

# Bare cavity leak tests

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ENGINEERING  
DEPARTMENT

# Motivation

- Explore the need of tools for performing leak tests on the bare cavity ( $\Delta p = 1$  bar)
- Leak tests:
  - Full cavity (flanges closed)
  - Partial cavity (before last weld)

# Partial cavity leak test

**F: No support H**

Figure

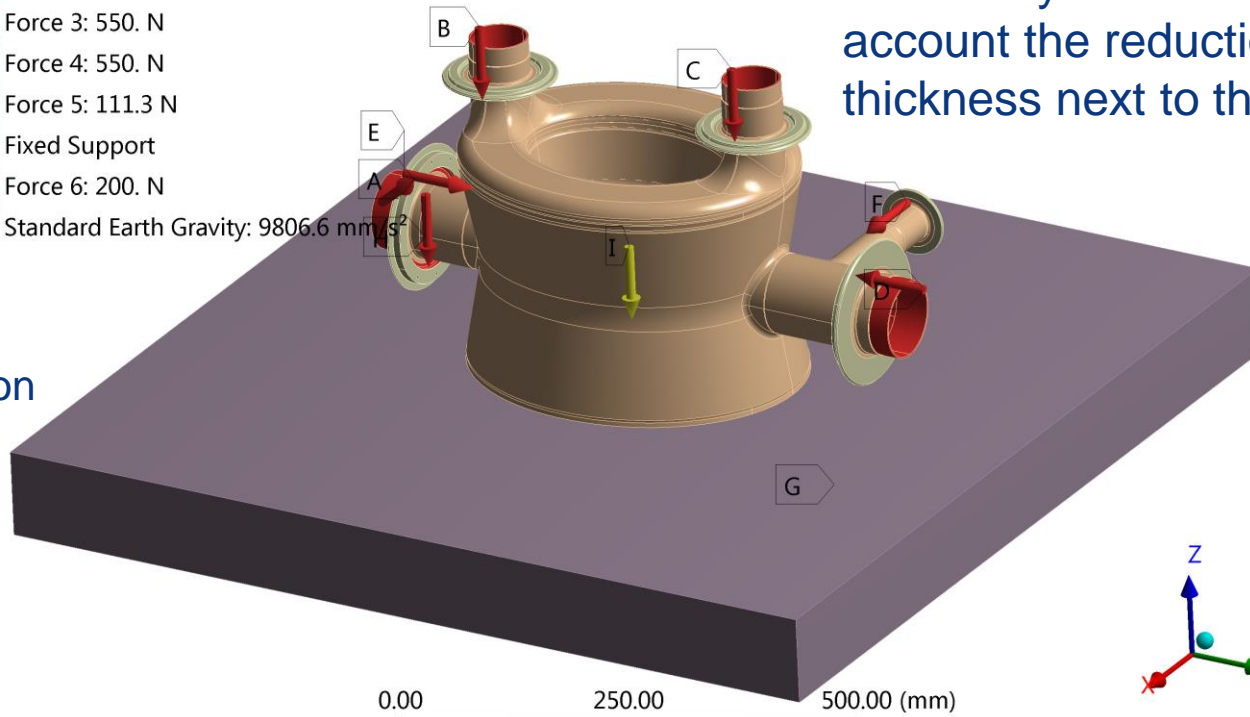
01/07/2016 16:47

- A** Pressure: -0.1 MPa
- B** Force: 302. N
- C** Force 2: 302. N
- D** Force 3: 550. N
- E** Force 4: 550. N
- F** Force 5: 111.3 N
- G** Fixed Support
- H** Force 6: 200. N
- I** Standard Earth Gravity: 9806.6 mm/s<sup>2</sup>

