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Boeing Faces Hard Questions About Starliner and Its Future in Space

The moment NASA announced that the crew of Boeing's Starliner will return to Earth next year on a ship built by the company's rival, SpaceX, the questions began. NASA administrator Bill Nelson was asked how confident he was that Boeing's spaceship would ever fly with a crew again. "100%," Nelson replied without hesitation. Nelson said he had just spoken to Boeing's CEO before the press conference in Houston on Saturday, who assured him that "they intend to move forward and fly Starliner in the future." Not everybody is so sure.

Starliner will return from space as soon as next week. But the two astronauts who blasted off in June for what was supposed to be eight day mission at the International Space Station will now stay for eight months because of glitches that cropped up during the test flight. t's another blow for Boeing in what's been a brutal year for the aerospace giant, and observers say it could have big implications for the company's future in space. "Boeing is going to need to grapple with the consequences of the failure of this mission to achieve its test objectives," said Todd Harrison, a space industry veteran who's now a senior fellow at the American Enterprise Institute. Boeing has changed since the contract for Starliner was awarded a decade ago, Harrison said, becoming less focused on human spaceflight.

"It's fairly likely Boeing will, within a few weeks or months, come to the conclusion that they just need to step back" from Starliner, he said. "This program kind of sticks out as something that doesn't fit with the rest of their business." That would be a momentous shift for a company with a storied history in space that stretches back decades. Ten years ago, Boeing got the lion's share of funding for NASA's Commercial Crew Program — more than $4 billion, while the upstart SpaceX got only $2.6 billion. Boeing has since lost an additional $1.6 billion on Starliner. NASA's goal all along was to have more than one private company that could get astronauts and equipment into orbit and back. Boeing's struggles with Starliner make that strategy look smart." This really proves that you do need redundancy," said Makena Young, a fellow with the Aerospace Security Project at the Center for Strategic and International Studies. "Sometimes things go wrong and you need that second plan." Young thinks it's too soon to know if Boeing will walk away from the Starliner program. "It's not a failure just yet," Young said. "We very well could still see a success of this system, if it's able to get back to Earth and land safely."

Space is a relatively small piece of Boeing's portfolio. The company's new CEO, Kelly Ortberg, has other pressing problems, like turning around the company's commercial airline business after major safety and quality control lapses. The engineering challenges there are very different, but observers say there are some parallels as well. "Almost all of Boeing's problems are cultural," says Richard Aboulafia, an aviation industry analyst at AeroDynamic Advisory. "It's a management team that was completely disconnected from the folks who actually did the design, integration and manufacture of the company's products. That's a recipe for trouble. And you've seen it in jetliners and defense products and now, of course, in space systems." Boeing has not said much publicly about Starliner. Read the full article here.

Nickel/Cobalt & Stainless-Steel Flat Rolled Surcharges

--	Jun '24	Jul '24	Aug '24	Sept '24	Oct '24	Nov '24
15-5	0.9543	0.9410	0.8851	0.8477	*	*
17-4	0.9675	0.9540	0.8976	0.8599	*	*
17-7	0.9831	0.9570	0.8844	0.8502	*	*
201	0.6867	0.6762	0.6435	0.6271	*	*
301 7.0%	0.9586	0.9319	0.8619	0.8292	*	*
302/304/304L	1.0543	1.0253	0.9453	0.9079	*	*
304-8.5%	1.0956	1.0656	0.9805	0.9409	*	*
305	1.3916	1.3537	1.2336	1.1776	*	*
309	1.4366	1.3992	1.2791	1.2231	*	*
310	2.0416	1.9885	1.7984	1.7097	*	*
316/316L	1.6310	1.6406	1.5340	1.4536	*	*
321	1.1238	1.0926	1.0025	0.9605	*	*
347	1.4334	1.4022	1.3121	1.2701	*	*
409/409 Mod	0.2988	0.2872	0.2872	0.2872	*	*
410/410S	0.3088	0.2972	0.2972	0.2972	*	*
430	0.3668	0.3556	0.3556	0.3556	*	*
439	0.3791	0.3683	0.3683	0.3683	*	*
263	7.2037	7.5222	7.7369	8.1174	7.4431	7.0858
276	8.4690	8.8325	9.0886	9.9294	9.5647	9.1005
A286	2.2549	2.3887	2.4877	2.7088	2.4501	2.2944
600	5.2453	5.7004	6.0009	6.5626	5.7464	5.0647
601	4.4003	4.7578	4.9957	5.4508	4.8029	4.4458
617	7.4565	7.8179	8.0628	8.6323	7.9955	7.5783
625	8.3298	8.7005	8.9518	9.6282	9.0710	8.6425
718	7.2408	7.5559	7.7691	8.2477	7.7123	7.3737
X-750	5.7073	6.1339	6.4162	6.9448	6.1772	5.7535
800	2.4550	2.6283	2.7505	2.9928	2.6548	2.4714
825	3.8810	4.1142	4.2785	4.6712	4.2831	4.0233
Alloy X	5.6762	5.9659	6.1674	6.7538	6.3432	5.9894
188	8.2733	8.4554	8.5847	8.3965	8.0026	7.8815
L-605	8.4870	8.6063	8.6954	8.3402	7.9910	7.9367

