

Design and Analysis of CPU Cooling Fan Blades Using Solidworks

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ABSTRACT

The main contribution of our project isto replace of plastic CPU cooling fan blades into aluminium CPU cooling fan blades and also we made different angel plates to improve the velocity of cooling. While changing plastic into aluminium we get more efficiencyof cooling. With the help of our project we can increase efficiency of cooling, decrease the temperature and absorb the heat flow of air and also aluminium fan Blades life time also high compare to plastic Blade. can handle variable and high statics pressure and air flow. the fan Blade angles were giving different amounts efficiency while comparing to normal plastic one.

We can use extreme temperatures while using aluminium fan Blades, so compare to plastic fan Blades aluminium fan plastic is good. while compare to plastic(polypropylene) the aluminium has a heat suction is high.

KEYWORDS

Solidworks,Time of Computer, Prototype Model.

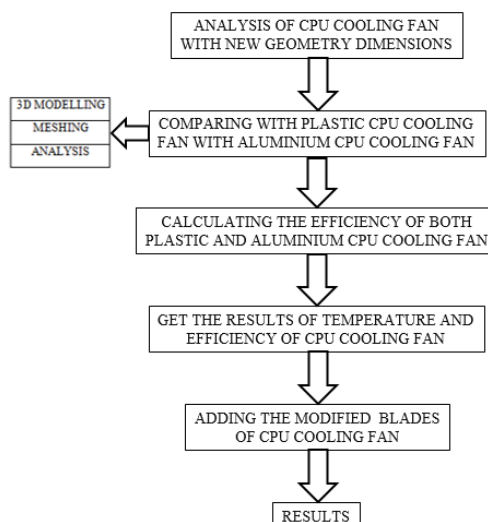
Introduction

Now-a-days rapid IT development like internet PC is capable of processing more data at a tremendous speed. This leads to higher heat density and increase the temperature,while the CPUtemperature is high and decrease the life time. While it causes more failure in theCPU. Especially CPU cooling fan play a vital role in Cooling process. it is decrease the temperature produced by CPU and increase the life time of Computer.

At present, the common methods of the CPU temperature control are divided into two aspects.

