AUGUST 2023

UNITED PERFORMANCE METALS

QUALITY SOLUTIONS. TRUSTED PARTNERS.

AN ONI COMPANY

THE UPM MARKET INFORMER

INSIDE THIS ISSUE

www.upmet.com

Apple and Honor to Use Titanium Metal 3D Printing for Production of Next Gen Devices

Ming Chi-Kuo, an analyst at TF International Securities, recently reported that – according to his latest survey – Apple is actively adopting 3D printing technology. He thus expects that some of the titanium mechanical parts of the 2H23 new Apple Watch Ultra will be made by 3D printing. Although currently the mechanical parts made by 3D printing still have to go through the CNC process for back-end processes, he believes that AM can still improve the production time and reduce the production cost. In terms of the supply chain for 3D printers used to produce mechanical parts for the Apple Watch Ultra, IPG Photonics is the exclusive supplier of laser components, and the printer suppliers are Farsoon and BLT. If shipments go well, Kuo believes more Apple products will adopt 3D printing technology, which will help improve production cost and ESG performance in Apple's supply chain, and the above-mentioned suppliers will also benefit from this new production trend. The components could include the Digital Crown, Side Button, and Action Button, as these are the only mechanical parts of the Apple Watch Ultra. These are the titanium parts that are currently CNC machined. The change has the potential to improve production time and reduce costs.

While this is just an unconfirmed deduction, the real news here is confirmation that Apple uses 3D printing technology from BLT and Farsoon. There is no confirmation that the company will actually produce the Apple Watch Ultra parts but that is very likely, especially in light of the fact one of its Chinese competitors in the mobile device segment, Honor, just accurately detailed its own – very real and very clear – strategy, to implementing metal AM for mass production of the new Magic V2 foldable smartphone. According to Siemens VP of Additive Manufacturing Karsten Heuser, who first reported about the Honor project in Western media via a LinkedIn post "The Honor Magic V2, achieves a thickness of just 9.9 mm in its folded state by designing a titanium hinge to be produced with & by 3Dprinting. According to the announcements, using AM made it 62% lighter and reduce the number of hinge parts from 92 parts to only 4. Strength is also improved due to tailored titanium alloy vs traditionally machined steel and aluminum parts.

If the Apple rumor is confirmed, and the Honor project follows through (along with commercial success for the new smartphone product, this will usher in a new era in terms of using AM for serial and even mass production. We have argued here that really small (and really large) parts currently represent key USPs for additive manufacturing (along with complex geometries and subassemblies) because there is just no alternative method of production. It is likely that the products of the future will increasingly make use of AM in production simply because there is no other way. This is something that the entire AM industry already knows and that most adopting companies are starting to discover (with medical and aerospace leading the way, especially in the west). However, scaling use of AM for serial production – which was hailed as a means to "reshore manufacturing" – is now being led by Asian and especially Chinese companies where manufacturing already happens. Western companies made huge proclaims but in the end they have failed so far to aggressively implement strong AM-based production strategies, mostly because they simply did not make the required investments. Read the full article here.

Nickel/Cobalt & Stainless-Steel Flat Rolled Surcharges

	May	June	July	Aug	Sept	Oct
15-5	1.1235	1.1052	1.0380	0.9852	*	*
17-4	1.1396	1.1212	1.0536	0.9986	*	*
17-7	1.2296	1.2207	1.1300	1.0578	*	*
201	0.9302	0.8428	0.7891	0.7335	*	*
301 7.0%	1.2011	1.1929	1.1045	1.0324	*	*
302/304/304L	1.3216	1.3123	1.2146	1.1360	*	*
304-8.5%	1.3746	1.3647	1.2621	1.1814	*	*
305	1.7525	1.7384	1.6026	1.5061	*	*
309	1.8042	1.7901	1.6553	1.5499	*	*
310	2.5748	2.5525	2.3514	2.2118	*	*
316/316L	1.9784	1.9254	1.8298	1.7535	*	*
321	1.4196	1.4076	1.2984	1.2169	*	*
347	1.7217	1.7111	1.6038	1.5234	*	*
409/409 Mod	0.3734	0.3722	0.3474	0.3194	*	*
410/410S	0.3789	0.3789	0.3557	0.3267	*	*
430	0.4453	0.4453	0.4233	0.3830	*	*
439	0.4691	0.4673	0.4433	0.3989	*	*
263	12.3785	11.6182	10.2646	9.6772	8.9444	8.4765
276	14.5412	14.9952	12.6782	10.9707	10.7136	10.5559
A286	4.0365	3.8984	3.4292	3.3624	3.1591	2.9677
600	10.0981	9.4687	8.1466	8.3296	7.7083	7.2431
601	8.2504	7.7529	6.7394	6.8854	6.3922	5.9930
617	12.9453	12.5807	10.8897	10.0656	9.4894	9.1029
625	13.4647	13.444	11.7114	10.8917	10.4959	10.1864
718	11.0906	10.8266	9.6864	9.4656	9.0635	8.7390
X-750	10.3044	9.706	8.4810	8.6586	8.0609	7.6070
800	4.4588	4.2056	3.7000	3.7774	3.5221	3.2999
825	6.8800	6.7479	5.8487	5.5654	5.2746	5.0231
HX	10.0649	10.1612	8.6280	7.7294	7.4375	7.2075
188	12.1294	10.4308	10.1272	10.0419	9.0778	8.6075
L-605	12.1584	10.2033	10.0991	9.9560	8.8933	8.4040