*Surcharge currently not available

Thin Gauge Stainless Steel and Nickel Alloy Surcharges

--	June '24	Jul '24	Aug '24	Sept '24	Oct '24	Nov '24
301 7%	1.1503	1.1182	1.0342	.9950	*	*
302/304/304L	1.2651	1.2303	1.1343	1.0894	*	*
304 8.5%	1.3147	1.2787	1.1766	1.1290	*	*
305	1.6699	1.6244	1.4803	1.4131	*	*
316L	1.9572	1.9687	1.8408	1.7443	*	*
321	1.3488	1.3110	1.2029	1.1525	*	*
347	1.7201	1.6825	1.5744	1.5240	*	*
201	7.8060	8.5373	9.0187	9.8935	8.5862	7.8636
600	6.2943	6.8405	7.2011	7.8751	6.8957	6.3546
625	9.9958	10.4406	10.7422	11.5539	10.8853	10.3711
625LCF	9.9958	10.4406	10.7422	11.5539	10.8853	10.3711
718	8.6889	9.0671	9.3229	9.8972	9.2548	8.8485
Alloy X	6.8115	7.1591	7.4009	9.7410	7.6118	8.5030
X750	6.8487	7.3607	7.6994	8.3337	7.4126	6.9042

*Surcharge currently not available

Nickel/Cobalt & Stainless-Steel Bar Surcharges

	Apr '24	May '24	Jun '24	Jul '24	Aug '24	Sep '24
316LS/316LVM	2.36	2.43	2.62	2.49	2.43	2.37
Custom 455	1.34	1.41	1.48	1.35	1.35	1.35
Custom 465	1.91	2.00	2.11	1.97	1.98	1.98
Custom 630	1.01	1.05	1.11	1.03	1.01	0.99
CCM	11.93	11.81	11.04	10.96	10.88	10.82
625	9.31	9.67	10.39	9.79	9.62	9.52
718	7.06	7.37	7.89	7.29	7.15	7.13
718CR	7.06	7.37	7.89	7.29	7.15	7.13
A286	3.44	3.62	3.86	3.55	3.50	3.50
A2861	3.44	3.62	3.86	3.55	3.50	3.50
A2862	3.44	3.62	3.86	3.55	3.50	3.50
A2867	3.44	3.62	3.86	3.55	3.50	3.50
A286R1	3.44	3.62	3.86	3.55	3.50	3.50
A286SH	3.44	3.62	3.86	3.55	3.50	3.50
Alloy X	7.70	7.99	8.56	8.14	8.03	7.91
Wasp6	8.98	9.28	9.66	8.99	8.76	8.73
L605	12.40	12.35	11.84	11.87	11.60	11.42
321	1.50	1.56	1.66	1.51	1.46	1.45
347	1.50	1.56	1.66	1.51	1.47	1.46
Greek Ascoloy	1.34	1.35	1.39	1.41	1.38	1.33

*Surcharge currently not available

Titanium Surcharges

Form	Grade	Q1 2024 Surcharge	Q2 2024 Surcharge	Q3 2024 Surcharge
TI - SHEET	6AL4V	8.23	7.82	6.36
TI - PLATE	6AL4V	8.08	6.52	5.30
TI - PLATE	6AL4VE	7.28	4.18	3.62
TI - COIL	GR 2	8.70	8.92	8.92
TI - COIL	GR 3	8.70	8.92	8.92
TI - COIL	GR 4	8.70	8.92	8.92
TI - SHEET	GR 2	8.70	8.92	8.92
TI - SHEET	GR 3	8.70	8.92	8.92
TI - SHEET	GR 4	8.70	8.92	8.92
TI - BAR	6AL4V	5.45	6.02	4.90
TI - BAR	6AL4VE	5.45	6.02	4.90

