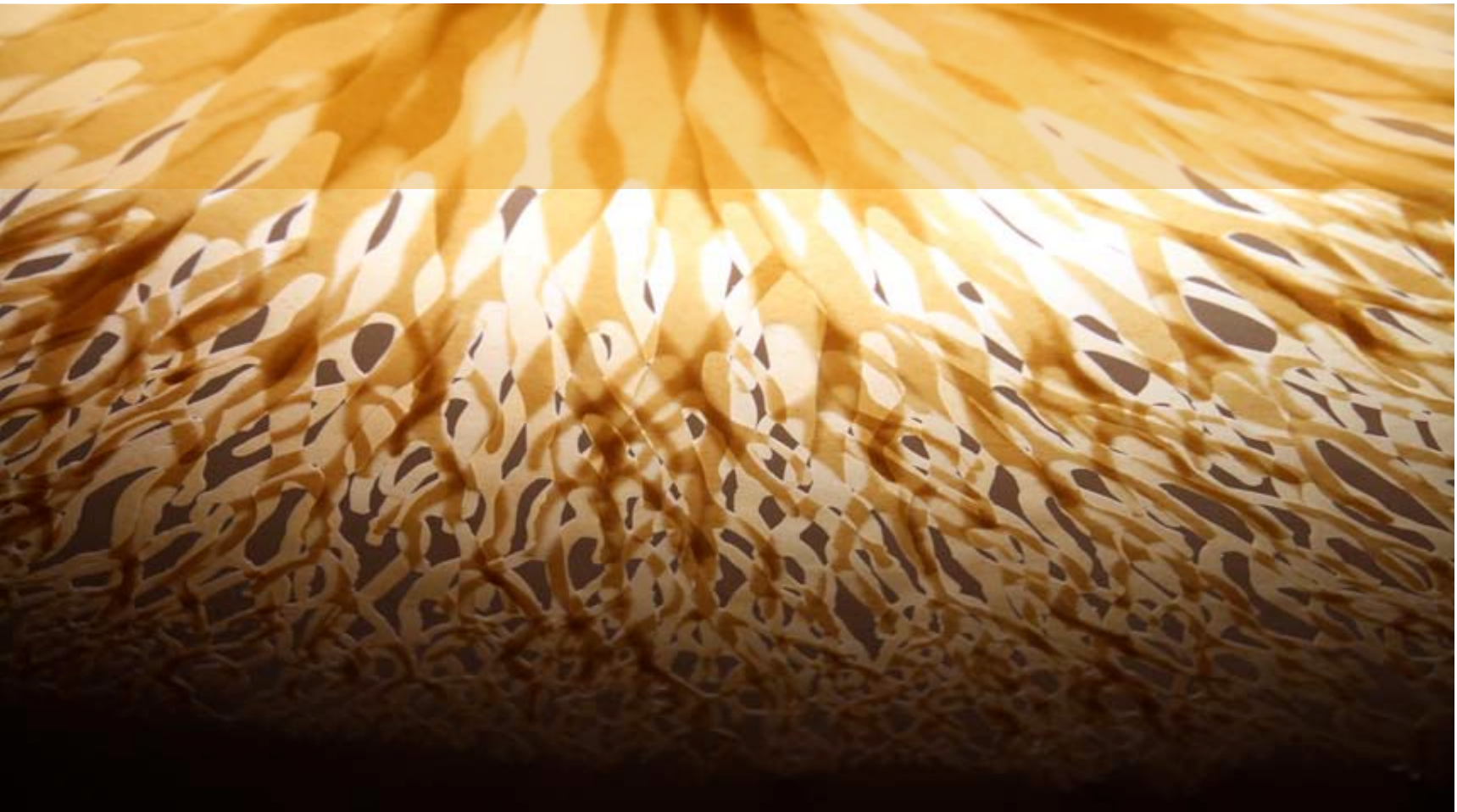


Overview Of Biopolymer Network & Research :

20th October, 2011



Biopolymer Network Ltd



Plant & Food
RESEARCH
RANGAHAU AHUMĀRA KAI



agresearch

SCION



- **Established: 2004**
- **Research & Technology Focus**
 - NZ Natural Extracts & their Biopolymer Products
 - ***plastics-coatings-cosmetics***
 - ultrafine starches ; functional proteins
 - tannin polyphenols
 - Non-wood Natural Fibres & Biocomposites
 - Thermoset Biobased Resins
 - Biofoam Technologies