*Surcharge currently not available

Nickel/Cobalt & Stainless-Steel Bar Surcharges

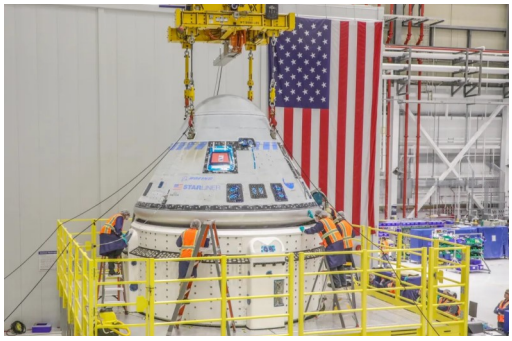
	Mar	Apr	May	June	July	Aug
316LS/316LVM	3.77	3.35	3.01	2.94	2.85	2.82
Custom 455	1.94	1.80	1.87	1.80	1.68	1.57
Custom 465	2.88	2.63	2.59	2.52	2.37	2.17
Custom 630	1.38	1.33	1.36	1.30	1.23	1.21
CCM	12.34	12.61	11.18	9.06	10.23	12.56
625	14.45	12.67	11.62	11.21	10.96	10.57
718	10.71	9.48	9.24	8.80	8.58	8.15
718CR	10.71	9.48	9.24	8.80	8.58	8.15
A286	5.30	4.73	4.71	4.50	4.25	3.98
A2861	5.30	4.73	4.71	4.50	4.25	3.98
A2862	5.30	4.73	4.71	4.50	4.25	3.98
A2867	5.30	4.73	4.71	4.50	4.25	3.98
A286R1	5.30	4.73	4.71	4.50	4.25	3.98
A286SH	5.30	4.73	4.71	4.50	4.25	3.98
Alloy X	12.04	10.58	9.49	9.16	8.91	8.65
Wasp6	12.82	11.53	11.04	10.15	10.01	10.20
L605	12.10	12.41	11.87	10.22	11.01	12.84
321	2.25	2.06	2.11	2.00	1.88	1.85
347	2.24	2.05	2.10	1.99	1.88	1.85
Greek Ascoloy	1.49	1.49	1.50	1.51	1.45	1.46

*Surcharge currently not available

Titanium Surcharges

Form	Grade	Q1 Surcharge	Q2 Surcharge	Q3 Surcharge
TISH	6AL4V	5.56	8.80	8.80
TIPL	6AL4V	3.71	5.87	5.87
TIPL	6AL4VE	4.08	6.45	6.45
TIBR	6AL4V	7.50	6.88	6.88
TIBR	6AL4VE	4.45	4.45	4.45
TICO	GR 2	8.33	8.69	8.69
TICO	GR 3	8.33	8.69	8.69
TICO	GR 4	8.33	8.69	8.69
TISH	GR 2	8.33	8.69	8.69
TISH	GR 3	8.33	8.69	8.69
TISH	GR 4	8.33	8.69	8.69

Boeing Records More Losses From Starliner Delays



Boeing took another loss on its CST-100 Starliner commercial crew program as the first crewed flight of that vehicle remains in limbo. In its fiscal second quarter financial results released July 26, the company said it took a $257 million loss on the Starliner program, citing the delay in the vehicle's first flight with astronauts on board that Boeing and NASA announced June 1. That loss was the biggest single factor in a $527 million loss the company reported for its Defense, Space and Security business unit in the quarter.

The loss is the latest financial setback for Boeing on the fixed-price contract. The company has previously recorded $883 million in charges against earnings linked to Starliner, including $195 million in the third quarter of 2022. Those charges covered delays in the vehicle's development and the cost to fly a second uncrewed test flight. "On Starliner, we're in lockstep with our customer. We've prioritized safety, and we're taking whatever time is required. We're confident in that team and committed to getting it right," said David Calhoun, president and chief executive of Boeing, in an earnings call. He did not elaborate on those efforts or estimate how much time is required.

