NAWA AMERICA: THE NEW GLOBAL LEADER IN MULTIFUNCTIONAL, ULTRA-STRONG COMPOSITES FROM NAWA TECHNOLOGIES

- NAWA Technologies, pioneer of energy storage systems based on vertically aligned carbon nanotubes (VACNT), announces the establishment of NAWA America
- New company created by the acquisition of the US leader in VACNT, N12 Technologies
- NAWA America will focus on the industrialization of NAWAStitch, which makes composites ultra-strong and brings other game-changing characteristics: 'structural' energy storage
- NAWAStitch-reinforced carbon fiber composites have shear strength increased by a factor of 100 and shock resistance by a factor of 10
- Huge potential across automotive, aerospace, space and defense as well as sporting equipment, consumer products and luxury goods
- Prototype production begins now; volume manufacturing from 2021
- Established collaboration with University of Dayton Research Institute (UDRI)
- Technology licensing agreement with Massachusetts Institute of Technology (MIT)
- Film: https://bit.ly/NAWAStitch
- Hi-res images: http://bit.ly/NAWA_America

Aix-en-Provence, 19th November 2020: NAWA Technologies, a pioneer of next-generation energy storage systems, today further cements its position as one of the world's leading technology innovators, with the announcement of NAWA America – a new US-based company focused on industrializing advanced composite materials.

Based in Dayton, Ohio, NAWA America will bring multifunctional ultra-strong composites to market; game-changing materials based on unique, proprietary technology, aimed at sectors including automotive, aerospace, renewable energy, space, defense, sporting equipment and consumer & luxury goods.

NAWA America has been created by the acquisition of the assets of the US leader in VACNT for composite applications, N12 Technologies. N12 began developing its own two-step patented VACNT growth process in 2014 and became experts in VACNT-enhanced composite materials. Over a similar period, NAWA Technologies has developed its own single-step VACNT growth process, applying the unique properties of VACNT to its high power and high energy ultracapacitors, but also recently as one of the fastest electrodes for lithium batteries and hybrid systems, as debuted by its NAWA Racer.

NAWA America's objective will be to significantly widen the range of applications of multifunctional composites, engineering truly next-gen materials and substantially scaling manufacture. Its immediate focus will be on a bringing a new materials concept, NAWAStitch, to mass market. Comprising a thin film containing trillions of VACNT arranged perpendicular to the carbon fiber layers, NAWAStitch acts as 'nano-velcro', reinforcing the weakest part of a composite: the interface between the layers. Eliminating the probability that a crack will occur in the interface, the concept also greatly improves strike damage resistance.

Carbon fiber composites with NAWAStitch have their shear strength increased by a factor of 100 and shock resistance by a factor of 10.

What's more, a high-speed impact results in 50 percent less interior damage versus a

conventional carbon composite. Together, this makes NAWAStitch the optimum way to reinforce the mechanical properties of carbon fiber composites.

As well as continuing all of N12 Technologies' activities in this field, with existing and new customers, NAWA America has also established a research collaboration and license agreement with the University of Dayton Research Institute (UDRI), through the Multifunctional Structures and Materials Group of Dr. Paul Kladitis – ranked number one in the U.S. in materials research. It has also signed a field exclusive license agreement with the Massachusetts Institute of Technology (MIT), through Prof Brian Wardle's (NECSTLAB) research group, well known in the fields of composites and nanotubes.

Synergies already exist with NAWA Technologies. At its HQ in France, it has independently created a multifunctional composite materials concept: NAWAShell. NAWAShell is an integrated structural hybrid battery, incorporating VACNT to give two complimentary characteristics: enhanced mechanical strength and electrical energy storage within the composite structure's core. Potential use cases include a solar roof panel in a car that could generate energy stored within the roof, and provide a circular green solution, with almost no additional mass to the vehicle structure.

