SUSTAINABLE Chemicals CONFERENCE & EXPO

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Using Nanofibrillated Cellulose to Improve Performance and Sustainability of other Materials

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PERFORMANCE BioFilaments

making great materials better

company overview

- Performance BioFilaments Inc. is a biomaterials company focused on commercializing **Nanofibrillated Cellulose (NFC)** based materials in performance-driven applications.
- NFC increases strength and enhances rheology while improving sustainability for nonwovens, concrete & mortars, industrial fluids, polymers, and other advanced materials & specialty chemicals.
- Commercial manufacturing in Canada(QC) producing 21,000kg/day, 7000tonnes/year.
- Warehousing is in Montreal, finalizing locations in the US and Europe.

Shareholders

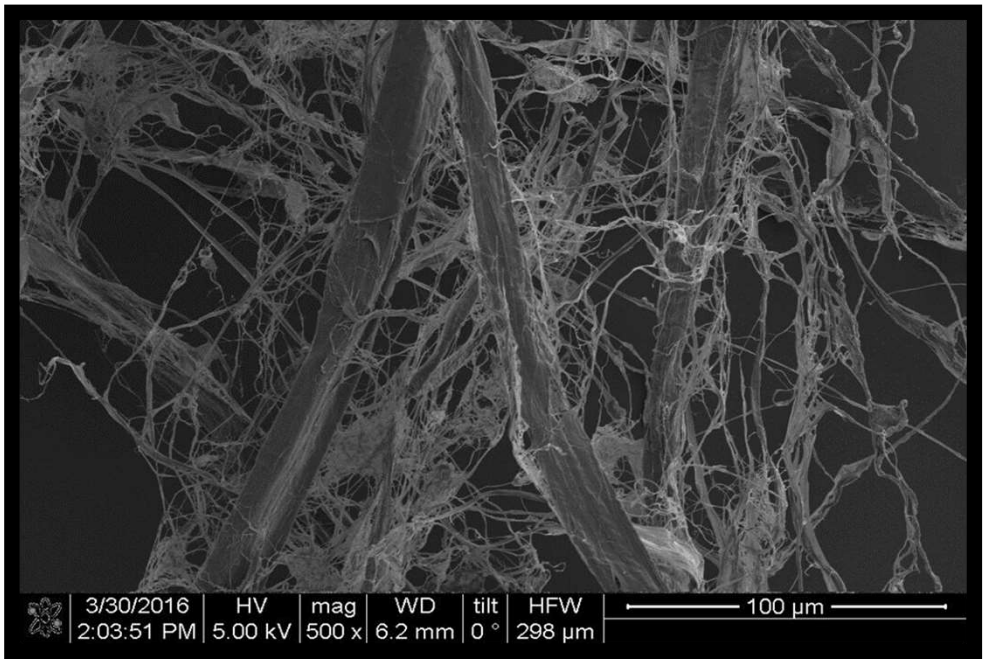
Domtar

Montreal based integrated forest products company with operations in Canada and the United States.

MERCER

Vancouver based integrated forest products company with operations in Canada, USA, Germany, and Australia.

nanofibrillated cellulose - NFC



Kraft “parent” fiber with NFC nano-fibrils
From sustainably managed and certified forests

NFC fibrils at nano-scale widths
Produced using 100% hydroelectricity

- NFC nano-scale fibrils are 80-300 nm in width X 100-500 µm length.
- Ultra-high aspect ratio of 800-1200 L/D and surface area of 150 m^2/g.

nanofibrillated cellulose - NFC

30% solids non-activated | 10% solids paste | 2% solids slurry

packaging and delivery

sustainable bio-based additive

- NFC is derived from softwood kraft fibres (bio-based input).
- The feedstock (residual wood fiber) comes from managed forests in Canada.
  - FSC®, PEFC and SFI® Certificates and ISO 14001 and ISO 9001.
- Life Cycle Analysis (LCA) and Environmental Product Declaration (EPD) are pending.
- NFC is exempted from the US EPA TSCA Nanoscale Materials Regulation.
- NFC is designated by the CAS as Cellulose Pulp (CAS# 65996-61-4).
- US FDA Food Contact compliance and USDA BioPreferred Program certification is pending, expected fall 2024.