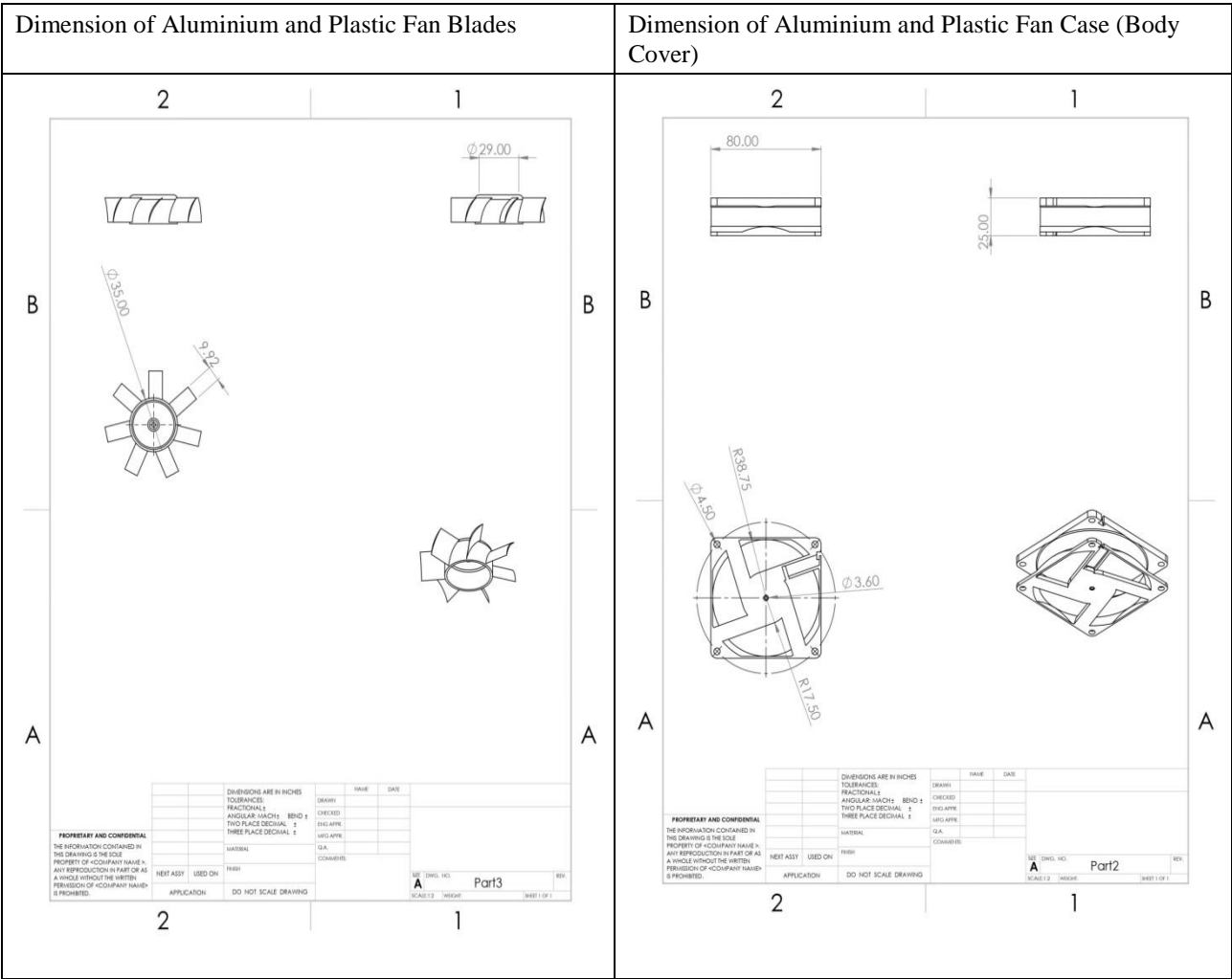
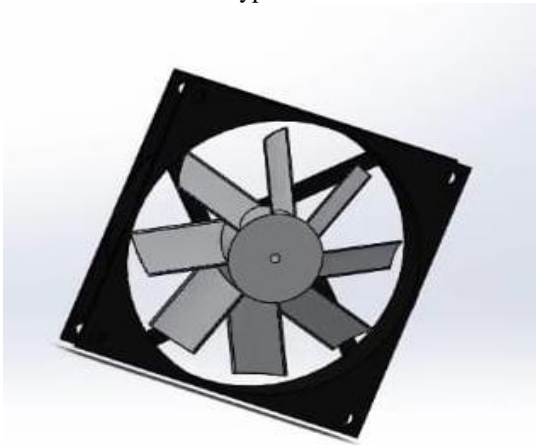
1. Replace plastic(polypropylene) CPU cooling fan into aluminium CPU cooling fan, we can absorb the more heat flow and temperature also decreased.
2. While change the fan Blades angles it give more efficiency of cooling and heat suction also high.

