



Mr. Matthew D. Zolnowski
Office of Industrial Policy
1400 Defense Pentagon, Room 3B854
Washington, DC 20301-1400

Dear Mr. Zolnowski,

**Comment to the Department of Defense on “America’s Supply Chains”
(Docket No. DoD-2021-OS-0022)**

As the leaders in the domestic titanium production industry, Allegheny Technologies Incorporated (ATI), Howmet Aerospace, and the Titanium Metals Corporation (TIMET) submit this comment to inform DoD’s approach to America’s supply chain for titanium, a critical material, as well as other nickel-based superalloys produced by some of these companies and used in other environments requiring high strength and high heat tolerance at acceptable weights.

5. DoD should establish and strengthen manufacturing of value-added products, containing strategic and critical materials, which support the U.S. economy.

Titanium and superalloys have long been recognized as uniquely valuable and critical materials for U.S. defense. Since 1972, DoD has committed to purchasing these materials only from domestic and certain allied sources as a way of ensuring that these critical materials are available in case of war or national emergency. Titanium and superalloys are key and irreplaceable parts of many defense systems. The most notable of these are aerospace systems, where the high strength and heat tolerance of titanium and superalloys is critical for engine and airframe applications, but these materials are also used in ground vehicle armor, naval vessel propulsion, and many other systems.

These applications, as well as their related consumer applications, employ tens of thousands of Americans in advanced manufacturing jobs and produce billions of dollars in economic activity within the United States each year. The processing of titanium and superalloys, especially at aerospace grades, is not a rudimentary process: it requires sophisticated manufacturing facilities and engineering technologies. These all add significant value to the supply chain as titanium and superalloys make their way from the mine into finished systems.

It is important that the U.S. Government recognizes that core capabilities of the domestic specialty metals industry lie in downstream product applications (mill products, forgings, investment castings, etc.) and that key feedstock materials (e.g., titanium sponge, vanadium pentoxide) may

often be sourced globally. Where these feedstock issues arise, and there are potential national security issues, rational non-market-distortive policies, including the use of stockpiles, should be contemplated. These issues also afford opportunities to work with our allies who might be reliable sources of these materials.

DoD should ensure that these critical industries are supported and viable in a globalized economy. Existing initiatives such as the Metals Affordability Initiative, a long-running public-private partnership operated by the Air Force Research Laboratory, are important in developing advanced capabilities that make advanced metalmaking more efficient and suitable for DoD needs. Legislation like the Specialty Metals Amendment (10 U.S.C. §4863) is vital for protecting the U.S. national security supply chain from foreign interference and disruption.

DoD should ensure availability of titanium sponge for domestic manufacturing needs. This could be done through existing stockpile authorities. We also encourage DoD to work with the U.S. Trade Representative, the Department of Commerce, and others to maintain tariffs on sponge imports from competitor nations (such as China and Russia) while removing the tariff from allies and other nations with friendly trade relations. We would be happy to provide additional details on the effect of tariffs on friendly nations on the titanium supply chain, as well as to USTR and Commerce, if DoD would prefer.

Finally, we encourage DoD to continue with its existing approach to the titanium and superalloy supply chains and encourage its contractors to increase their usage of domestically-produced titanium and superalloys in their commercial offerings as a way of further ensuring the long-term viability of the industry. We encourage DoD to ensure that its audit organizations are fully resourced to maintain a vigilant outlook for Specialty Metals Amendment compliance within DoD contracts.

7. There are no available material and manufacturing process substitutes for titanium and superalloys in many applications.

Titanium has unique properties in strength, heat resistance, and weight. DoD systems would have significant drawbacks in their size, weight, and power (SWaP) requirements were they to use materials other than titanium in many applications. Likewise, superalloys have been developed and engineered to present the highest possible performance in demanding environments with the fewest potential drawbacks.

Over the history of the industry, new materials, such as composites, have been developed to substitute in for titanium and superalloys in some applications. However, these applications typically take years, if not decades, to develop, and these materials will never be a substitute for all applications currently using titanium and superalloys. There are therefore no short-term substitutes for titanium and superalloys in existing DoD applications in case of supply chain interruption. DoD should therefore continue to maintain the American titanium and superalloy

industry to ensure that it has the critical materials that it needs for air, ground, sea, and space systems.

12. The titanium industry is eager to participate in research, development, and demonstration priorities to support production and an advanced manufacturing base for strategic and critical materials.

Titanium and superalloys are costly and difficult to produce, especially at aerospace grades. Technologies that reduce the amount of raw material and forming processes needed to produce end items and components are always of interest in the industry. All three of the respondent companies participate in government research initiatives already, such as the Metals Affordability Initiative. However, outside of MAI, government research and development initiatives for metalmaking are often focused either on low-TRL “blue sky” efforts or on the formation of specific components for use in specific supply chains.

The titanium industry therefore urges DoD to consider how it can best stimulate R&D in areas of general applicability in the industry, including expanding the set of feedstocks that would be available for use in aerospace-grade titanium, technologies that reduce the amount of material needed for complex geometries (such as pressing and forming technologies), and additive manufacturing technologies. All three companies already spend heavily in these areas, but DoD has unique requirements that could easily be cost-shared among all participants and the government.

Conclusion

The United States titanium and superalloy industry is a national security asset that is appropriately sized to meet U.S. defense needs in peacetime but capable of being scaled to meet emergent necessities during war. It is an industry that has invested billions in world class technologies and capabilities. The industry appreciates DoD’s stewardship in maintaining this important capability in the United States, especially through the Specialty Metals Amendment but also through existing research and development activities. The titanium industry encourages DoD to increase enforcement of the Specialty Metals Amendment and to continue funding innovative research into the efficient use of titanium and superalloys in defense systems.

Sincerely,

A handwritten signature in black ink, appearing to read 'JAG', with a long horizontal flourish extending to the right.

Jeff A. Green
President, J.A. Green & Co.
On behalf of ATI, Howmet, and TIMET