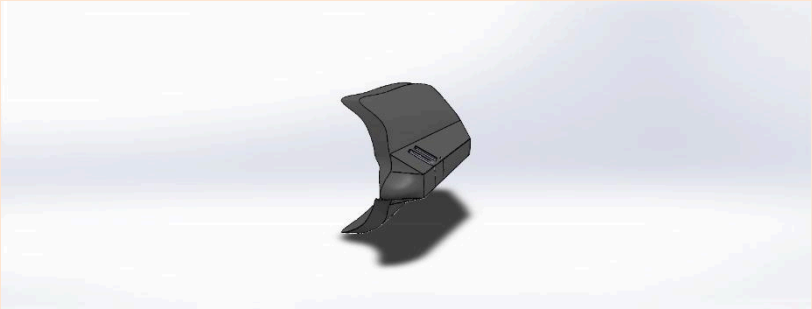


Simulation of Combined mask

Date: Sunday, May 23, 2021
Designer: Solidworks
Study name: Design Study 1
Analysis type: Design Study

Table of Contents

Description

No Data

Designing a component or its part is crucial, and the first step into prototyping a model How a product is going to stand up in the real world matters a lot. After conducting the Static study, we used the data to conduct the Design study on Solidworks Simulation. We had to modify the parts several times, like the thickness of the material, to get a final satisfying design.

Model Information

Document Name	Configuration	Document Path	Date Modified
Combine mask	Default	C:\Users\USER\Downloads\Assembly of everuthing\Combine mask.SLDPRT	May 22 17:38:39 2021

Study Properties

Study name	Design Study 1
Analysis type	Design Study (Optimization)
Design Study Quality	High quality (slower)
Result folder	SOLIDWORKS document (C:\Users\USER\Downloads\Assembly of everuthing)

Units

Unit system:	SI (MKS)
Length/Displacement	mm
Temperature	Kelvin
Angular velocity	Rad/sec
Pressure/Stress	N/m^2

Design Study Setup

Design Variables

Name	Type	Value	Units
Thickness 2	Range with Step	Min:3 Max:5 Step:1	mm
Thickness1	Range with Step	Min:3 Max:5 Step:1	mm
Thickness3	Range with Step	Min:3 Max:5 Step:1	mm

Constraints

Sensor name	Condition	Bounds	Units	Study name
Mass3	is greater than	Min:5	g	-

Goals

Name	Goal	Properties	Weight	Study name
Stress1	Minimize	Stress	10	Static 1

Study Results

2 of 29 scenarios ran successfully.

Component name	Units	Current	Initial	Optimal	Scenario1	Scenario2
Thickness 2	mm	0.5	0.5	0.5	3	4

Thickness1	mm	0.5	0.5	0.5	3	3
Thickness3	mm	0.5	0.5	0.5	3	3
Mass3	g	9.19508	9.19508	9.19508	-	-
Stress1	N/mm^2 (MPa)	0.016501	0.016501	0.016501	-	-

Component name	Units	Scenario3	Scenario4	Scenario5	Scenario6	Scenario7
Thickness 2	mm	5	3	4	5	3
Thickness1	mm	3	4	4	4	5
Thickness3	mm	3	3	3	3	3
Mass3	g	-	-	-	-	-
Stress1	N/mm^ 2 (MPa)	-	-	-	-	-

Component name	Units	Scenario8	Scenario9	Scenario10	Scenario11	Scenario12
Thickness 2	mm	4	5	3	4	5
Thickness1	mm	5	5	3	3	3
Thickness3	mm	3	3	4	4	4
Mass3	g	-	-	-	-	-
Stress1	N/mm^ 2 (MPa)	-	-	-	-	-

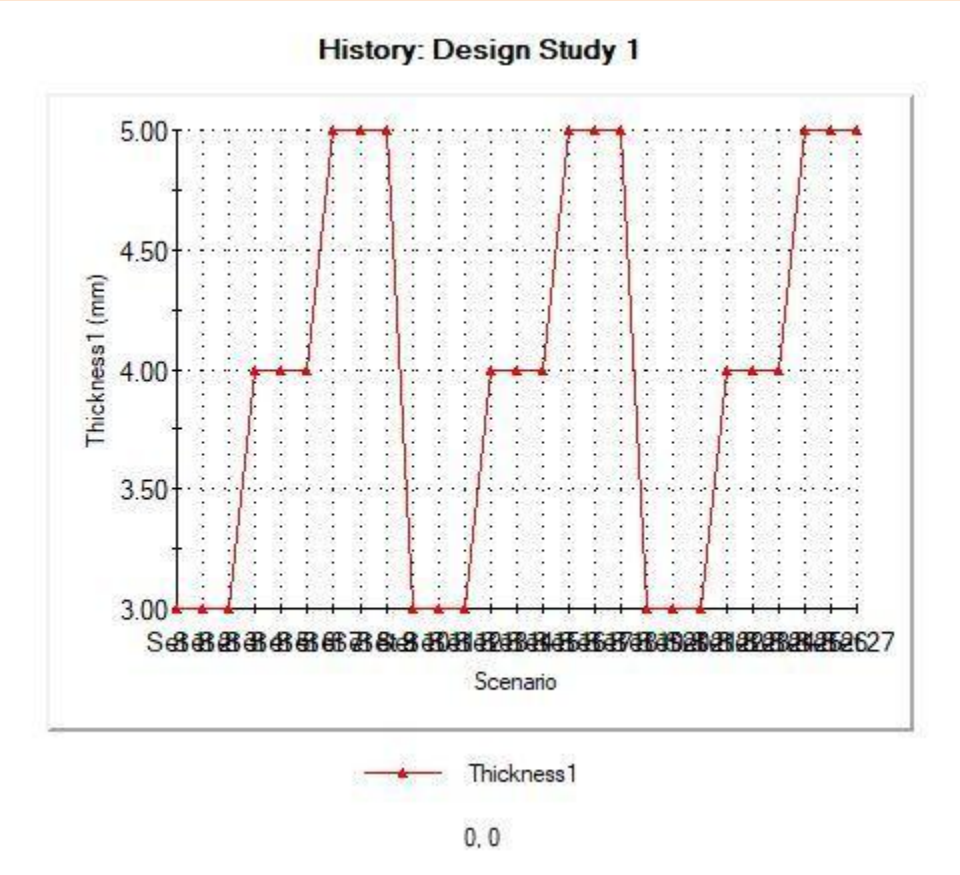
Component name	Units	Scenario13	Scenario14	Scenario15	Scenario16	Scenario17
Thickness 2	mm	3	4	5	3	4
Thickness1	mm	4	4	4	5	5
Thickness3	mm	4	4	4	4	4
Mass3	g	-	-	-	-	-
Stress1	N/mm^ 2 (MPa)	-	-	-	-	-