Methodology

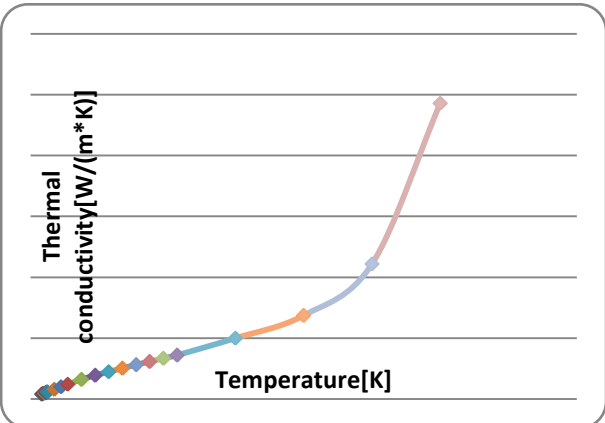
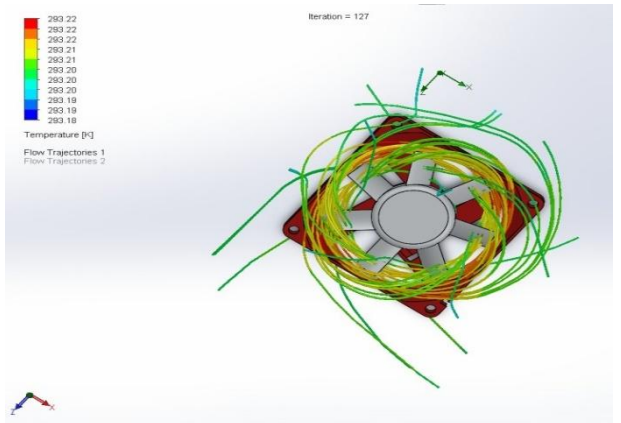
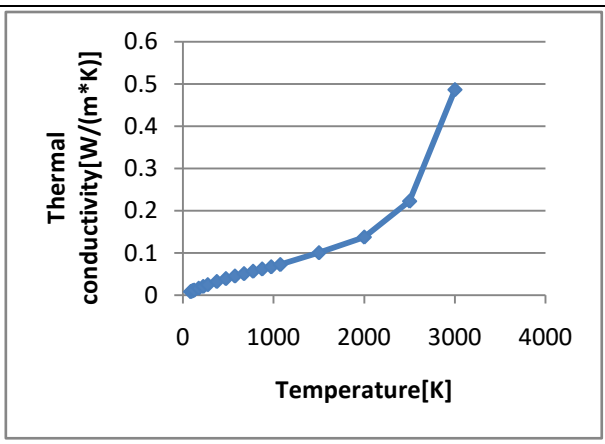
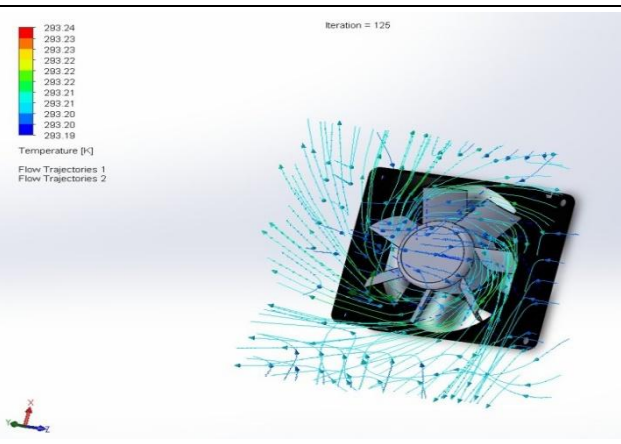


Prototype Model of Solidworks

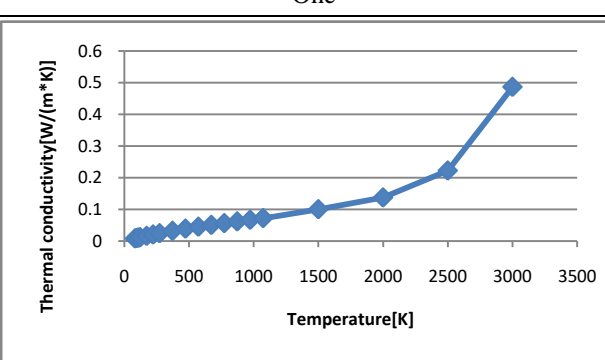
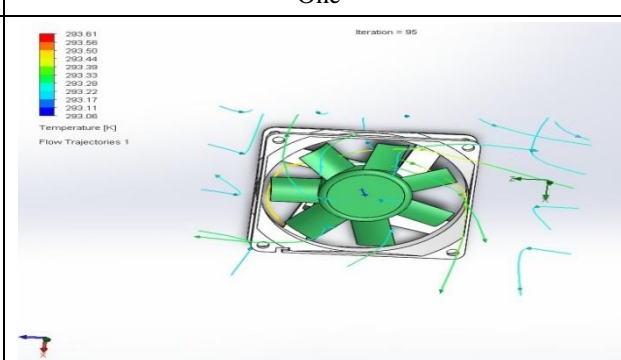
Front View of Aluminium and Plastic Fan blades Prototype Model

