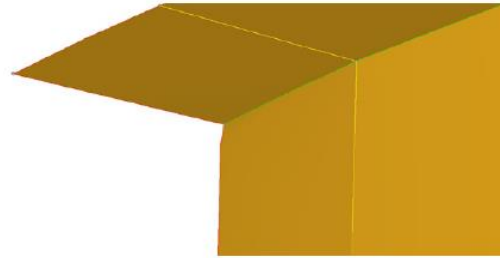
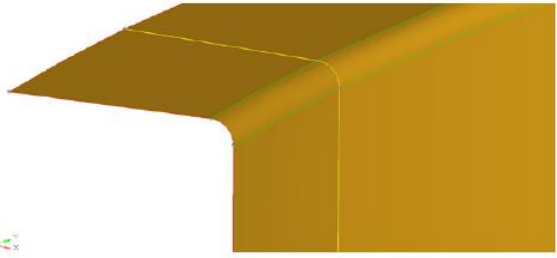


Common Issues

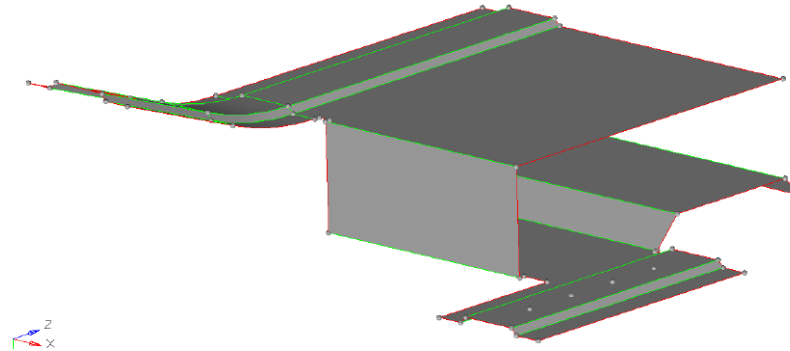
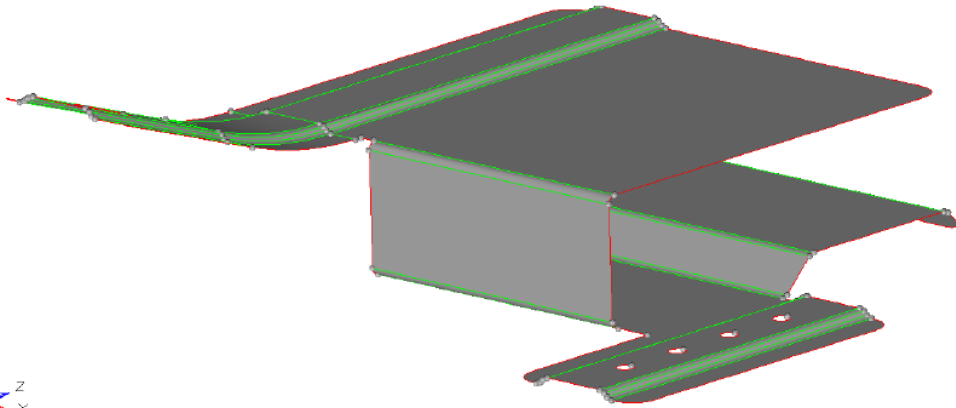


- FEA is just a computer program
 - Garbage in = garbage out!

