

Stresstest av IGLO Fönsterskydd

Stresstestet är utfört i simulator på fönsterskyddets aluminiumkorset och testar händelseförloppet vid en belastning på 200 kg tryck.

Förutsättningar är att infästningarna i fönsterkarm är utfört så att:

- Svarta trimmlinor fästes direkt runt gångjärn.
- Svarta remmar fästes runt aluminiumkorset samt direkt i skruvöglor vilka är infästa i karm.

Fakta:

- Svart rem kan belastas till 400 kg/st.
- Svart lina (4mm trimmlina) kan belastas till 400 kg/st.
- Plasten har en draghållfastighet på 116 kg/5cm.
- Aluminium fyrkantör 20x20x2mm är av kvalitet 6060, härdade.

Testresultatet visar att fönsterskyddet är intakt vid 200 kg trycks belastning på korset och att den armerade plasten klarar en belastning på 116 kg/5cm. Det betyder att när arbete sker i karmen fungerar aluminiumkorset som ett stöd och skydd för arbetaren.

Nordwind AB
Uppsala den 29/09 - 2010.

Per Båth

Stress Analysis Report

Autodesk®

| | |
|----------------------------|---------------------------------|
| Analyzed File: | Stress_F_skydd.iam |
| Autodesk Inventor Version: | 2010 SP1 (Build 140253100, 253) |
| Creation Date: | 2010-09-29, 01:28 |
| Simulation Author: | GBo |
| Summary: | |

Project Info

Project

| | |
|-------------|----------------|
| Part Number | Stress_F_skydd |
| Designer | GBo |

Physical

| | |
|-------------------|---|
| Mass | 14,4038 kg |
| Area | 3527490 mm ² |
| Volume | 12089600 mm ³ |
| Center of Gravity | x=92,8035 mm y=148,877 mm z=32,956 mm |

Simulation: 1

General objective and settings:

| | |
|---------------------------------------|-------------------|
| Design Objective | Single Point |
| Simulation Type | Static Analysis |
| Last Modification Date | 2010-09-29, 01:07 |
| Detect and Eliminate Rigid Body Modes | No |

Advanced settings:

| | |
|--|--------|
| Avg. Element Size (fraction of model diameter) | 0,1 |
| Min. Element Size (fraction of avg. size) | 0,2 |
| Grading Factor | 1,5 |
| Max. Turn Angle | 60 deg |
| Create Curved Mesh Elements | No |
| Ignore Small Geometry | No |

Material(s)

| | | |
|----------------|---------------------------|------------------------|
| Name | Aluminum-6061-AHC | |
| General | Mass Density | 2,71 g/cm ³ |
| | Yield Strength | 275 MPa |
| | Ultimate Tensile Strength | 310 MPa |
| Stress | Young's Modulus | 68,9 GPa |
| | Poisson's Ratio | 0,33 ul |
| | Shear Modulus | 25,9023 GPa |
| Stress Thermal | Expansion Coefficient | 0,0000236 ul/c |
| | Thermal Conductivity | 167 W/(m K) |
| | Specific Heat | 1256,1 J/(kg c) |
| Part Name(s) | StagV.ipt Stag H.ipt | |
| Name | Polycarbonate, Clear | |
| General | Mass Density | 1,2 g/cm ³ |

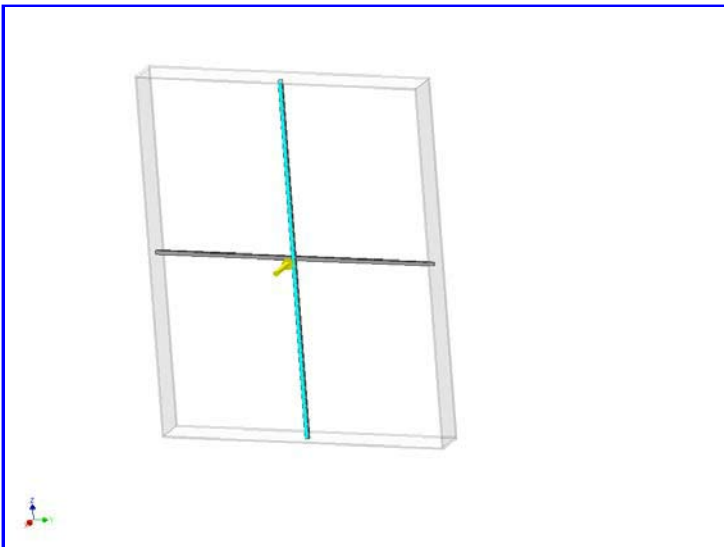
| | | |
|----------------|---------------------------|-------------------|
| | Yield Strength | 62,01 MPa |
| | Ultimate Tensile Strength | 68,9 MPa |
| Stress | Young's Modulus | 2,275 GPa |
| | Poisson's Ratio | 0,38 ul |
| | Shear Modulus | 0,824275 GPa |
| Stress Thermal | Expansion Coefficient | 0,0000675 ul/c |
| | Thermal Conductivity | 0,137 W/(m K) |
| | Specific Heat | 1256,1 J/(kg c) |
| Part Name(s) | Ram.ipt | |

