



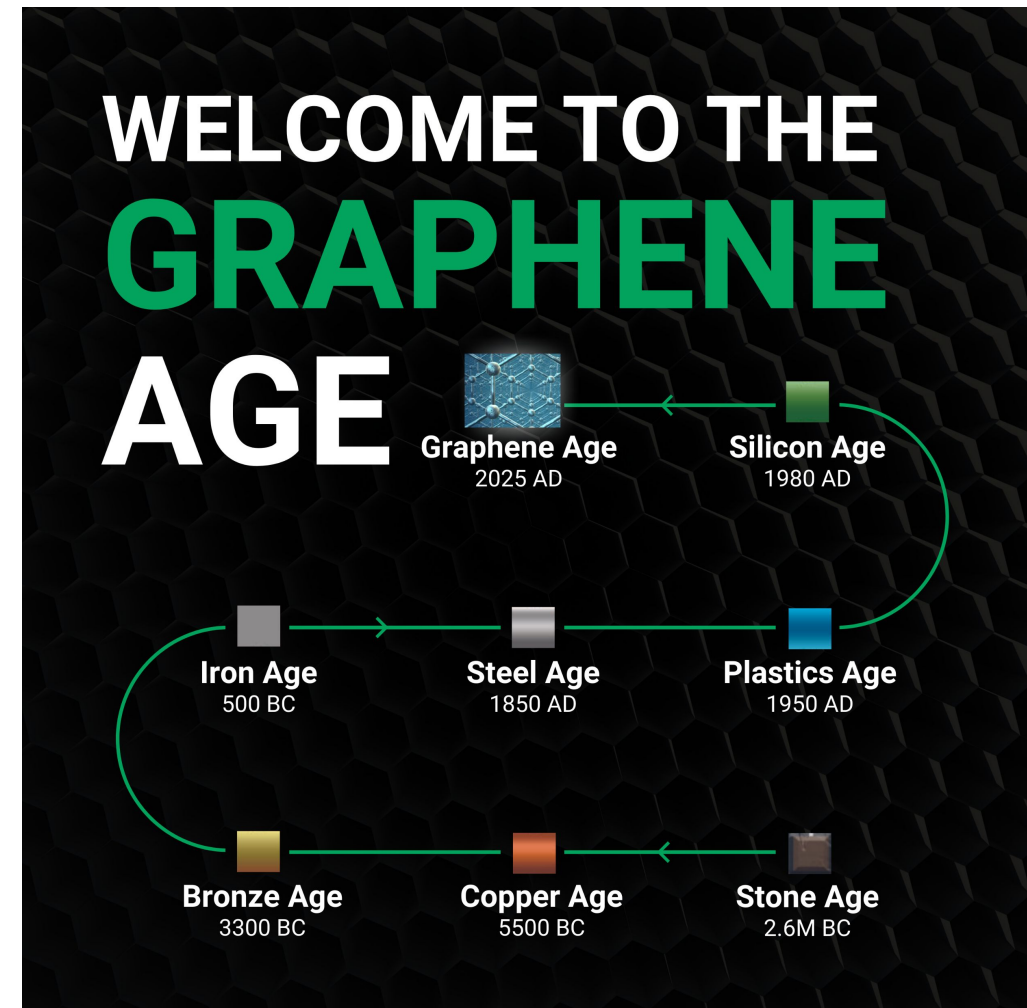
AVADAIN

THE GRAPHENE REVOLUTION HAS ARRIVED

March 2021

The \$11 trillion wonder material not many people have heard of...yet

- Graphene is hexagonal carbon which, at a few atoms thick, possesses truly fantastic properties
- Graphene is an additive material. A tiny amount confers strength, durability, flexibility and/or conductivity to thousands of products
- Only large, thin & nearly defect free (LTDF) graphene can impart the superlative combination of properties:
 - 200x stronger than steel
 - 1 gram can cover a soccer field
 - 1,000,000x the current density of copper & 100x the electron mobility of silicon



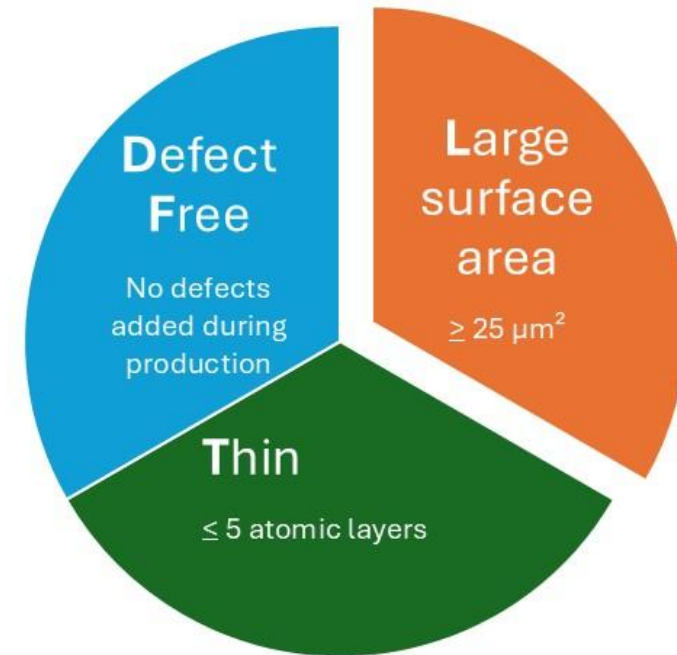
Tech futurist George Gilder predicts that graphene can have an \$11 trillion impact



