# Simulation of ITER Cone Simulation Spots

**Date:** Wednesday, March 23, 2016
**Designer:** Solidworks
**Study name:** Thermal 1
**Analysis type:** Thermal(Transient)

## Table of Contents

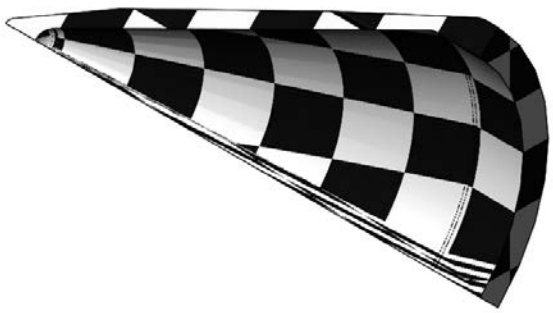


## Description

No Data

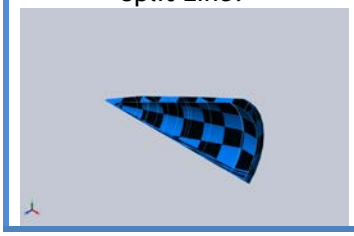
## Assumptions

## Model Information



**Model name:** ITER Cone Simulation Spots
**Current Configuration:** Default

**Solid Bodies**

| Document Name and Reference | Treated As | Volumetric Properties | Document Path/Date Modified |
|---|---|---|---|
| Split Line9  | Solid Body | **Mass:0.440706 kg**<br>**Volume:5.48825e-005 m^3**<br>**Density:8030 kg/m^3**<br>**Weight:4.31892 N** | **C:\Users\David\Desktop\Simulation\ITER Cone\ITER Cone Simulation Spots.sldprt**<br>Mar 23 14:35:04 2016 |

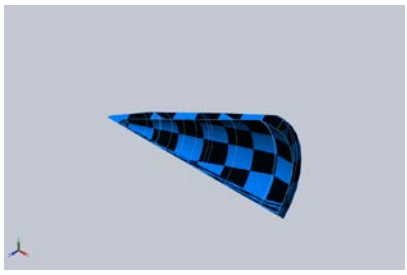
## Study Properties

| | |
|---|---|
| **Study name** | Thermal 1 |
| **Analysis type** | Thermal(Transient) |
| **Mesh type** | Solid Mesh |
| **Solver type** | FFEPlus |
| **Solution type** | Transient |
| **Total time** | 50 Seconds |
| **Time increment** | 0.01 Seconds |
| **Contact resistance defined?** | No |
| **Result folder** | SOLIDWORKS document (C:\Users\David\Desktop\Simulation\ITER Cone) |

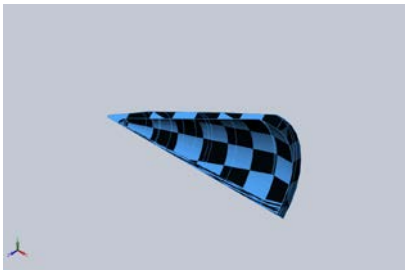
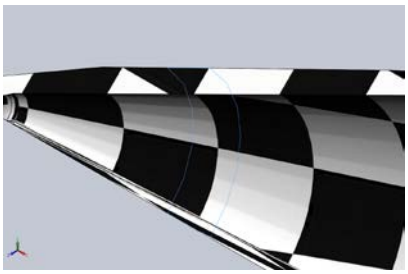
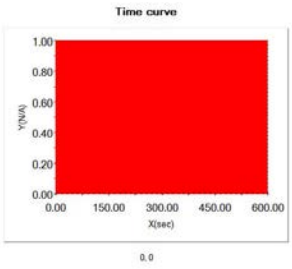
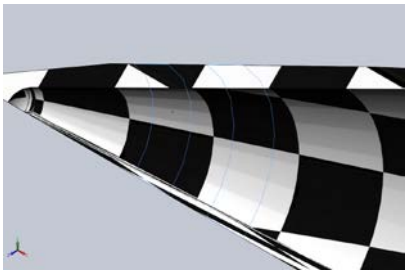
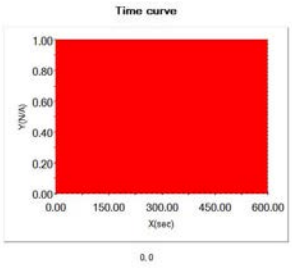
## Units

