

**CASE 1. CALCULATING SIF(i)**

NODE	Axial Stress MPa	Bending Stress MPa	Torsion Stress MPa	Hoop Stress MPa	Max Stress Intensity MPa	SIF In Plane	SIF Out Plane	Code Stress MPa	Allowable Stress MPa	Ratio %		Piping Code
210	13.32	1.47	0.62	29.61	30.64	1.000	1.000	16.69	0.00	0.00		B31.3
220	13.32	3.20	-0.62	29.61	30.64	1.852	2.135	18.19	0.00	0.00		B31.3
220	13.32	3.20	-0.00	29.61	30.62	1.852	2.135	17.96	0.00	0.00		B31.3
230	13.32	1.69	0.00	29.61	30.62	1.000	1.000	16.45	0.00	0.00		B31.3

HEADER: 210-220-230 (220 is SIF point)

BRANCH: 220-410-etc..

The screenshot displays the 'Classic Piping Input' software interface. On the left, a 3D model shows a main pipe (Node 210) with a branch (Node 220) connecting to another pipe (Node 410). The branch connection is highlighted in purple. The software interface includes several input panels:

- Front/To:** Node 210 to Node 220.
- Material:** [104]A106 A.
- Welding:** Type: 3 - Welding.
- Checkboxes:** 'SIFs & Tees' is checked. Other options include Bend, Reducer, Rigid, Expansion Joint, Restraints, Displacements, Hangers, Flange, Nozzles, Forces/Moments, Uniform Loads, and Wind/Wave.
- Material Properties:** Elastic Modulus (C), (H1), (H2), (H3); Poisson's Ratio; Pipe Density; Fluid Density; Insulation Density.
- Dimensions:** Diameter: 168.2750, WT/Sch: 4.5000, Insul Thk: 120.0000.
- Temperatures and Pressures:** Temp 1: 200.0000, Temp 2: 230.0000, Pressure 1: 19.4000, Pressure 2: , Hydro Press: 29.1000.

Red circles highlight the 'From' and 'To' node fields, the 'SIFs & Tees' checkbox, and the 'Node' field in the welding section.

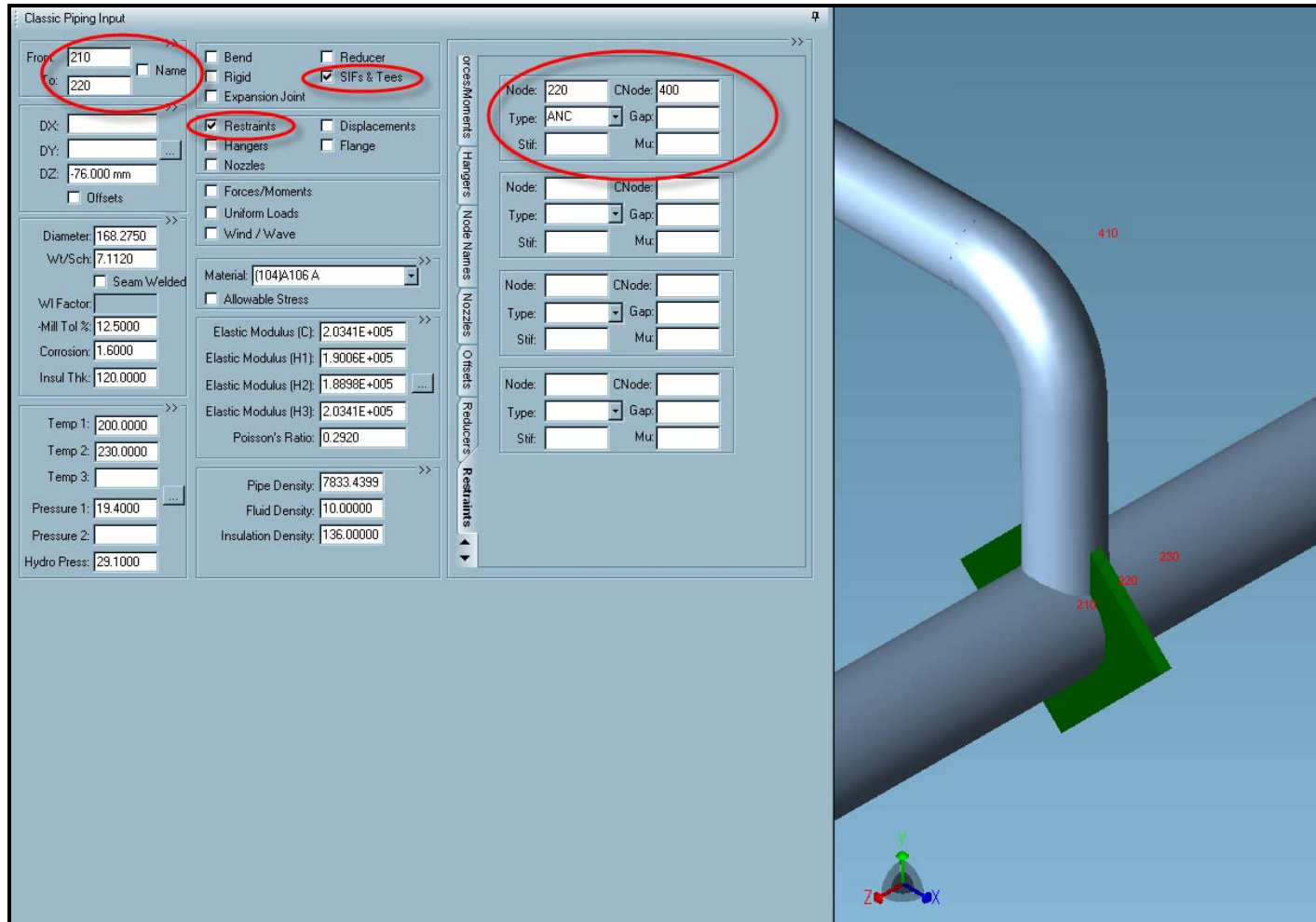
**CASE 2.** INSTERTING an ANCORE and CALCULATING BRANCH LOADS