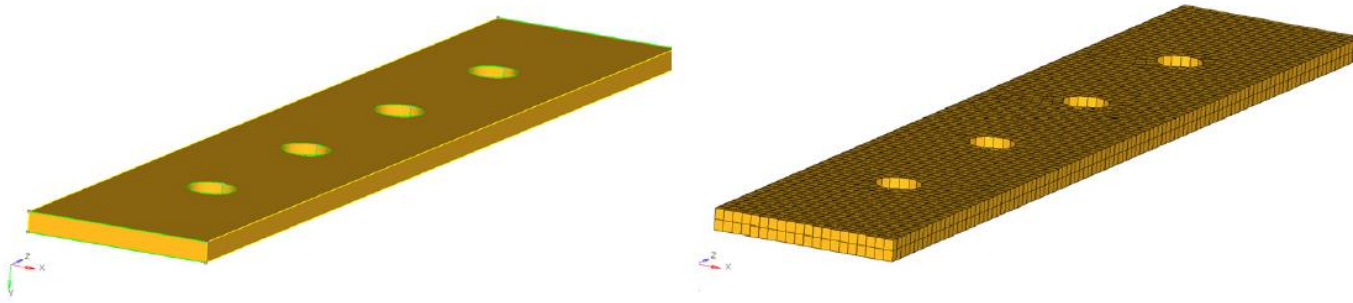
Geometry Simplification



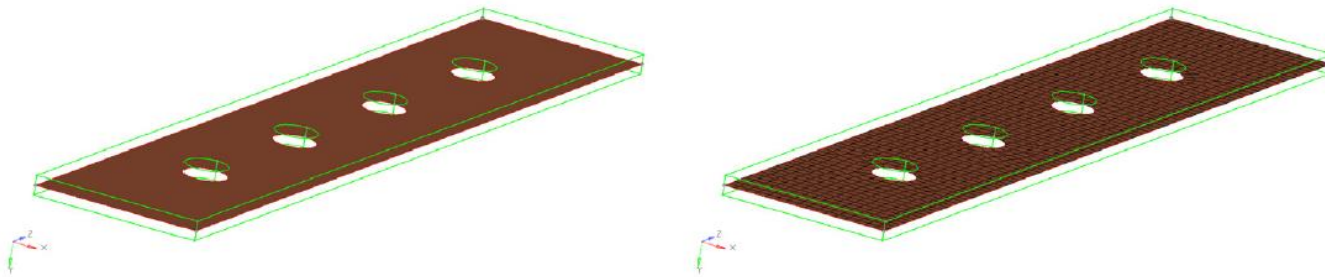
- Will your geometry simplification influence your results?



