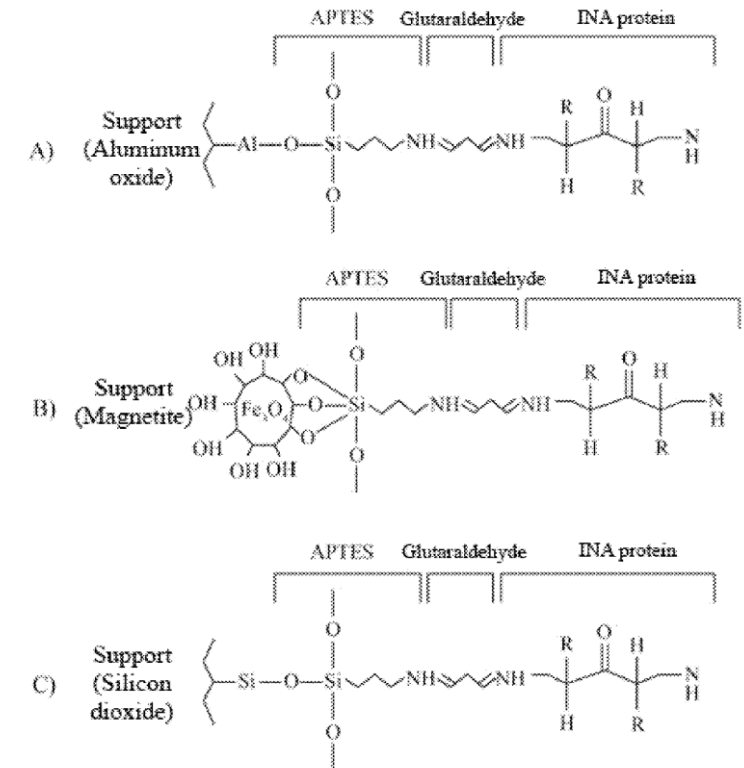
freezing point, vs. -7.05 °C for
pure water: ice forms 5.4 °C
warmer

4 cycles

of freezing and thawing with the
same bio-nanocompound

~80%

less energy needed to reach the
freezing point



Patent FIG. 2 — the same chemistry on three supports:
aluminum oxide, magnetite, silicon dioxide

THE SOLUTION

COLD COATS

B2B: Recurring Revenue; 70% Margin

- ✓ Pay Back: First use.
- ✓ From 30% of food waste to almost 0% with NanoFreeze.
- ✓ Guarantees quality and freshness of the products.
- ✓ Replaces refrigerated truck within a radius of 300 miles.
- ✓ Reduces Carbon emissions.



THE SOLUTION

NATURAL FREEZERS

B2B: Long term contracts; 50% Margin

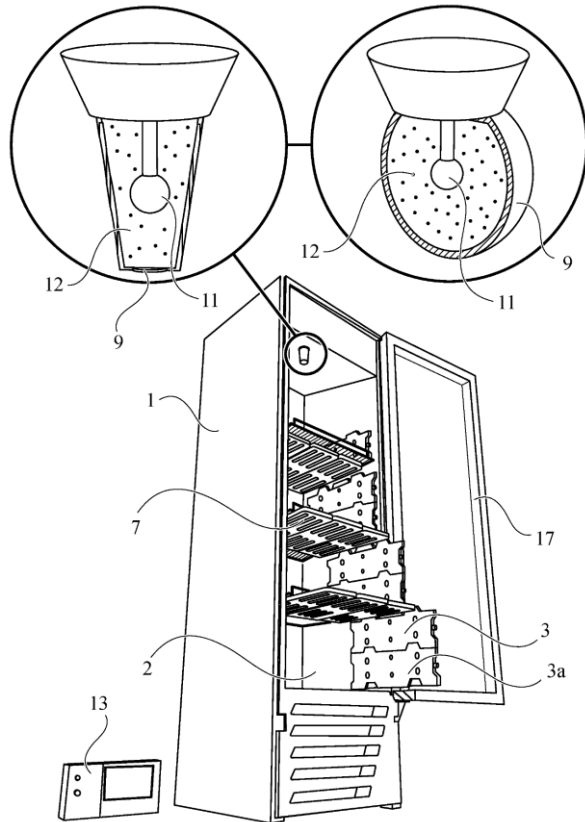
- ✓ Pay Back: Between 9 to 14 months.
- ✓ Energy savings from 20% to 50%.
- ✓ Energy costs savings.
- ✓ CO2 emissions savings.
- ✓ Retro fit: For old and new refrigerators.



