

Reaction Forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Body	N	-0.0444336	0.0229836	-0.00256348	0.0500915

Free-Body Forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Body	N	-0.118179	-1.70021	-0.828918	1.8952

Free-body Moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Body	N-m	0	0	0	1e-033

Bolt Forces
Bolt Connector-1

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	-407.19	1649.2	10.413	1698.7
Axial Force (N)	-1196.6	-776.55	76196	76209
Bending moment (N-m)	50.968	15.073	0.95405	53.159

Bolt Connector-2

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	-181.43	1390.8	11.738	1402.7
Axial Force (N)	-1187.3	-795.54	75913	75927
Bending moment (N-m)	38.487	7.754	0.6832	39.266

Bolt Connector-3

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	28.27	1464.8	15.176	1465.1
Axial Force (N)	-1175.6	-763.06	75838	75851
Bending moment (N-m)	40.409	1.7137	0.64362	40.45

Bolt Connector-4

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	206.48	1519.9	19.009	1534
Axial Force (N)	-1181.5	-786.57	75728	75742
Bending moment (N-m)	42.079	-3.3695	0.62152	42.219

Bolt Connector-5

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	327.55	1585.7	21.264	1619.3
Axial Force (N)	-1175.3	-772.36	75698	75711
Bending moment (N-m)	44.293	-6.2841	0.62356	44.74

Bolt Connector-6

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	489.87	1637.9	24.64	1709.8
Axial Force (N)	-1196.2	-781.04	75699	75713
Bending moment (N-m)	45.787	-11.191	0.60808	47.139

Bolt Connector-7

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	649.96	1735	27.639	1853
Axial Force (N)	-1161	-769.33	75598	75611
Bending moment (N-m)	48.994	-16.077	0.58884	51.568

Bolt Connector-8

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	776.09	1768.3	30.092	1931.4
Axial Force (N)	-1174	-771.52	75616	75629
Bending moment (N-m)	49.925	-19.618	0.57496	53.644

Bolt Connector-9

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	951.76	1804.6	33.728	2040.5
Axial Force (N)	-1192.9	-783.78	75597	75611
Bending moment (N-m)	51.018	-25.055	0.54525	56.841

Bolt Connector-10

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1097.5	1862.2	36.075	2161.9
Axial Force (N)	-1173.8	-771.08	75517	75530
Bending moment (N-m)	52.954	-29.287	0.52407	60.515

Bolt Connector-11

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1265.3	1860.1	38.516	2249.9
Axial Force (N)	-1157.5	-776.22	75512	75525
Bending moment (N-m)	52.923	-34.355	0.4581	63.098

Bolt Connector-12

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1454.3	1850.7	41.61	2354.1
Axial Force (N)	-1177.2	-771.93	75477	75490
Bending moment (N-m)	52.778	-40.291	0.41112	66.401

Bolt Connector-13

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1613.7	1828.8	43.205	2439.3
Axial Force (N)	-1162.4	-756.97	75454	75467
Bending moment (N-m)	52.326	-45.124	0.35341	69.097

Bolt Connector-14

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1756.2	1763.1	45.12	2488.9
Axial Force (N)	-1169.5	-766.76	75483	75496
Bending moment (N-m)	50.333	-49.329	0.27875	70.475

Bolt Connector-15

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1907.1	1654.1	46.763	2524.9
Axial Force (N)	-1171.3	-781.85	75424	75437
Bending moment (N-m)	46.933	-54.005	0.16906	71.549

Bolt Connector-16

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2019.1	1553.4	47.421	2548
Axial Force (N)	-1177.5	-771.91	75423	75436
Bending moment (N-m)	43.908	-57.304	0.098998	72.192

Bolt Connector-17

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2126.9	1417.1	47.481	2556.2
Axial Force (N)	-1171.9	-770.17	75484	75497
Bending moment (N-m)	39.666	-60.567	-0.0021384	72.4

Bolt Connector-18

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2219.6	1268.7	47.455	2557
Axial Force (N)	-1172.2	-770.02	75414	75427
Bending moment (N-m)	34.957	-63.281	-0.10278	72.295

Bolt Connector-19

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2290.3	1133.8	47.16	2556
Axial Force (N)	-1172.8	-769.31	75454	75467
Bending moment (N-m)	30.971	-65.516	-0.18658	72.468

Bolt Connector-20

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2330	952.05	46.241	2517.4
Axial Force (N)	-1178.2	-784.39	75518	75531
Bending moment (N-m)	25.347	-66.939	-0.29982	71.578