Operating conditions

Force:1

| | |
|-----------|-------------|
| Load Type | Force |
| Vector X | -2000,000 N |
| Vector Y | 0,000 N |
| Vector Z | 0,000 N |

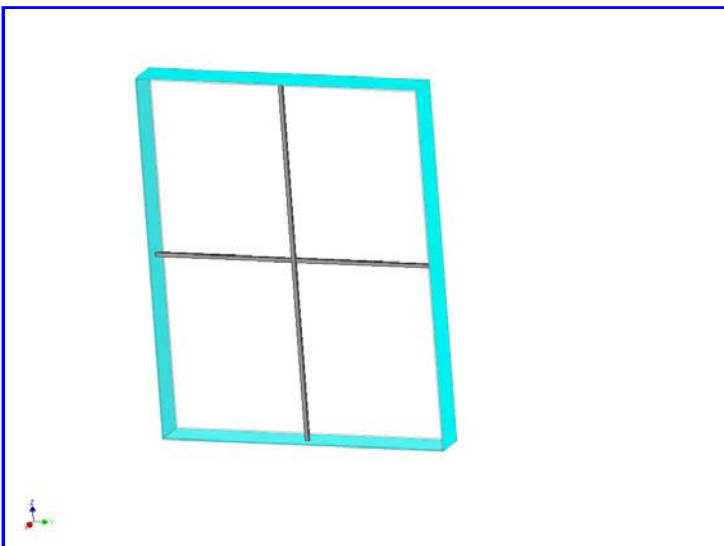
Selected Face(s)



Fixed Constraint:1

| | |
|-----------------|------------------|
| Constraint Type | Fixed Constraint |
|-----------------|------------------|

Selected Face(s)



Results

Reaction Force and Moment on Constraints

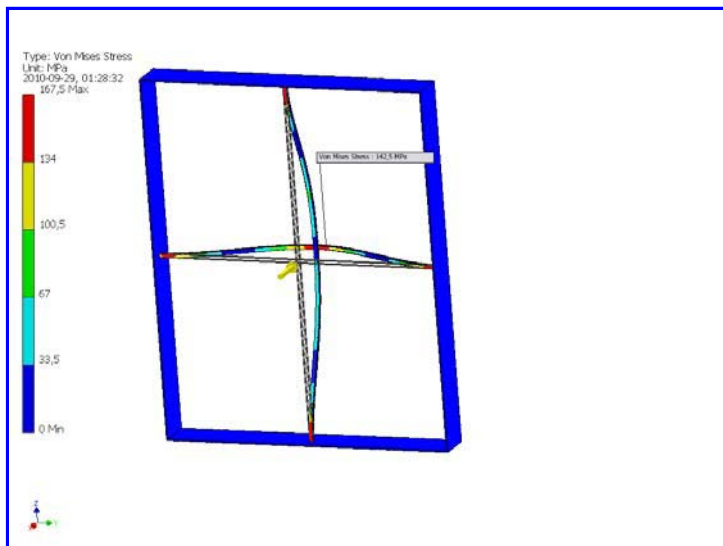
| Constraint Name | Reaction Force | | Reaction Moment | |
|--------------------|----------------|-------------------|-----------------|-------------------|
| | Magnitude | Component (X,Y,Z) | Magnitude | Component (X,Y,Z) |
| Fixed Constraint:1 | 2015,33 N | 2015,14 N | 62,685 N m | 59,3943 N m |
| | | 26,8207 N | | -5,8461 N m |
| | | 6,63792 N | | -19,1715 N m |