Problem – No Source for LTDF Graphene

- Tens of billions of dollars of high value products can be enhanced with graphene but are sidelined because there is no source of LTDF graphene flakes
- Today, companies are forced to work with suboptimal quality materials called “graphene” but are really graphene oxide, reduced graphene oxide, platelets, particles/powders & graphitic material. These materials are small/tiny, too thick or laden with defects

3 Properties Differentiate LTDF Graphene



Only LTDF graphene can confer the full range of graphene's remarkable properties as an additive material

Solution

- Avadain has a globally patented & **highly differentiated platform technology** to reliably manufacture LTDF graphene flakes
- Avadain's superior quality flakes should meet the need of >80% of a tens of billions of dollars market
- Significant pent-up demand from many deep tech, industrial & defense companies

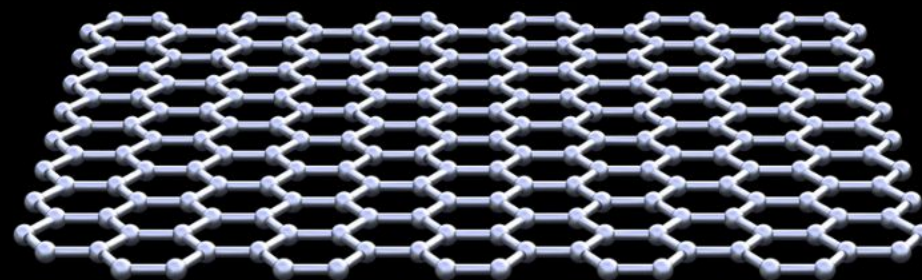
Graphene will impact more than 45 industry sectors and applications:

- | | | |
|------------------------|-------------------------|--------------------------|
| • Additive Manufacture | • Lubricants | • Synthetics |
| • Aerospace | • Magnets | • Semiconductors |
| • Automotive | • Medical Applications | • Sensors |
| • Barrier Properties | • NEMS | • Sound Transducers |
| • Coatings | • Optical Modulators | • Spintronics |
| • Composites | • Optoelectronics | • Structural Materials |
| • Concrete & Cement | • Photodetectors | • Thermal Management |
| • Conductive Ink | • Piezoelectric Devices | • Touch Screens |
| • Corrosion | • Plasmonics | • Transistors |
| • Electrochemical | • Plastics | • Transparent Electrodes |
| • Electronics | • Polymers | • Water Filtration |
| • Energy Generation | • Pressure Sensors | • Waterproof Coatings |
| • Energy Storage | • Quantum Dots | |
| • Hall Effect Sensors | • Rubber | |

Source: The Graphene Council

Avadain's LTDF Graphene Versus Others

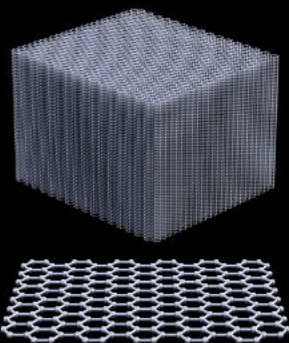
AVADAIN LTDF FLAKES



25 μm^2 | 1-5 Layers

Large, thin & defect-free

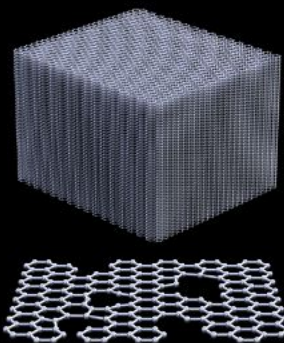
GRAPHITE



100- ∞ Layers

Properties far different than graphene

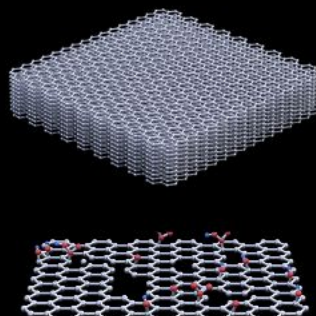
NANOPLATELETS



0.5 μm^2 | 11-100 Layers

More defects & smaller flakes

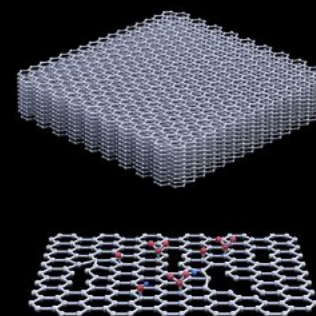
GRAPHENE OXIDE (GO)



3.5 μm^2 | 1-10 Layers

Impure, non-conductive, defective

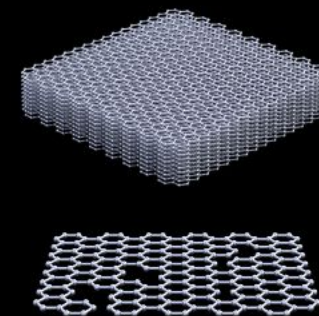
REDUCED GRAPHENE OXIDE (rGO)