concrete & mortars

nonwoven materials

polymer materials

paints, coatings and industrial fluids

mine products and waste streams

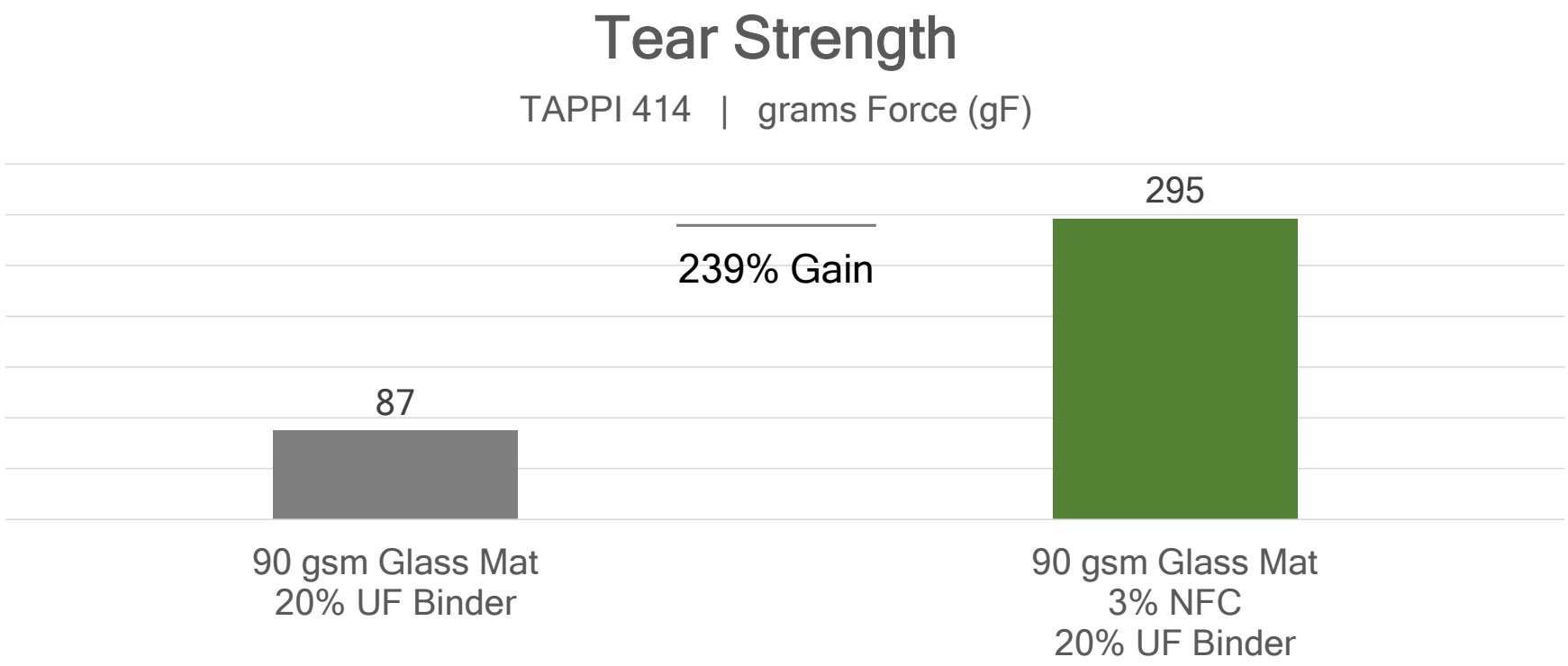
packaging

case study - glass fiber nonwovens