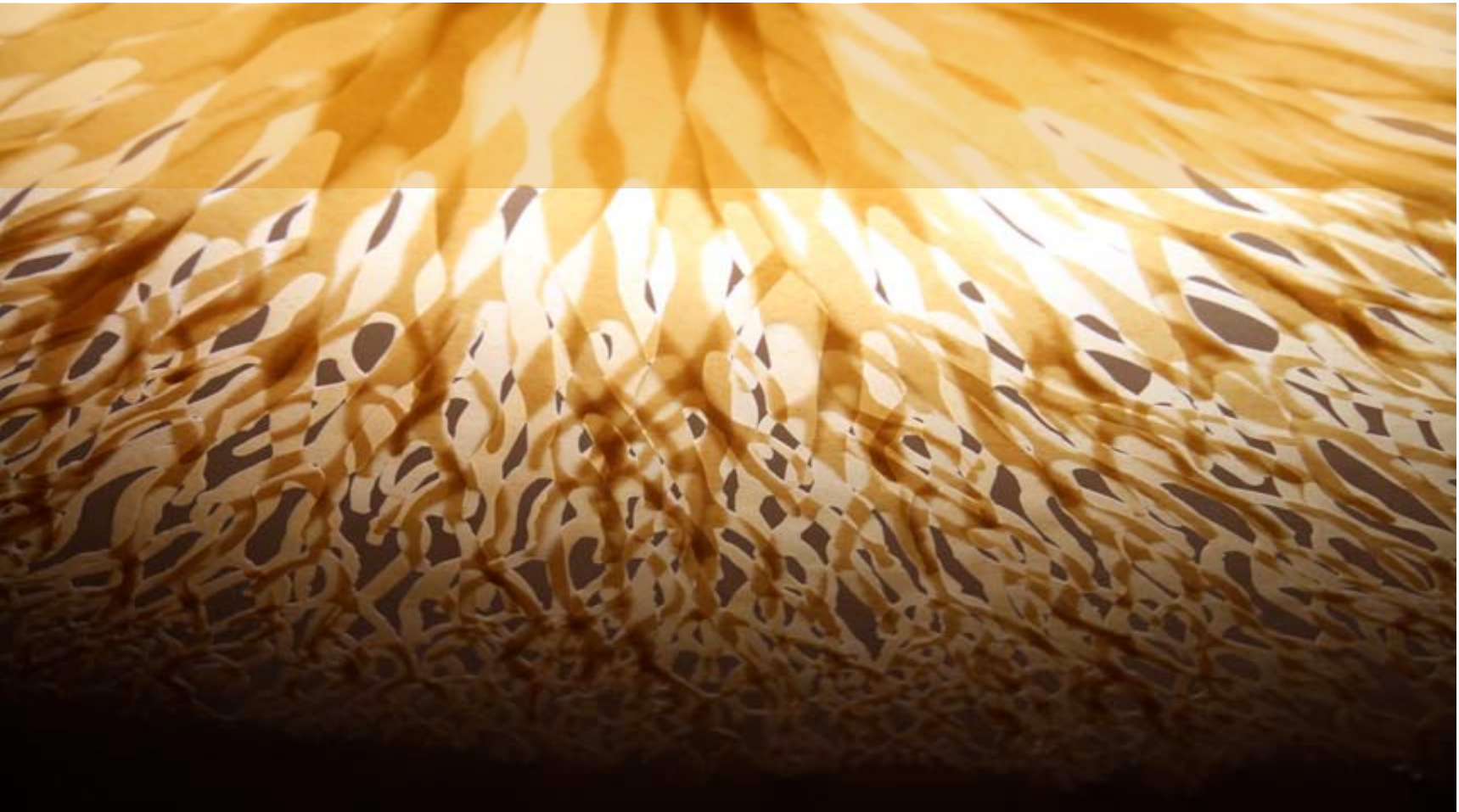
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Example Developments: Biopolymer Network

