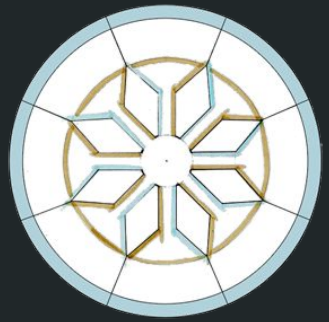
Instaclave Technologies

Revolutionizing the advanced materials industry



“How will we build large structures in space?”

- **Question** **“How will we build large structures in space?”**
- **Answer**: A **carbon fiber** type structure would be the only material capable of the demands of space and light enough to get into orbit economically.
- **Problem**: Existing materials, solutions and processes **would not work** in the extreme conditions of space.
- **Solution**: **Remake composite materials technologies** to realize the vision
- Drawing on design experience across diverse disciplines, John Calder has just that, developing the **Differential Pressure Assisted Resin Transfer (DPART**) process and its support technology, the **Caldera Lamination System (CLS)**

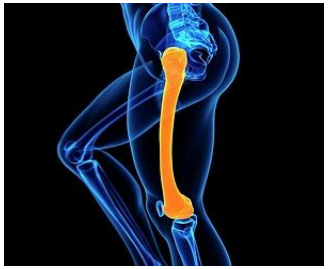
Differential Pressure Assisted Resin Transfer (DPART) & The Caldera Lamination System (CLS)

- ***New Chemistry*** - The *Caldera Lamination System* composition creates new chemical resins that modify viscosity and temperature ranges.
- ***New Fabrication Process*** - Complex structures can be created with minimal intervention by controlling the pressure between composite structures in multiple stages, yielding stronger results.
- ***Simplicity*** - The component part is *both* the tooling and the mold.
- ***New Material*** - The *Caldera Lamination System* is a new material, a new tool for designers. If you can visualize a project, this technology will allow you to build it.
- ***New Technology*** - *On-Site Self-Assembly & Manufacturing*. By sequencing the *Caldera Lamination System* parts, very massive, very intricate, extremely complex structures can self-form and self-erect. Simple to complex machines can also be created.

Market Opportunities

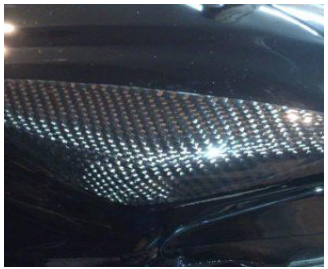
Aerospace

Build extremely large structures in space, that can support an atmosphere. Create mechanical structures and expansions on-site.



Medical

Build custom medical implants with less invasive surgeries, greater accuracy and faster healing time.



Automotive

Create automotive frames & chassis, within the cycle time of an assembly line.

Energy

Create stable piping systems at the same time of drilling, increasing safety.

Construction

Fabricate structural building components on site. I-beams and A-frames in a box.