In future, NAWA Technologies sees enormous potential in combining NAWAStitch and NAWAShell to create ultra-strong, multifunctional lightweight materials that can also store energy, whether in a vehicle, airplane, building or mobile device.

Pascal Boulanger, Founder of NAWA Technologies, Chairman of the Board and CTO said: *"The creation of NAWA America is a very exciting and natural strategic step. We have been aware of N12 Technologies' exceptional work for many years; I am delighted the opportunity has arisen to acquire its activities, develop the technology further and bring it within our portfolio.*

"This move further cements NAWA Technologies as THE leading specialist in VACNT – and the largest manufacturer of continuous industrial scaled VACNT. Not only do we possess the rights and know-how for the two most efficient and complementary patented VACNT growth processes, strong academic support from both sides of the Atlantic, but also the expertise to bring two major applications of VACNT to a global market: ultra-strong composites and energy storage.

"We expect both sectors to grow exponentially over the coming decade. Innovations such as these will have a significant impact on the global search for a fully sustainable world – and also align with NAWA Technologies' ethos to provide clean, sustainable energy solutions."

Ulrik Grape, CEO of NAWA Technologies said: *"This is a major milestone for NAWA Technologies. The creation of NAWA America means NAWA Technologies now covers virtually 100 percent of worldwide VACNT uses, a global addressable market currently worth $140 billion, expected to grow to $250 billion in 2025*, across energy storage and composites. The objective for NAWA America is simple: combine the expertise that exists within the Dayton operation with that of NAWA Technologies, harnessing the huge potential of our relationships and agreements with the University of Dayton Research Institute (UDRI) and Massachusetts Institute of Technology (MIT), in addition to our relationship already existing with CEA.*

"This will allow us to finalize development of NAWAStitch and ramp-up to volume production in 2021. In the short term, our first markets will be sporting equipment, consumer products and luxury goods, while our longer-term focus is automotive and aerospace. Combined with our home facility

in France, NAWA Technologies will offer a wider portfolio of solutions to our customers, combining lighter, stronger and smarter composites and energy storage."

ENDS

***Source:** For batteries: Avicenne: the rechargeable Battery Market and Main trends – 2019
For composites: JEC Observer "Overview of the global composites market, 2019-2024

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Assets:
NAWA America media image bank: http://bit.ly/NAWA_America
NAWAStitch film: https://bit.ly/NAWAStitch

About NAWA Technologies
Based in Aix-en-Provence, France, NAWA Technologies is a world-leader in energy storage. Its Ultra-Fast Carbon Batteries are the next generation of the ultracapacitor, featuring VACNT – the fastest electrodes in the world. Combined with a unique coating they can offer up to five times more energy than existing ultracapacitors and ten times more power, depending on application. Setting new standards for charging speed, frequency and environmental friendliness, the Ultra-Fast Carbon Battery bridges the gap between ultracapacitors and traditional li-ion batteries. Capable of being charged and discharged within seconds over a million cycles without any loss in performance, the batteries are also have exceptional second life usage, because they are based on carbon – a naturally-occurring, accessible and abundant material. NAWA Technologies' new Ultra-Fast Carbon Batteries have multiple uses, from the power tool and manufacturing sectors, to automotive and commercial vehicle markets, within the IoT and sensor sectors as well as playing a key role in managing energy flow in a smart grid, to aerospace and even space.

About UDRI
UDRI already operates as an industrial acceleration platform to help companies ramp up their technology in fields such as aerospace, space and defense. Working with UDRI, NAWA America will continue the development of applications in composites and also address multifunctional applications combining both composites and energy storage.
UDRI researchers have performed cutting edge R&D in nano-enhanced composites for 20 years, remaining a leader in developing and applying the latest innovations, exemplified by the partnership with NAWA Technologies where UDRI's 1.5-meter wide VACNT reactor is being leveraged for industrial NAWAStitch production. Additionally, UDRI is partnering with NAWA Technologies to help expand the commercial application of VACNT related technologies, and multifunctional structures that result in power and weight savings.