

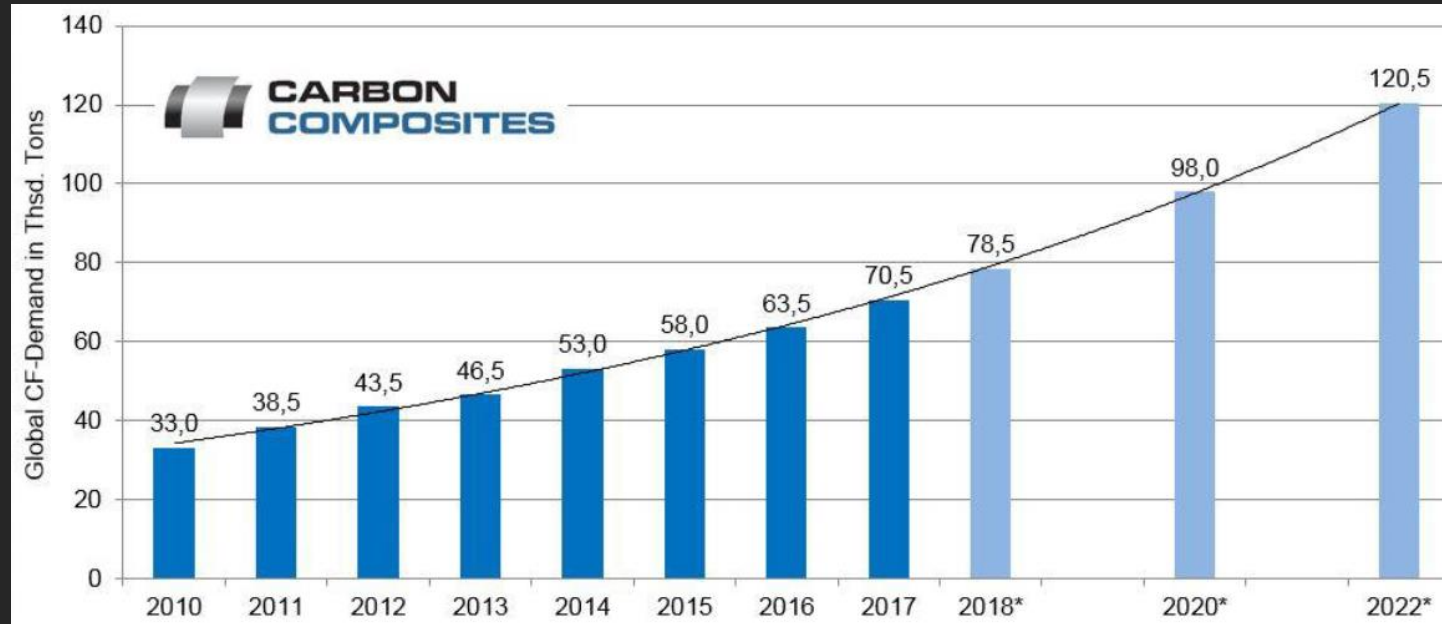


Advancing the composites industry

Through novel
technical nonwovens

ENDEAVOR
COMPOSITES

Carbon Fiber Rising Market



* According to AVK Composites