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Ilika Introduces Tiny Solid-State Batteries

Ilika has launched a new line of mm-scale solid-state batteries designed for use in medical implants. The Southampton, England-based company said its Stereax M50 batteries take solid-state batteries to a new level of miniaturization, with form factor choice that may enable medtech innovations that have previously been limited by the available battery technology.

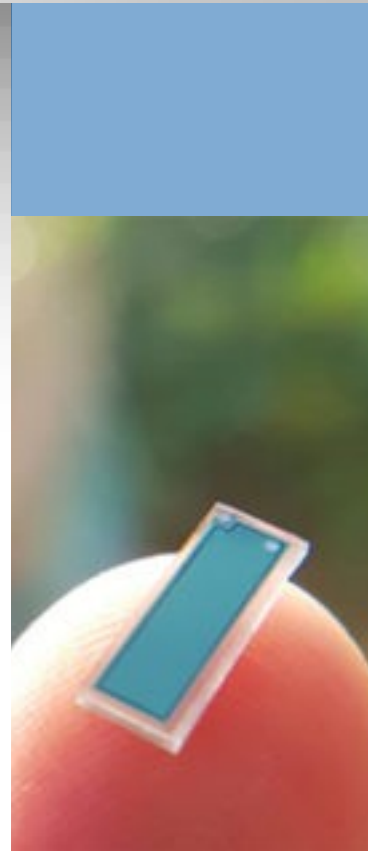
The medtech space is one of the most challenging environments for battery technologies. Batteries need to be small enough to be unobtrusive, enabling implantable devices to be charged in a way that does not restrict a patient. The batteries need to have as long a life-span as possible, avoiding the risks of repeated surgical intervention. They also need to be biocompatible so that they do not pose a risk of leakage.

Compared with standard lithium-ion batteries, Stereax M50 solid-state batteries have longer life spans of up to 10 years (up to 5x longer) and lower leakage currents (10x smaller), making them suitable for low-power wireless charging, according to Ilika. They can also be integrated with other electronic components enabling the end medical device to be kept as small as possible. Stereax M50 batteries yield 50% extra energy density compared to other commercially available solid-state batteries, the company said.

Ilika said it can customize Stereax M50 batteries' shapes and sizes for applications that require injection into the bloodstream, monitoring heart rhythm or attachment onto the peripheral nervous system for neurostimulation. The batteries enable self-sustaining power sources that do not need to be changed regularly or use inconvenient cabling, the company added.

"The implantable medical device industry has a growing need for miniaturized, long-life power sources to enable wireless data transfer from increasingly sophisticated devices that are improving patients' lives" said Endotronix chief technology officer Mike Nagy in a statement from Ilika.

"The Stereax product family continues to grow, addressing a wide range of end applications. Medical applications are some of the most demanding environments for battery technology," added Ilika CEO Graeme Purdy. "The Stereax M50 is a smaller, safer and longer-lasting battery, opening up the opportunities of life-enhancing medical devices." *Source: Medical Design & Outsourcing, Nancy Crotti*



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Full-Scale Lilium eVTOL Demonstrator Enters Flight Test

As the number of would-be electric vertical-takeoff-and-landing (eVTOL) concepts continue to proliferate, Germany-based Lilium has stepped ahead of the wave by starting test flights of a full-scale, five-seat production-weight prototype.

Designed to fly at up to 300 kph (165 kt.) for 300 km (186 mi.), at higher speed and range than most of the other urban air mobility (UAM) eVTOLs in development, the Lilium Jet is positioning its offering for intercity and urban missions. To achieve this performance, the battery-powered vehicle incorporates an unusual combination of canards and a fixed wing with arrays of electric ducted fans.

- *Five-seat eVTOL incorporates 36 electric ducted fans*
- *Lilium Jet aims for up to 1-hr. flights on one charge*
- *Vehicle has 300-kph Max. speed and 300-km range*



Unveiling new details about the Lilium Jet shortly before the May 4 first flight of the full-scale vehicle, company CEO and co-founder Daniel Wiegand says others “like Bell and Uber are talking about urban mobility with local flights in a metropolitan area with flights of maybe up to 50 km.” He notes, “What we have in mind is something with a bigger range and an ability to service two markets—the metropolitan area and an intercity market.”

The chief innovation on the vehicle is an integrated propulsion and lift system, which comprises 36 electrically driven ducted fans mounted on 12 tilting flaps. Three are clustered per flap for a total of 12 fans on the trailing edges of the canard and 24 on the wing. The flaps tilt down for vertical lift and aft to provide thrust in forward flight, enabling the vehicle to rely on the lift generated by the fixed wing, thereby using less than 10% of its maximum 2,000 hp during cruise flight.