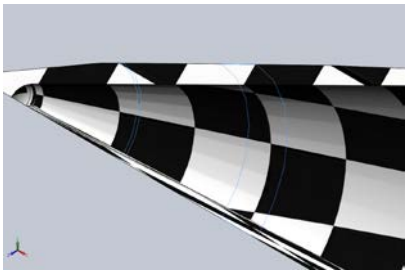
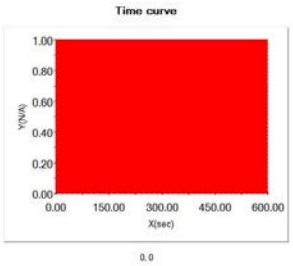
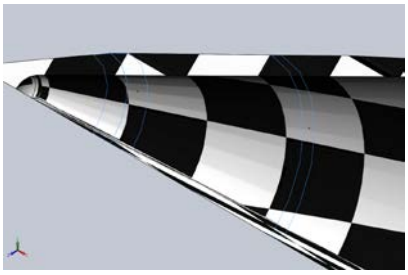
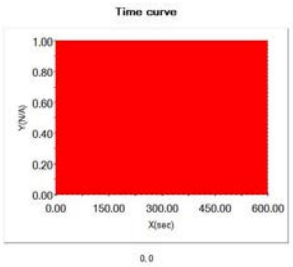
| | |
|---|---|
| **Unit system:** | SI (MKS) |
| **Length/Displacement** | mm |
| **Temperature** | Kelvin |
| **Angular velocity** | Rad/sec |
| **Pressure/Stress** | N/m^2 |

## Material Properties

| Model Reference | Properties | | Components |
|---|---|---|---|
|  | **Name:** | AK Steel 304L Austenitic Stainless steel | SolidBody 1(Split Line9)(ITER Cone Simulation Spots) |
| | **Model type:** | Linear Elastic Isotropic | |
| | **Default failure criterion:** | Max von Mises Stress | |
| | **Thermal conductivity:** | 16.3 W/(m.K) | |
| | **Specific heat:** | 500 J/(kg.K) | |
| | **Mass density:** | 8030 kg/m^3 | |
| Curve Data:N/A | | | |

## Thermal Loads

| Load name | Load Image | Load Details | Function Curve |
|---|---|---|---|
| Temperature-1 |  | **Entities:** 1 Solid Body (s)<br>**Initial temperature:** 25 Celsius | |
| Convection-1 |  | **Entities:** 1 face(s)<br>**Convection Coefficient:** 15000 W/(m^2.K)<br>**Time variation:** Off<br>**Temperature variation:** Off<br>**Bulk Ambient Temperature:** 313.15 Kelvin<br>**Time variation:** Off | |
| Heat Flux-1 |  | **Entities:** 1 face(s)<br>**Heat Flux Value:** 4.2e+006 W/m^2<br>**Time variation:** on |  <br>Time curve |
| Heat Flux-2 |  | **Entities:** 2 face(s)<br>**Heat Flux Value:** 3.5e+006 W/m^2<br>**Time variation:** on |  <br>Time curve |

| | | | |
|---|---|---|---|
| Heat Flux-3 |  | **Entities:** 2 face(s)<br>**Heat Flux Value:** 2.8e+006 W/m^2<br>**Time variation:** on |  <br>Time curve |
| Heat Flux-4 |  | **Entities:** 3 face(s)<br>**Heat Flux Value:** 2.1e+006 W/m^2<br>**Time variation:** on |  <br>Time curve |

