

Aerospace – Industry Structure

The aerospace industry worldwide involves manufacturing as well as services operations. On the manufacturing front, the major activities include Design engineering & IT solutions, Component manufacturing, and Aircraft assembly, while on the services side are the MRO (Maintenance, Repair and Operations) services. Various sub-activities involved are illustrated in the exhibit below.

Design Engineering & IT Solutions	Component Manufacture (Tier 3)	Component Manufacture (Tier 2)	Subsystems Manufacture (Tier 1)	Aircraft Assembly	MRO
<ul style="list-style-type: none"> • Aircraft and Subsystems Design • Avionics and Critical Components Design • Simulation and Testing Services • Component Design and IT Solution 	<ul style="list-style-type: none"> • Casting, Forgings • Power and Electronic Components, Cables, Wiring • Sheet Metal Components • Aircraft Interiors, Seats, windows, Upholstery 	<ul style="list-style-type: none"> • Hydraulic Systems • Electronic Systems • Avionic and Flight system Components 	<ul style="list-style-type: none"> • Engine Manufacture • Avionic and Flight Control Systems • Wings and Landing Gear Assembly 	<ul style="list-style-type: none"> • Full Aircraft Assembly • Aircraft testing and Validation • Fuselage, Empennage Assembly 	<ul style="list-style-type: none"> • Engine MRO • Airframe MRO Services • Components MRO Services • Line Maintenance

The aerospace industry in India is mainly concentrated in ‘Design, Engineering & IT solutions’ and ‘Tier-3’ manufacturing supplier’ space. Off late MRO is also emerging as major sector with OEMs, airlines and private MRO service providers setting up their businesses in India. Nevertheless, the Indian aerospace industry has a very fragmented coverage along the overall value chain. Although, public sector entities like HAL and DRDO have developed capabilities in most parts of the value chain, but they still struggle to master some critical high-end technologies. The rest of the industry remains woefully short in technological capabilities and experience. Hence, most of the businesses can be categorized so far as low-tech, low cost and low volume.