2.5 μm^2 | 1-10 Layers

Some impurities, very defective

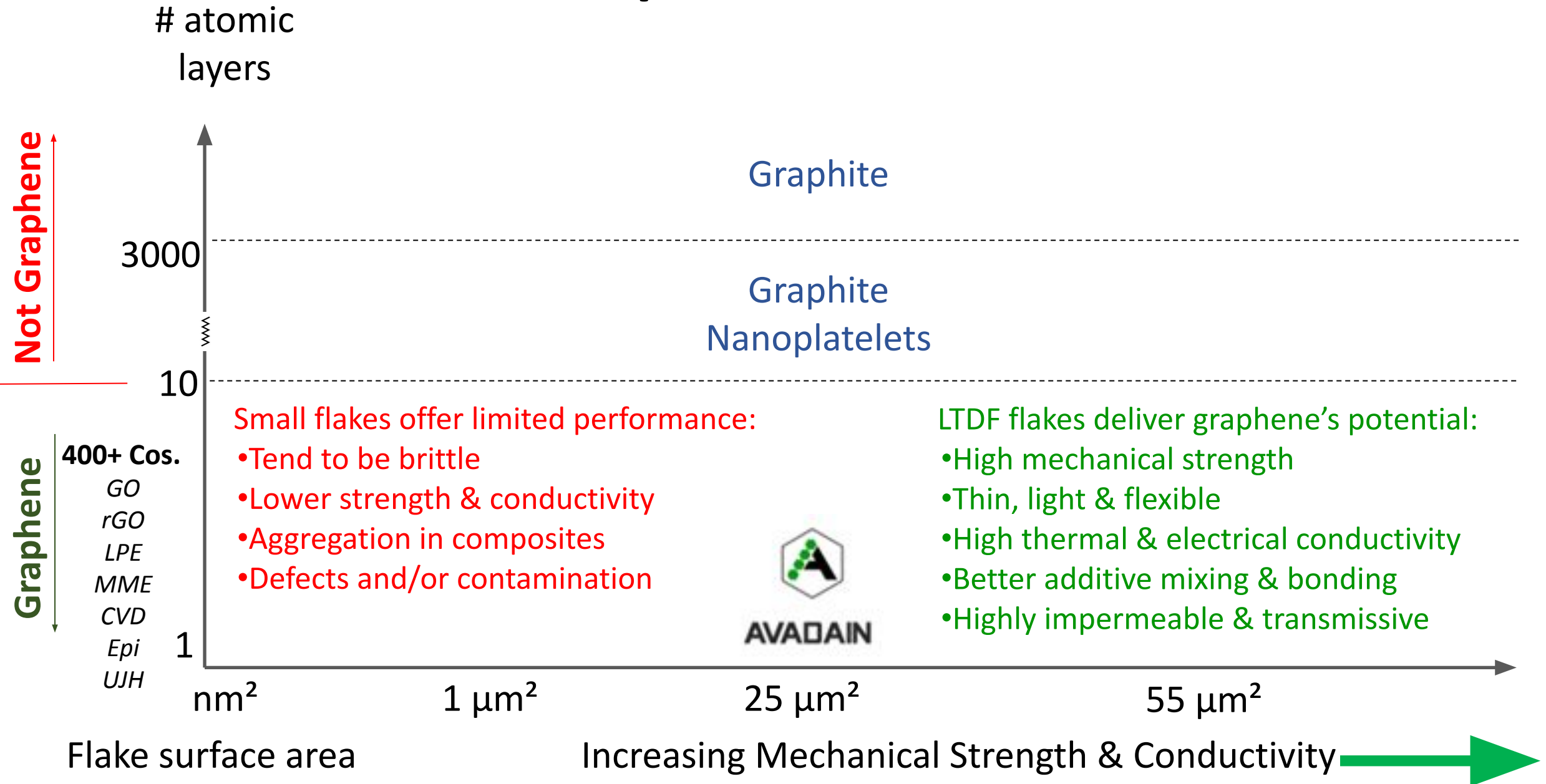
NANOPARTICLES/POWDERS



0.05 μm^2 | 1-10 Layers

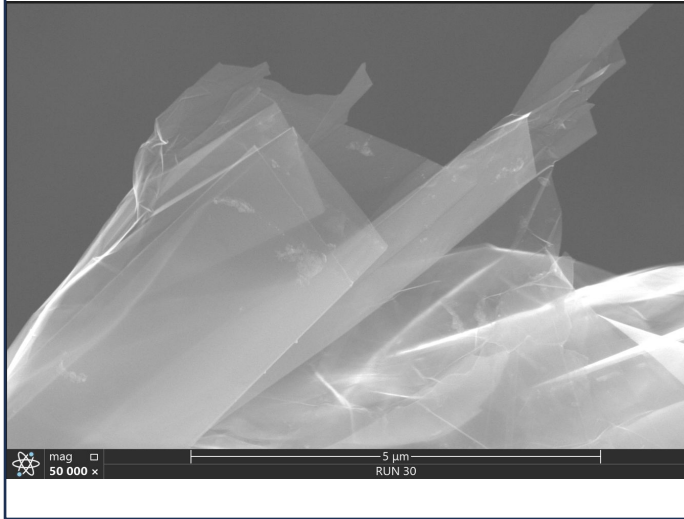
Smallest size, some defects

LTDF Graphene Flake Differentiation



Adding 0.1% - 0.5% Can Transform Thousands Of Products

Avadain's LTDF Graphene



- Composites
- Films
- Membranes
- Fibers
- Conductive Inks
- Paints & Coatings
- Pastes & Slurries
- Polymers
- Substrates
- Metal Alloys



