

## Agnikul Cosmos Patents World's Largest Single-Piece 3D-Printed Rocket Engine



In a groundbreaking achievement for the global aerospace industry, Indian space technology startup Agnikul Cosmos has unveiled what it is calling the world's largest single-piece 3D-printed rocket engine. The Chennai-based company also announced it has secured a US patent for the design and manufacturing process of this revolutionary technology. This milestone marks a significant leap in additive manufacturing for rocketry, showcasing India's growing influence in the private space sector.

The engine, which is a full meter in length, was produced entirely as a single integrated component, eliminating the need for traditional welds, joints, or fasteners from fuel entry to plume exit. This unique manufacturing process drastically reduces production complexity and time. Made from Inconel, a high-performance superalloy known for its resistance to extreme heat and pressure, the engine is designed to be a core component of Agnikul's Agnibaan launch vehicle. According to the company, this single-piece approach not only enhances structural integrity but also significantly lowers the weight and cost of the propulsion system.

The US patent is a major intellectual property victory for Agnikul, providing legal protection for its innovative design in one of the world's most competitive markets. This recognition validates the technical sophistication of an Indian-origin design and underscores the nation's rising stature in next-generation rocket manufacturing. The company, which has been supported by key Indian

institutions like ISRO and IN-SPACe, has been at the forefront of leveraging 3D printing to create more efficient and reliable space technology.

This achievement follows Agnikul's successful suborbital test launch in May 2024, which featured the world's first rocket with a single-piece 3D-printed engine. The company's vision is to make space access more affordable and flexible by offering customizable launch solutions for small satellites. By automating the engine-making process and reducing the production timeline, Agnikul is positioning itself as a serious contender in the global space race. The firm aims to launch an orbital mission soon and is working towards a target of 50 launches per year by 2028. This rapid progress highlights the effectiveness of India's policy to foster a vibrant private space ecosystem.