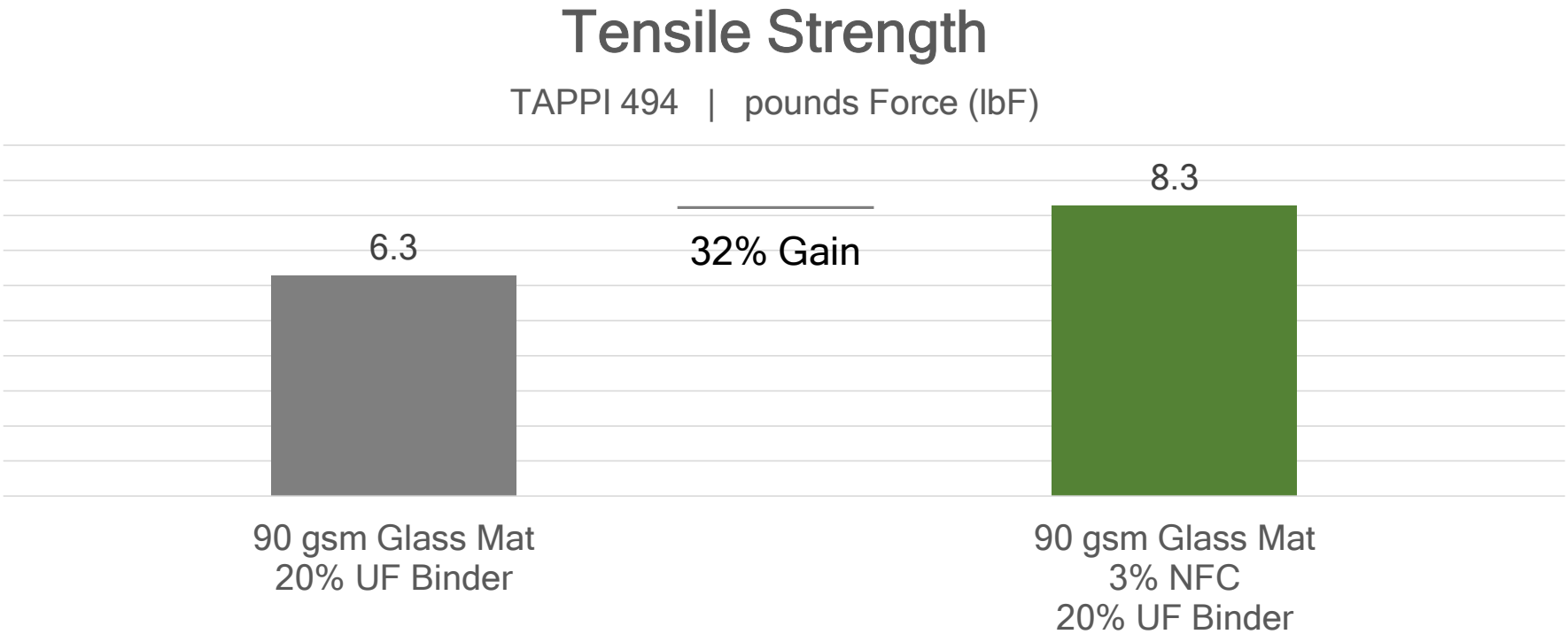
Nanofibrillated Cellulose (NFC) “Reinforcement” of:

- Water-Based Urea Formaldehyde (UF) Resin Binder
- Water-Based Acrylic Latex Resin Binder