Meshing



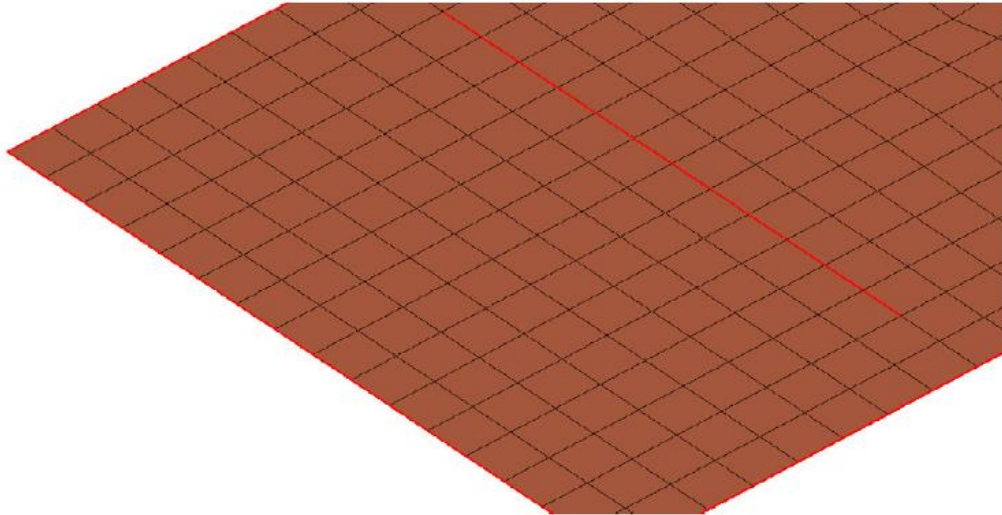
Model meshed with 3D elements



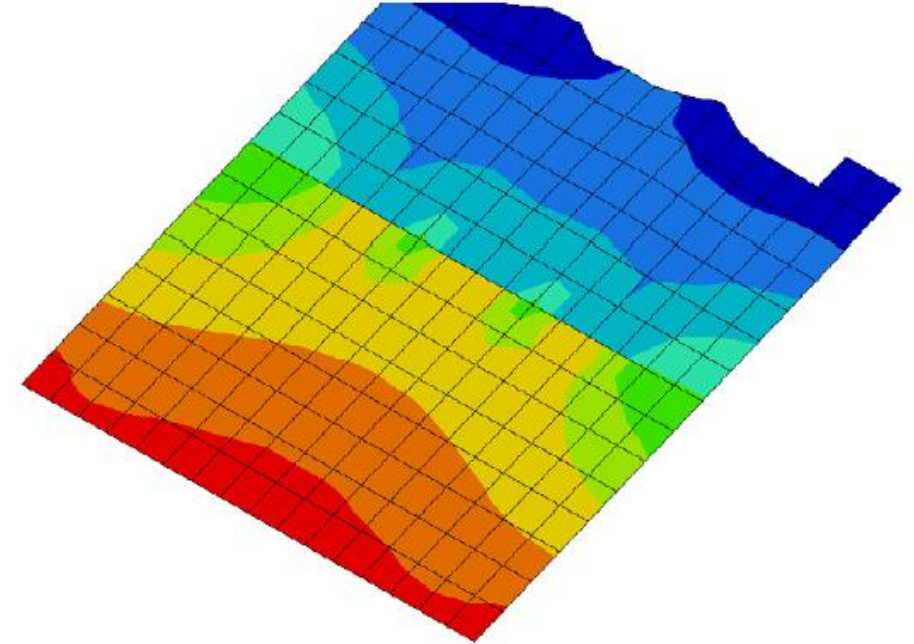
Model meshed with 2D elements

- Have you used the correct element type? Why?
- Is your mesh size appropriate?
- Have you check element quality?
- Have you checked for duplicates?

Meshing

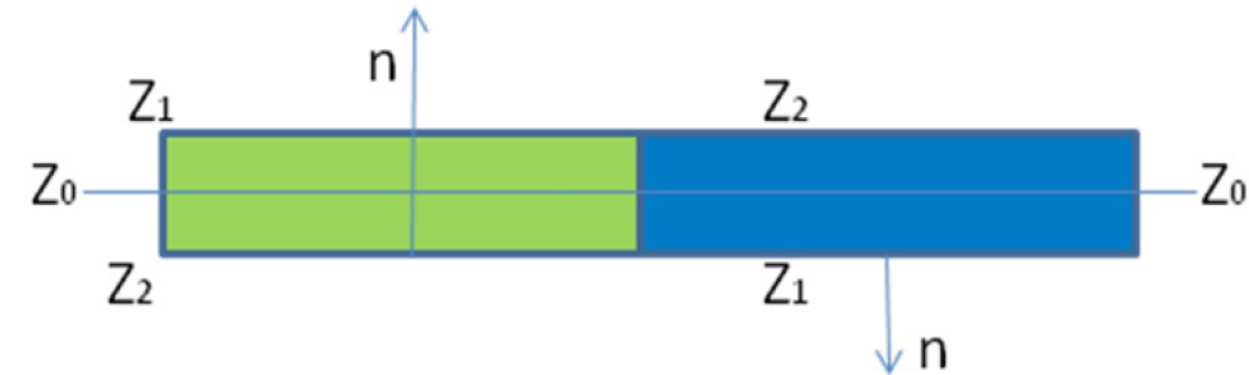


Contour Plot
Displacement(Mag)
Analysis system
5.073E-04
4.948E-04
4.824E-04
4.699E-04
4.574E-04
4.449E-04
4.324E-04
4.199E-04
4.074E-04
3.949E-04
Max = 5.073E-04
Grids 39333
Min = 3.949E-04
Grids 39522