When NASA and Boeing announced the latest delay in the Crew Flight Test (CFT) mission, Mark Nappi, vice president and program manager for CST-100 Starliner at Boeing, said it was premature then to announce a new launch date, stating that the company needed "several days" to review the work needed to address parachute harness and wire tape issues that caused the delay. During a July 25 NASA briefing about the upcoming SpaceX Crew-7 mission to the International Space Station, Steve Stich, NASA commercial crew program manager, said the Starliner program had "stepped back" to take a detailed look at all aspects of preparations for the crewed flight, a recommendation made by NASA's Aerospace Safety Advisory Panel shortly before the latest problems.

The program had found a new joint for use in the parachute system that would meet the required factor of safety that the existing component fell short of. "That joint is in testing right now and we're in the middle of looking at that joint and figuring out how to get it into the chutes for flight," he said.

Others have been removing tape for wire harnesses in the spacecraft that tests showed to be flammable. Stich said engineers had found an alternative tape that is not flammable to use in its place. Stich, though, did not offer a revised schedule for the CFT mission, which will carry NASA astronauts Butch Wilmore and Suni Williams to the International Space Station for a brief stay. That launch had been scheduled for July 21 before the delay. "The work on Starliner is progressing well," he said. "We need to step back a little bit and take a look at how all this work lines up. We're not really ready to talk a launch opportunity yet." Stich said the focus for now is resolving the technical issues. NASA and Boeing will meet "when the time is right and pick a launch target." Read the article here.

Airbus and Boeing Race to Boost Aircraft Production

Airbus and Boeing both stepped up deliveries of commercial aircraft in the first half of this year, boosting revenue as they strive to ramp up production to meet demand from airlines. Both aircraft manufacturers released results on Wednesday, with Airbus reporting a net profit of 1.06 billion euros ($1.17 billion) in the second quarter while Boeing suffered a $149 million loss following delays and cost issues in its defense and space program.

Both saw revenues jump as they delivered more aircraft to clients. Boeing boosted revenue by 18 percent during the quarter to $19.8 billion, while Airbus posted a 24 percent increase to $17.6 billion. In the second quarter, U.S.-based Boeing notched a 12 percent increase in commercial plane deliveries to 136.
Its European rival Airbus managed a 6.4 percent increase to 316 deliveries in the first half of the year. As airlines have announced major new orders in response to robust travel demand following COVID-19 lockdowns, Airbus and Boeing have had trouble boosting production.

Both companies slashed output and cut staff during the pandemic as global air travel came to a near halt, and ramping it back up has proved slow and difficult for them and their suppliers. Boeing Chief Executive Dave Calhoun pointed to "steady progress" in the aerospace giant's turnaround, calling demand strong in the company press release. Boeing's commercial plane program has been beset with various manufacturing and quality control issues in recent years that have limited deliveries for its top-selling jets, the 737 and 787 Dreamliner, pushing the company into loss.
In an interview on CNBC, Calhoun described the supply chain difficulties as "settling down" as he reviewed the ramp-up planned for the best-selling jets and reviewed a number of major contracts with carriers in India, Saudi Arabia and elsewhere.

Calhoun offered a somewhat more upbeat appraisal Wednesday as he mapped out the plan to increase production of the 737 MAX to 38 a month from 31 a month. "Suppliers have been working diligently to sort of settle down and eliminate the constraints, and slowly and steadily we're seeing fewer and fewer concerns," Calhoun told CNBC, adding that the company plans to boost output to 50 per month down the road.

Boeing also announced new production targets for the 787 Dreamliner. Later on a conference call with analysts, Calhoun characterized supply chain issues as still the "most significant" challenge facing the company, but said "it's steadily getting better". Airbus also highlighted the critical importance of ramping up production and continued supply chain difficulties. "On the supply side, our deliveries continue to be paced by a few critical suppliers," chief executive Guillaume Faury said in a conference call.

Airbus confirmed plans to make 75 of its best-selling single-aisle A320 family aircraft per month in 2026. This production rate "is now the key reference point for the company", it acknowledged. But it dropped reference to making 65 A320 aircraft per month in 2024. Read the full article here.

ULA Delays 1st Vulcan Rocket Launch to Late 2023 After Explosion During Test

We'll have to wait a bit longer for the first flight of United Launch Alliance's (ULA) new heavy-lift rocket. The Vulcan Centaur is now scheduled to debut in late 2023, provided the rest of its development goes according to plan, ULA CEO and President Tory Bruno told reporters on Thursday (July 13).The rocket was supposed to launch for the first time in May, but the company is now recertifying the structure of its Centaur upper stage before authorizing it to fly.

