

SUPER MAT



**New Hydrophobic
Blanket Insulation**



Combination of two proven
mature technologies



to create new
hydrophobic flexible blanket

Pyrogel XTE vs. Super Mat

Aerogel blanket	Polymer-coated Blanket
Dust during handling, cutting, install	Zero dust – No aerogel content

Pyrogel XTE vs. Super Mat

Aerogel blanket	Polymer-coated Blanket
Dust during handling, cutting, install	Zero dust – No aerogel content
Hydrophobic to 315C (600F)	Hydrophobic to 315C (600F)

Pyrogel XTE vs. Super Mat

Aerogel blanket	Polymer-coated Blanket
Dust during handling, cutting, install	Zero dust – No aerogel content
Hydrophobic to 313C (600F)	Hydrophobic to 315C (600F)
Not moldable	Moldable version available

Pyrogel XTE vs. Super Mat

Aerogel blanket	Polymer-coated Blanket
Dust during handling, cutting, install	Zero dust – No aerogel content
Hydrophobic to 315C (600F)	Hydrophobic to 315C (600F)
Not moldable	Moldable
\$\$\$	\$\$ (25 – 35% less than Pyrogel XTE based on thermal equivalent thickness)

Pyrogel XTE vs. Super Mat

Aerogel blanket	Polymer-coated Blanket
Dust during handling, cutting, install	Zero dust – No aerogel content
Hydrophobic to 315C (600F)	Hydrophobic to 315C (600F)
Not moldable	Moldable
\$\$\$	\$\$ (25-35% less than Pyrogel XTE based on thermal equivalent thickness)
Skin dryness discomfort	No hydrophobe to contact skin

Pyrogel XTE vs. Super Mat

Aerogel blanket	Polymer-coated Blanket
Dust during handling, cutting, install	Zero dust – No aerogel content
Hydrophobic to 600F	Hydrophobic to 600F
Not moldable	Moldable
\$\$\$	\$\$ (25 – 35% less than Pyrogel XTE based on thermal equivalent thickness)
Skin dryness discomfort	No hydrophobe to contact skin
No weather barrier coating	Available with weather barrier coating

Pyrogel XTE vs. Super Mat

Aerogel blanket	Polymer-coated Blanket
Dust during handling, cutting, install	Zero dust
Hydrophobic to 313C (600F)	Hydrophobic to 315C (600F)
Not moldable	Moldable
\$\$\$	\$\$ (2/3 of aerogel based on thermal equivalent thickness)
Skin dryness discomfort	No hydrophobe to contact skin
No weather barrier coating	Weather barrier coating option
Hot and cold service products available	Hot service introduced first. Cold service to come later.