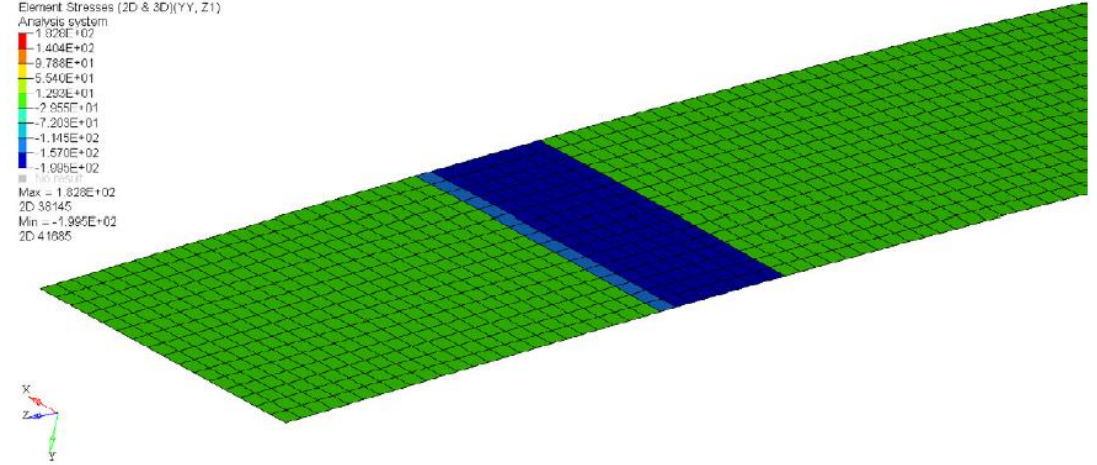


- Have you checked for free edges?

Meshing



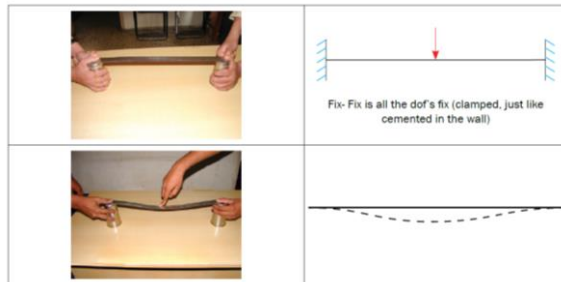
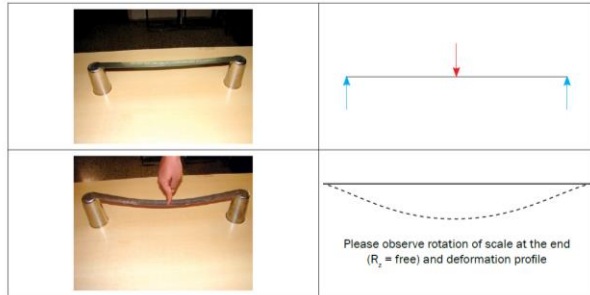
Contour Plot
 Element Stresses (2D & 3D)(YY, Z1)
 Analysis system
 1.828E+02
 -1.404E+02
 -9.788E+01
 -5.540E+01
 1.233E+01
 -2.955E+01
 -7.203E+01
 -1.145E+02
 -1.570E+02
 -1.985E+02
 Max = 1.828E+02
 2D 38145
 Min = -1.995E+02
 2D 41685

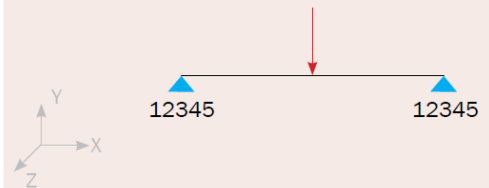
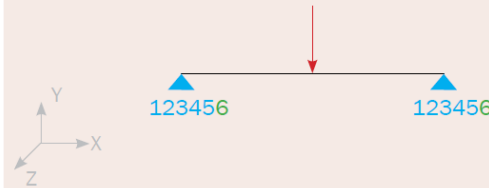


- Have you checked element normals?