The company plans to manufacture and operate the Lilium Jet as part of an on-demand air taxi service. “We will operate the vehicle in a transportation service, so our business model is that we are selling mobility, *not* the aircraft,” he emphasizes. The landing pads, nicknamed Lilypads by Lilium staff, will not be provided by the company. “We do not intend to build or run our own infrastructure—we run the service, [this includes] aircraft operations, pilots, and we design the aircraft, run the bookings and so on.”

Lilium is already developing partnerships for the infrastructure. “Our vision is to have a neutral infrastructure standard that allows all kinds of vehicles to land there, but it also means you have a self-growing marketplace where anyone can build an independent landing pad or some gates and coordinate this into our service,” explains Wiegand.

Lilium hopes to certify the aircraft by 2024 and begin commercial services in various cities around the world by 2025, although trial services will start earlier in several locations. [For the complete story, visit Aviation Week.com](#)

Look for United Performance Metals at These Upcoming Shows



OMTEC is June 11-13 in Chicago, Illinois. Look for UPM in Booth #504. UPM is certified 13485 and supplies materials for medical implants and instrumentation.



The Paris Air Show is June 17-21. Visit UPM is the U.S. Pavilion Hall 3 E150 or the Northern Ireland Hall 2B G172. UPM is certified AS9100D, ISO 9001:2015 with laser processing approvals NADCAP AC7116 and GE S422.

The Moon and Mars: Connecticut Aerospace Companies Prepare for New NASA Missions to Outer Space



NASA and U.S. military and space allies pitched Monday for business from more than 200 representatives of aerospace companies attending a Hartford meeting in search of potential contracts for a sooner-than-expected trip to the Moon. Vice President Mike Pence in March urged a 2024 return to the Moon, 55 years after the historic first landing by Apollo 11 and four years earlier than planned. NASA is now looking to beef up its supply chain of manufacturers in anticipation of the nearly 500,000-mile round trip and construction of a base on the lunar surface in anticipation of a trip to Mars.

The previous 2028 date was going to require “not necessarily all hands-on deck, but a tremendous amount of focus by the supply chain,” Dan Burbank, a former astronaut and senior technical fellow at Collins Aerospace, a unit of United Technologies Corp., said at the International Space Summit. The intent of a return to the moon, this time not only by a man, but also a first-ever trek by a woman, is to “extend human presence there to our nearest solar system neighbor,” he said. “It is absolutely critical for us to be able to learn how to do those things before we send a crew on a three-and-a-half-year journey to Mars,” Burbank said. “If anything, we need an even more, rich supply base.”

To meet the shorter schedule, the supply chain should reach into schools to

find students who will “join us in this great effort,” Burbank said.

NASA has selected 11 companies to conduct studies and produce prototypes of a human lander for its Artemis lunar exploration program to bring humans to the Moon’s south pole by 2024 and establish missions by 2028.

For many Connecticut aviation and aerospace businesses, the shift to space is a logical next step. Propulsion systems, air filtering equipment, avionics and countless other components are already being manufactured by state businesses. Collins Aerospace, for example, is the successor company to UTC Aerospace Systems, which replaced Hamilton Sundstrand, the manufacturer of numerous space travel components, including the space suit used by astronauts to replicate Earth’s environment in the void of outer space.

GKN Aerospace, an Irving, Texas-based company with sites in Cromwell, Manchester, Newington and Wallingford, is a major supplier to another UTC business, jet engine maker Pratt & Whitney, said Jon Sonju, director of government affairs at GKN. “GKN is always looking for a key supply base,” he said. In addition, the gathering, hosted by the U.S. Department of Commerce, presented businesses with opportunities to forge relationships with other firms, Sonju said.

Overseas companies were represented, reflecting the international consortium leading the space initiative. The so-called Five Eyes, an intelligence alliance of Australia, Canada, New Zealand, the United Kingdom and the United States, is working together on space travel and sent representatives to the conference. “People come here from everywhere and understand there’s a place for us to play,” said Vinesh Karan, commercial director at A.W. Bell, a Melbourne, Australia, manufacturer of grinding and other machines.

Marta Mager, minister counselor of the New Zealand Space Agency, said international cooperation is particularly important because space is becoming congested with rising launch competition by governments and businesses and efforts to weaponize space.