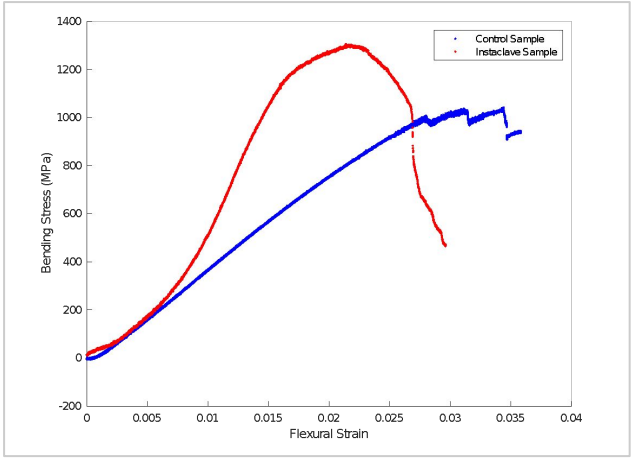
Commercial

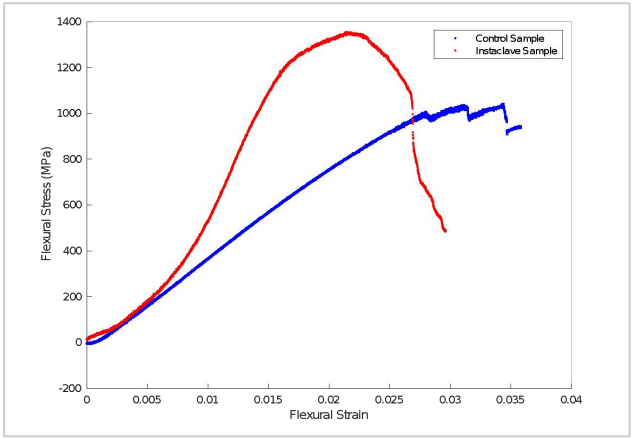
Create hardened emergency shelters with solar and communications panels.

Where We're At - *Research & Development*

What started as a theory has been proved out

- To disrupt the existing carbon fiber marketplace, we identified 5 variables to modify and experiment with: **G**eometry, **P**rocess, **A**tmosphere, **C**hemistry, **E**nergy (**GPACE**)
- A Proof of Concept sample using CLS was created by changing 2 variables: **G**eometry & **P**rocess
- Proof of concept & a control sample strength tested and analyzed by materials science PhD candidate at Stanford University in a certified testing laboratory.
- **Results**: **Differential Pressure Assisted Resin Transfer (DPART)** produces a **30% stronger** part!





Testimonials

The application of the Caldera Lamination System to composite structures creates a new construction material that is “**as important and potentially disruptive as the invention of Aluminum.**”

Ravi Prather
Division Director
Lawrence Berkeley National Lab

(I’m) convinced that the Differential Pressure Assisted Resin Transfer (DPART) process is **a transformative approach** to fabricate fiber-reinforced composites that can **be used for many advanced applications**.

Anonymous Panel Reviewer
National Science Foundation

This project is very promising: a faster FRP composites processing method using green energy source such as steam. The **proposed activities will advance scientific understanding** of additive manufacturing methodology of thermoset polymer.

Anonymous Panel Reviewer
National Science Foundation

What We're Offering

Offerings

Process License

Proprietary
Tooling & Materials

Engineering
& Design Services

Today

- Engage with existing business partners to use **DPART** & **CLS** in the manufacture of carbon fiber/ composite materials projects, using commercially available materials
- Focus on aerospace industry and leverage existing network

Future

- As we continue to innovate, creating proprietary materials, chemistries and processes, we will expand our offerings into new markets, becoming the ubiquitous process across multiple industries

Where We're At- *Setting the Business Foundation*

Partnership

PACIFIC AEROSPACE CORP

AS9100D aerospace manufacturer

25,000 square feet of facilities

Advanced composite manufacturing capabilities

Credentials & Registrations

Service Disabled Veteran Owned Small Business
SDVOSB
cVE

SAM.GOV®

Approved US Government Vendor

Service Disabled Veteran Owned → 20% advantage

Where We're Going *The next 3 years*

***Land and Expand* in Aerospace**

- Win contracts in aerospace and expand awareness of DPART/CLS/Instaclave

Accelerate and Expand Research & Development

- Materials, Chemistries, Process, Tooling

Gain Traction in New Markets

- Automotive
- Architecture/Construction
- Energy
- Medical

Expand Licensing Program as IP developed

Raising $20m Seed Round to activate the business and accelerate research & development

- Operational runway 18-36 months
- Technical, Sales, Marketing, and Operations Resources
- Secure IP with Trademark and Patent Filings

Instaclave *Key Team*

John Steven Calder

Founder & CEO

Philip DePond

Consulting Head of R&D

U.S. AIR FORCE

BELL

Advanced Technology Group

Walmart

Lawrence Livermore National Laboratory

CORNELL UNIVERSITY FOUNDED A.D. 1865

UCLA

Instaclave *Advisory Board*

Rick Maxwell

Aerospace Systems Engineer
Lockheed Martin

Mark Ferrera

Founder & CEO
Pacific Aerospace Corp

Mark Calder

MRB Engineer
Archer Aviation

Instaclave Technologies is all about **innovation.**

Our **goal is to disrupt** the existing market,
tear everything apart, break it all down to it basics,
and **put it all back together** in the most effective way possible.

We'll create more markets for the new products and
reduce the cost of the existing supply chain **by 90 %**.

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