Component name	Units	Scenario18	Scenario19	Scenario20	Scenario21	Scenario22
Thickness 2	mm	5	3	4	5	3
Thickness1	mm	5	3	3	3	4
Thickness3	mm	4	5	5	5	5
Mass3	g	-	-	-	-	-
Stress1	N/mm^ 2 (MPa)	-	-	-	-	-

Component name	Units	Scenario23	Scenario24	Scenario25	Scenario26	Scenario27
Thickness 2	mm	4	5	3	4	5
Thickness1	mm	4	4	5	5	5
Thickness3	mm	5	5	5	5	5
Mass3	g	-	-	-	-	-
Stress1	N/mm^ 2 (MPa)	-	-	-	-	-

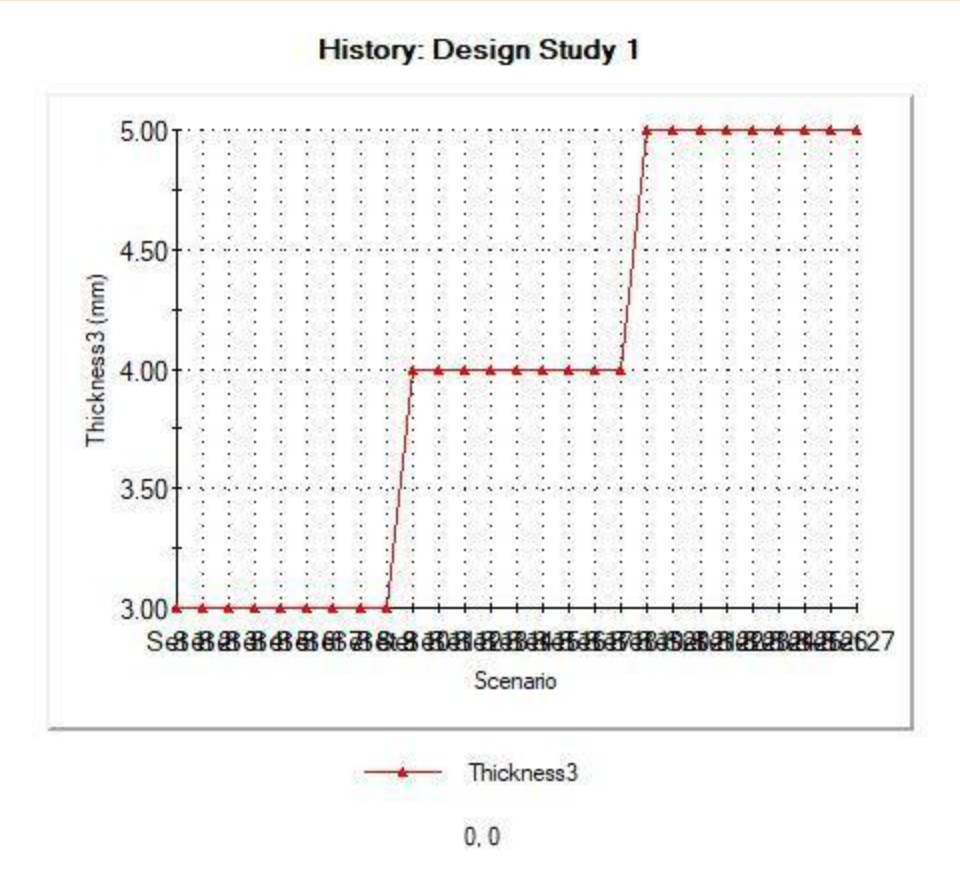
Name	Type	Min	Max

Graph1	History: Design Study 1	-	-



Combine mask_Design Study 1-History: Graph1

Name	Type	Min	Max
Graph3	History: Design Study 1	-	-



Combine mask_Design Study 1-History: Graph3

Conclusion

The design study focuses on the eco-design methodology of making an environmentally sustainable face mask. This analysis was adequately implemented using Solidworks design study simulation. To date, this design study is crucial in an attempt to contribute to the preservation of the natural environment while facing the world COVID-19 emergency, with a preventive approach to be applied during the design phase. More generally, considering that the risk of future unexpected events such as the COVID-19 pandemic is not null, it can be affirmed that this kind of methodology will be helpful each time a very high demand for disposable fossil-based products (as face masks) will be needed to face an emergency.