Market Report 2018 and Freedonia group study 2019



Lighter



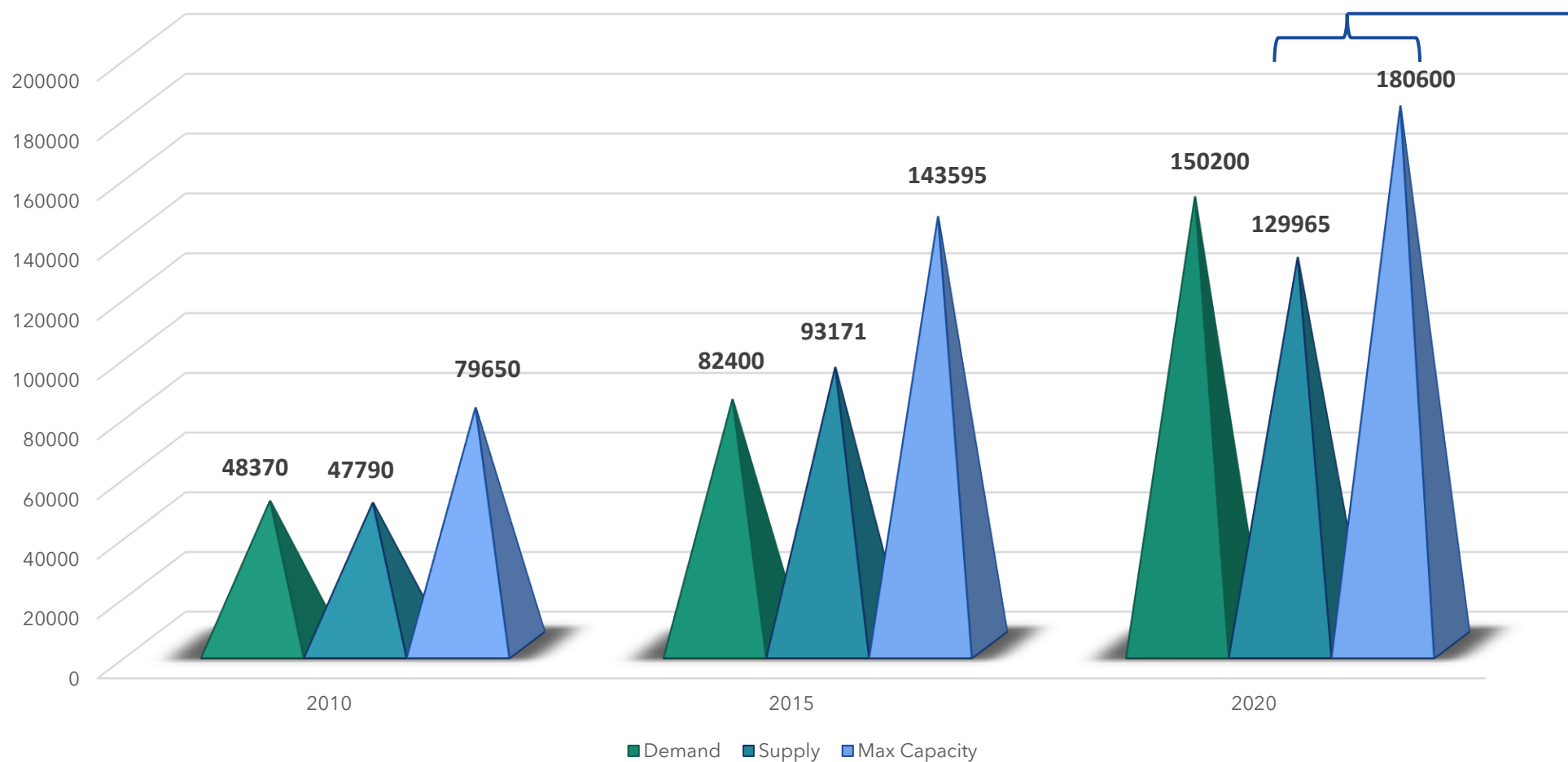
Faster



Stronger

Supply Chain Limitations

Carbon fiber demand and supply, metric tonnes (MT)

