

## **DESIGN AND ANALYSIS OF AN AERIAL WORKING PLATFORM, 2012** Ebubekir GÜNEŞ Muhammet Y. NAYİR Yasin AKSUNGUR Supervisor : Assoc. Prof. Dr. Mehmet Ali GÜLER

**UNIVERSITY OF** ECONOMICS AND TECHNOLOGY



# Abstract

Nowadays, in many industrial areas, aerial working platforms are increasingly used instead of non-technological products intend of lifting any kind of loads. In this project, an aerial working platform is examined on request of HIDROKON company. Mechanical analysis and design modifications are made on this product according to company's demands and regulations. For these analysis and modifications, SolidWorks, ANSYS, AutoCad Inventor and HyperMesh are used. The results which are taken from these programs are compared with analytical solutions' results. Finally, the product design is optimized depending on compared results.

<b>Product Specification</b>	
Height	10 m
Working Height	12 m
Capacity	350 kg
Standards	TS EN 280







Assembly of the product in SolidWorks



### **Design and Analysis SolidWorks**

SolidWorks software lets to draw 3D CAD parts and assemblies. It introduces data management and it has a wide range of library. SolidWorks offers to simulate the assemblies. Nowadays, most of the companies used SolidWorks for designing.

### ANSYS

ANSYS offers a wide range of engineering simulation solution sets assuring access to virtually any field of engineering simulation that a design process requires. Companies use ANSYS to reach the best results for their engineering simulation software investment.

#### **HyperMesh**

HyperMesh is a program that components can be meshed easily. HyperMesh has a lot of choices to mesh. It saves the time while changing thickness of the geometry with its midsurface method.

A view of the system with mesh in Transient Structural Model (ANSYS)









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A view of equivalent stress on a connection part of cylinder in Static Structural Model



A view of total deformation on a connection part of cylinder in Static Structural Model



A view of safety factor on a connection part of cylinder in Static Structural Model

# Conclusion

In this project, examined studies for an aerial working platform are given below;

- Force changes in between min. and max. position of the aerial working platform
- Stresses on each profile
- **Total Deformations on each profile**
- Safety Factors on each profile
- Analysis for different mesh size of a profile
- **Different profile thickness**
- **Different bushing thickness**
- Loading on different points
- **Optimization of the system**