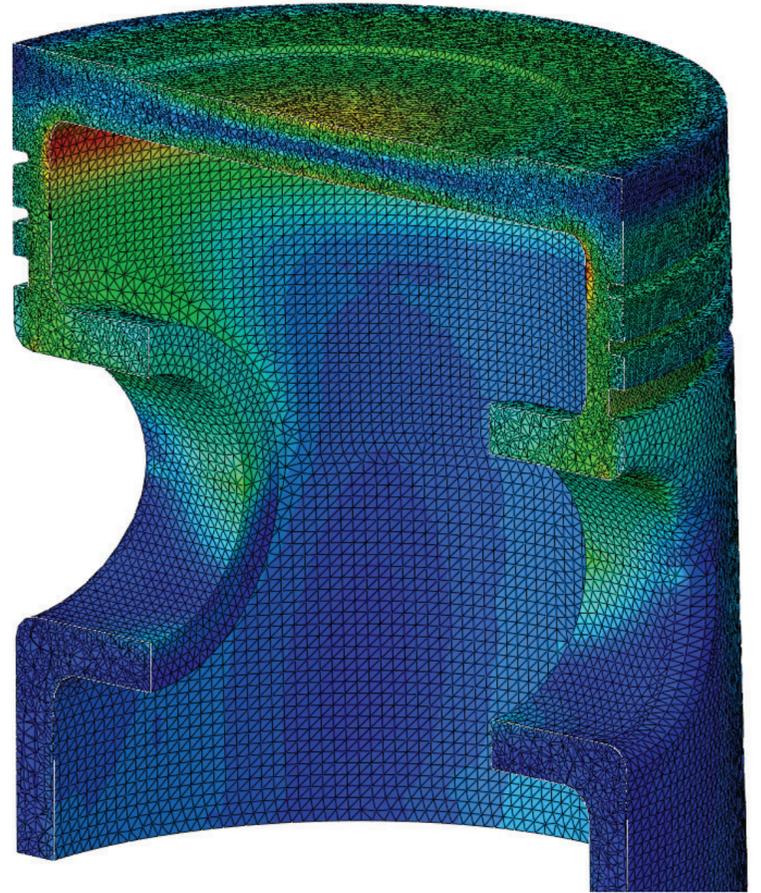


## Future of Lightweighting Entry



### Indian Institute of Technology Bombay Sheet metal piston

Lightweighting engine components enables reduction in the inertial forces on the reciprocating masses of the engine components. This reduces piston slap and hence engine noise and engine wear, leads to a marginal saving in fuel due to a lower idling torque, decrease in the fatigue loading on the connecting rod, thereby enhancing its life.

Lightweighting engine components has been achieved by manufacturing them using sheet metal. Estimates predict that close to 20-25% weight savings may be achieved in the weight of the piston. In addition to the above, manufacture using sheet metal also shortens the processing time, reduces in-process inventory and part handling. The capital investment also can be expected to be relatively lower. To manufacture a piston using sheet metal, the round sheet metal blank is drawn into a cup, with the impression of the combustion chamber made thereafter. A flanged hole is made using a tool specially designed for the purpose. Design for manufacture from sheet metal is critical since the piston must withstand high temperatures and few thousand pressure pulses every minute at the temperature of service. This makes material selection/design and the design procedure for the piston, crucial.

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