increased tear strength



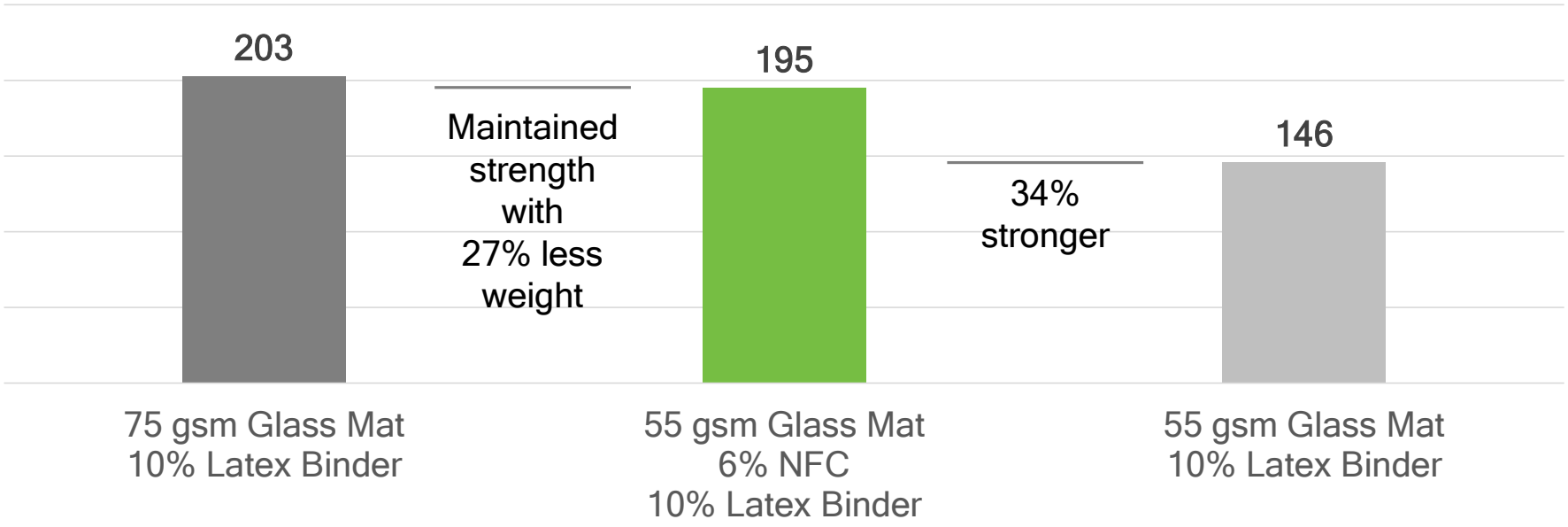
increased tensile strength



NFC reduces weight & maintains strength

Tear Strength

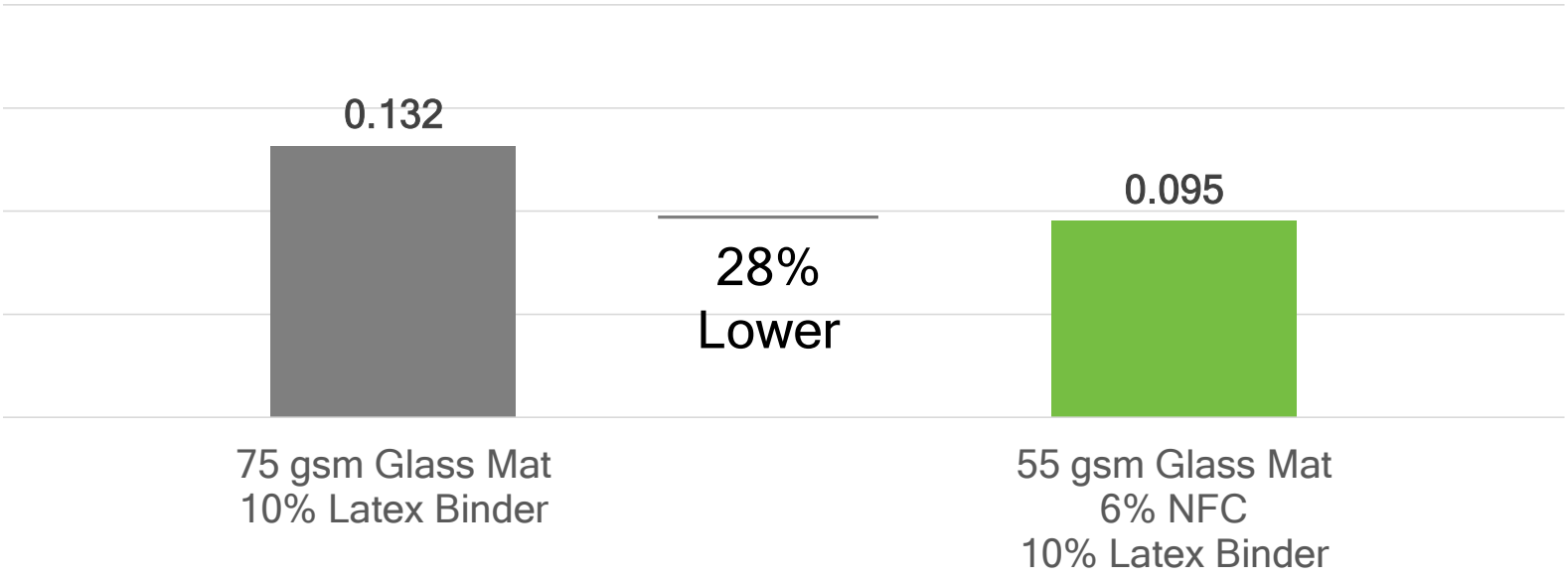
TAPPI 414 | grams Force (gF)