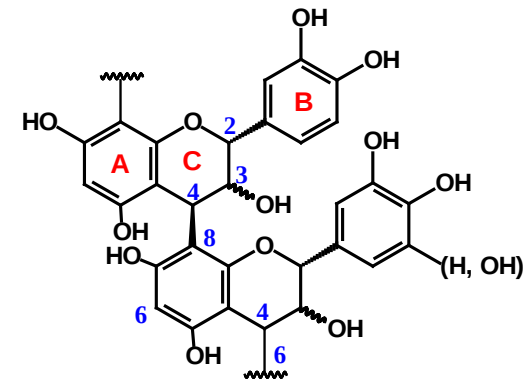
20th October, 2011



Tannins: Functional Additives/Resins



- **Bark Extraction, Fractionation, Derivatisation**
- **Characterisation & Functionality Testing**
 - *antioxidant, UV stabiliser, anti-microbial, ...*
 - *plasticisers, crosslinkers, flame retardants,...*
- **Pilot Plant Extraction & Drying**
- **Processing, Formulation, Dispersion**
- **Resins & composites**
- **Personal care (cosmetics), plastics, coatings,**



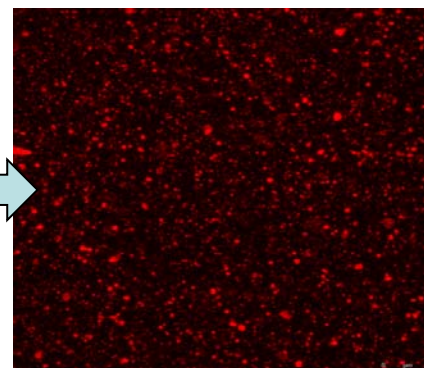
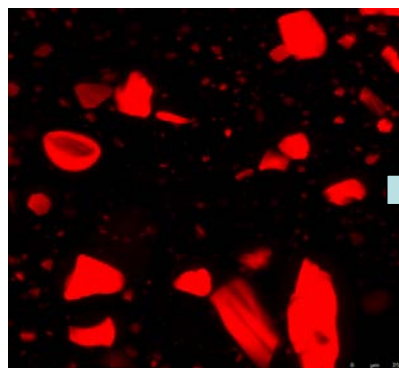
Natural Bioactives/Extractives in Plastics (BPN + Scion)

Flame Retardant
Heat Resistant
Melt Strength
Chain Extender
Plasticiser
Impact Modifier
Compatibiliser



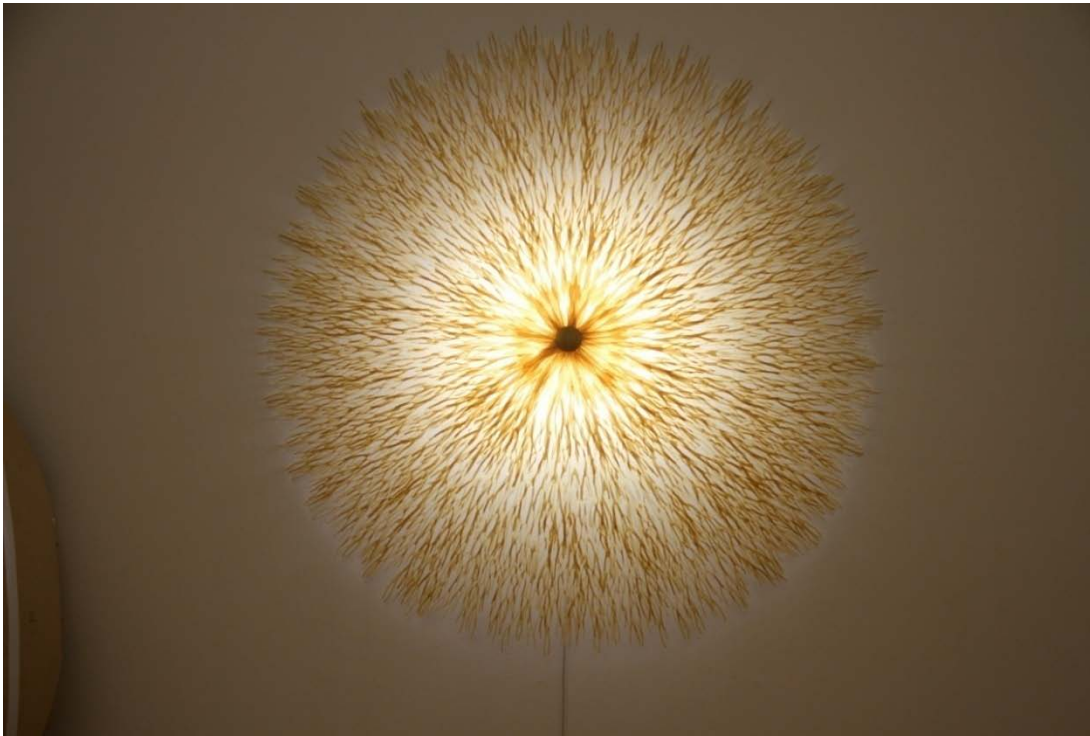
Anti-microbial
Anti-fouling
UV Protective
Antioxidant
Anti-corrosion