## Contact Information

No Data

## Mesh information

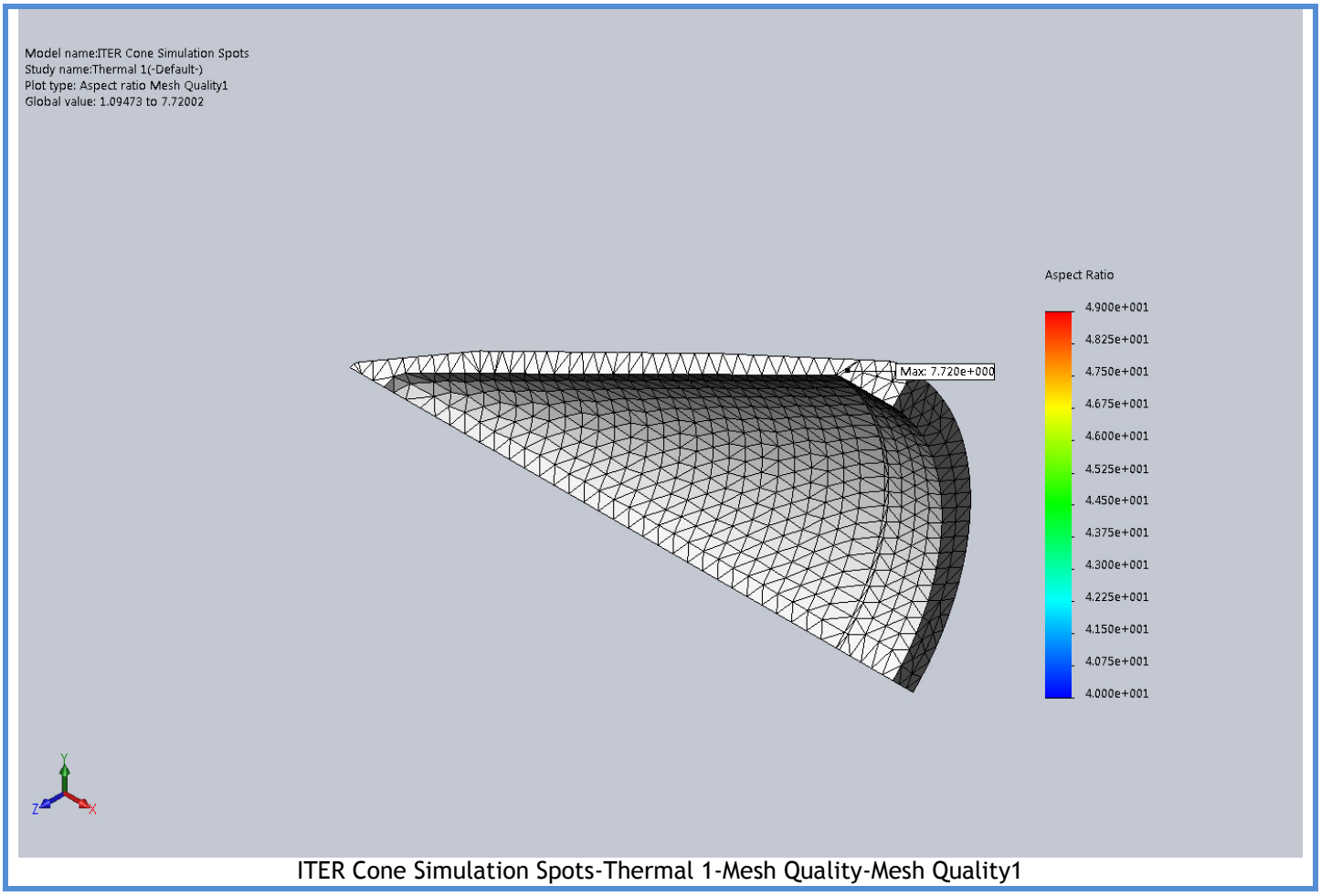
| | |
|---|---|
| **Mesh type** | Solid Mesh |
| **Mesher Used:** | Standard mesh |
| **Automatic Transition:** | Off |
| **Include Mesh Auto Loops:** | Off |
| **Jacobian points** | 4 Points |
| **Element Size** | 0.178619 in |
| **Tolerance** | 0.00893096 in |
| **Mesh Quality** | Draft Quality Mesh |

### Mesh information - Details

| | |
|---|---|
| **Total Nodes** | 1389 |
| **Total Elements** | 4782 |
| **Maximum Aspect Ratio** | 7.72 |
| **% of elements with Aspect Ratio < 3** | 96.9 |
| **% of elements with Aspect Ratio > 10** | 0 |
| **Time to complete mesh(hh;mm;ss):** | 00:00:42 |
| **Computer name:** | DAVID-PC |

