



THE
OCEAN COLLECTIVE
SUMMIT 2024



Innovative Solutions Showcase

UrbaX Nanotechnology Platform

Building a Greener Future: Nano-Engineered Binders

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Centre for
Advanced 2D Materials



CONSTRUCTION REMAINS CLIMATE-UNFRIENDLY
THIS IS THE CHALLENGE OF OUR GENERATION

35%

Share of the cement and petrochemicals-based building solutions industries in the global final energy use and CO₂ emissions.

What is the sustainable business opportunity?



Performance/Durability

Conventional Concrete
and Mortars



UrbaX Concrete
and Mortars

Sustainability



Today cementitious products for marine environment are non-durable & unsustainable (high CO₂ footprint – health issues Volatile Organic Compounds (VOCs) – non-recyclable)

What is the CO₂ footprint?



Sand



Cement

+



Water



Chemicals

=



3600kg CO₂/t



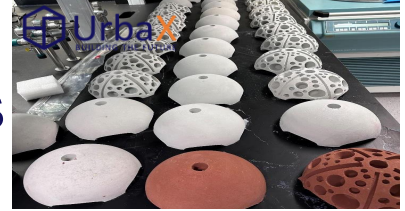
881kg CO₂/t

Mortars
for
concrete
protection



200kg-
350kg CO₂/t

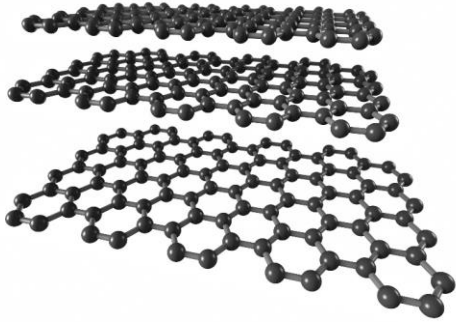
Bio-blocks



180kg CO₂/t

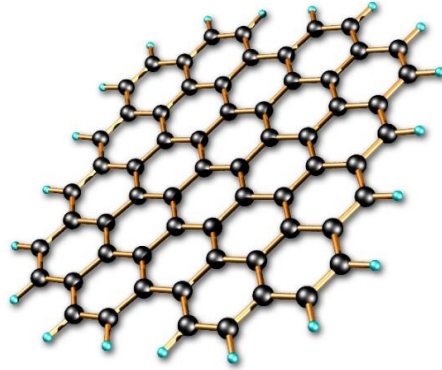
Cementitious products for marine environment emits x5 to x18 more CO₂ than UrbaX solutions

The origins: urbaX scientists have been inspired by graphene functionalization



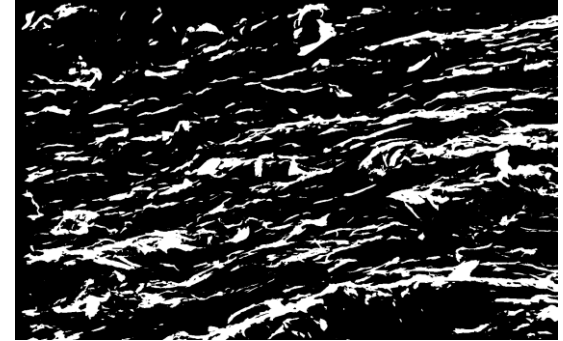
GRAPHITE

3D-LAYERED, VAN DER
WAALS BONDED



GRAPHENE

MONOLAYER, CAN BE
FUNCTIONALIZED

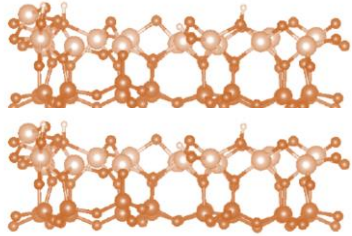


KARBOHM™

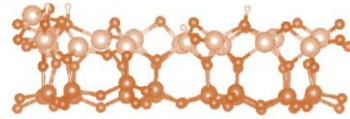
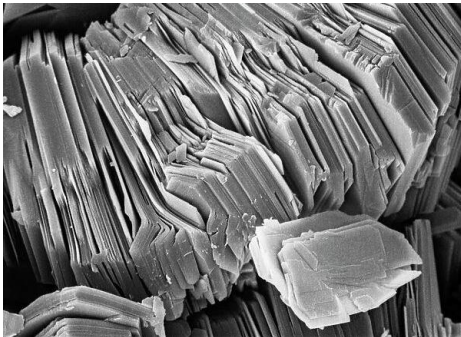
A UNIQUE PROCESSABLE
GRAPHENE DEVELOPED BY
THE SAME TEAM