Achieving good compatibility, dispersion & interactions are critical for good all-round performance in plastics



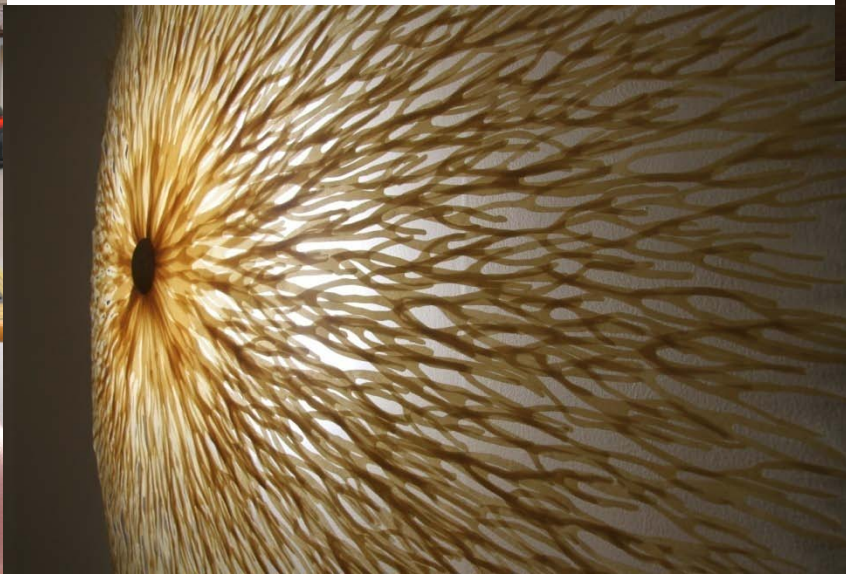
Novel Hot-Strength PLA Film *plus NZ harakeke fibre*

joint development with David Trubridge Ltd



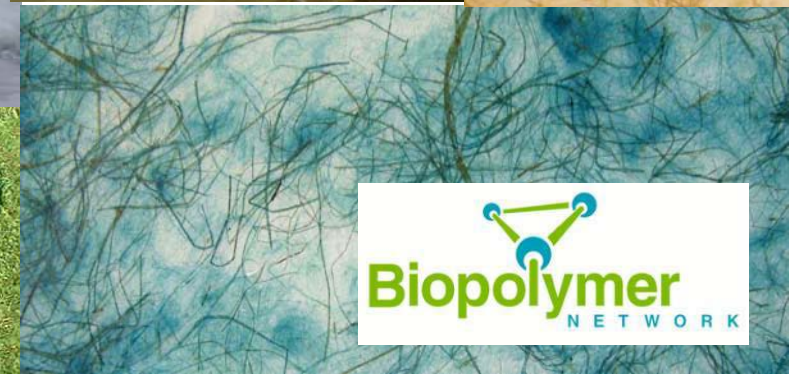
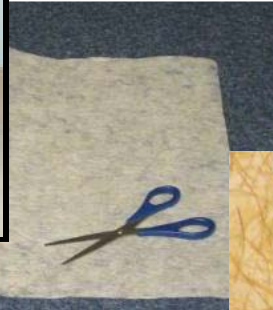
This lamp design, named Tipu, stands two metres in diameter. It was unveiled at the prestigious Hawke's Bay Invitational Art Exhibition and sold on the first night.