Force on closed flanges

Force to hold down cavity initially applied on the beam ports

The cavity model takes into account the reduction of thickness next to the welds



# Stress

**F: No support H**

Figure

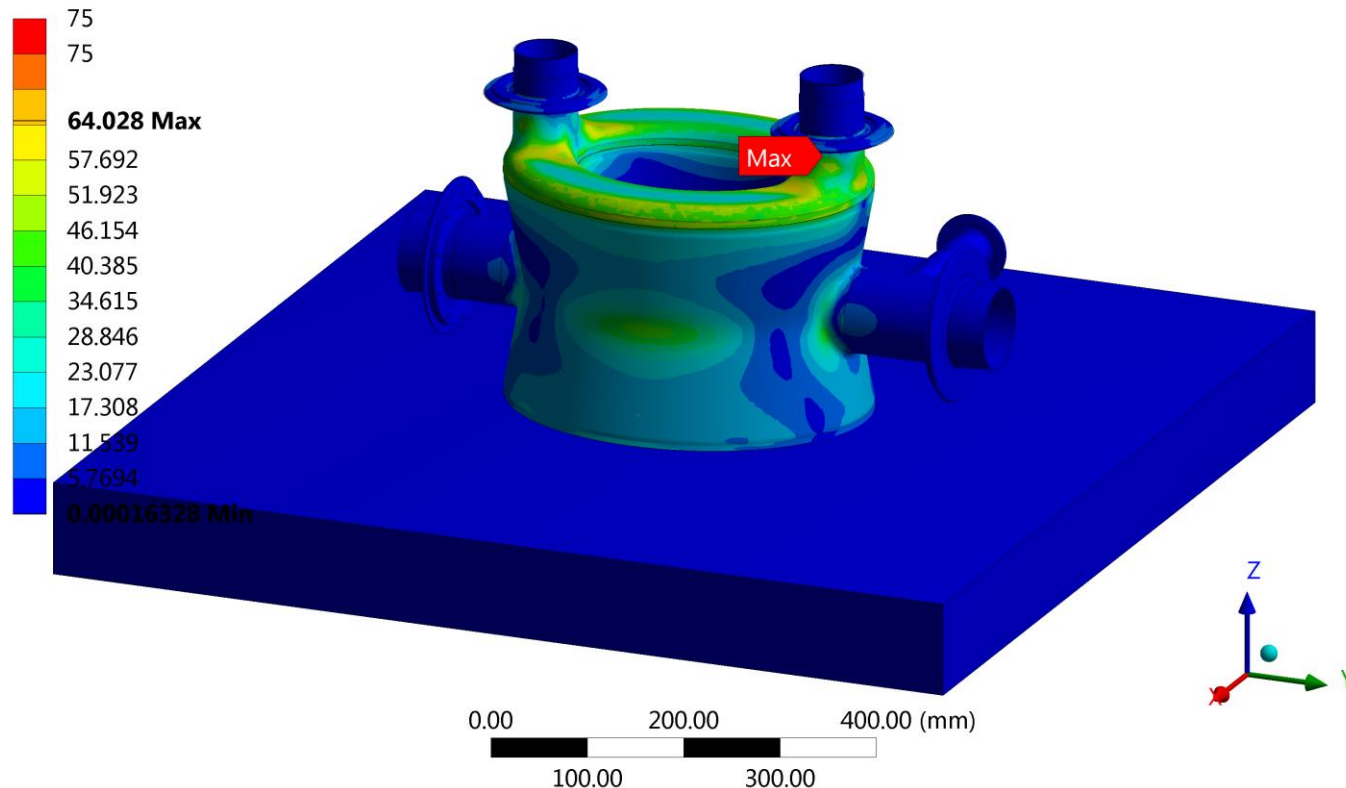
Type: Equivalent (von-Mises) Stress

Unit: MPa

Time: 1

01/07/2016 17:09

No safety factor applied  
on load or on material  
properties



# Deformation

**F: No support H**

Figure

Type: Directional Deformation(Z Axis)

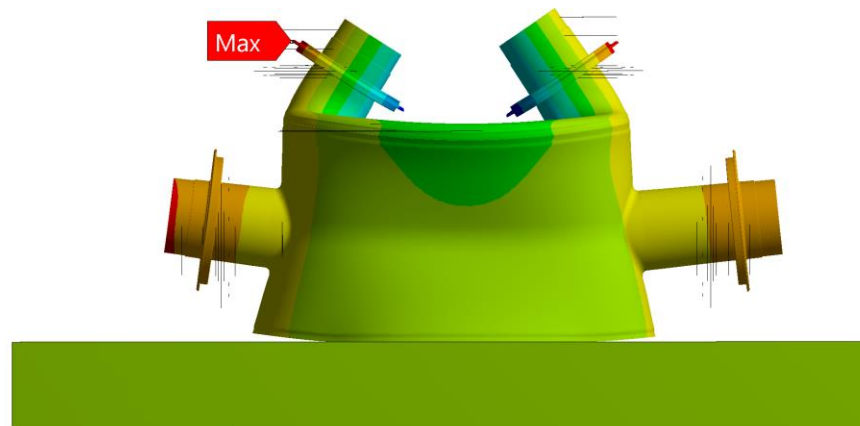
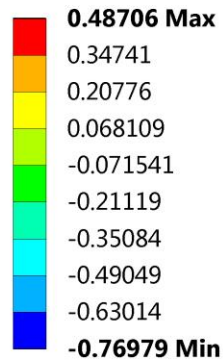
Unit: mm

Global Coordinate System

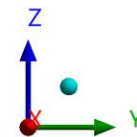
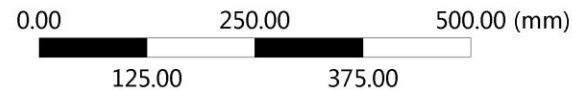
Time: 1

