



wipro 3D



AUTO

Component
Exhaust & Inlet Rocker Covers

Material
AlSi10Mg

In the highly competitive auto industry, speed to market, high strength to weight ratios, fuel efficiency are some of the few goals that constantly drive engineers and designers. New high-strength steels, along with composites and adhesives, are helping to reduce weight and increase strength in modern vehicles. Additive Manufacturing using metal alloys, has found interesting applications in tooling, jigs and fixtures, and design prototypes allowing companies to iterate rapidly and validate designs of components and subsystems. While metal Additive Manufacturing of components at the production scale of automotive may be challenging, there are certainly emerging applications in the low volume, higher end of the industry including Formula 1 and military vehicles.

Additive Manufacturing allows optimizing the maximum strength with minimum weight and material (Topology Optimization) owing to the potential to handle complex geometries. "Monolithizing" sub-components or child parts into a monolith assembly reduces production time, improves functional performance. Typical applications of Metal AM in Automotive are weight optimized manifolds, turbine housings that form part of the current turbo powertrain ERS systems, water-wheel pumps, aluminum axle pivots. A leading name in industry has developed rocker arms and camshaft bearing caps using Metal Additive Manufacturing for its next generation truck engines.



— ABOUT THE PROJECT

The 'Exhaust & Inlet Rocker Covers' are designs of new products that need to be validated by a leading organization in the Automotive industry. They are part of a thermal management system and are used as heat shields to protect the surrounding components and bodyworks from damage due to heat. They also have a positive effect on performance by reducing intake temperature.



— AM COMPETENCIES USED

The first stage of realization lays grounds for topology optimization and sub-component reduction that will further strengthen the case for Metal AM in Automotive industry.



**ADDITIVE
DESIGN &
ENGINEERING**

The Covers were built with customized build parameters that resulted in a superior surface finish when compared to the output of conventional manufacturing techniques. Dimensional accuracy achieved resulted in highly reduced net shaping operations.



**BUILD
TECHNOLOGY**



Owing to almost negligible set up costs, the designers had the flexibility and freedom to simulate and execute the proto design in practically a fraction of the cost and time of conventional realization techniques. Wipro 3D with its proprietary AM methods ensured that the drawings designed to adjust for castings, were adjusted in models to isolate conventional shrinkage and yet factor in shrinkage of the AM process.



COST OF ITERATION



TIME-TO-REALIZE

The entire set of components was turned around in a period of one week, with the requisite mechanical properties, tolerances and finish, allowing designers to rapidly move to the design validation and improvement stage.

About Wipro 3D

Wipro 3D is an AS9100 Certified metal AM solutions and services provider, serving Aerospace, Space, Defense, Industrial, Heavy Engineering, Automotive, Energy, Nuclear & Healthcare sectors. Our solutions include AM Consulting, Additive Engineering & Design Offerings, Manufacturing Services, Research & Development based solutions right unto Design - Deployment and Operation of captive metal AM centers.

Visit: <http://wipro-3d.com> to learn more