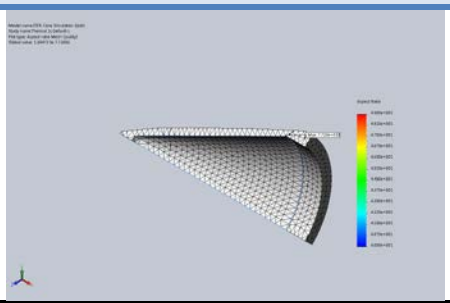
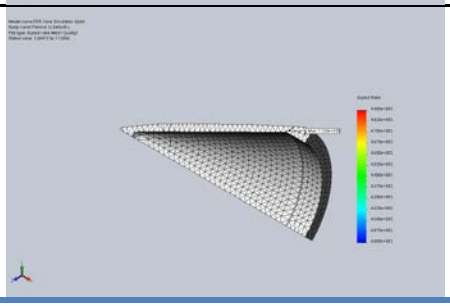
### Mesh Quality Plots

| Name | Type | Min | Max |
|---|---|---|---|
| Mesh Quality1 | Aspect Ratio | 1.09473<br>Element: 1172 | 7.72002<br>Element: 2203 |



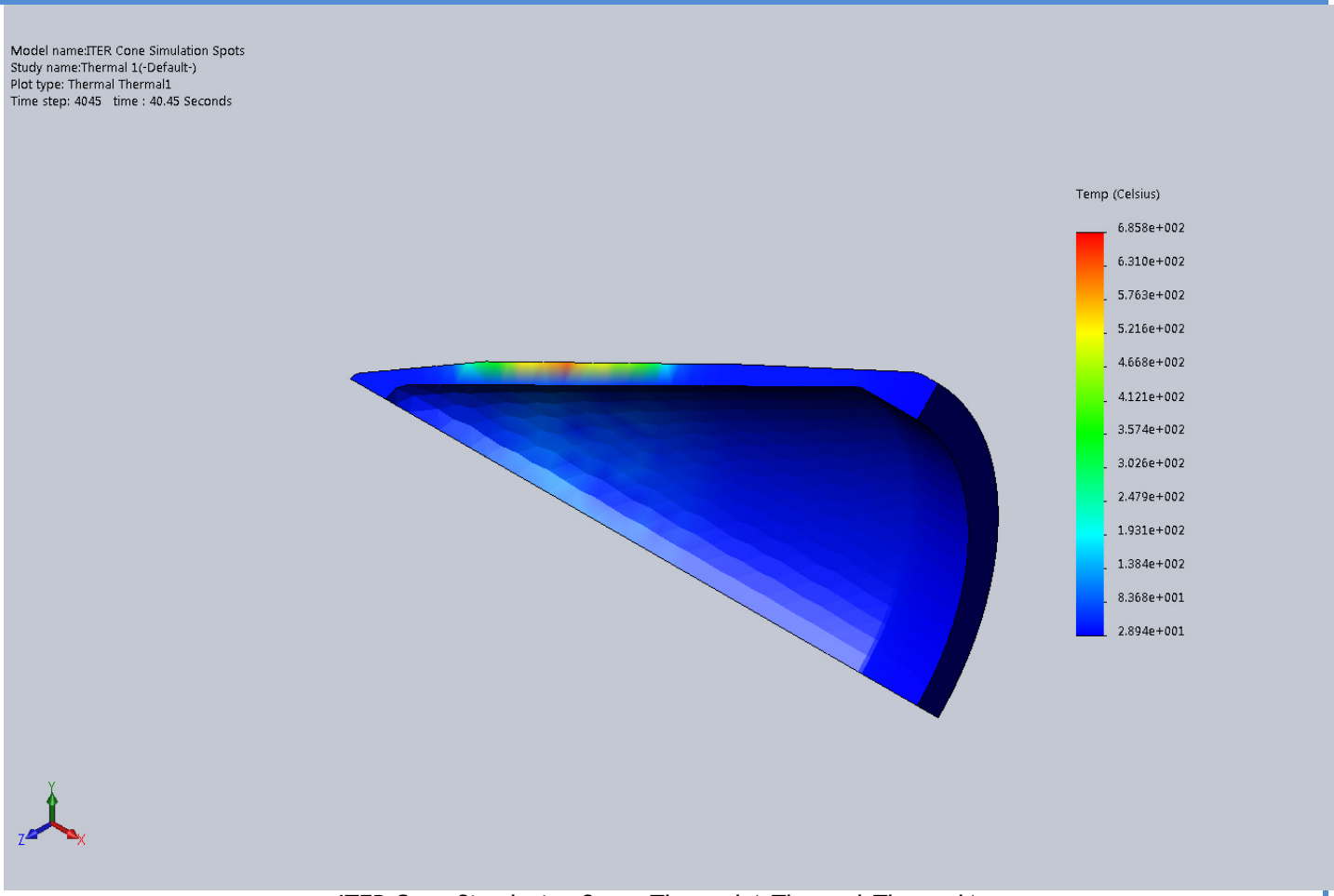

ITER Cone Simulation Spots-Thermal 1-Mesh Quality-Mesh Quality1

## Sensor Details

| Sensor name | Location | Sensor Details |
|---|---|---|
| Thermal1 |  | Value : Transient<br>Entities :1 face(s)<br>Result :Thermal<br>Component :TEMP: Temperature<br>Criterion :Max over Selected Entities<br>Step Criterion : Transient<br>Step No.:1<br>Alert Value: NA |