01/07/2016 17:27

BUCKLING factor: 14



Gap opening of  
0.14 mm



# Full cavity leak test

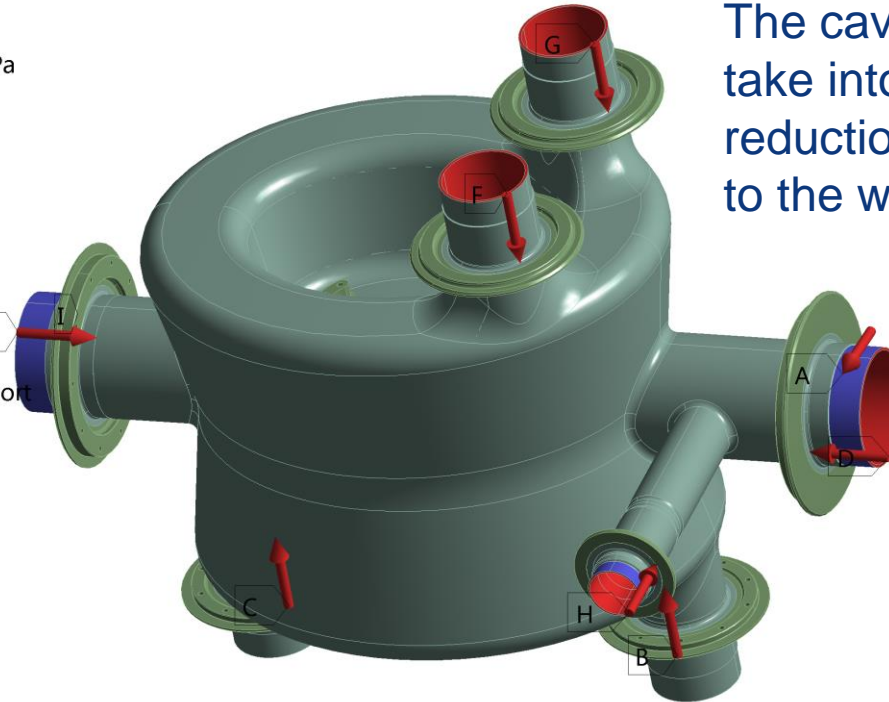
**D: No support full**

Figure

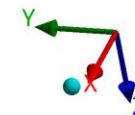
04/07/2016 08:29

- A** Pressure: -0.1 MPa
- B** Force: 302. N
- C** Force 2: 302. N
- D** Force 3: 540. N
- E** Force 4: 540. N
- F** Force 5: 302. N
- G** Force 6: 302. N
- H** Force 7: 111.3 N
- I** Frictionless Support

Force on closed flanges



The cavity model does NOT take into account the reduction of thickness next to the welds



# Stress

**D: No support full**

Figure

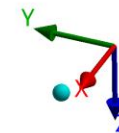
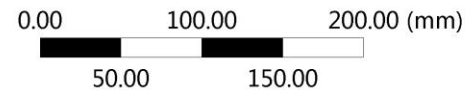
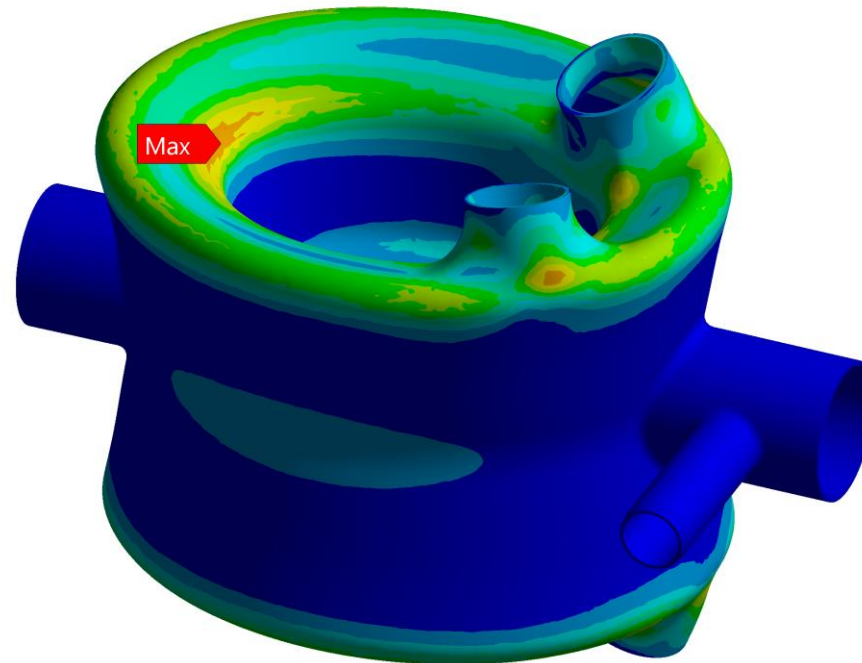
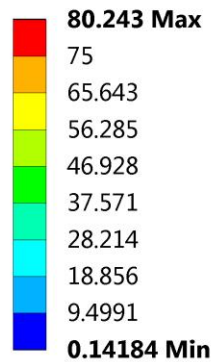
Type: Equivalent (von-Mises) Stress

Unit: MPa

Time: 1

04/07/2016 08:29

No safety factor applied  
on load or on material  
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