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Analysis of Enhancement of Heat Transfer in Hydrogen Cylinder Using Fins

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***Abstract*: In the automobile sector for heat transfer fins are commonly used. The heat transfer through any component or part is mainly depends up on design of part and selection of material. In this project we create 3D model of cylinder with fins using Creo and for analysis purpose Ansys software is used and compare with manufactured cylinder.**

***Keywords*: heat transfer enhancement, heat transfer rate, fins, Creo, Ansys.**

1. Introduction

To prevent the cylinder from thermal effect of high temperature to increase the heat transfer rate through the cylinder. Create 3D Model of cylinder and analyze the 3D model With Different temperature with different materials by using ANSYS software. The heat transfer rate is increases due to extended surface. This extended surface comes in contact with air at a velocity of 2 m/s – 20 m/s.

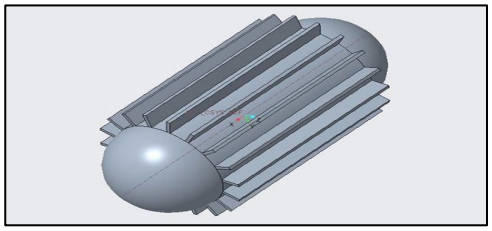

Fig. 1. 3D model of cylinder by Creo

Fig. 2. Experimental setup of cylinder

2. Thermal Calculation by using ANSYS Software

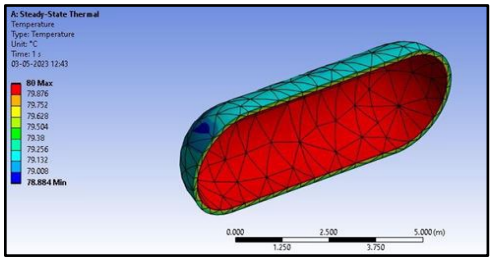

Fig. 3. Temperature distribution of cylinder without fins

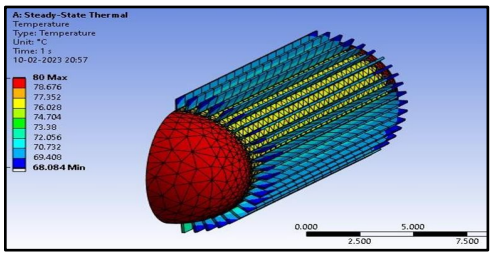

Fig. 4. Temperature distribution of cylinder with fins

3. Result

The table 1 and 2 shows the result comparison with and without fins.

4. Conclusion

Fins are widely used for dissipating heat from different devices where heat is generated. The work purpose to use rectangular fins on the cylinder and study their heat transfer performance. This objective has been fulfilled by using analytical and Experimental methods. The cylinder with fins is compared with cylinder without fins with Analytical and Experimental Methods. The modelling and analysis were done by using Creo and ANSYS workbench respectively. The

Table 1
Result comparison without fins

Cylinder without fins	Inner surface temperature in (Celsius)	Outer surface the temperature in (Celsius)
Ansys results	80	78.88
Experimental results	80	75

Table 2
Result comparison with fins

Cylinder with fins	Inner surface temperature in (Celsius)	Outer surface temperature in (Celsius)
Ansys results	80	68.08
Experimental results	80	62

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following conclusions were drawn from ANSYS and Experimental results.

- The analysis is done for cylinder with and without fins also Take temperature readings of cylinder with and without fins.
- The cylinder with fins has better heat heat transfer rate than cylinder without fins.

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