

The specimen details

Diameter of bolt	d (mm)	20
Diameter of bolt hole	d_0 (mm)	22
End distance	e_1 (mm)	60
Edge distance	e_2 (mm)	55
Spacing between centres of bolts in the direction of load transfer	p_1 (mm)	70
	p_2 (mm)	133.4
Spacing between rows of bolts	p_3 (mm)	90
Thickness of end plate	t_p (mm)	8
Horizontal distance of lever arm	B_L (mm)	490
Vertical distance of lever arm	D_L (mm)	51.7

Steel Grade	S275	S355
Dimension of Members	UB305x165x40	UC254x254x89
Depth of Section	D (mm)	303.4
Width of Section	B (mm)	165
Thickness of Web	t (mm)	6
Thickness of Flange	T (mm)	10.2
Root Radius	r (mm)	8.9
Depth between Fillets	d (mm)	265.2

Nominal Temperature

550°C

Time (minute)	Thermocouple Average(°C)	Jack Displacement (mm)	Load Angle α (°)	Beam Rotation (°)	Column Rotation (°)	Connection Rotation (°)	Force Rotation (°)	F3 from F1 (kN)	F3 from F2 (kN)	F3 Average (kN)	Tension (kN)	Shear (kN)	Moment (kN*m)
0	539.511	-0.045											
1	539.676	-0.043											
2	539.846	-0.051											
3	540.018	-0.042	41.75	0.000	0.000	0.000	72.514	-22.46	-18.07	-20.27	-15.12	-13.50	-7661.28
4	540.091	1.266	41.78	0.028	0.032	-0.004	72.460	-18.67	-15.26	-16.97	-12.65	-11.30	-6415.81
5	540.235	2.746	41.79	0.080	0.099	-0.019	72.397	-14.75	-12.54	-13.65	-10.17	-9.09	-5161.26
6	540.402	4.306	41.81	0.095	0.127	-0.032	72.367	-11.57	-10.60	-11.09	-8.26	-7.39	-4194.80
7	540.491	6.030	41.84	0.134	0.194	-0.060	72.297	-8.49	-7.43	-7.96	-5.93	-5.31	-3014.55
8	540.618	7.749	41.80	0.219	0.231	-0.012	72.245	-6.15	-5.89	-6.02	-4.49	-4.01	-2276.54
9	540.692	9.414	41.82	0.270	0.296	-0.026	72.176	-4.45	-4.15	-4.30	-3.20	-2.87	-1626.90
10	540.900	11.069	41.78	0.330	0.364	-0.034	72.159	-3.59	-2.75	-3.17	-2.36	-2.11	-1198.74
11	541.010	12.654	41.79	0.398	0.254	0.144	72.080	-3.32	-3.32	-3.32	-2.47	-2.21	-1254.03
12	541.157	14.291	41.79	0.452	0.476	-0.024	72.028	-3.25	-2.41	-2.83	-2.11	-1.89	-1070.51
13	541.350	15.913	41.61	0.506	0.502	0.004	72.147	-2.63	-2.00	-2.32	-1.73	-1.54	-874.63
14	541.491	17.491	41.28	0.528	0.497	0.031	72.461	-2.70	-2.87	-2.78	-2.09	-1.84	-1043.61
15	541.630	19.079	41.69	0.534	0.504	0.030	72.042	-2.57	-2.67	-2.62	-1.96	-1.74	-989.19
16	541.668	20.677	42.01	0.534	0.525	0.009	71.719	-2.26	-1.87	-2.06	-1.53	-1.38	-783.83
17	541.857	22.181	42.04	0.557	0.529	0.028	71.671	-1.54	-0.84	-1.19	-0.88	-0.80	-451.95
18	542.049	23.311	42.00	0.650	0.574	0.076	71.613	-0.60	0.54	-0.03	-0.02	-0.02	-11.43
19	542.151	24.666	41.98	0.684	0.625	0.059	71.602	1.37	1.34	1.35	1.01	0.91	513.53
20	542.275	26.163	41.95	0.720	0.638	0.081	71.600	3.52	4.75	4.14	3.08	2.77	1568.93
21	542.378	27.598	41.84	0.796	0.696	0.100	71.635	5.85	6.05	5.95	4.43	3.97	2252.80
22	542.496	29.039	41.80	0.829	0.742	0.087	71.640	8.15	9.26	8.70	6.49	5.80	3292.59