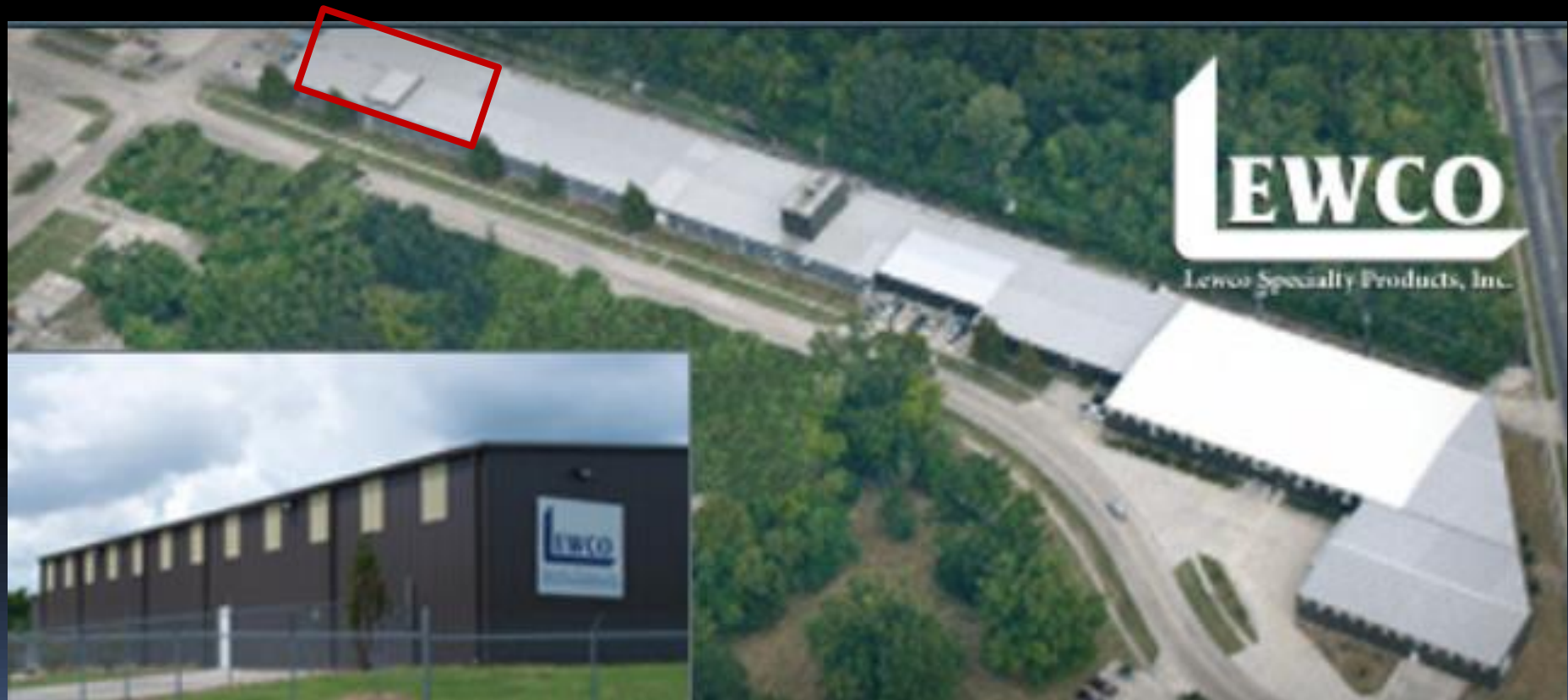
Lewco Specialty Products

- Manufacturer of fiberglass needle felted blanket and woven textiles
- Founded in 1985 by Lewis Dill. Owned 100%. Remains President and CEO.
- \$40 MM AUD annual sales. Zero debt.
- Facilities in two U.S. locations:
 - Baton Rouge, Louisiana
Needle felting and polymer impregnating
 - Columbia, South Carolina
High temp. and reinforcement textile weaving

Lewco Specialty Products

- Desire to enhance value of needle felted blanket.
- Invented and patented a method to achieve through-thickness coating of fiberglass blanket with PTFE.
- ISO 9001-2008 certified

Baton Rouge, Louisiana facility 14,000 m² on 15 acres



Location of new blanket-impregnating facility

South Carolina --
100 loom
weaving facility



11,200 m² on
30 acres

Research Line
($\frac{1}{2}$ meter wide)

Impregnation
step



Second
heating
step

315C air duct
Insulated w/
Super Mat





Main Line





Proven mature technologies

PTFE

- Invented in 1938.
- 80 years of demonstrated:
 - + Heat and chemical resistance
 - + Thermal shock resistance – cookware
 - + Environmental resistance
 - + Lubricity
- Used in most all industries
 - + Outer space
 - + Aviation
 - + Heavy and light industry
 - + Household appliances'
 - + Automotive

Examples of PTFE-impregnated fiberglass:

- Insulation on O₂ tanks on Space Shuttle
- Coated fabric on Apollo space suits.
- Industrial removable blankets
- Welding blankets
- +Other textiles



Denver Airport

24 yr. old PTFE-coated
fiberglass canopy



Denver International Airport

*"... chemically inert,
highly resistant to dirt and pollution, and provides a
long lifecycle with minimal service."*

Per BirdAir, roofing & membrane specialty contractor



Proven mature technologies

Fiberglass

- Existed for centuries
- Mass production of glass fiber Invented in 1930's
- Used as reinforcement in polymer composites
 - + Marine
 - + Aviation
 - + Heavy industry
 - + Municipal
 - + Electronics
 - + Automotive
 - + Wind turbines
- Used to manufacture high temperature textiles
- Used as thermal insulation in most all industries

Technical Properties

Hydrophobicity

After 24 hr. heat soak at 315C (600F)