U.S. Rep. Joe Courtney, D-2nd, said rising NASA funding has bipartisan backing, beginning with President Barack Obama and continuing in the administration of President Donald Trump. Federal spending is rising, to \$22.3 billion in fiscal year 2020 from \$21.5 billion the previous year and \$20.7 billion in 2018, according to his Washington office.

Areas of cooperation among the five nations could include not just space travel, but also a Space Force that Trump last year called for in a directive to the Pentagon, Courtney said. “There’s so much activity that didn’t exist five or six years ago,” he said. Joint efforts present an opportunity to discuss ways to collaborate and integrate “undertakings that almost defy imaginations,” Courtney said. *Source: Hartford Courant, Stephen Singer, Photo from Patrick Raycraft*

First Driverless Truck Hits the Road in Sweden

An electric truck without a driver is being tested for the first time on Sweden's roads after the vehicle built by Swedish startup Einride got permission from the regulator to mix with other traffic within an industrial area.

While the first ride for the cabless vehicle called "T-pod" on a public road commenced on Wednesday, the permit is valid until December 31, 2020.

The permit applies to a short distance on a public road within an industrial area between a warehouse and a terminal where traffic speeds are typically low, Einride said in a statement.

The truck is supervised remotely by an operator who can take control if necessary, CNN reported.

Equipped with cameras, radars and 3D sensors, which give it 360-degree awareness of its surroundings, the vehicle uses an autonomous driving platform made by NVIDIA and its systems are connected via a 5G network.

Source: *Economic Times*



Surcharge Totals March, 2019 - August 2019

	Mar	Apr	May	June	July	Aug
15-5	0.4865	0.5269	0.5186	0.4846	*	*
15-7	0.7158	0.7894	0.7753	0.7310	*	*
17-4	0.4802	0.5205	0.5124	0.4804	*	*
17-7	0.5701	0.6235	0.6144	0.5658	*	*
201	0.4712	0.5117	0.5053	0.4716	*	*
301 7.0%	0.5643	0.6171	0.6081	0.5606	*	*
302/304/304L	0.6142	0.6721	0.6630	0.6110	*	*
304-8.5%	0.6351	0.6952	0.6859	0.6315	*	*
305	0.7856	0.8607	0.8506	0.7796	*	*
309	0.8146	0.8927	0.8829	0.8125	*	*
310	1.1236	1.2328	1.2214	1.1184	*	*
316/316L	0.8784	0.9686	0.9537	0.8932	*	*
316LS/316LVM	1.1900	1.2600	1.2400	*	*	*
317L	1.0354	1.1440	1.1268	1.0626	*	*
321	0.6475	0.7087	0.6992	0.6423	*	*
347	0.9572	1.0183	1.0089	0.9520	*	*
409/409 Mod	0.2197	0.2379	0.2301	0.2146	*	*
410/410S	0.2263	0.2450	0.2373	0.2218	*	*
430	0.2633	0.2861	0.2787	0.2641	*	*
434	0.3373	0.3696	0.3604	0.3463	*	*
439	0.2713	0.2948	0.2876	0.2732	*	*
440A	0.2633	0.2861	0.2787	0.2641	*	*
2205	0.8331	0.9209	0.9060	0.8699	*	*
263	8.7744	8.1914	6.6255	5.6357	5.1224	5.2572
276	4.9542	4.8268	4.8402	5.3238	5.5766	5.4513
A286	1.2671	1.1942	1.2554	1.4141	1.4935	1.4536
330	1.5083	1.4042	1.5145	1.7351	1.8334	1.7842
400	2.6645	2.5065	2.6933	3.1557	3.3232	3.2392
455	0.6800	0.7000	0.6900	*	*	*
465	0.8300	0.8700	0.8500	*	*	*
600	2.8281	2.6425	2.8836	3.3514	3.5278	3.4326
601	2.5046	2.3368	2.5331	2.9156	3.0716	2.9927
617	6.7235	6.3381	5.5608	5.2837	5.1310	5.1436
625	5.1717	5.0201	5.1199	5.5572	5.7679	5.6646
718	4.9963	4.8583	4.9881	5.3343	5.4896	5.4121
X-750	3.4131	3.2307	3.4651	3.9198	4.0928	4.0001
825	2.1291	2.0167	2.1033	2.3732	2.5047	2.4417
HX	3.2009	3.0669	3.0802	3.4023	3.5678	3.4849
188	8.1300	6.7400	7.2200	*	*	*
CCM	10.0800	7.1700	9.3200	*	*	*
L-605	9.3700	7.5400	8.2100	*	*	*

*Surcharge currently not available