Decades of experience in 2D materials have led to the
UrbaX tech stack

Urbax materials are nano-engineered to form a covalently-bonded binder matrix



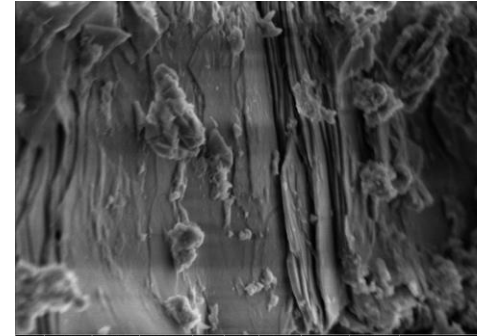
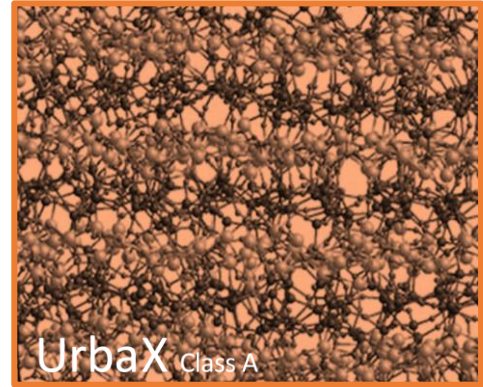
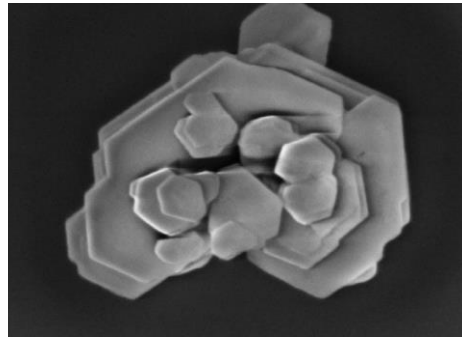
3d-layered materials
(e.g., KAOLIN, METAKAOLIN)



Monolayer



functionalization



Turn waste and low value streams raw materials into durable high performance(s) Green Cement at low cost



Raw materials
Minerals, inorganic chemicals, nanomaterials, low value streams & waste



Nano-technology platform
Activators & additives to boost, combine performances & properties



Nano-engineered & geo-engineered green cement
Durable high-performance(s) & cost-effective

What are our baseline performances?



MATERIAL
CO₂
FOOTPRINT

-60%



MECHANICAL
RESISTANCE

x2



WATER &
CHEMICAL
RESISTANCE

100%



LONG
LASTING

x2

We demonstrate unique features compared to conventional marine environment solutions

URBAX IS A PLATFORM

WE PARTNER
FOR IMPACT



Empowering building materials manufacturers



To deliver concrete protection and Bio-blocks for Marine Environment Applications



CONSULTING

+



LICENSING

+



PRODUCT DEVELOPMENT

+



INDUSTRIALISATION



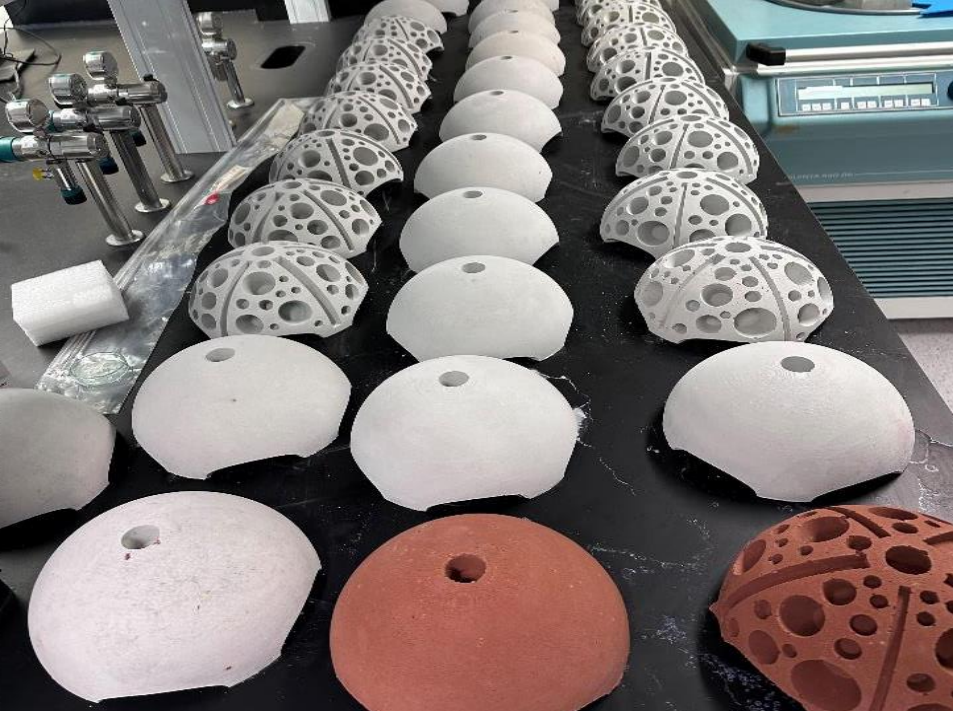
PRODUCT DESIGN



APPLICATION



With The GEAR we have been able apply our repair and protection product



We are also piloting in collaboration with PUB and NUS for coastal protection and marine life promotion at the marina of Keppel bay

The differentiation for concrete protection in marine environment

Urbax mortar for protection

- ✓ \$250/SQM
- ✓ 275kg CO₂/t
- 🎯 X2 Durable

Competition

- ✗ \$280/SQM
- ✗ 3600kg CO₂/t
- ✗ Sensitive to UVs

The differentiation for bio-blocks

Urbax Bio-Blocks



\$200/t



180kg CO₂/t



Bio-Compatible

Competition



\$200/t



881kg CO₂/t



Reduced
Bio-compatibility

The leadership team has more than 50 years of Industrial Stamina & Scientific Expertise



Centre for
Advanced 2D Materials



Institute for Functional
Intelligent Materials

Dr. Jérôme Enrico Lombardi
Co-Founder
&
Designate CEO

31 years of Expertise & Leadership in
Building Materials & Waste
Management Industries

Prof. Antonio Castro Neto
Co-Founder
&
Designate CSO

25 years of Expertise & Leadership in
Physics, Materials Science,
Nanotechnologies and Quantum Materials
& their Applications.



THE
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WAVES OF CHANGE

Uniting Business in Ocean Conservation



THANK YOU