

## **"PTC Industries develops Technology and Capability for Manufacturing of Single Crystal and Directionally Solidified Castings"**

***First company in India to bring this cutting edge casting technology to India***

**Lucknow, Uttar Pradesh, 29 June 2024:** Aerolloy Technologies Limited (a wholly owned subsidiary of PTC Industries Limited, herein referred to as "ATL"), a manufacturer of strategic and critical materials and high integrity metal components, for various critical and super-critical applications in aerospace, is excited to announce that we have successfully developed the **most advanced casting technology for manufacturing Single Crystal and Directionally Solidified** blades and vanes for Aero-engine and Industrial Gas Turbine applications. The company has setup this manufacturing capability at its Lucknow facility. This technological know-how makes PTC the only company to have this capability in India and amongst very few in the world. This technology till now has been kept very closely guarded and access to this technology has remained restricted for any country in the developing world. Creation of this indigenous capability by the company is a of major milestone for the company in achieving its overarching objective (*Dharma*) – to achieve *Parity*.

This capability and its related infrastructure will enable the company to produce **Airfoils (blades and vanes) with complex internal hollow cooling passages while having highly specialized microstructures like Single Crystal or Directionally Solidified**.

This manufacturing technology is extremely specialized and has **traditionally been closely guarded by industry leaders in 3 – 4 countries worldwide**. With this strategic advancement, the company is now among very few companies in the world to have the technology and capability to manufacture and deliver these most advanced metallurgical components.

### **About Single Crystal Directionally Solidified Castings:**

In order to achieve higher levels of efficiencies Aero-engines and Industrial Gas Turbines need to operate at **very high temperatures, in excess of 2500 degrees Celsius, in the combustion and exhaust (hot section) portions**. Airfoils (blades and vanes) which are used in this "hot section" need to withstand these extremely high operating temperatures (at which any metal alloy would melt) and simultaneously intensely high rotational forces. Single Crystal and Directionally Solidified castings are advanced casting techniques used to manufacture metal components with exceptional strength and resistance to very high temperatures. Using these technologies castings can be produced having a microstructure with no grain boundaries (Single Crystal) or aligned grains (Directionally Solidified). These metallurgical properties in the Airfoil castings significantly enhance their performance in demanding environments such as aircraft engine turbines, where they help improve efficiency and reliability. Airfoils (blades and vanes), used in



such demanding applications and environment, utilise these metallurgical properties of Single Crystal or Directionally Solidified microstructures along with capability to cast internal hollow cooling passages to operate at such high temperatures and high loads.

***Commenting on this development Mr. James Collins, Chief Technology Officer, PTC Industries said:***

*“We are immensely proud to have integrated the pinnacle of casting technologies into our operations, marking a significant milestone for our company. The acquisition of Single Crystal and Directionally Solidified casting capabilities not only enhances our product offerings but also reinforces our commitment to innovation and excellence. By mastering this highly specialized manufacturing technology, we are poised to meet the growing demand of the defence and aerospace industry and secure a leading position in manufacturing technology.”*

**About PTC Industries:**

PTC Industries Limited is a leading Indian manufacturer of precision metal components for critical applications for over 60 years. Through its wholly owned subsidiary Aerolloy Technologies Limited, the company is manufacturing and supplying Titanium and Superalloy castings for Aerospace and Defence applications within India as well as for exports. The company is substantially expanding its Aerospace castings capability by making a multi-million-dollar investment in a new state-of-the-art manufacturing facility at the newly acquired 50 acres land in the Lucknow node of the Uttar Pradesh Defence Industrial Corridor. This facility will be a fully vertically integrated with a Titanium and Superalloy Mill, producing aerospace grade ingots, billets, bars, plates and sheets in these critical and strategic materials.

**For more information, please contact:**

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