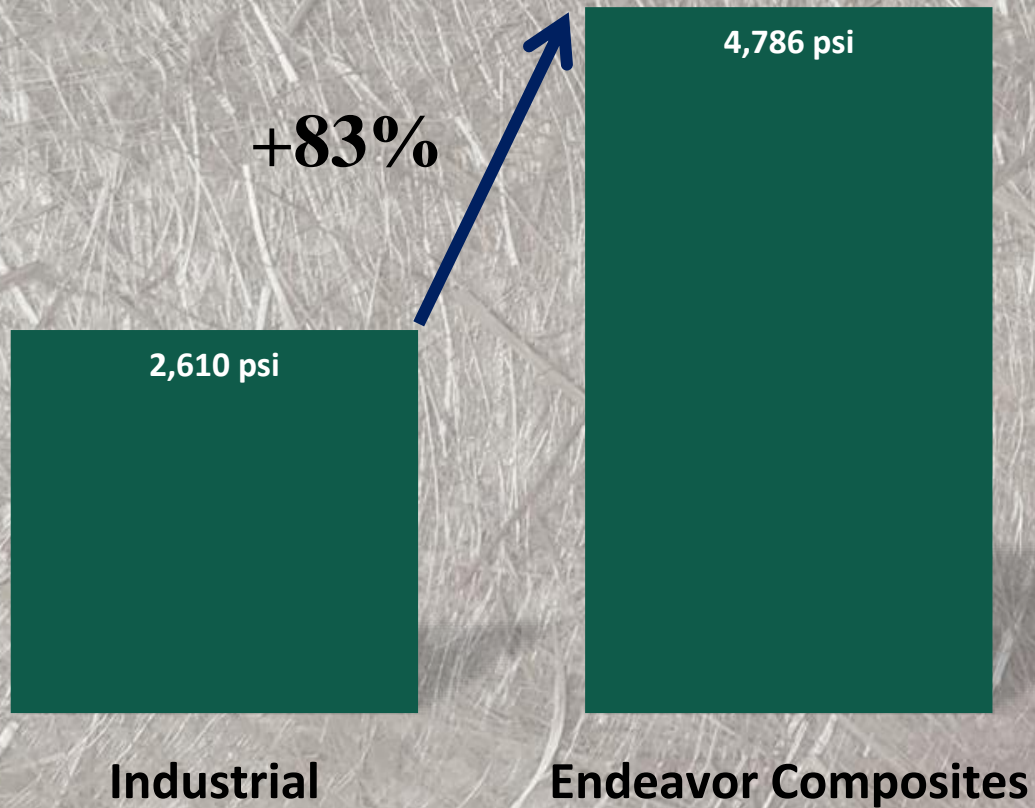


- 28% difference
- 40,635 MT of unused production
- \$1B sent to landfill
- If turned into turnkey preforms
- \$15B in added value products

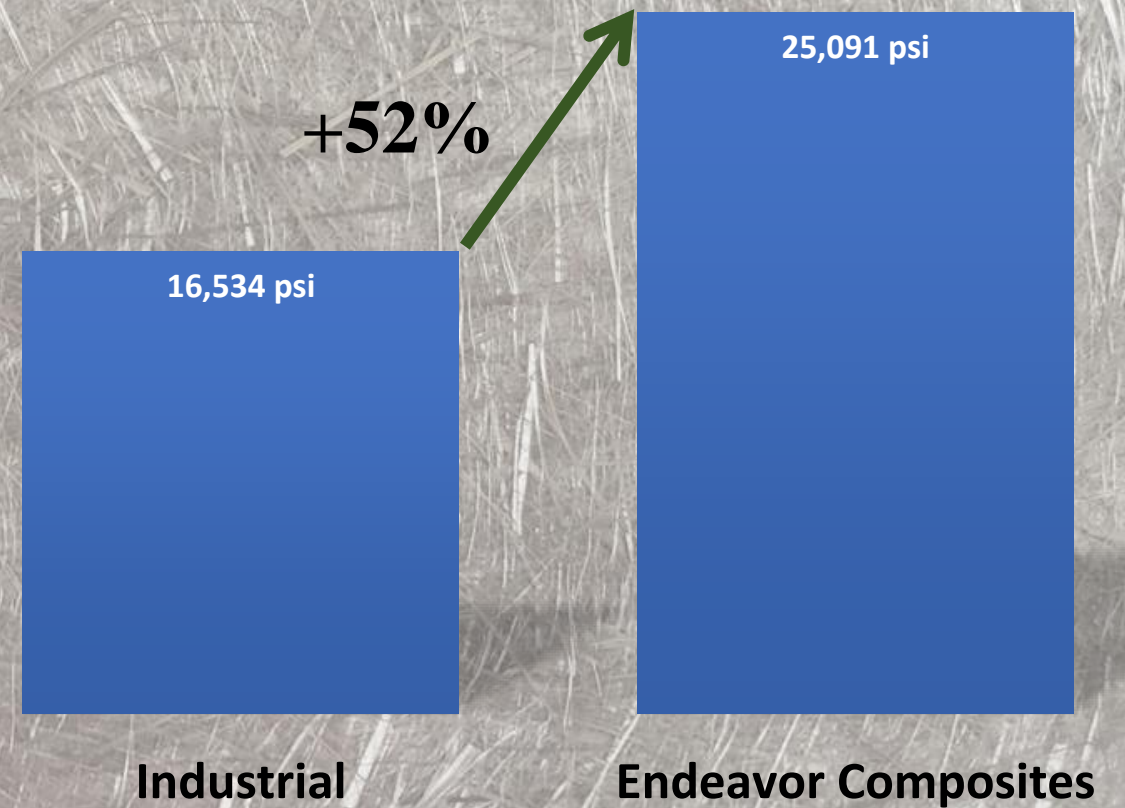
* Source: Composites Forecasts and Consulting LLC - March 2019