Aside from that work, however, "development is essentially done," Bruno told reporters on Thursday's call. He also said that a recent explosion of a Blue Origin BE-4 engine during testing won't affect Vulcan Centaur's first mission. (The BE-4 powers Vulcan Centaur's first stage.) Vulcan Centaur is a new methane-fueled rocket from ULA, a joint venture of Boeing and Lockheed Martin. Once ready, Vulcan will replace ULA's Atlas V and Delta IV rockets, which have sent many NASA missions and U.S. Department of Defense payloads to space over the years. Both entities require rigorous certification before Vulcan Centaur can fly their spacecraft, however.

Vulcan Centaur was supposed to launch its first mission in May, sending the private Peregrine lunar toward the moon. However, the launch was delayed after a Centaur upper stage exploded during testing at NASA's Marshall Space Flight Center on March 29. Last month, ULA decided to destack the first Vulcan Centaur, which had already aced a prelaunch engine firing on the pad, and send the upper stage back to its Alabama factory for modification. The March 29 failure, Bruno said in Thursday's press conference, happened during the 15th test of a tank, as a result of a hydrogen leak.

The leak, near the top of the hydrogen dome, continued for 4.5 minutes and caused a crack in the tank. Analyses showed that the issue came down to laser welding on the Centaur, he said, adding that the arc welding used on the previous generation of Centaur was stronger. Future tanks will include an extra stainless-steel ring to strengthen that area, Bruno said.

Blue Origin's in-development New Glenn rocket, which the BE-4 will also power, has endured delays as well; the heavy lifter was originally supposed to debut in 2020. Thursday's press call with Bruno came just days after it was reported that a BE-4 exploded during testing on June 30. That incident destroyed the engine and damaged nearby infrastructure, according to CNBC. "Remedial actions" are underway to address the cause, Blue Origin officials said at the time.

The engine was being readied to fly on the second launch of Vulcan Centaur, the report added. Bruno confirmed that information and said the BE-4 issues will have no effect on the first launch, as the initial Vulcan Centaur features flight-approved engines.

Bruno added the second Vulcan Centaur launch, for the U.S. Space Force, is now expected in the second half of 2024 as long as the engines are ready and the first flight goes to plan.

The June 30 incident was during an "acceptance test" (ATP) that probes for problems with individual units ahead of a flight. (New engine types commonly undergo several testing steps ahead of going to space, such as a "hot fire" on the launch pad.)

"This is not unexpected, it won't be the last and there will be other components on the rockets that also fail acceptance testing," Bruno said, echoing other comments he made on Twitter in recent days.

He joked, "I'm flattered by the attention we have, now that a routine acceptance test was colorfully discussed on social media, but it really isn't news." Read the article here.

UPM Focus: Stainless Steel 304L and 316L

United Performance Metals stocks a plethora of high-performance metals, and this month we would like to highlight two of our commodities: 304L and 316L. To learn more about stainless steel, and these two grades in particular, we sat down with Ben Randall, UPM's Product Manager for Stainless Steel.

According to Randall, stainless steel is something that, in a way, gets taken for granted. It is used in so many different industries and is used for an incredible number of everyday applications, and just is not appreciated enough. "Do you like having AC during the summer? Well, there is stainless steel, even 304 and 316, in HVAC tubing and systems," Randall said. "It is so essential to so many everyday items; knives, flex hoses in your kitchen sink, countertops in fast food restaurants, exhaust systems in cars, and even simple doorknobs."

When asked about the reason behind stainless steel's popularity and usage in so many industries, Randall said, "for 304L and 316L, the higher nickel concentration makes them react better to heat, but their main allure is their corrosion resistance. This resistance makes refinery equipment much more durable, and the life of the material is just so much longer. The environments that are required for something like refinery equipment, where your material will be constantly submerged in salt water, make 316L the perfect choice. It also helps that this material is fairly inexpensive, which plays well for larger, non-commercial use, as well as for commercial end-users like you and me. So, what it comes down to is this: 304L and 316L are extremely durable, long-lasting, corrosion-resistant materials that can be used in a multitude of industries and can be applied to a multitude of products, all while serving everyone from oil and gas companies to someone in the kitchen of your favorite restaurant."

United Performance Metals strives to meet every customer's needs and when it comes to 304L and 316L Stainless Steel, we have the material you desire! Our inside sales team is committed to helping you find the best solution for your business using 304L and 316L, in addition to any other materials you may require. We provide an array of high-performance metals in multiple forms and grades. Take a look here to see all of the products we carry. If you'd like to learn more about 316L, please visit this page on our website. For more information on 304L, click here . If you would like to request a quote, submit a form on www.upmet.com or email sales@upmet.com.