NODE	Axial Stress MPa	Bending Stress MPa	Torsion Stress MPa	Hoop Stress MPa	Max Stress Intensity MPa	SIF In Plane	SIF Out Plane	Code Stress MPa	Allowable Stress MPa	Ratio %		Piping Code
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220	13.32	3.20	-0.00	29.61	30.62	1.852	2.135	17.96	0.00	0.00		B31.3
230	13.32	1.69	0.00	29.61	30.62	1.000	1.000	16.45	0.00	0.00		B31.3

HEADER: 210-220-230 (220 is SIF point with manually inserted SIF(i) values and 220 is also an ANC with CNODE to point 400)

BRANCH: 400-410-etc..

TO KNOW HOW SEE THE SCREENSHOTS



Classic Piping Input

From: 210 To: 220  Name

Bend  Reducer  SIFs & Tees

Rigid  Expansion Joint

Restraints  Displacements

Hangers  Flange

Nozzles

Forces/Moments

Uniform Loads

Wind / Wave

Material: (104)A106 A

Allowable Stress

Elastic Modulus (C): 2.0341E+005

Elastic Modulus (H1): 1.9006E+005

Elastic Modulus (H2): 1.8898E+005

Elastic Modulus (H3): 2.0341E+005

Poisson's Ratio: 0.2920

Pipe Density: 7833.4399

Fluid Density: 10.00000

Insulation Density: 136.00000

Node: 220

Type: 3 - Welding

SIF(i): 1.852

SIF(o):

Crotch T:

Ftg Ro:

Crotch R:

Weld(d):

Fillet:

Weld ID:

Wc:

N/A

Reducers

Restraints

Rigid

SIFs & Tees

Classic Piping Input

From: 220 To: 230  Name

Bend  Reducer  SIFs & Tees  
 Rigid  Expansion Joint

Restraints  Displacements  
 Hangers  Flange  
 Nozzles

Forces/Moments  
 Uniform Loads  
 Wind / Wave

Material: (104)A106 A  
 Allowable Stress

Elastic Modulus (C): 2.0341E+005  
Elastic Modulus (H1): 1.9006E+005  
Elastic Modulus (H2): 1.8898E+005  
Elastic Modulus (H3): 2.0341E+005  
Poisson's Ratio: 0.2920

Pipe Density: 7833.4399  
Fluid Density: 10.00000  
Insulation Density: 136.00000

Node: 220  
Type: 3 - Welding  
SIF(i): 1.852  
SIF(o):  
Crotch T:  
Ftg Ro:  
Crotch R:  
Weld(d):  
Fillet:  
Weld ID:  
Wc:  
N/A