Electric Vehicles

- Lightweighted composite parts
- Faster charging batteries
- Lighter, more efficient motor coils



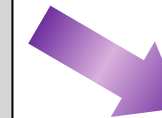
Renewable Energy

- Stronger, lighter wind turbine blades
- High efficiency solar cells
- Efficient energy storage & transmission



Air & Space Defense

- Lightweighted composites parts
- Adv. materials for hypersonics & space
- Better ballistic & stealth protection



Supercapacitors

- Better charge/discharge & cycle life
- More efficient public transportation
- Smaller, safer consumer electronics



Filtration

Medical

Energy Storage

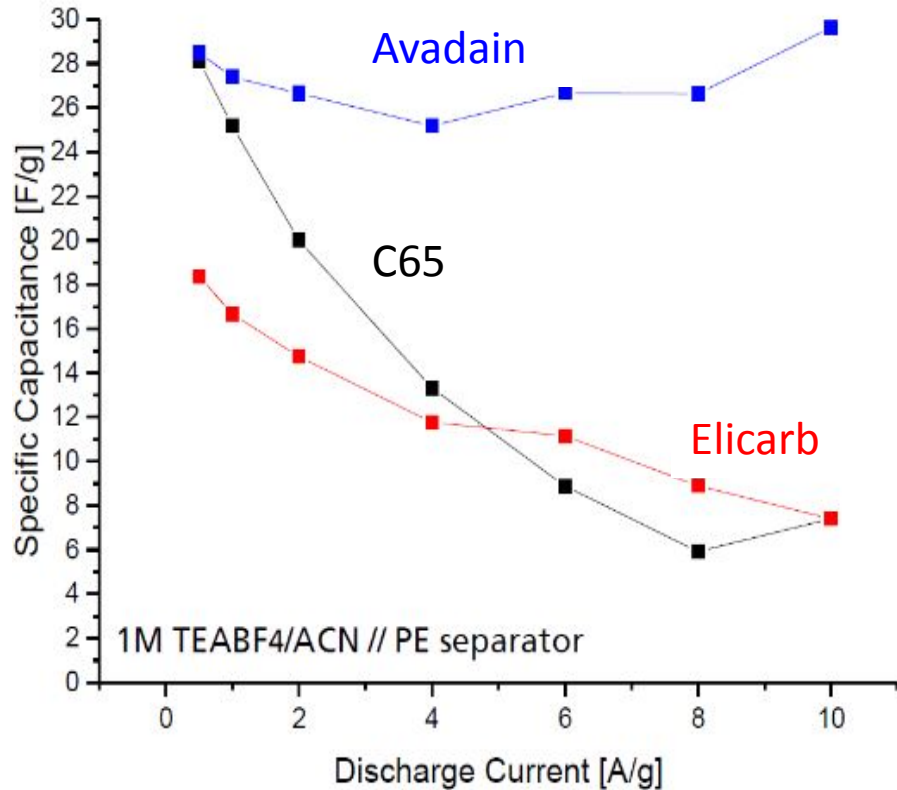
Electronics

Infrastructure

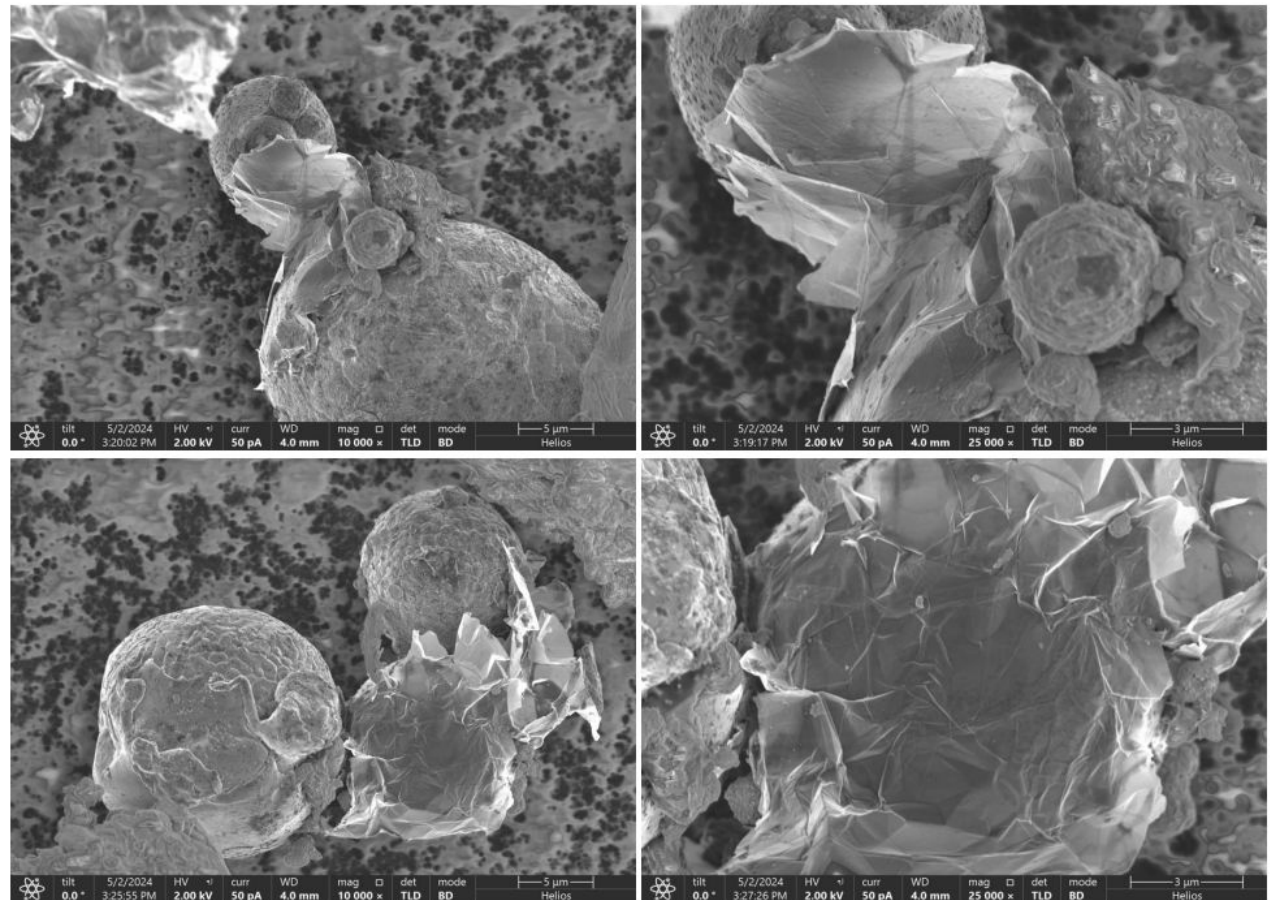
Aviation

Avadain's Performance Improvement Examples

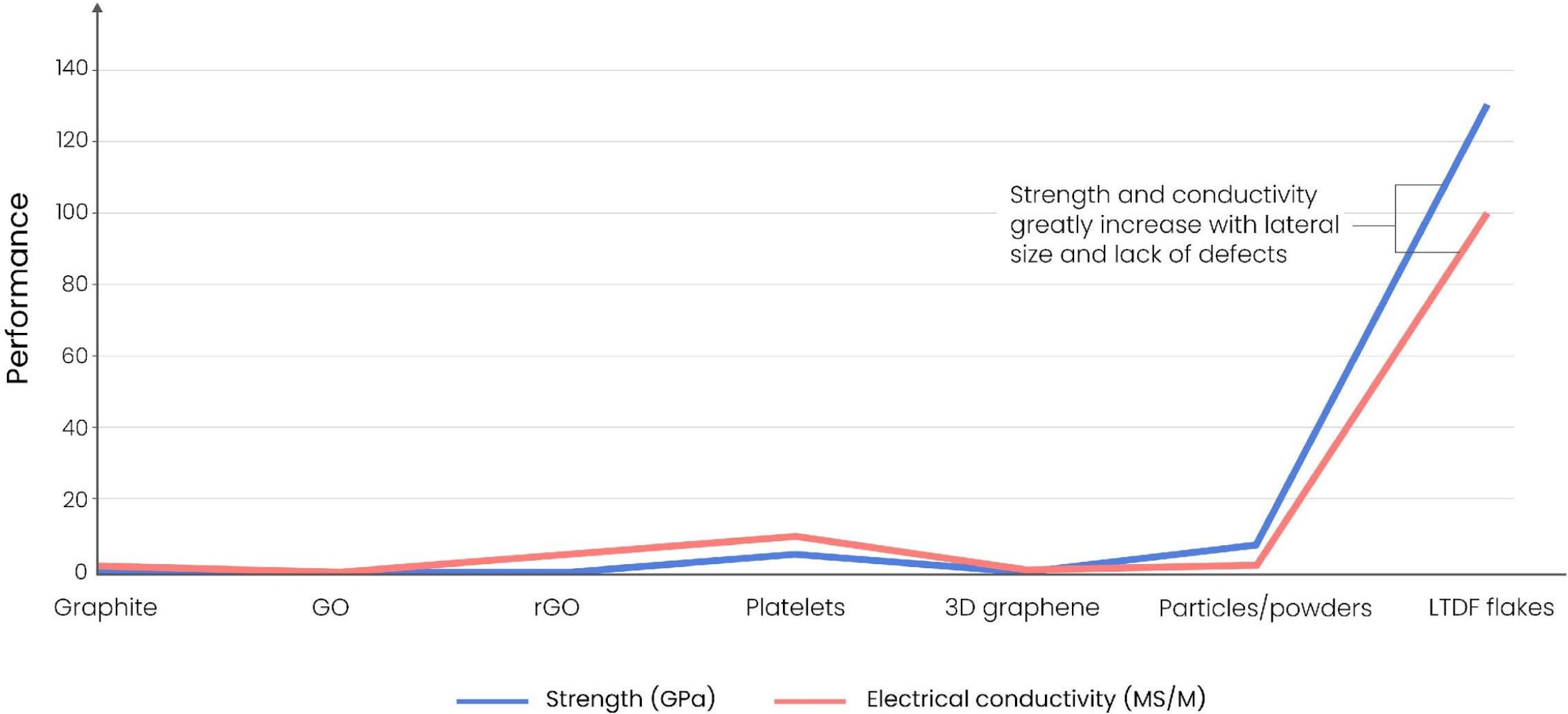
Supercapacitor electrodes - constant specific capacitance as the discharge current increases