Bolt Connector-21

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2394.4	795.89	45.477	2523.6
Axial Force (N)	-1178.1	-767.58	75461	75474
Bending moment (N-m)	20.681	-69.191	-0.38094	72.216

Bolt Connector-22

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2355.3	628.21	42.979	2438.1
Axial Force (N)	-1172.9	-770.77	75542	75555
Bending moment (N-m)	15.475	-67.688	-0.45037	69.436

Bolt Connector-23

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2313.6	448.14	40.882	2357
Axial Force (N)	-1182	-792	75575	75589
Bending moment (N-m)	10.005	-66.279	-0.5381	67.032

Bolt Connector-24

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2274.9	282.42	38.094	2292.7
Axial Force (N)	-1171.1	-765.21	75606	75619
Bending moment (N-m)	4.9637	-65.061	-0.5816	65.253

Bolt Connector-25

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2171.2	156.2	35.497	2177.1
Axial Force (N)	-1180.7	-786.06	75679	75692
Bending moment (N-m)	1.384	-61.604	-0.61828	61.623

Bolt Connector-26

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	2063.8	3.3046	32.455	2064.1
Axial Force (N)	-1188.8	-767.87	75673	75686
Bending moment (N-m)	-3.1377	-58.216	-0.64002	58.304

Bolt Connector-27

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1963.8	-142.5	29.562	1969.2
Axial Force (N)	-1196.6	-781.25	75720	75734
Bending moment (N-m)	-7.7158	-55.293	-0.69242	55.833

Bolt Connector-28

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1768.3	-181.35	25.588	1777.8
Axial Force (N)	-1175	-763.58	75790	75803
Bending moment (N-m)	-8.4485	-49.12	-0.62586	49.845

Bolt Connector-29

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1628.7	-282.62	22.503	1653.2
Axial Force (N)	-1182.6	-783.4	75756	75769
Bending moment (N-m)	-11.522	-45.051	-0.64575	46.505

Bolt Connector-30

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1470.3	-328.97	19.594	1506.8
Axial Force (N)	-1182.2	-769	75805	75818
Bending moment (N-m)	-12.912	-40.477	-0.612	42.491

Bolt Connector-31

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1300	-347.05	16.455	1345.7
Axial Force (N)	-1166.9	-772.89	75893	75905
Bending moment (N-m)	-13.25	-35.369	-0.56392	37.774

Bolt Connector-32

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	1100.4	-366.44	13.439	1159.9
Axial Force (N)	-1184.6	-774.46	75874	75887
Bending moment (N-m)	-13.999	-29.245	-0.51706	32.427

Bolt Connector-33

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	937.26	-319.25	11.573	990.2
Axial Force (N)	-1199	-766.74	75951	75965
Bending moment (N-m)	-12.527	-24.585	-0.44595	27.596

Bolt Connector-34

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	759.02	-244.08	9.2802	797.35
Axial Force (N)	-1174.6	-765.01	75947	75960
Bending moment (N-m)	-9.9479	-19.242	-0.34767	21.664

Bolt Connector-35

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	601.44	-218.67	7.1497	640
Axial Force (N)	-1184.3	-775.22	75912	75926
Bending moment (N-m)	-9.3737	-14.583	-0.29515	17.338

Bolt Connector-36

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	471.58	-109.79	6.2016	484.23
Axial Force (N)	-1179.7	-775.27	75983	75996
Bending moment (N-m)	-5.9371	-11.182	-0.20627	12.662

Bolt Connector-37

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	318.4	-18.246	4.7629	318.96
Axial Force (N)	-1181	-775.82	75982	75995
Bending moment (N-m)	-3.27	-6.638	-0.11861	7.4007

Bolt Connector-38

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	168.44	38.923	3.0067	172.9
Axial Force (N)	-1173.8	-789.13	75975	75988
Bending moment (N-m)	-1.6677	-2.3548	-0.050224	2.886

Bolt Connector-39

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	-8.5907	112.21	0.98937	112.55
Axial Force (N)	-1172.5	-760.41	76065	76078
Bending moment (N-m)	0.49576	2.6654	0.034287	2.7113

Bolt Connector-40

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	-213.14	186.94	-1.4083	283.51
Axial Force (N)	-1187.5	-780.59	76109	76122
Bending moment (N-m)	2.1683	8.7973	0.12406	9.0614