NATURAL FREEZERS: OUR SECOND INVENTION



Active + passive refrigeration in one modular system · PCT/IB2025/055381 · WO 2026/109947 A1



PCT FIG. 1 — retrofit inside a commercial fridge

1

Modular cold panels

Panels with phase-change material connect to each other and attach magnetically, vertically or horizontally.

2

A sensor inside the cold

A temperature sensor sits inside a spherical container of the same material, reading the real state of the stored cold.

3

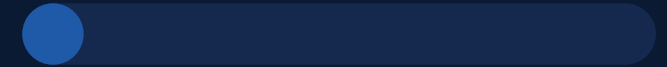
Smart control unit

Extends the compressor's off-cycles so passive cooling takes over, without abrupt shutdowns.

Energy savings

measured in the patent examples

Panels only



3–5%

+ control unit



20–29%

+ sensor (full system)

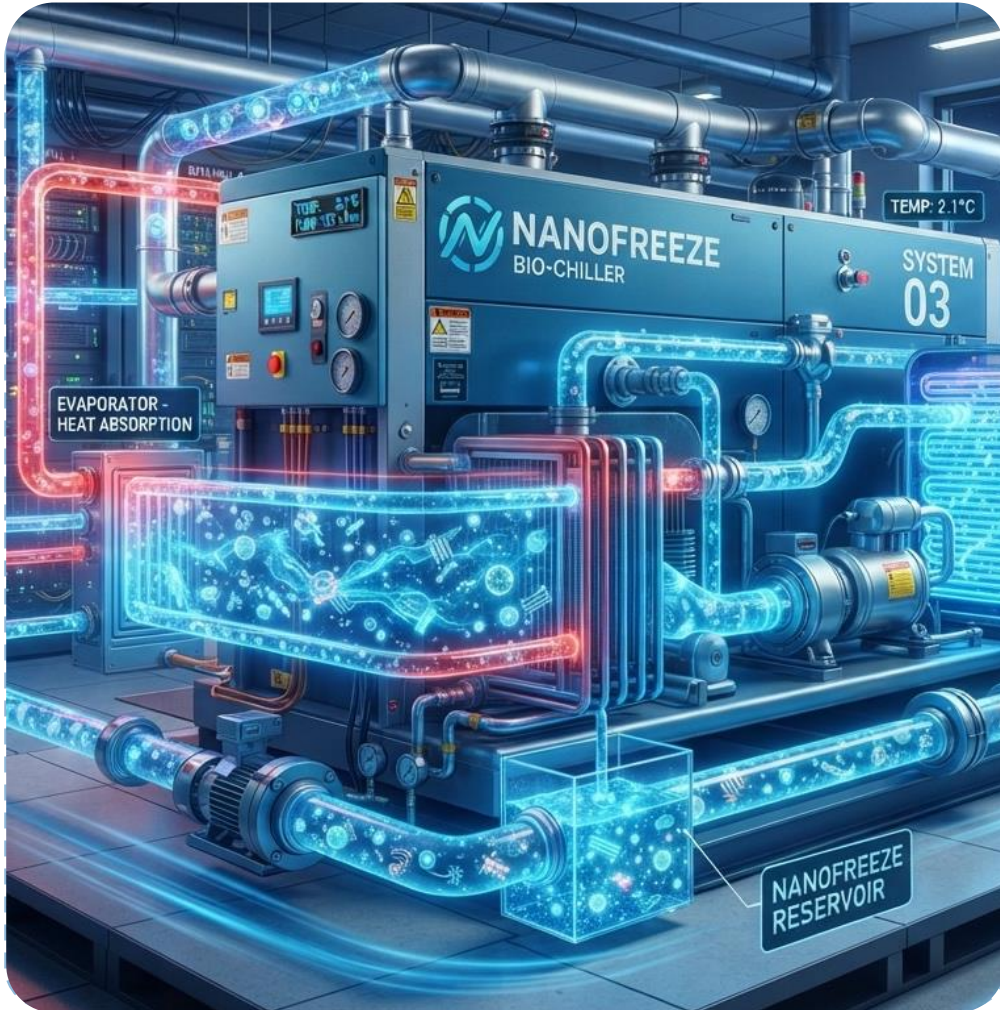


41–53%

NEXT FRONTIER: DATA CENTER CHILLERS



The same bio-nanotechnology, as a nanofluid for industrial cooling



The challenge

Data centers used ~415 TWh of electricity in 2024 (~1.5% of global demand), and the IEA expects this to more than double by 2030. Cooling is their largest load after IT.



