

## WEEK 8: GEOMETRY MODEL

- **Geometry model**

- In this project, 2 blade models are used. Blades' airfoil profile is SD8000.
- All models have a mean chord of  $c = 6$  cm and the radius of rotation  $R = 0.35$  m.
- To generate geometry models, SolidWorks 2018 is used. Blade number of models is 3.
- Model 1 has no pitch angle while Model 2 has pitch angles. Shown in Table 1 are the geometric parameters of blades.

Section	$r$ (m)	$c$ (m)	$\theta_p$ (degree)
1	0.08	0.060	0
2	0.11	0.091	21.8
3	0.14	0.108	17.2
4	0.17	0.091	14.4
5	0.20	0.079	12.5
6	0.23	0.069	10.3
7	0.26	0.062	8.6
8	0.29	0.056	7.3
9	0.32	0.051	6.2
10	0.35	0.046	5.2

Table 1. Geometric Parameters

Generating the geometry model,

1. The airfoil profile of SD8000 is used in SolidWorks.

2. Blades consist of 10 planes and it has length of 0.27m and the plug part of blade has length of 0.8m
3. Mean chord length is 0.06 m and in Table 1, specific chord lengths for each plane is given
4. After each blade is completed, blades are used in assembly section of SolidWorks to assemble 3 blades to hub.

In the Figure 4 Shown Model 2's Blade Geometry models created using SolidWorks.