NFC can reduce carbon footprint

Carbon Footprint (kg CO_2e / m^2) of Fiber Materials

(Glass: 1,950 kg CO_2e / tonne | NFC: 1,550 kg CO_2e / tonne)



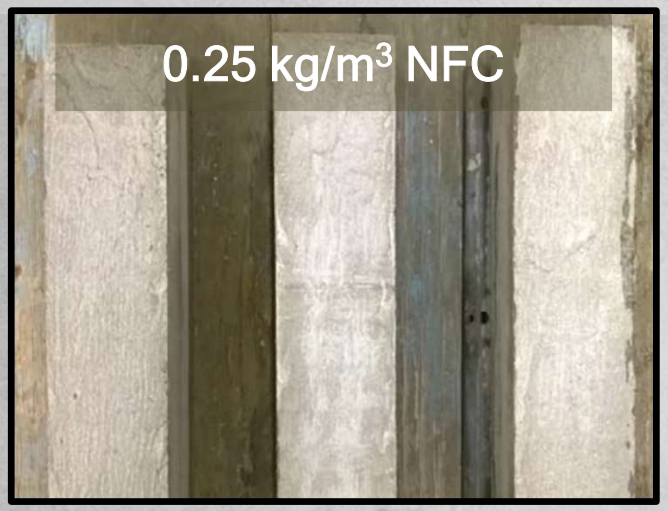
construction & infrastructure

NFC improves internal curing of concrete, reduces corrosion, mitigates cracking, increases strength, and enhances durability.

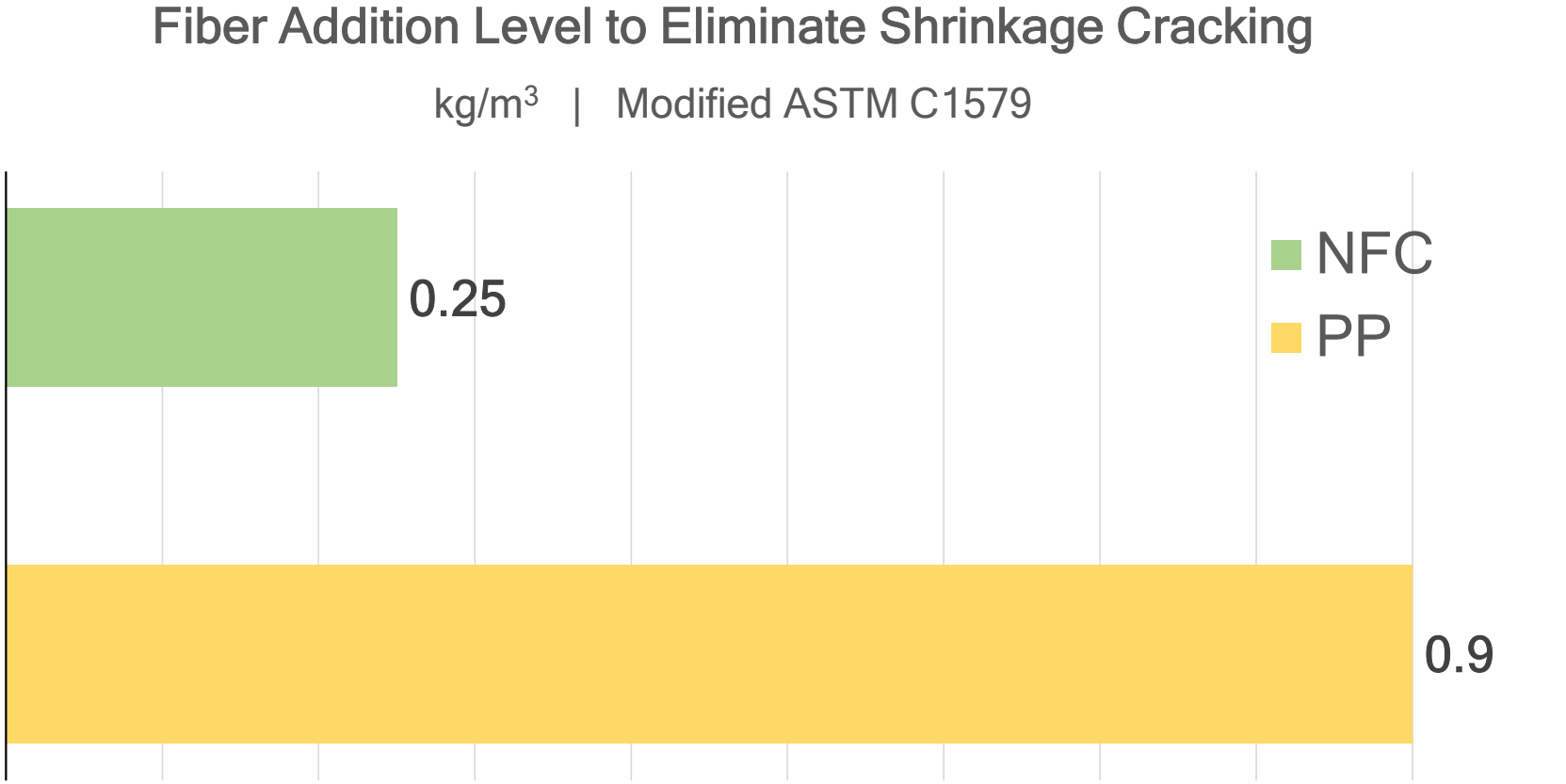
case study - concrete for a factory floor