Keselowski Advanced Manufacturing Joins ADDMAN Group

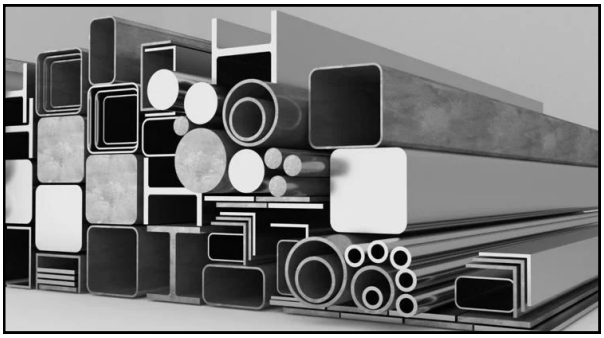
ADDMAN announces the addition of Keselowski Advanced Manufacturing (KAM) to its portfolio of businesses, together forming the largest and fastest-growing additive manufacturing (AM) provider in the United States. This move represents ADDMAN's most significant expansion in metal additive manufacturing and technological readiness to date. The combined entity now operates over 50 metal additive production machines, establishing its leadership in North America's metal additive industry.

Customers will now have unprecedented access to a fully integrated metal additive manufacturing process, from design to serial production. The expanded ADDMAN Group offers over 300,000 square feet of additive manufacturing capacity, enhanced by KAM's 70,000-square-foot facility in Statesville, North Carolina. The combined expertise of ADDMAN and KAM ensures superior quality and faster delivery times for customers, making them a leading force for advanced manufacturing needs.

Brad Keselowski, Founder of KAM, has been a strong advocate for this partnership, affirming, "ADDMAN's integration marks a pivotal moment for the additive industry. Combining these companies brings a powerful combination with KAM's world-class processes and systems, and ADDMAN's abundant resources and R&D. Together, we set a new standard for innovation and excellence in the additive manufacturing industry." Keselowski will remain deeply committed and invested in the operation's success, assuming a role as a Commercial Advisor on ADDMAN's Board of Directors, ensuring a seamless transition and continued expansion.

KAM joins Castheon, ADDMAN's metal additive research and production facility in Thousand Oaks, California. By combining the strengths of both locations, the teams will work together to provide enhanced solutions with industry-leading capability and lead times in refractory alloy production and material science. This collaboration ensures coast-to-coast support from engineering design to full-scale production, leveraging the expertise and capabilities of both facilities to deliver superior AM solutions.

Joe Calmese, CEO, ADDMAN states, "We hold immense respect for the legacies of the companies we integrate into our fold. Brad and the exceptional team at KAM have built an impressive, profitable, and sustainable 3D printing enterprise in a remarkably short time. This is yet another proof point that ADDMAN is dedicated to assembling the industry's finest under our banner. I look forward to seeing the new era of our combined company unfold." Read more on this story here.



How Machine Learning Aids Material Selection

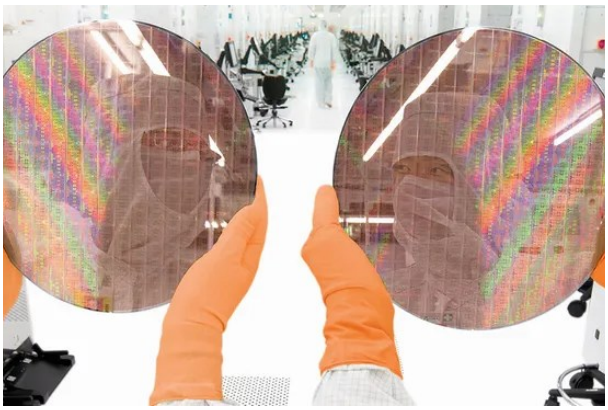
Machine learning (ML) is a branch of artificial intelligence that helps computers analyze large datasets and make informed decisions about their environment. When it comes to materials, businesses can leverage the technology to automate the screening process, simulate the performance of different materials and identify the best option. ML feeds data through various algorithms that give businesses the necessary insights to optimize everything from employee scheduling to resource allocation. The algorithms—computational models of varying complexities—allow computers to recognize patterns, forecast trends and make objective judgments without human supervision.

“By utilizing machine learning algorithms, industry professionals can analyze vast amounts of data related to material properties, performance and manufacturing processes,” explains Kevin Ameche, president of RealSteel, a Pasadena, Texas-based metalworking shop. “This enables them to make informed decisions about material selection, optimizing the overall manufacturing process.”

Genetic algorithms and simulated annealing are particularly useful for material selection. Genetic algorithms effectively put items through a natural selection process to determine the fittest option. Simulated annealing mimics the physical annealing of metal by performing random stress tests until they reach a desired structure. Another effective algorithm is particle swarm optimization (PSO), which simulates the behavior of different materials nonlinearly. Rather than putting everything through the same simulation, PSO algorithms use other measurements and conditions to identify each one’s ideal parameters within the various environments.