Avadain LTDF graphene bonding with AA7075 powders



Graphene Performance Comparison As An Additive Material



Avadain's Partners

- Our technology was invented in 2016 by the Fraunhofer Institute for Applied Solid State Physics
- Panasonic & Bastille funded Fraunhofer's R&D (2016-2020)
- NIST awarded a non-dilutive grant of \$3.77 M (March 2022) to upscale our technology to mass production & test in two high profile applications. The RAPID Manufacturing Institute, a part of the Manufacturing USA network, was our project manager
- Southwest Research Institute (SwRI) scaled our technology to mass production in a modular reactor & is now engineering our first pilot plant. SwRI is one of the USA's leading applied R&D institutes
- Harcros Chemicals is our first manufacturing licensee. Harcros sees our LTDF graphene as a tremendous first mover market leadership opportunity & have been working with us on pilot plant design & dispersion chemistry



Strong Intellectual Property Strategy

- The US' #1 IP law firm, Fish & Richardson, filed our patents
- Avadain now has 58 issued patents across 40 countries and counting
- We plan to file additional patents to continue to build a moat around our disruptive technology
- Avadain owns all patents & applications
 - We have 100% ownership of any IP developed by SwRI & RAPID



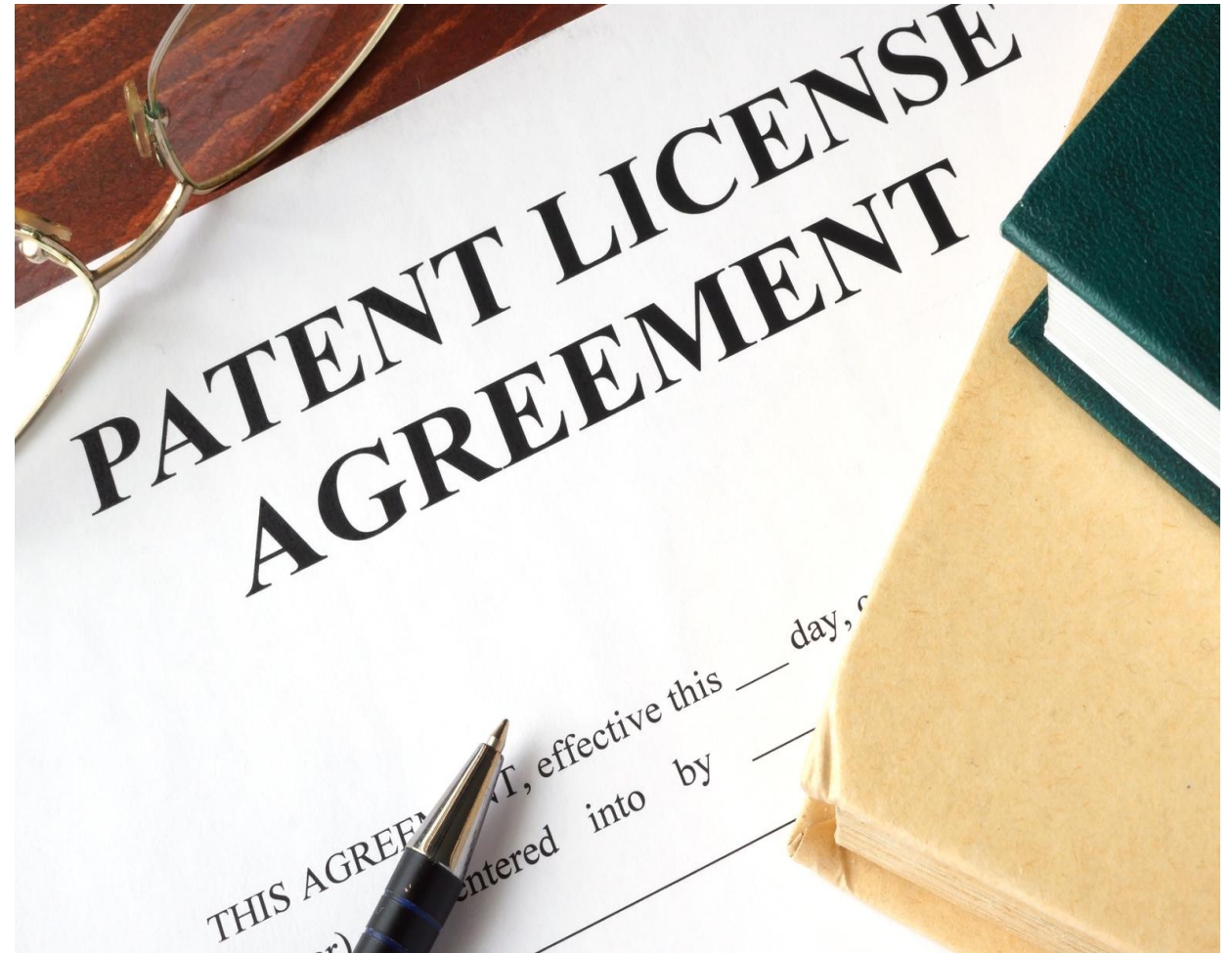
No known competitors capable of producing industrial volumes of large, thin & nearly defect free graphene flakes