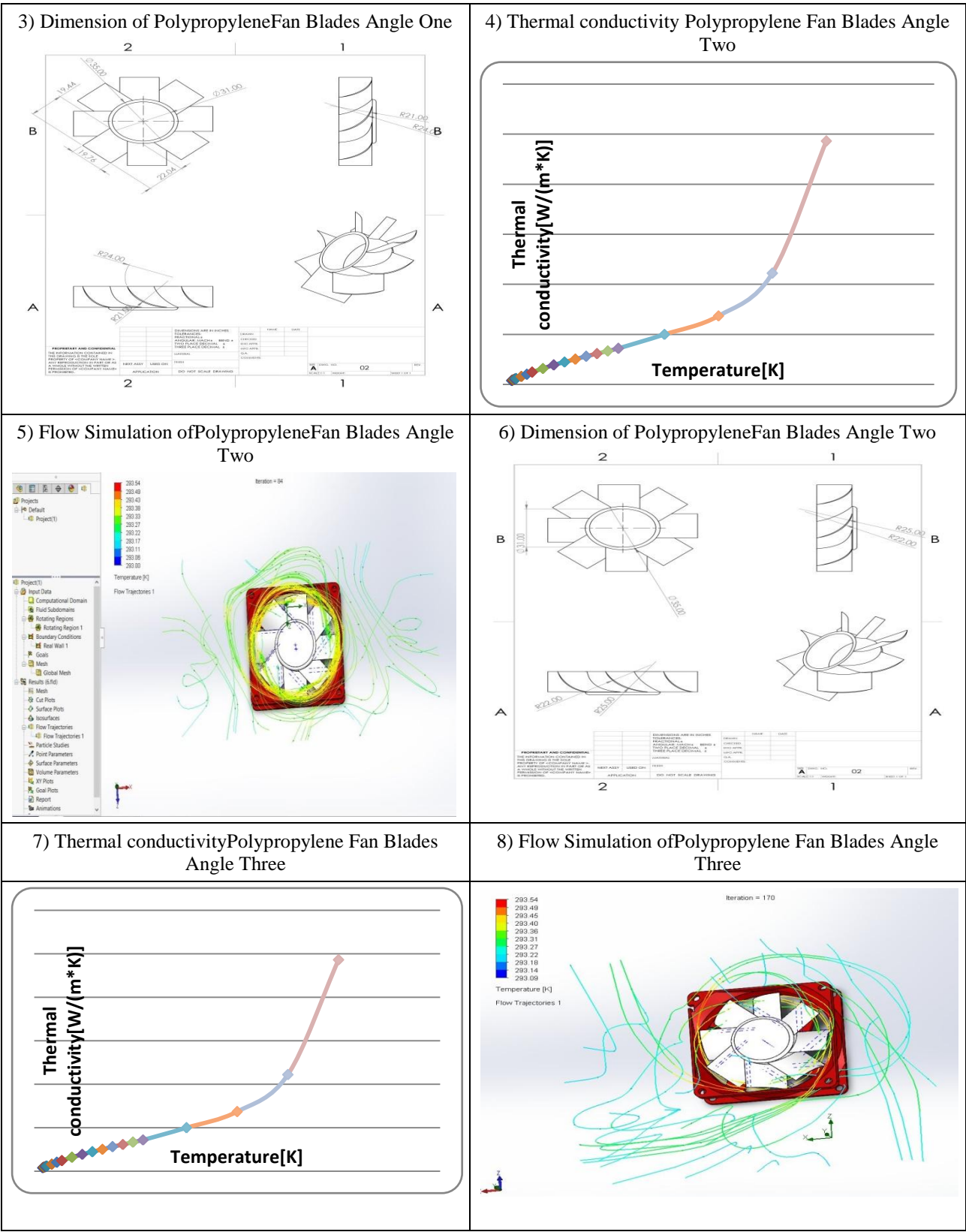


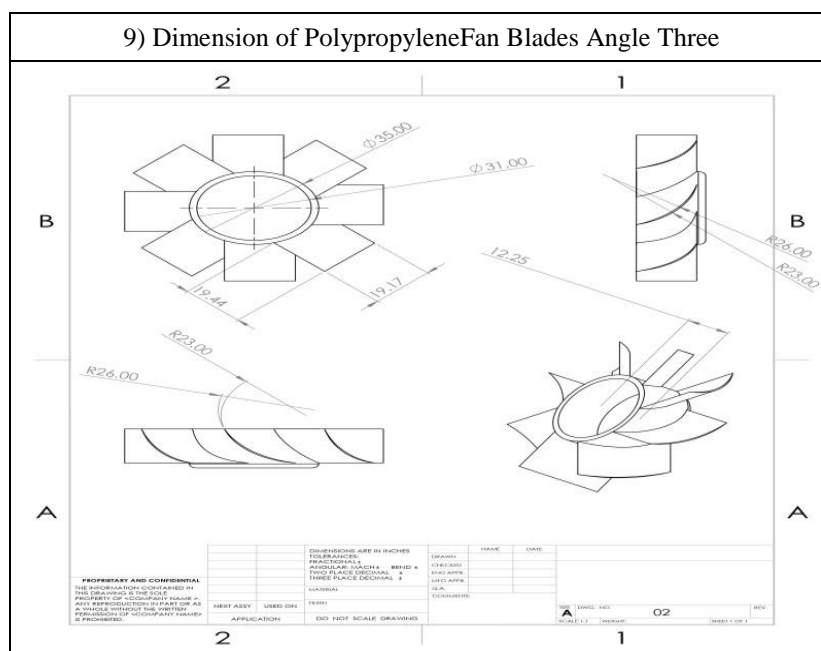
Experimental Setup Analysing Diagram
Analysis Report of Aluminium and Plastic Fan Blades

<p>1) Thermal conductivity ofAluminium Fan Blades</p> 	<p>2) Flow Simulation of Aluminium Fan Blades</p> 
<p>3) Thermal conductivity ofPlastic Fan Blades</p> 	<p>4) Flow Simulation of Plastic Fan Blades</p> 

Different Angle Blades of CPU Cooling Fan

<p>1) Thermal conductivityPolypropylene Fan Blades Angle One</p> 	<p>2) Flow Simulation ofPolypropylene Fan Blades Angle One</p> 
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Working Principle

Using solidworks 2019 we created and analysed the cpu cooling fan. Sketch of the fan and casing were drawn by using line, circle and arc in the sketch commands. Each and every measurements of parts were drawn by iso(MMGS).

We extrude the sketch of casing and fan by using boss extrude feature which is available in solidworks. Fan blades were drawn and multiplied by using circular pattern commands. Materials were selected from the solidworks material section for each parts. Plastics were used in the casings. Fan blades were selected for two types of materials Aluminium and Polypropylene.

After finishing the both parts we have to assemble the parts in the assembly section the solidworks 2019. For assembly, we are using mate, rotate and moving commands. After assembly, we have fix the motor in the center of the fan blades for rotation. we have to use motion study which is in assembly section.

We have to fix the part which is to be rotated and select the face of the rotational direction and enter the speed. In the rotational motion study we have to give the speed unit in RPM (Revolution per minute).

After finishing we have add the new part in the cooling fan which is going to act as rotational region.