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Expanded PLA (E-PLA) Biopolymer Foam Technology

The Technology



*Expanded(E) - Polylactic Acid (PLA) Foams using CO₂
A sustainable alternative to EPS & other foams*

Research

- Foaming of biopolymers & fibre-filled foams
- **CO₂ processing – bioplastics**
- **Impregnation & moulding of plastics with CO₂**
- Properties of biopolymer foams
- Flame retardant PLA & PLA foams

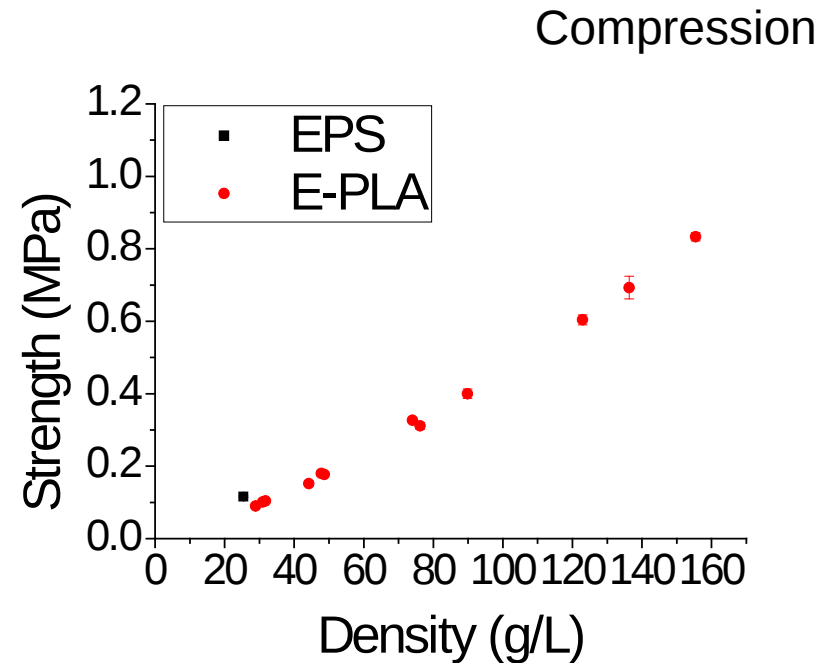
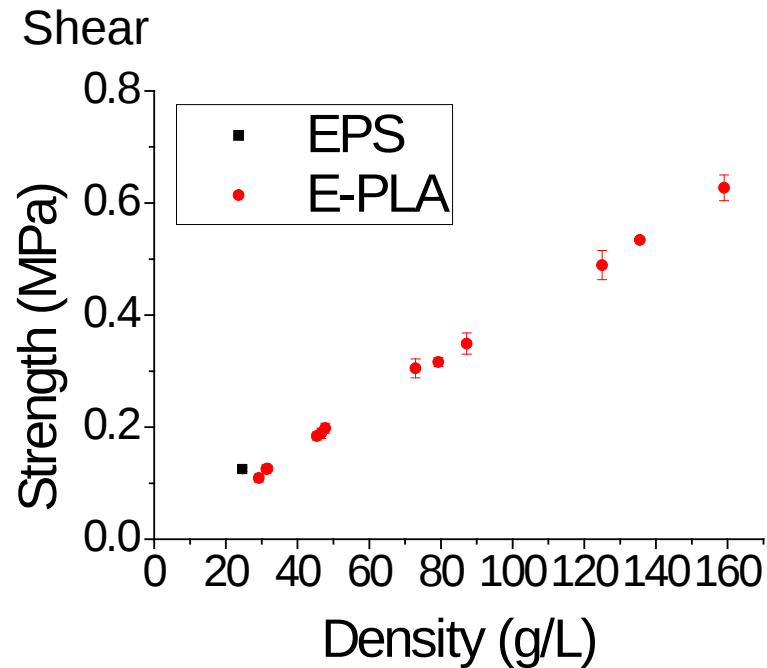