Licensing Model

Target licensees:

- Advanced materials manufacturers
- Chemical companies
- End users with mission-critical need

Avadain's first manufacturing licensee is advanced materials company Harcros Chemicals, Inc.



Capital Light Licensing Strategy Enables Rapid Scaling

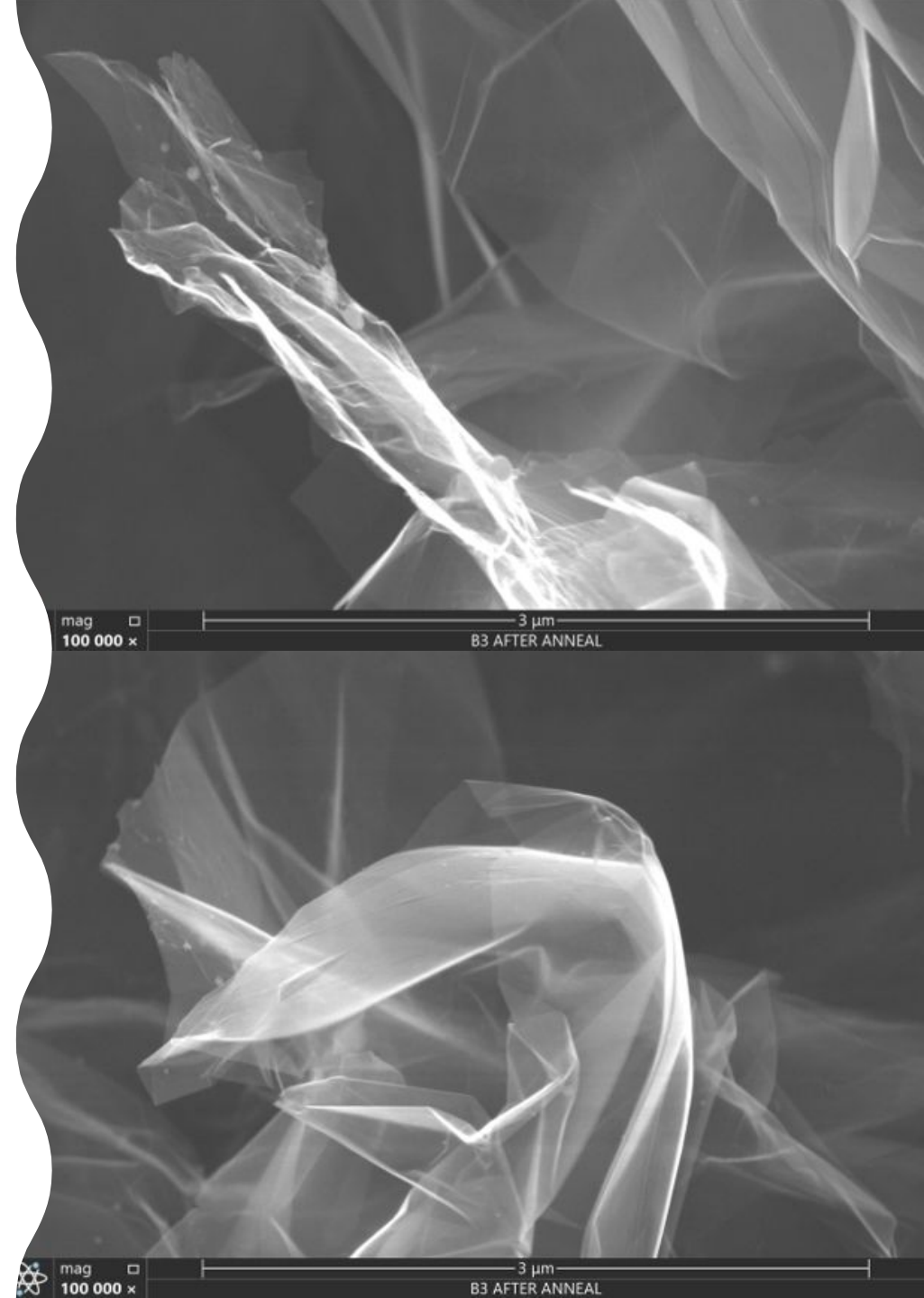
- De-risks Avadain
- Facilitates modular & widely distributed production
- Allows Avadain to rapidly & flexibly scale
- Enables meeting the significant pent-up & rapidly growing demand

Democratizing Graphene

The forecasted demand for LTDF graphene is projected to exceed supply for the foreseeable future. Avadain is democratizing graphene by making the material and its applications more accessible & widely available through licensing, benefiting a broader range of industries & product applications