We have to draw the circle from center of the fan upto edge of the fan blades and extrude the sketch using boss extrude command.

And hide the new part which is named as rotational region. This is for analysing purposes. And goto the solid works flow simulation section, here we are going to analysis the heat flow in the fan blades.

We have to set the boundary conditions for conduct the analyze within the area. After setting the boundary condition we have to fix the speed of the flow and part. We have to set the RPM speed in negative sign for exhaust purpose. Commonly we fixed -5600 RPM.

Create a new wizard in the flow simulation section select the SI unit system and select the rpm unit for angular velocity. And select the substance which is flowing through the fan. Air is selected as the substances which is going to flow through it.

Finally run the study in the flow simulation section. After running the study there is flow trajectories, We have to set flow trajectories as temperature.

Here the temperature is mentioned in Kelvin.

For the viewing purpose the heat flows will be viewed as arrow lines.

After that we can see the animation of the arrows as heat flow, the amount of heat will be displayed in different colour. From that we can analyze how much amount of heat is flowing through it.

Conclusion

- While comparing the aluminium fan blades and plastic fan blades, Aluminium absorbs the more heat and even though it has a heavy efficiency of heat absorbing is high.
- While making different type of cooling fan Blades angle it increases the efficiency of cooling and suck the more hot air.
- The fan blade angles were giving different amounts efficiency while comparing to normal plastic one.
- But, aluminium has more weight and its rpm also reduce due to weight while comparing to plastic cooling fan, the aluminium cooling fan amount of heat suction is high.

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