ASTM C1511 Water retention After Immersion (15 min. under 6" water)	
(Specimens tested heat soaked @ 315C (600F) for 24 hrs.)	
Mass absorbed (mean of 3 specimens)	4.99%
ASTM C1104 Water Vapor Sorption (96 hrs. at 95% RH)	
(Specimens tested heat soaked @ 315C (600F) for 24 hrs.)	
Mass absorbed (mean of 3 specimens)	0.30%

Flame spread/Smoke generation

- ASTM E84 = 0/0 (Uncoated version)

Fungi Resistance

- ASTM C1338 = No growth

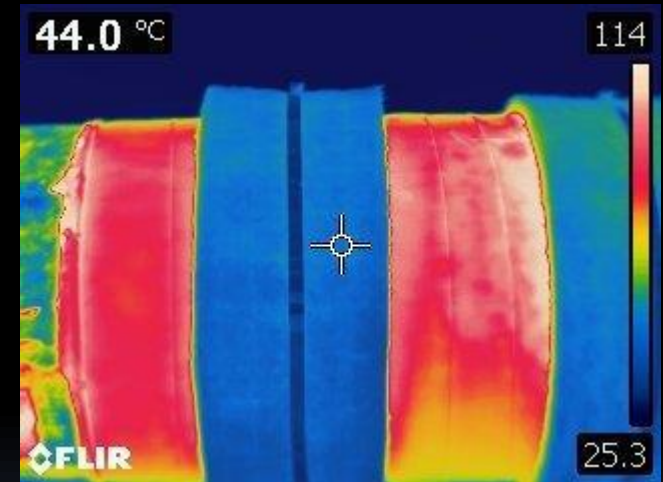
28 Day Corrosion Test & Chem Analysis

- ASTM C871/C795 = no cracks, 4 coupons tested

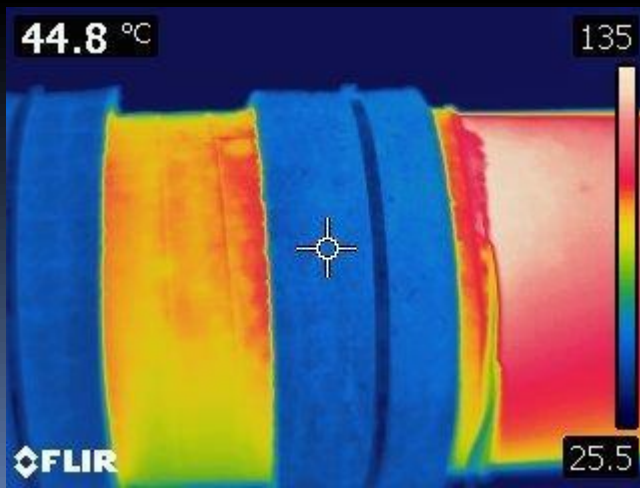
Kaefer Quick Test 16May18



← 102 C steel temperature



40.0C Reading for Super Mat 16mm →

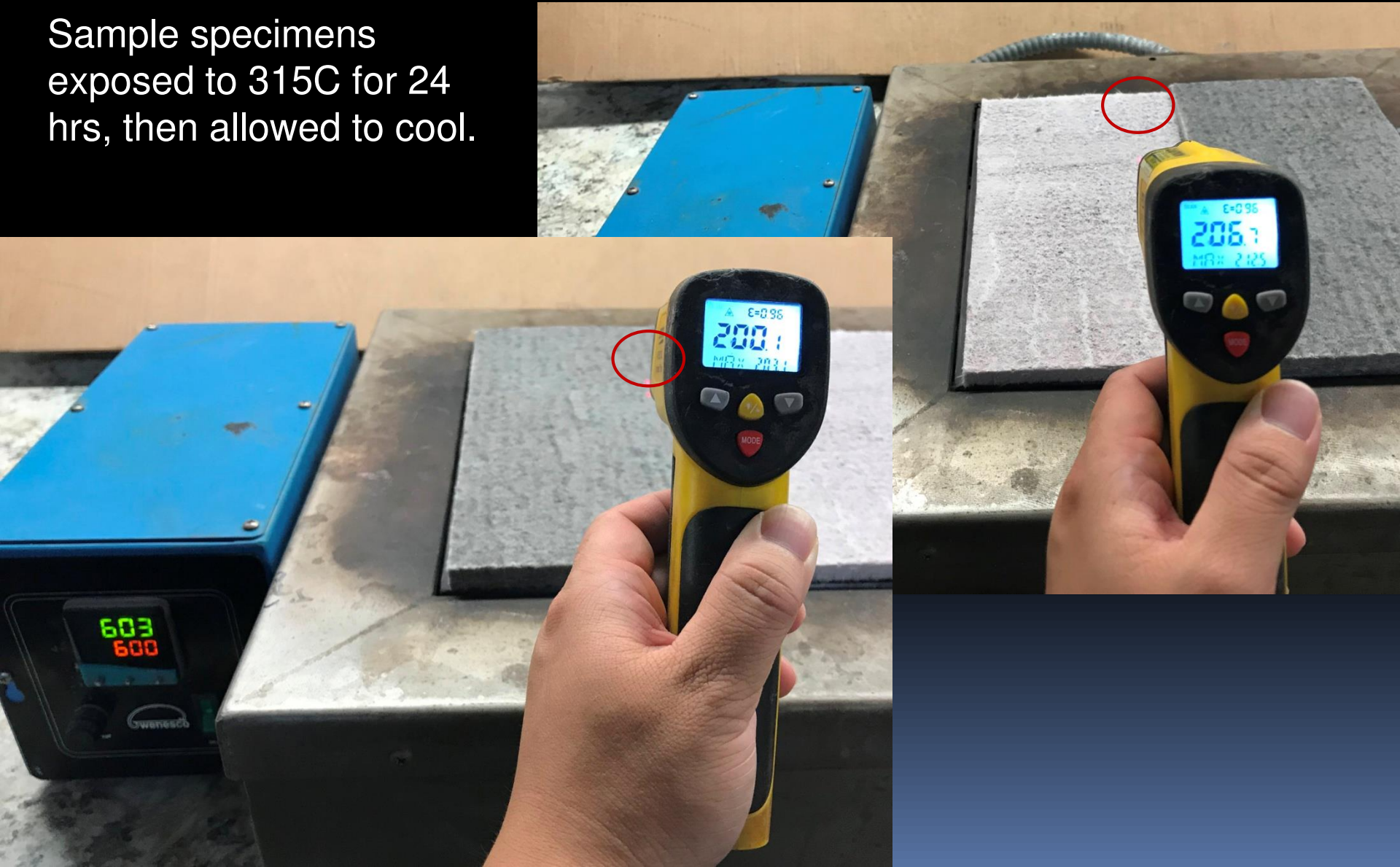


← 44C Reading for Pyrogel XTE 10mm

16 mm Super Mat = 10 mm Pyrogel XTE

In-house Surface Temperature Comparison

Sample specimens exposed to 315C for 24 hrs, then allowed to cool.





Install Examples







U.S. Contractor Mockup & Feedback



Feedback:

“Cuts like butter.”

“Damn near too easy to work with.”



20 mm pressed
elbow cover good
fit for 16mm



Columbian Contractor Field Trial / Feedback



Installed field trial at two power plants.

400F (204 C) steam line.

One layer 16mm = 108F (42C)

Left unjacketed and observed after rain event. No change.

Feedback from Refratermic in Columbia.

- 1) Easier to work with and install than Pyrogel.
- 2) No complaints about dust.
- 3) Likely not to use the coated version in areas where prone to damage.
- 4) Would like to see it used in pipe racks to eliminate metal jacket to reduce cost for customer.
- 5) Recommending to customers as improvement on Pyrogel.

Testing and Startup Status

- 1 ½ yr. development and testing
- Research line running daily
 - Opportunity for routine in-house testing on output
 - Available for and mockups and field trials on reference areas
- Startup of main production line targeted for August 2018.
- Beginning second round of third party testing
- Lewco is planning UL1709 fire resistance and acoustic testing after main production line startup.
- Discussions with Dr. Kod at Curtin University to consider testing for cold service.

Production Capacity

At design capacity:

- Annual production = 832,000 m²
(based on 260 days/year)
- Monthly production = 70,000 m²
- Daily production = 3,200 m² (one 40 ft. container)

Thank you for your time!