| Thermal2 |  | Value : Transient<br>Entities :<br>Result :Thermal<br>Component :TEMP: Temperature<br>Criterion :Model Max<br>Step Criterion : Transient<br>Step No.:1<br>Alert Value: NA |

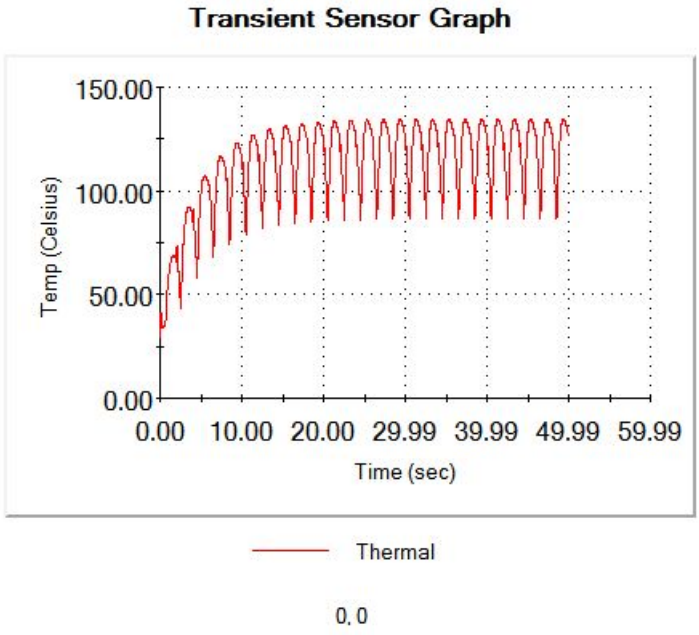
## Study Results

| Name | Type | Min | Max |
|---|---|---|---|
| Thermal1 | TEMP: Temperature at Step No: 4045(40.45 Seconds) | 28.9449 Celsius<br>Node: 686 | 685.758 Celsius<br>Node: 179 |



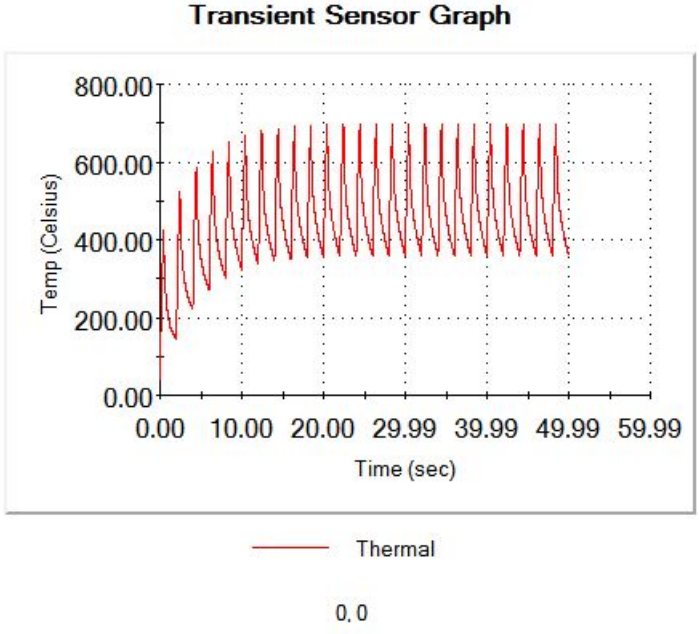

ITER Cone Simulation Spots-Thermal 1-Thermal-Thermal1

| Name | Type |
|---|---|
| Sensor Graph1 | <SR_Type/> |




ITER Cone Simulation Spots-Thermal 1-Sensor Graph-Sensor Graph1

| Name | Type |
|---|---|
| Sensor Graph2 | <SR_Type/> |




ITER Cone Simulation Spots-Thermal 1-Sensor Graph-Sensor Graph2

## Conclusion