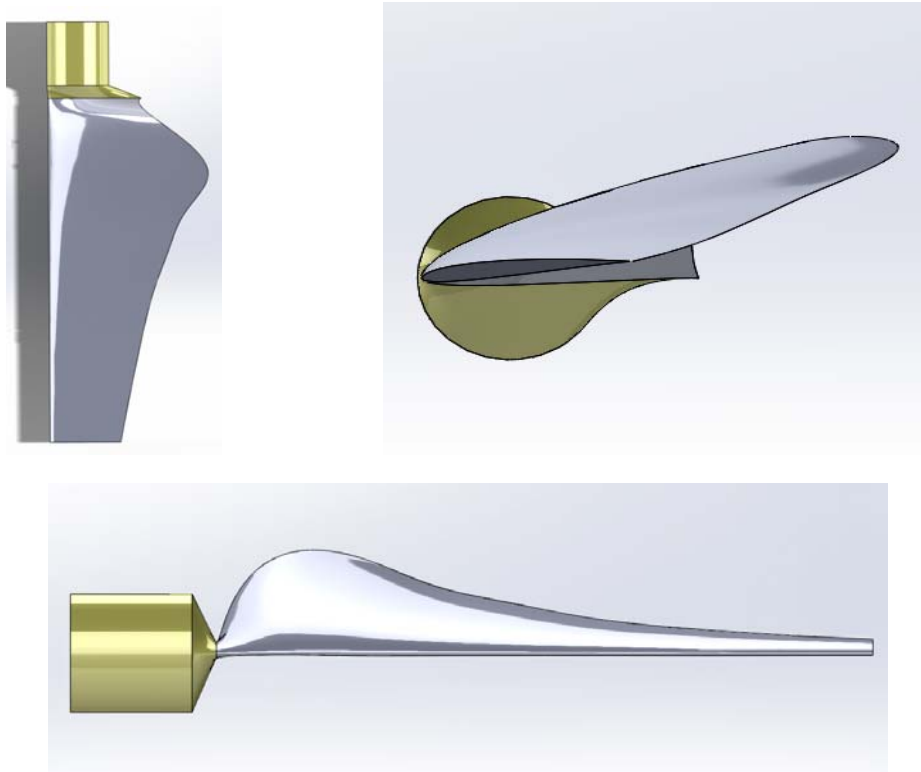


Figure 4. Geometry models created for Model 2

In Figure 5 shown Model 1's Blade Geometry models created using SolidWorks

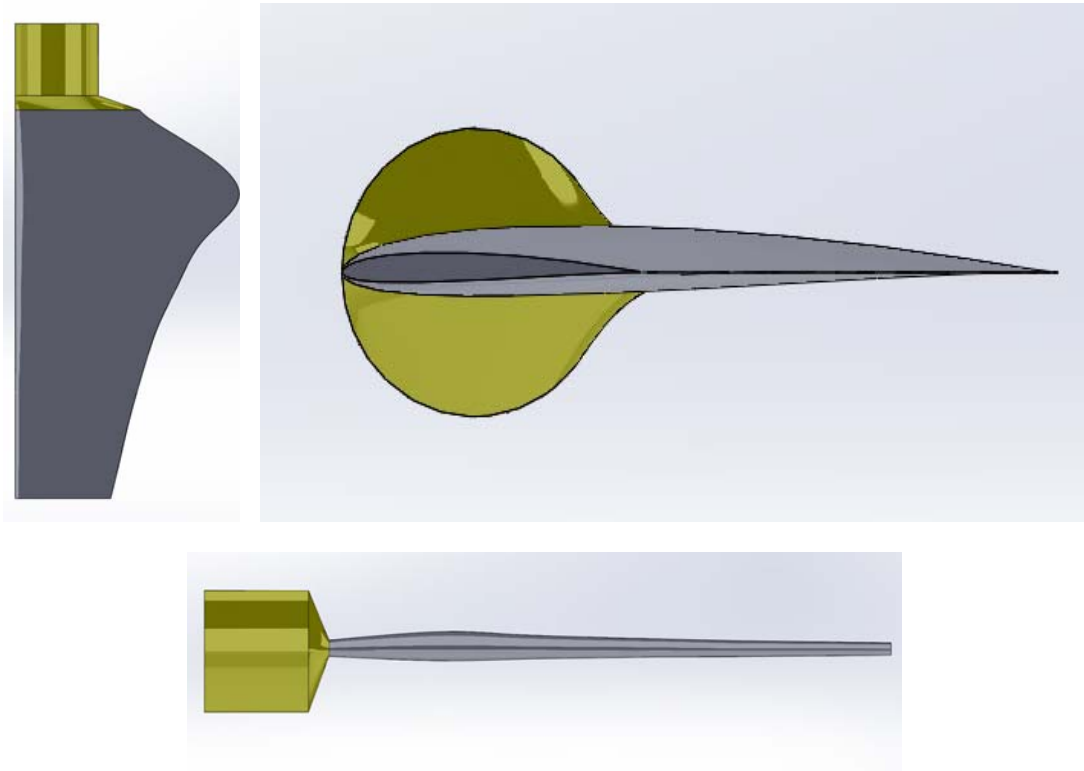


Figure5. Geometry models created for Model 1

Shown in Figures 6 and 7, horizontal 3 blade turbine geometries of Model 1 and Model 2

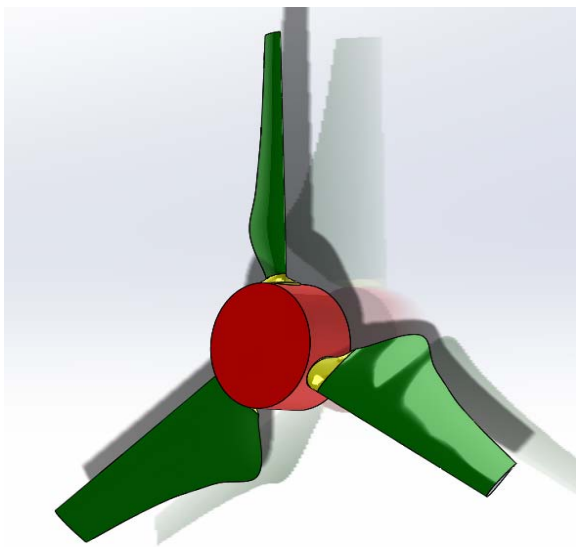


Figure 6 . Model 1

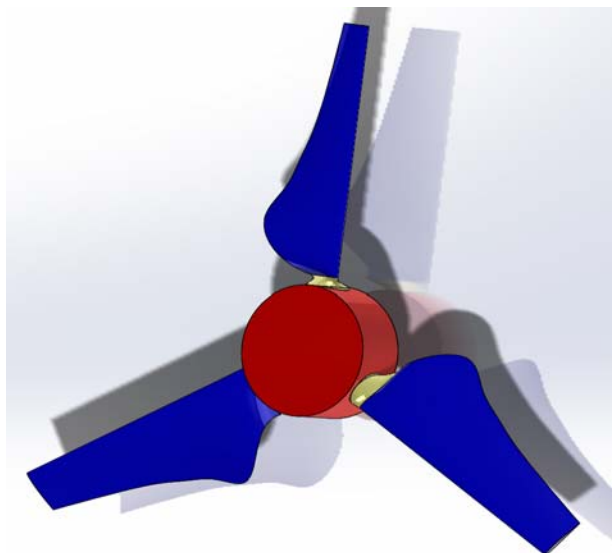


Figure 7. Model 2