Technology Status

- Avadain's platform technology was proven in a batch process to reliably & consistently produce LTDF flakes with a >70% yield
- Our technology was [published](#) in a respected peer reviewed journal in 2019
- SwRI began upscaling the reactor in May 2022 & successfully increased capacity 2000x
- SwRI is building a modular pilot plant for our first manufacturing licensee, Harcros Chemicals, to manufacture large sample volumes
- Harcros pilot plant design will be expanded to a 2 mt capacity & we plan to license three additional manufacturers in 2025



Avadain Board



Henry Ford III,
Chairman of the Board

Mr. Ford advises early-stage companies and serves on several boards of directors, including Ford Motor Company, where he sits on the finance committee and the sustainability, innovation, and policy committee.



Yuichiro Takayanagi,
Panasonic director

Mr. Takayanagi is past-President of Panasonic Intellectual Property Corp. of America, where he was involved in funding Avadain's technology starting in 2017. Now retired from Panasonic, he is an active Avadain Board member representing Panasonic and advises the company on IP issues.



Bradley Larschan, CEO

Mr. Larschan is an accomplished entrepreneur who specializes in creating value around intellectual property. An international lawyer by training, he has 35 years experience leading start-up companies, including 15+ years experience leading two successful technology licensing companies.



Ericka Wojack, CFO

Ms. Wojack has spent her career in finance, technology valuation and licensing. She has held CFO roles for the past 27 years in start up and early-stage companies, as well as a senior advisor in a consulting role.

Our Team



Brad Larschan
CEO

Serial entrepreneur with 35 years experience leading start-up companies. 15+ years experience leading two successful technology licensing companies.



Dr. Kevin Wyss
Graphene Chemical
Process Engineering

Dr. Wyss did his PhD in graphene synthesis from waste materials using the Flash Joule method under Prof. James Tour. He has experience in production and characterization of graphene and its use as an additive in composites, electrocatalysis, energy storage, and other sustainable applications



Ericka Wojack
CFO

27 years experience as COO/CFO of start-up companies, 15 of which were with IP licensing.

Dr. Sarah Roscher
Graphene
Electrochemist



Sarah was the key team member who developed our graphene flake manufacturing technology at Fraunhofer's Institute for Applied Solid State Physics. She did her PhD thesis on electrochemical exfoliation of graphene.

Phil Van Wormer
CCO



40 years experience as executive at Fortune 100 companies including DuPont and GE as well as CEO and CCO of multiple technology start-ups. During his 17 years at DuPont, Phil was actively involved in commercializing disruptive advanced materials.

Melissa Beall
Shareholder
Engagement
Manager



20 years executive assistant experience with C-suite executives and communications liaison for top investors.



Funding History

Avadain has benefited from \$14.2 million in funding (\$3.87 million non-dilutive)

- Avadain has no debt
- No preferred stock issued
- No convertible notes or SAFEs
- Clean cap table

20+ months’ runway

Series A: \$6.6 M

<u>Pre-incorporation</u>	<u>Seed</u>	<u>Federal Grant</u>	<u>2022 Reg CF</u>	<u>TN Grant</u>	<u>Angels</u>	<u>2023 Reg CF</u>	<u>Reg D</u>
\$1.6 M Panasonic & Bastille	\$190 K	\$3.77 M to upscale technology & demonstrate	\$1.36 M	\$100 K	\$605 K	\$4.5 M	\$2.1 M



Ask

- \$2.5 million
- \$52 million pre-money valuation

Proceeds

If the offering's maximum amount of \$2.5 million is raised:

Use	Value	% of Proceeds
Samples & Testing	\$1,525,000	33.9%
Licensing Activities	\$865,000	19.2%
Intellectual Property	\$480,000	10.7%
Operations and Payroll	\$1,404,745	31.3%
Intermediary Fees	\$220,255	4.9%

Exit Strategy

- In 2028-29, we plan to have 10+ licensed production lines, generating ~\$200 million in royalty revenue for Avadain, growing on a steep curve
- Potential acquirers include:
 - Global fossil fuel companies (*e.g.*, Exxon-Mobil, SABIC, Shell, BP)
 - Global chemical companies (*e.g.*, BASF, Celanese, DOW, DuPont, Huntsman, LG Chem, Mitsubishi, Sumitomo, Solvay)
 - Tech companies which see the vision & want to lead the graphene revolution (*e.g.*, Apple, SpaceX, Tesla)



Summary

- ✓ Disruptive platform technology
- ✓ Patented globally
- ✓ Pent-up demand, huge global market
- ✓ No known competitors
- ✓ Panasonic backed
- ✓ Federal grant
- ✓ Top tier angel investors
- ✓ Capital-light licensing model
- ✓ Great team/complementary skills

Just as plastics were *the* material of the 20th Century, graphene is on its way to becoming *the* material of our Century

Avadain has a globally patented, disruptive platform technology to manufacture LTDF graphene meeting the needs of the composites, advanced materials & other industries

Our experienced, highly qualified leadership team is driven to achieve substantial recurring licensing revenue & achieve a successful exit



AVADAIN

THE GRAPHENE REVOLUTION HAS ARRIVED