Bolt Connector-41

Type	X-Component	Y-Component	Z-Component	Resultant
Shear Force (N)	-429.71	-41.519	-7.1325	431.77
Axial Force (N)	-1192.1	-779.41	76359	76372
Bending moment (N-m)	-9.4689	15.801	0.013452	18.421

Study Results

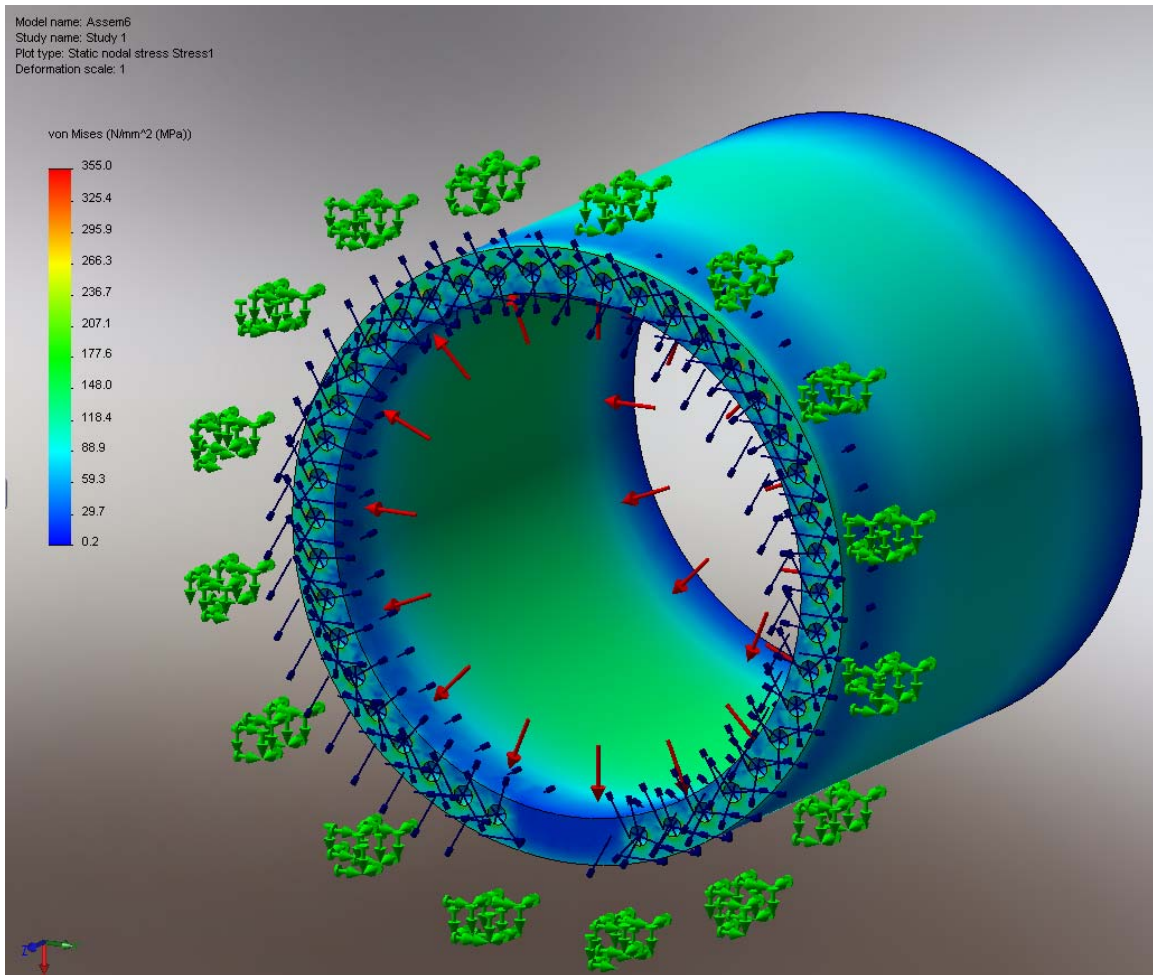


