

**“Innovative Development Of Turbocharger Impeller Using  
Stereolithography Apparatus Technique”**

*A dissertation submitted to*  
**KARNATAKA STATE COUNCIL FOR SCIENCE AND  
TECHNOLOGY**  
**INDIAN INSTITUTE OF SCIENCE, BANGALORE- 560012**

**MASTER OF TECHNOLOGY  
IN  
COMPUTER INTEGRATED MANUFACTURING**

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2011-13**

## ABSTRACT

A Turbocharger is a forced induction device that is used to allow more power to be produced for an engine of a given size driven by the engine's exhaust gases is used in petrol, diesel powered cars, trucks, marine applications, aircraft etc. In exhaust gas turbo charging, part of exhaust gas energy, which would normally be wasted is used to drive a turbine. The turbine shaft is connected to a compressor, which draws in combustion air, compresses it, and then supplies it to the engine. The increased air supply enables more fuel to be burnt; hence the engine develops higher power and thus leading to lower fuel consumption and less emission. Development of impeller for turbochargers through conventional manufacturing has got many challenges due to the blade geometry complexity and high competition in industries due to cost management. If small modification requires in impeller means the entire tooling system has to be changed. The normal manufacturing route involves casting and machining this would lead the cost. Time consumption and not efficient for small manufactures. The aim of the project is to make impeller for turbochargers with great design flexibility, less time consumption by integrating the reverse engineering (RE) and rapid prototyping (RP) techniques called stereolithography apparatus (SLA). Prototype of the turbocharger impeller is for the visualization, mechanical testing. For this prototyping of impeller epoxy resin material has been used.

**Keywords:** Reverse Engineering, SLA, Epoxy resin, Rapid prototyping, Impeller