Our answer

A bio-nanofluid added to chiller coolants: it raises the nucleation temperature and holds the cold longer, so chillers work less.



Business model

Energy Efficiency as a Service (EEaaS): clients pay from the savings they achieve.

Validation: TECNALIA and AZTI (Spain) · **Launch:** 2027

POTENTIAL IMPACT



Affordable cold for those who need it most, and less energy for everyone

Up to 50%

energy savings in
commercial refrigeration

~0%

food loss in transport with
Cold Coats (down from 30%)

7x

longer cold retention

300 mi

radius where Cold Coats
replace refrigerated trucks



Rural producers

Cold without a constant power supply for the 32% of Colombians who live in rural areas.



Shopkeepers and retail

Lower electricity bills for the fridges that keep small businesses running.



Industry and data centers

Less energy and fewer emissions in large-scale cooling.

Sustainable Development Goals

7 AFFORDABLE AND
CLEAN ENERGY



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



13 CLIMATE
ACTION



BRINGING REFRIGERATION EVERYWHERE

THE MISSION: AFFORDABLE AND ACCESIBLE REFRIGERATION



TRACTION

FROM 2020 TO 2026



VALUE PROPOSITION

UNIQUE TECHNOLOGY, HIGHER ENERGY EFFICIENCY, LOWER COSTS

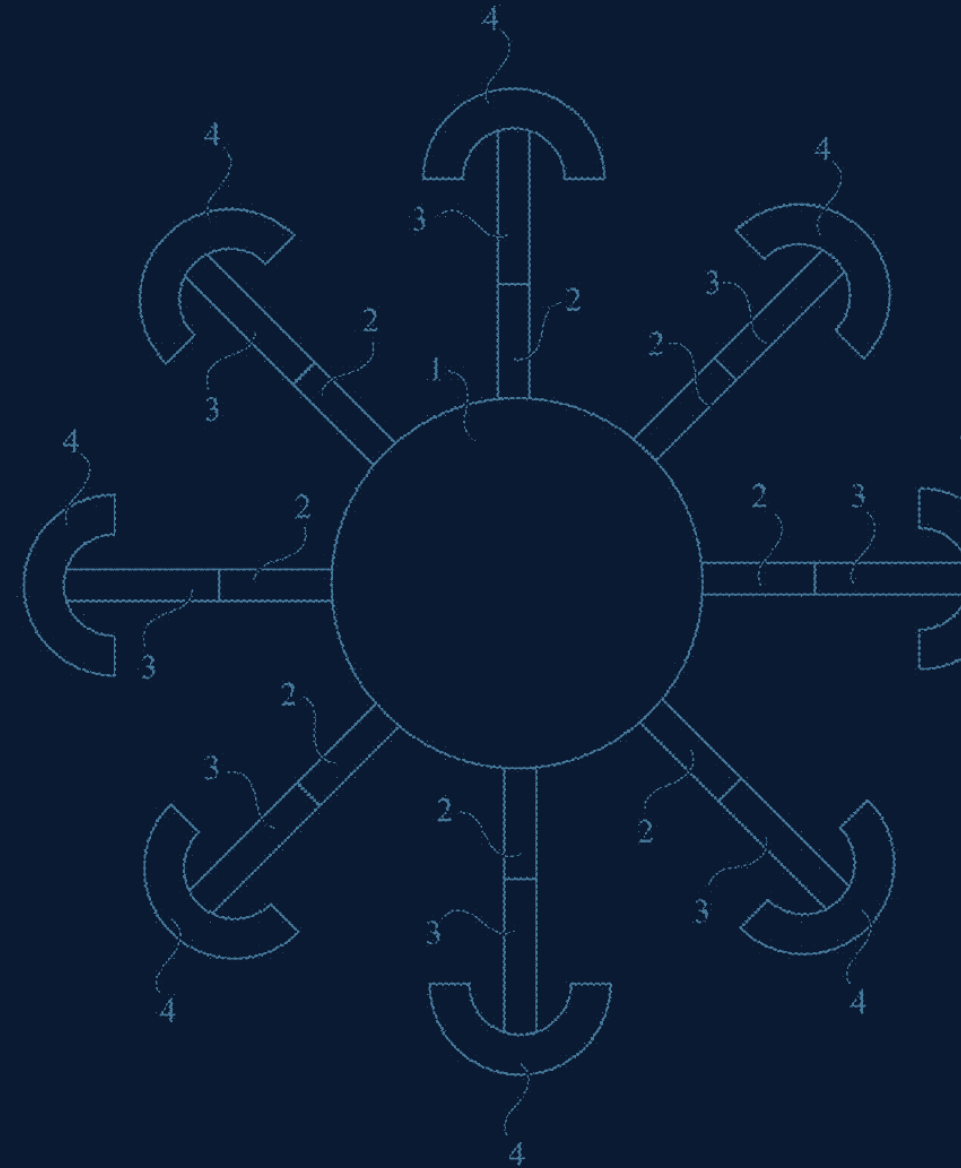
Enterprise	 SMARTER HEAT TRANSFER FLUIDS™ Nanofluid	 Energy Saving Solution Nanofluid	 AI + Smart Controller	WATER	 Bionanotechnology Fluid
Accesible?	USD \$3000 - \$5000	USD 17,200	USD \$1,490	USD ~\$700	USD \$435
Materials used	Al ₂ O ₃ + TiO ₂	Al ₂ O ₃ + TiO ₂ + Fe ₂ O ₃	Smart Controls	Water	h-BN + Al ₂ O ₂ + Smart Control
Thermal Conductivity Improvement	15–34%	35%	0%	0%	45 - 58%
Energy Efficiency	15%	20%	5 - 10%	0%	20 - 60%
Unique Technology	✓	×	×	×	✓