Figure 1: Stress plot on barrel

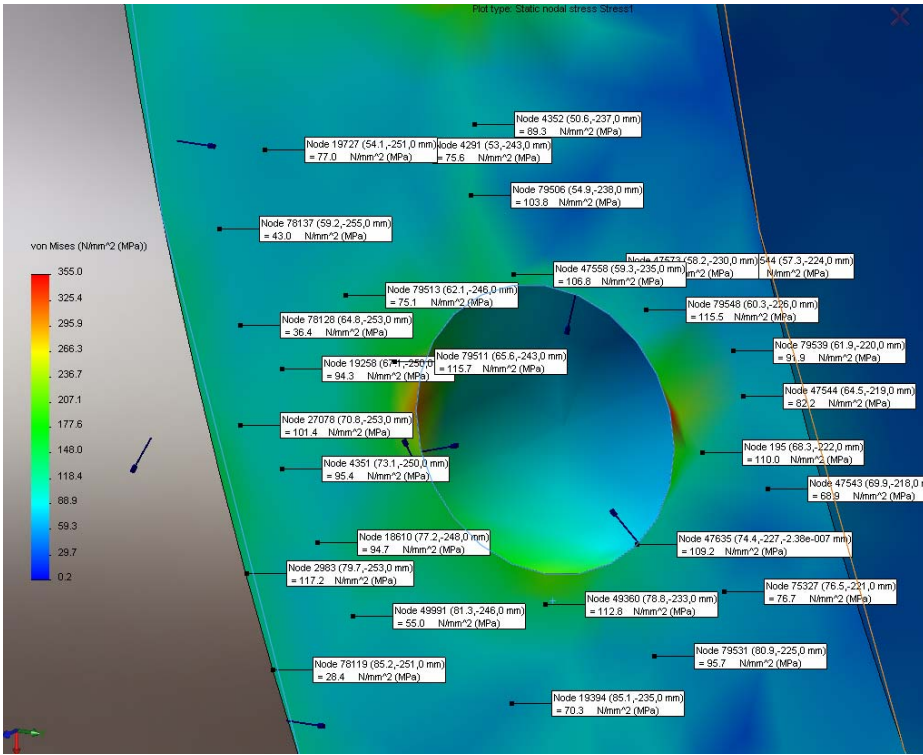


Figure 2: Stress plot on barrel tapped holes surroundings

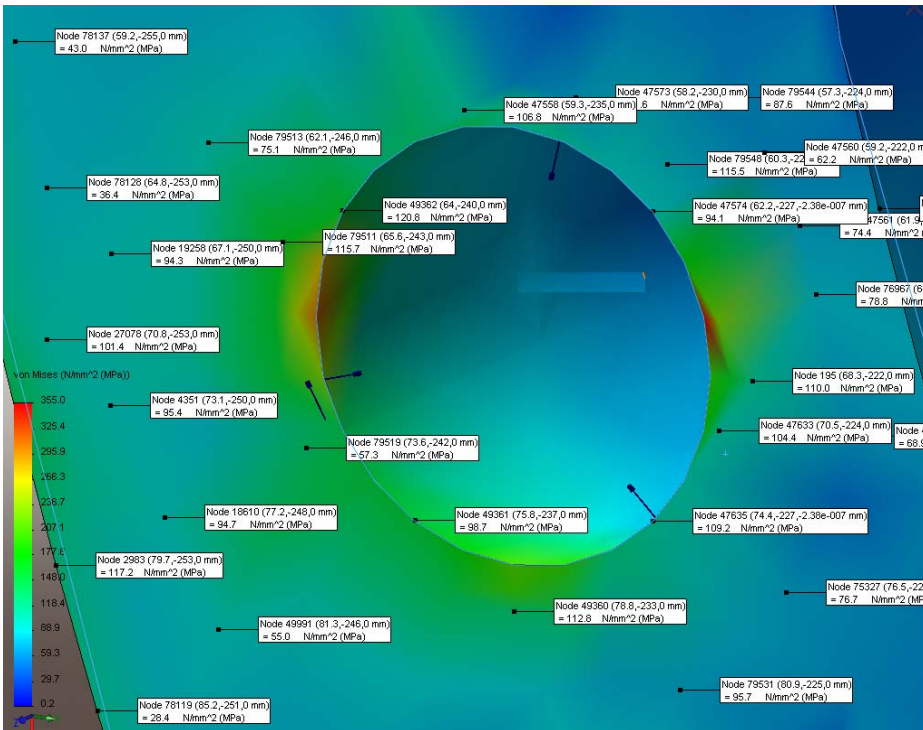


Figure 3: Stress plot on barrel tapped holes surroundings