Boundary Conditions

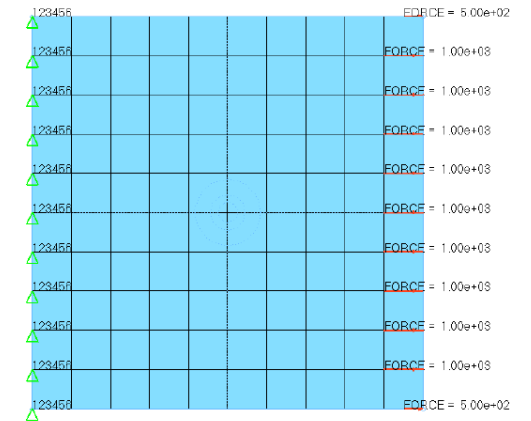
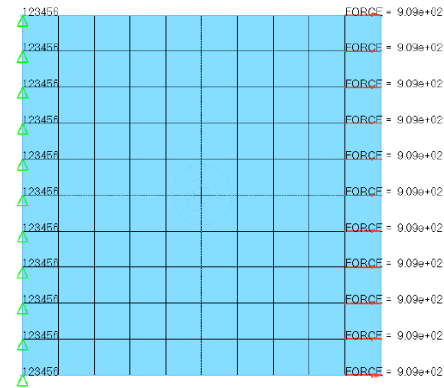
- Are these realistic?
 - Can these be checked with testing? Strain gauges/DTI gauges?
- Have 'hinges' been set-up?
- Nodes attached to solid elements do not have rotational stiffness
- If loads/constraints are attached to geometry – have you changed this? Is it still correct?



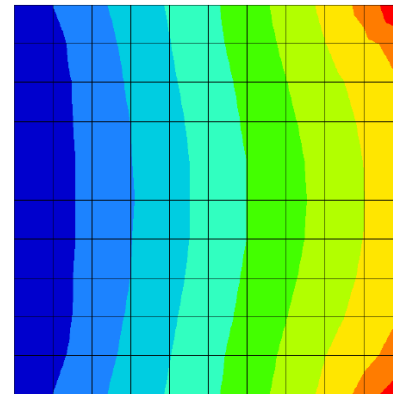
	Stress N/mm ²	Displacement mm
Simply supported		
	76.43	0.64
Fix-Fix		
	38.22	0.16

Loads

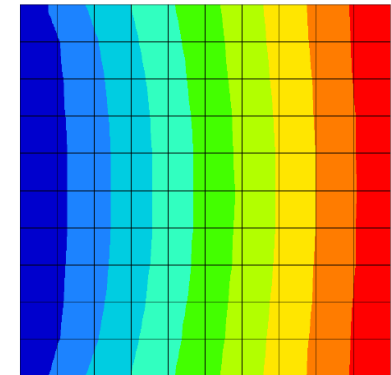
- Have loads been applied to points
- Have they been applied to edges correctly?
- Is self weight/gravity important?



Contour Plot
 Displacement(Mag)
 Analysis system
 Max = 5.966E-03
 Grids 14071
 Min = 0.000E+00
 Grids 14061



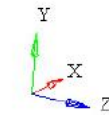
Contour Plot
 Displacement(Mag)
 Analysis system
 Max = 4.780E-03
 Grids 14071
 Min = 0.000E+00
 Grids 14061



Visualisation

- Check your displacements, deformed shape and stresses
- Use your common sense!
- Are these values sensible/what you expected?
 - Are displacements/rotations acceptable for a linear solver?
 - Are stresses seen below the yield stress?

Contour Plot
Displacement(Mag)
Analysis system
5.013E+01
4.456E+01
3.899E+01
3.342E+01
2.785E+01
2.228E+01
1.671E+01
1.114E+01
5.570E+00
0.000E+00
No result
Max = 5.013E+01
Gnds 41015
Min = 0.000E+00
Gnds 39333



Typos, units & significant figures

- Are your units consistent?
 - Generally use N and mm. Therefore stress is $\text{N/mm}^2 = \text{MPa}$
- Check the numbers that you have entered!
- Are you stating stresses etc. to an appropriate number of significant figures given the simplifications that you have made in your model?

Other errors

- Have you imported/exported your model between different software?
Is everything still correct?
- Check the real part/experiment – go down to the workshop!
- Check the mass of your part.
- Gain confidence in modelling technique with simple/quick models before going to 'complex' models.
- Are you using the right software?
- Can you actually manufacture the part that you have suggested?
- Log what you have done.

Correlate before suggesting changes

- If you are using your FE model to change the design – correlate the baseline first!
- If your baseline design does not correlate to test – why would anyone have any confidence in your suggestions?