Result Summary

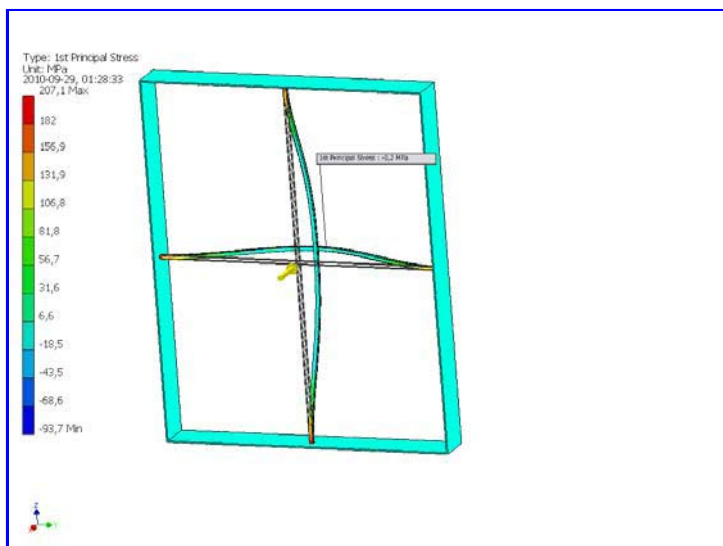
| Name | Minimum | Maximum |
|----------------------|--------------------------|-------------|
| Volume | 12089600 mm ³ | |
| Mass | 15,2903 kg | |
| Von Mises Stress | 0,0000423089 MPa | 167,511 MPa |
| 1st Principal Stress | -93,6548 MPa | 207,055 MPa |
| 3rd Principal Stress | -226,268 MPa | 85,6903 MPa |
| Displacement | 0 mm | 25,7241 mm |
| Safety Factor | 1,64168 ul | 15 ul |

Figures

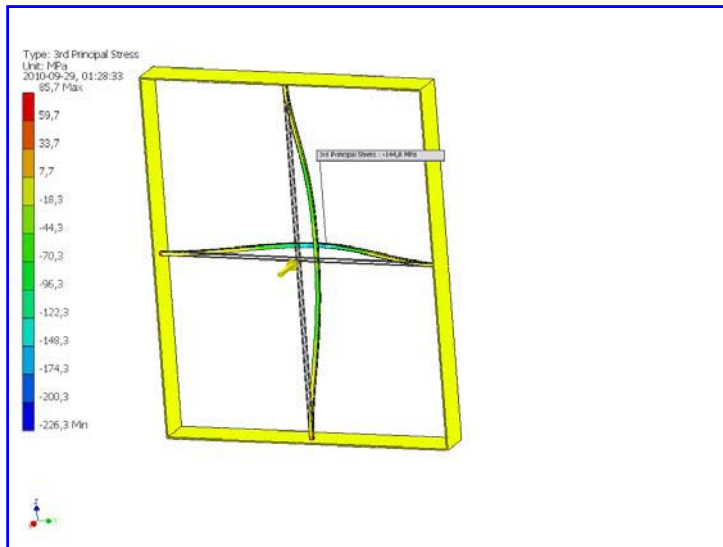
Von Mises Stress



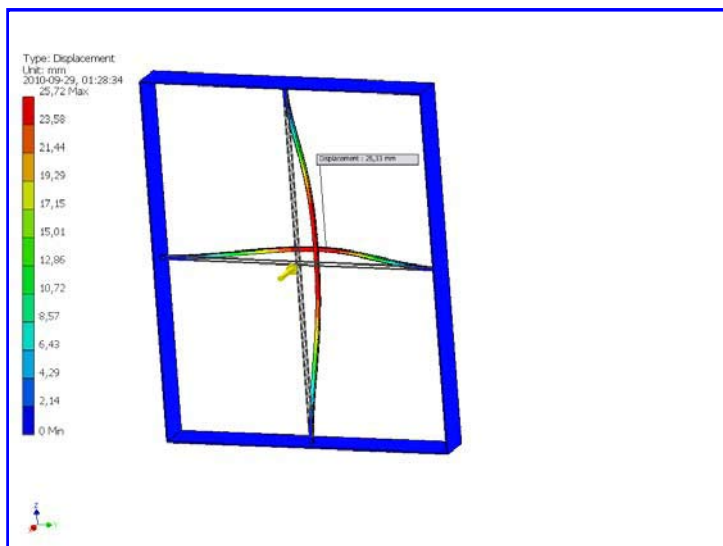
1st Principal Stress



3rd Principal Stress



Displacement



Safety Factor