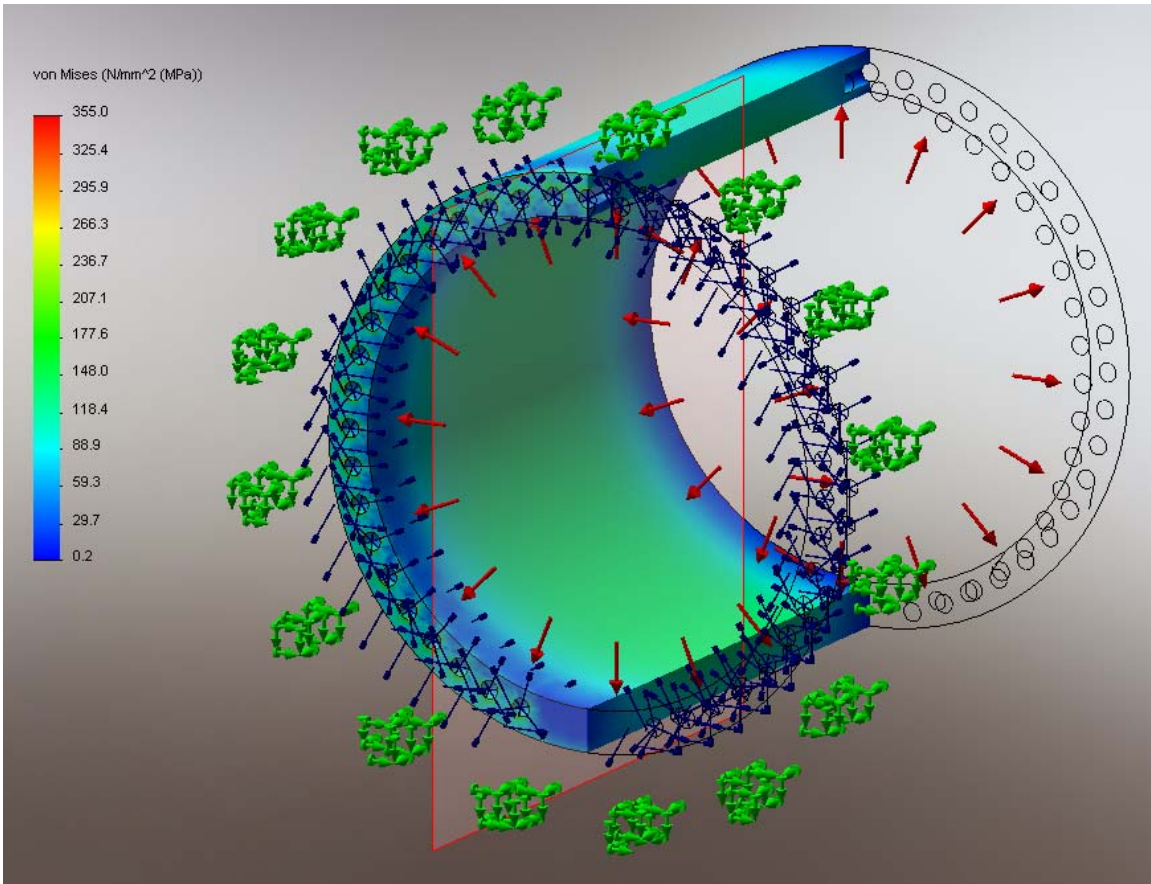


Figure 4: Section view stress plot

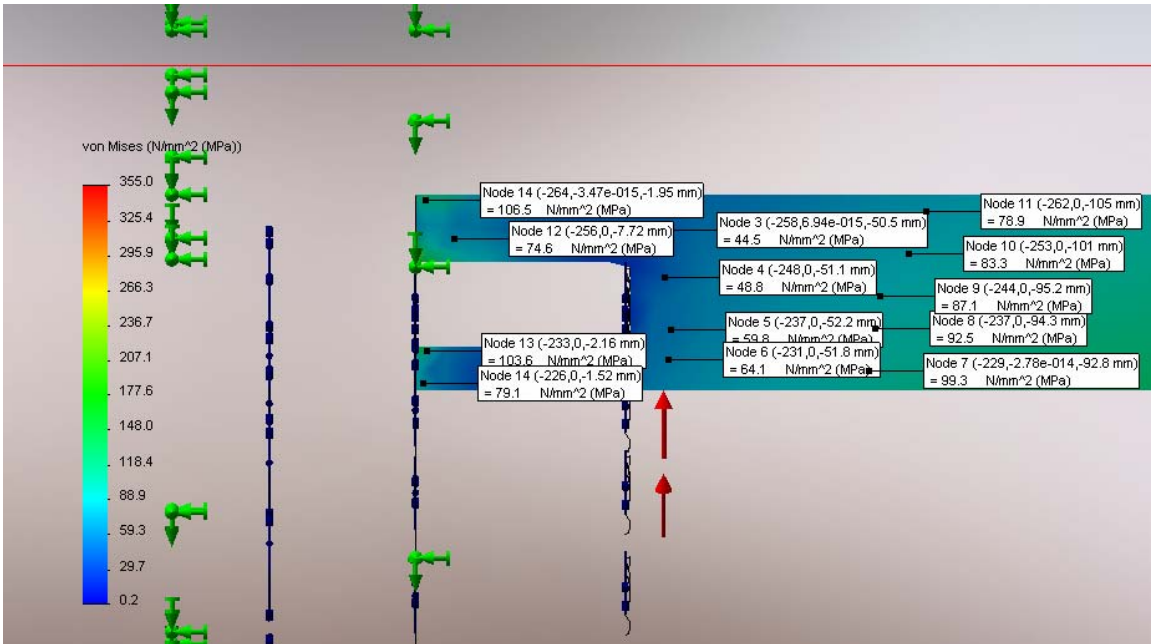


Figure 5: Section view stress plot

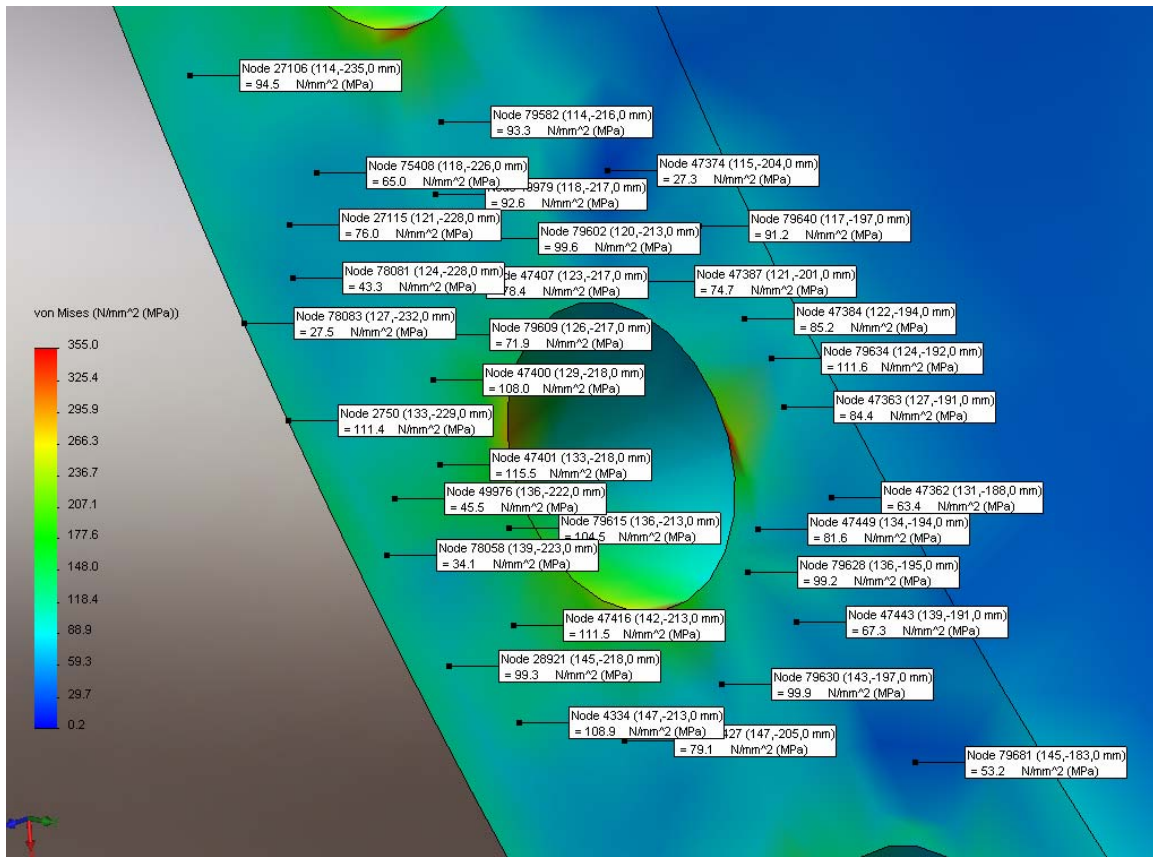


Figure 6: Stress plot on outer tapped holes surrounding area

Conclusion

High stresses are shown at the discontinuity between fixed node and free node.

Stress around tapped holes is less 120 MPa.

Tensile strength on E355 is 490 MPa. Resultant stress is less than 25% of the material tensile strength.