E-PLA properties

- Excellent insulation properties
 - *can be used as insulation like EPS*

	Density (g/L)	Thermal conductivity (W/m.k)
EPS	~30	0.032
E-PLA	~30	0.032

E-PLA : Shear, Compression, Cross-breaking




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Applications for our E-PLA

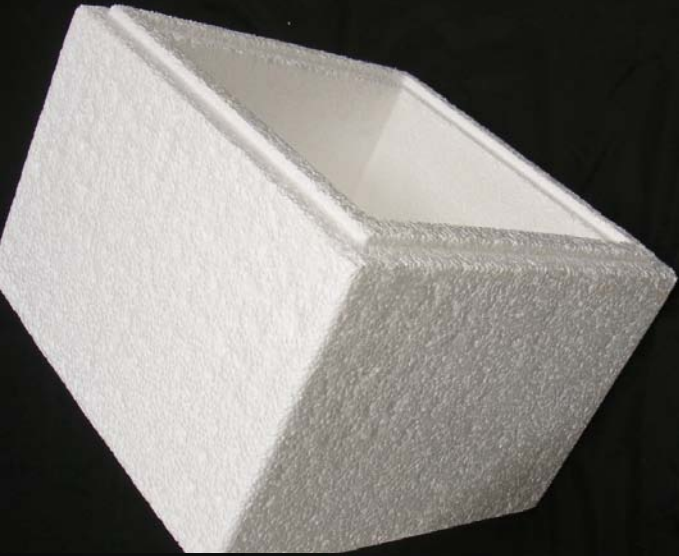
- Packaging
- Furniture
- Thermal and acoustic insulation
- Composites / structural insulation panels
- Biomedical
- Automotive
- Sporting goods
- Anywhere EPS **or other foams** are used!

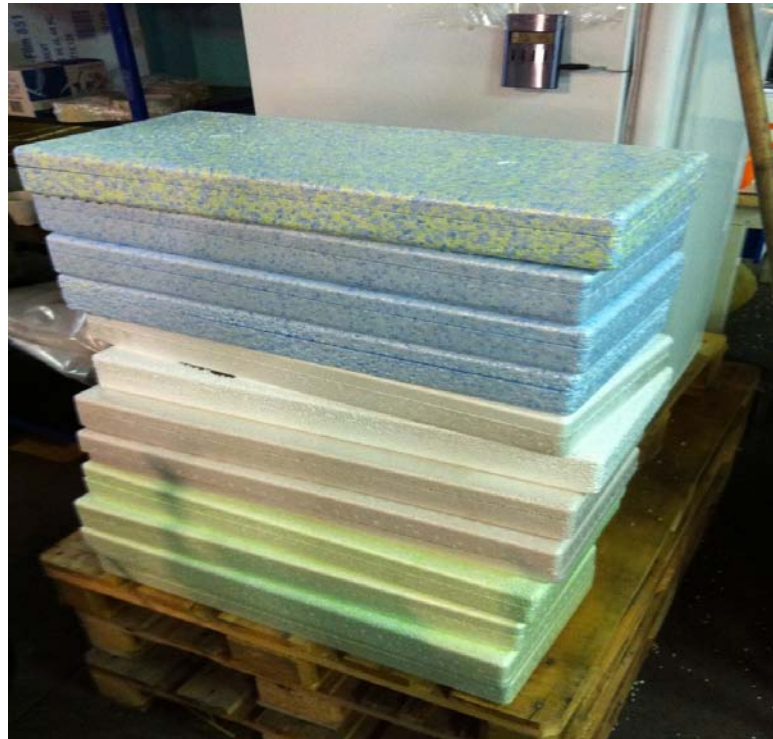
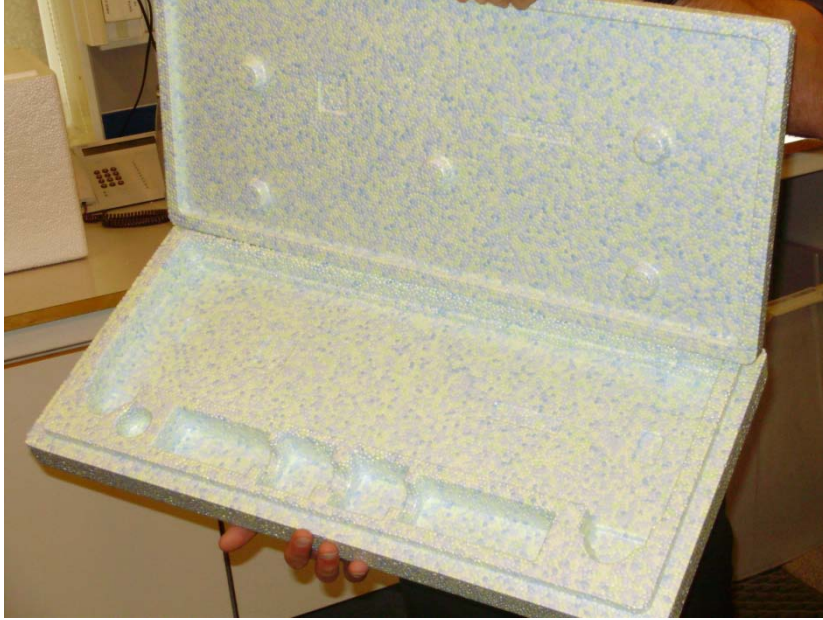