PART 2

Why intellectual property has been key to NanoFreeze

"Our patent has been the most important asset for our growth, and today we only have one. We are going for more."



FOUR WAYS OUR PATENT DROVE OUR GROWTH



Without IP, a new technology is just a promise



01

Credibility

For a company adopting a technology that is new to the market, a patent makes working with us make sense.



02

Market value

Protected technology is an asset: it is the foundation of NanoFreeze's US \$5M valuation.



03

Investor confidence

IP is one of the first things investors look at in our company.



04

Awards

A unique, protected technology has won us international prizes and non-dilutive funding.

CREDIBILITY THAT BECOMES VALUE



What a patent means for clients and investors

NANOFREEZE TODAY

US \$5M

company valuation, built on
protected technology

With only one granted patent so far.



Clients: a reason to say yes

A new technology is a risk for any company. Seeing a patent tells them it is real, unique and worth piloting. It opened doors with anchor partners such as AB InBev, Bavaria, Grupo Modelo and Postobón.



Investors: the first thing they check

In every fundraising conversation and due diligence, IP comes first: who owns it, where it is protected and how hard it is to copy.

PROTECTED TECHNOLOGY WINS RECOGNITION



International awards and non-dilutive funding



Cartier Women's Initiative

Science & Technology
Pioneer Award

US \$100K



P4G

Partnering for Green
Growth and the Global
Goals 2030

US \$282K



CATAL1.5°T

Tecnológico de
Monterrey climate
accelerator

EUR 100K



Johnson & Johnson

QuickFire Challenge

US \$50K



Cheers Award

Winner

US \$100K



Why? Because we have a unique technology: first protected by a patent application, and now by a granted patent. That is a huge added value.

OUR IP JOURNEY



One granted patent, a second invention on its way, and more to come

Bio-nanocompound

Core technology in every product



2020

US provisional

63/020,616



2021

PCT filing

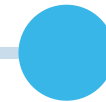
PCT/IB2021/053817



2022

US publication

US 2022/0411537 A1



2026

Patent granted

United States

Natural Freezers

Modular energy-saving system



2024

Colombian filing

NC2024/0015769



2025

PCT filing

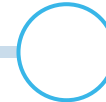
PCT/IB2025/055381



2026

PCT publication

WO 2026/109947 A1



Next

National phases

Key markets

Today we have one granted patent. We are going for more.

Bio-nanocompound: developed at Universidad de los Andes and exclusively licensed to NanoFreeze. Natural Freezers: applicant Biocold Technologies S.A.S. BIC (NanoFreeze).

IP INSPIRES YOUNG PEOPLE TO BUILD



Creating companies and jobs, not just finding one



"For young people it is deeply motivating to build a company, create jobs and make something new and our own."



Build, not just get hired

Entrepreneurship turns research into companies that create employment.



Patents reward creating

Knowing an invention can be protected motivates new ideas with real impact.



From Colombia to the world

IP lets a young company from an emerging economy compete globally.

THANK YOU

One patent got us here. We are going for more.

NanoFreeze · Biocold Technologies S.A.S. BIC · Bogotá, Colombia