Resolute Forest Products
- Senneterre lumber mill

reduced shrinkage cracking



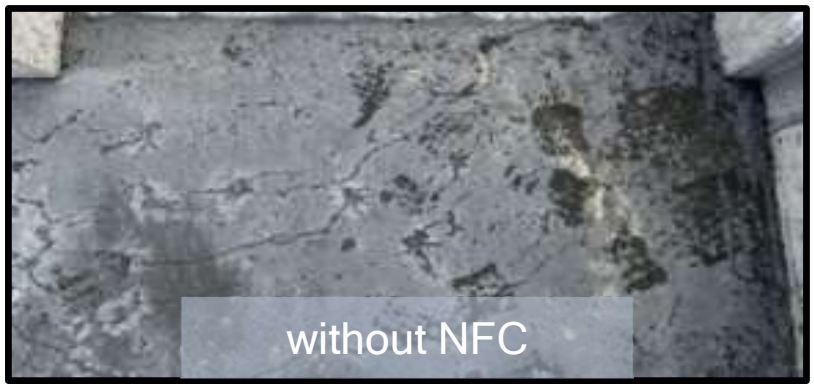
4X more effective than polypropylene fiber

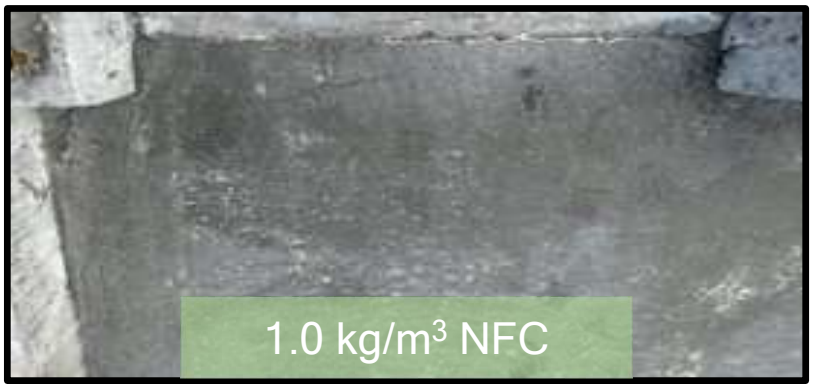


80% less cracking

Crack Density

m/m^2 | Field Measurement - Senneterre Factory





contact us to learn more

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