Manufacturing Trials/Evaluations - NZ



Manufacturing Trials/Evaluations - Overseas

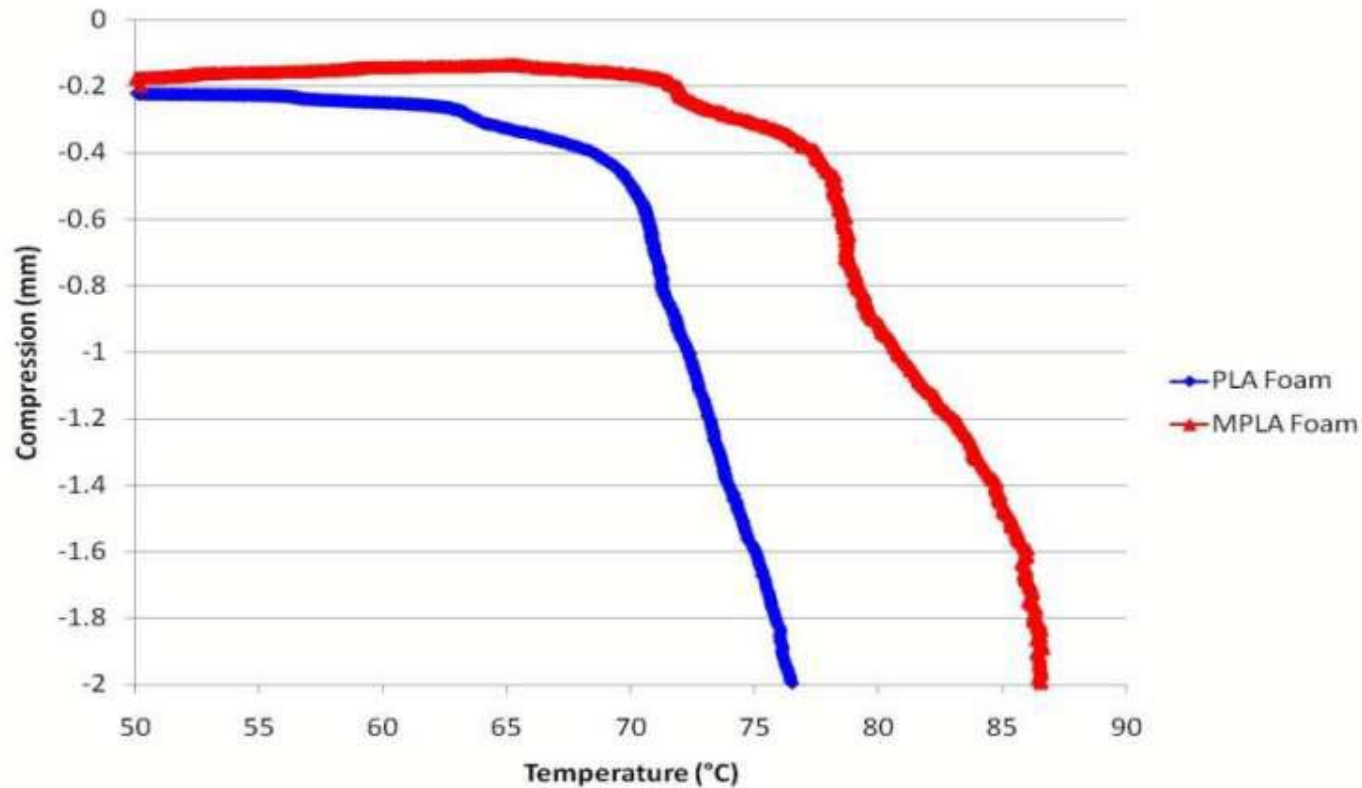





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E-PLA: Improved Heat Resistance



Other Biopolymer Network Foam Technologies

- **PLA Foams**

- Other CO₂ processes
- Extrusion PLA foams
- Reinforced PLA foams
- Flame retardant
- Heat resistant

- **Starch Foams**

(with *Potatopak/Plant& Food Res./BPN*))

- Water resistant
- Reinforced

- **Phenolic Foams**

- Biobased / Reinforced / Hybrids

- **Biopolyurethane Foams**



Thank You