LAMINAR SHEAR STRENGTH



TENSILE STRENGTH



Process, Performance, and Cost Competitive

Preform	Fiber length	Matrix choice	Performance	Shape complexity	Isotropy	Cost / lb (carbon)
Endeavor novel Wet Laid	> 1"	Agnostic	High	4" deep curves	100%	< \$12
Woven	> 5"	Agnostic	Very High	Limited	NA	\$40 - \$70
SMC	< 1"	Thermoset	Intermediate	Metal-like	Process-based	\$12 - \$20
Air Laid	> 1"	Agnostic	Intermediate	2" deep curves	NA	\$15 - \$20
Wet Laid	< .5"	Agnostic	Intermediate	2" deep curves	100%	\$15 - \$20
LFT	< .5"	Thermoplastic	High	Metal-like	Process-based	\$20 - \$50

Traction to Date - \$1.1M

\$500k in non-dilutive funding for R&D & \$462K for scale-up efforts



U.S. DEPARTMENT OF
ENERGY

 **OAK RIDGE**
National Laboratory



AFWERX



INNOVATION
CROSSROADS

OAK RIDGE NATIONAL LABORATORY

MC
MASSCHALLENGE



\$141K in commercial R&D projects through 2021 to date



Toray Group



TEIJIN

INNEGRATM

DUPONT



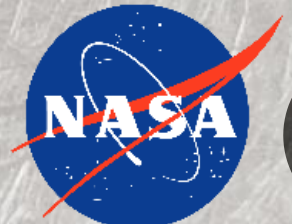
Viasat

LOCKHEED MARTIN



BECQ
RADIATION SHIELDING

agy



Project Engagements with MC primes

*Advanced materials
for astronaut
helmets*



*Fire retardant
nonwoven reinforced
matrix for aerospace
vehicles*



*Next generation trailer
composite material for
better fuel efficiency*



Team and Advisors



Hicham Ghossein, Ph.D.

Founder and CEO

- Lead PI on more than 12 composite industry projects
- International Composite division board of advisors' member with SPE
- Tech Inventor & DOE- Innovator
- NSF certified Science communicator
- Secretary of the Army – Civilian aid & Eisenhower School of Defense – Advanced Manufacturing day awards



Benjamin Schwartz, M.S.

Mechanical Engineering



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Manufacturing



Amit Naskar, Ph.D.

Carbon Fiber
Commercialization



Ganesh Deka, Ph.D.

Industrial
Nonwoven Expert



John Bruck

Business Strategy &
Development

Novel Technical Nonwovens



Defect Free



High Performance



Eco Friendly



Turnkey preforms



Fiber Agnostic



Resin Agnostic

Goals for 2022 and beyond



Paid pilots with market leaders



Raising a deep tech seed round



Ramp up production & performance



Create \$15B in added value products

ENDEAVOR COMPOSITES

Excellence in Advance Composites
Manufacturing



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