DX:   
DY:   
DZ: -76.000 mm  
 Offsets

Diameter: 168.2750  
Wt/Sch: 7.1120  
 Seam Welded  
Wt Factor:  
Mill Tol %: 12.5000  
Corrosion: 1.6000  
Insul Thk: 120.0000

Temp 1: 200.0000  
Temp 2: 230.0000  
Temp 3:  
Pressure 1: 19.4000  
Pressure 2:  
Hydro Press: 29.1000

Reducers  
Restraints  
Rigids  
SIFs & Tees

Classic Piping Input

From: 400 To: 410  Name

DX: DY: 500.000 mm DZ:  Offsets

Diameter: 114.3000 Wt/Sch: 6.0198  Seam Welded

WI Factor: -Mill Tol %: 12.5000 Corrosion: 1.6000 Insul Thk: 120.0000

Temp 1: 200.0000 Temp 2: 230.0000 Temp 3: Pressure 1: 19.4000 Pressure 2: Hydro Press: 29.1000

Bend  Rigid  Expansion Joint  Reducer  SIFs & Tees

Restraints  Hangers  Nozzles  Displacements  Flange  Forces/Moments  Uniform Loads  Wind / Wave

Material: (104)A106 A  Allowable Stress

Elastic Modulus (C): 2.0341E+005 Elastic Modulus (H1): 1.9006E+005 Elastic Modulus (H2): 1.8898E+005 Elastic Modulus (H3): 2.0341E+005 Poisson's Ratio: 0.2920

Pipe Density: 7833.4399 Fluid Density: 10.00000 Insulation Density: 136.00000

Model Status Allowable Stresses Bends Displacements Expansion Joints

Radius: 152.400 Type: Angle 1: M Node 1: 409 Angle 2: 0.000 Node 2: 408 Angle 3: Node 3: Miter Points: Fitting Thk: K-factor:  Seam Welded WI Factor:

Errors and Warnings																																								
Errors: 0		Warnings: 1		Notes: 1																																				
Message Type	Message Number	Element/Node Number	Message Text																																					
1	WARNING	39E	210-220	Node 220 on element 210 to 220 is specified as an INTERSECTION POINT and no valid geometric intersection can be located. SIF's will be calculated based on the smallest thickness and the largest diameter found for the pipes framing into the intersection.																																				
2	NOTE			<p style="text-align: center;">CENTER OF GRAVITY REPORT</p> <table border="1"> <thead> <tr> <th></th> <th>Total Wght</th> <th>X cg</th> <th>Y cg</th> </tr> <tr> <th></th> <th>N</th> <th>mm</th> <th>mm</th> </tr> </thead> <tbody> <tr> <td>Pipe</td> <td>710.3</td> <td>-111.1</td> <td>130</td> </tr> <tr> <td>Insulation</td> <td>422.9</td> <td>-139.7</td> <td>164</td> </tr> <tr> <td>Refractory</td> <td>0.0</td> <td>0.0</td> <td>0</td> </tr> <tr> <td>Fluid</td> <td>4.4</td> <td>-92.7</td> <td>109</td> </tr> <tr> <td>Pipe+Ins+Rfrty</td> <td>1133.2</td> <td>-121.8</td> <td>143</td> </tr> <tr> <td>Pipe+Fluid</td> <td>714.6</td> <td>-111.0</td> <td>130</td> </tr> <tr> <td>Pipe+Ins+Rfrty+Fld:</td> <td>1137.5</td> <td>-121.7</td> <td>143</td> </tr> </tbody> </table>		Total Wght	X cg	Y cg		N	mm	mm	Pipe	710.3	-111.1	130	Insulation	422.9	-139.7	164	Refractory	0.0	0.0	0	Fluid	4.4	-92.7	109	Pipe+Ins+Rfrty	1133.2	-121.8	143	Pipe+Fluid	714.6	-111.0	130	Pipe+Ins+Rfrty+Fld:	1137.5	-121.7	143
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**RESTRAINT SUMMARY REPORT: Loads On Restraints**

CASE 6 Operating Case (OPE)

NODE	Load Case	FX N	FY N	FZ N	MX Nm	MY Nm	MZ Nm
200		Rigid ANC					
	6 (OPE)	0	-733	135	-288	-0	138
220		Rigid ANC					
	6 (OPE)	-0	396	0	0	-0	-138
240		Rigid +Y; Rigid GUI					
	6 (OPE)	-0	-405	-121	0	0	0