A 2021 study by Aachen University’s Laboratory for Machine Tool and Production Engineering produced a PSO cutting simulation algorithm that calculated material model parameters within less than 40 iterations considering different process variables. Each one remembers its best solution, making PSO highly efficient when companies select materials for cutting or manufacturing applications. “Overall, machine learning enhances the material selection process by providing data-driven insights, enabling businesses to make informed decisions, optimize manufacturing processes and deliver high-quality products,” Ameche asserts. Read the full article here.

Chinese Companies Spend $26 Billion on Advanced Chipmaking Machinery Investment



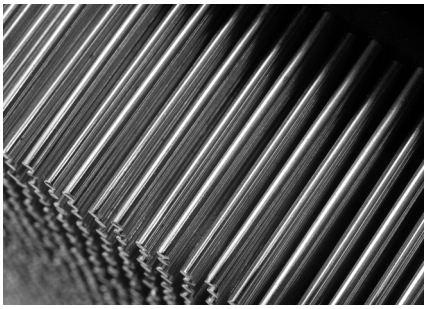
Chinese companies have drastically increased their imports of chip production equipment, spending nearly $26 billion in the first seven months of the year, according to a Bloomberg report citing data from China's General Administration of Customs. This surge marks a new record, surpassing the previous peak set in 2021, as these companies prepare for potential further restrictions from the U.S. and its allies on advanced chipmaking tools.

Chinese companies have particularly focused on acquiring lower-end semiconductor equipment used to make chips on mature process technologies from suppliers like ASML Holdings, Applied Materials, and Tokyo Electron. This shift to mature nodes allows Chinese fabs to develop and supply chips to other sectors of the Chinese economy, namely the automotive industry.

Dutch exports to China, largely driven by purchases from ASML, reached over $2 billion in July, the second-highest monthly total on record, according to Bloomberg. Most of these tools are lithography systems used to make chips on trailing nodes. Supply of these tools has been particularly important for companies like Semiconductor Manufacturing International Corp. (SMIC) which recently became the world's second-largest pure-play foundry due to its ability to supply chips made on advanced nodes to companies like Huawei and vast manufacturing capacities focused on mature nodes as well as smaller and emerging players that specialize solely on mature and specialty nodes. There are several reasons why Chinese companies are accelerating their purchase of semiconductor production tools. On the one hand, 18 new fabs are expected to start operations in China in 2024 and these production facilities must be equipped. Over a dozen more fabs are coming online in China in the coming years.

Another reason for the increase in equipment purchases is driven by concerns over tightening export controls from the U.S. and its allies. These controls, aimed at limiting China's access to advanced semiconductor production technology, have led Chinese firms to stock up on machinery while they still can. In terms of wafer starts, China is already the world's largest maker of chips. Industry group SEMI believes that China's semiconductor production capacity increased by 12% year-on-year, reaching 7.6 million wafers per month in 2023. Please read the full article here.

UPM Focus: Inconel 718® and A286 Fastener Bar



United Performance Metals offers a wide array of products aimed at providing solutions for the world's most innovative companies. We aid these companies in pushing their industries forward and contributing to the greater development of the aerospace, space, medical, and power generation sectors. In this piece, we will discuss two specific products of ours, their technical compositions, applications, and how you can potentially obtain some of our material.

Inconel® 718 is a nickel-chromium alloy with high-corrosion resistance, oxidation resistance, and is able to withstand extreme temperatures. Inconel® 718 remains intact and high-performing at temperatures as high as 1300°F (704°C). Its high-strength properties, combined with its weldability make its bar form very popular. Some applications of Inconel® 718 bar include turbine components and jet engines. In fact, nearly half of all Inconel® 718 that is produced today is used in the production of blades/sheet for aircraft engines. This is due to the corrosion resistance of the material and its ability to maintain strength in harsh conditions. Pete Stalnaker, Regional Outside Sales Manager at UPM, spoke about 718's importance to the turbine industry. "718 is one of the most important materials UPM stocks when it comes to power generation. Turbines run at very high temperatures and 718 material is able to maintain its shape and integrity, making it widely used in this industry."

A286 is another prolific material UPM stocks that often comes in bar form. Similar to 718, this stainless-steel variant is a superalloy known for its high performance in extremely corrosive environments. It has great high temperature oxidation resistance and is often applied to very similar products as 718. A286 in bar form is used in gas turbines, afterburner construction, and exhaust nozzles. A286 is a premier choice for one product in particular: fasteners. Modern fasteners are required to withstand extreme environments, so corrosion resistance and tensile strength is paramount. A286 is a popular choice for fastener products, and UPM readily stocks this material in bar form.

If you or your company is looking for a source for fastener bar products, look no further and visit this page to get a quote today! UPM will be exhibiting at the International Fastener Expo in Las Vegas, Nevada from September 9-11 in booth 470. Click here to schedule a meeting with a member of our team while at the show. We hope to see you there!