



**Product Line:** Designing of 3D CAD Model from and Manufacturing Drawing from Physical Model.

**Objectives:**

To manufacture a batch of water pump from physical sample available.

**Issues:**

- Non concentric circular profiles
- Un-uniform wall thickness and not clear galleries
- Lack of proper tangency
- Poor filleting (resulting in the piece to get stuck in the die)
- Wastage of material

**Project Methodology:**

- Reverse Engineering Methodology is been used by our Engineers.
- Outer profile of part was scanned by using CMM (Coordinate Measuring Machine) technique.
- The point cloud data & machining drawings were used together to get the outer profile and ensure concentricity of holes.
- The walls of the outer profile were taken as reference to produce inner galleries, by maintaining 5.5mm wall thickness, as design rule.
- The part was enveloped as an IGES 3D model which can be used for CNC die making.

**Benefits:**

- 3D model with proper tangency and concentricity achieved.
- Showing uniform wall thickness and clear galleries.
- Proper filleting ensuring smooth piece ejection while casting.
- Almost 25% weight reductions achieved

**Weight Reduction:**

Original Weight : 15.33 Kgs.  
New Part Weight : 11.52 Kgs.  
Weight Reduced : 3.81 Kgs.  
% of Reduction : 24.85%