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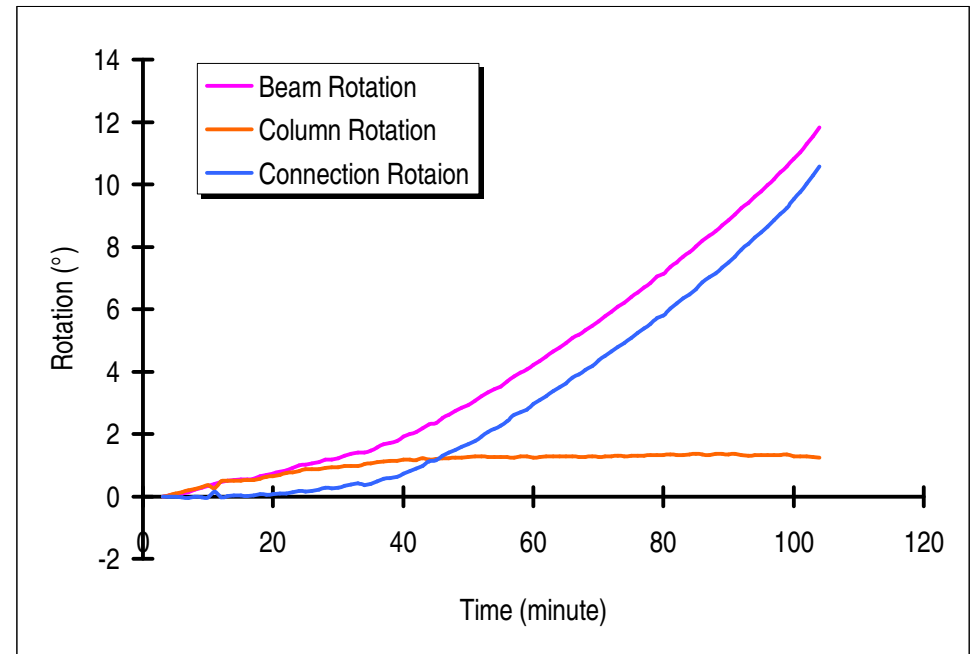
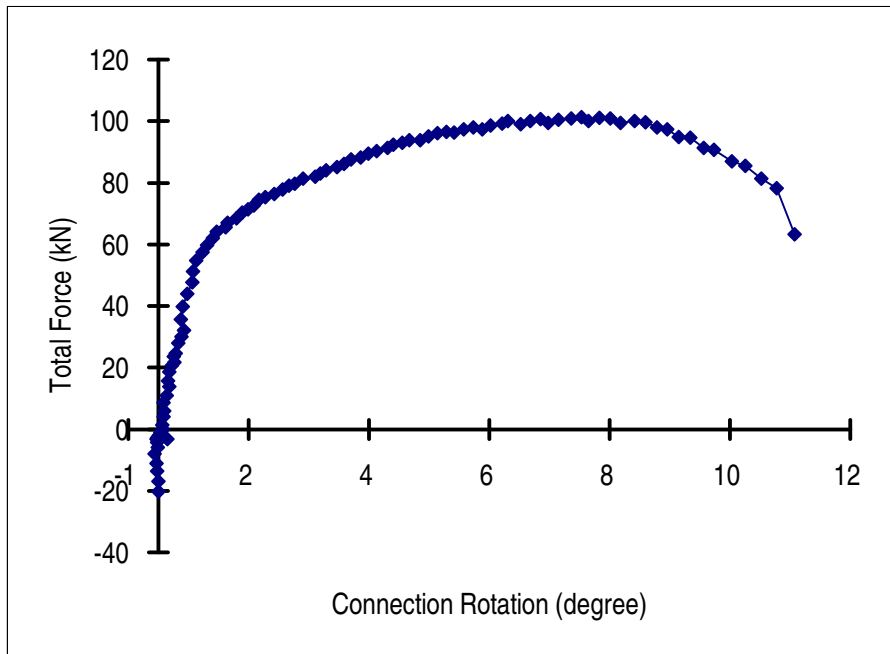
23	542.642	30.479	41.69	0.912	0.775	0.137	71.669	10.81	10.88	10.84	8.10	7.21	4094.03
24	542.727	32.026	41.66	0.988	0.809	0.180	71.621	13.19	14.57	13.88	10.37	9.23	5237.73
25	542.878	33.491	41.65	1.026	0.869	0.156	71.588	15.60	15.80	15.70	11.73	10.44	5925.50
26	542.945	35.077	41.64	1.058	0.877	0.181	71.571	18.12	18.88	18.50	13.83	12.29	6980.22
27	543.011	36.462	41.62	1.105	0.880	0.225	71.546	20.42	21.08	20.75	15.51	13.78	7824.47
28	543.108	37.728	41.54	1.174	0.905	0.269	71.558	21.53	21.93	21.73	16.27	14.41	8184.95
29	543.210	38.946	41.55	1.189	0.934	0.255	71.527	23.48	23.51	23.49	17.58	15.58	8850.71
30	543.374	40.033	41.53	1.226	0.941	0.284	71.511	24.49	24.62	24.55	18.38	16.28	9246.49
31	543.462	41.477	41.50	1.303	0.968	0.334	71.469	27.80	28.25	28.02	20.99	18.57	10546.78
32	543.544	42.693	41.47	1.361	0.978	0.383	71.437	29.85	30.34	30.09	22.55	19.93	11321.09
33	543.650	43.830	41.44	1.405	0.977	0.428	71.423	31.86	32.36	32.11	24.07	21.25	12073.96
34	543.666	45.279	41.48	1.406	1.038	0.368	71.385	35.53	35.84	35.68	26.74	23.63	13425.31
35	543.831	46.754	41.48	1.467	1.060	0.407	71.322	39.62	40.00	39.81	29.83	26.37	14977.78
36	543.908	48.275	41.41	1.573	1.096	0.477	71.280	43.84	44.17	44.00	33.00	29.11	16537.66
37	543.959	49.749	41.37	1.672	1.111	0.561	71.224	48.01	47.43	47.72	35.81	31.54	17919.78
38	544.023	51.286	41.45	1.710	1.134	0.575	71.111	51.73	50.90	51.32	38.47	33.97	19296.44
39	543.962	52.823	41.51	1.778	1.145	0.633	70.982	55.16	54.28	54.72	40.98	36.26	20597.98
40	544.098	54.355	41.51	1.909	1.175	0.734	70.846	57.99	57.00	57.50	43.06	38.11	21645.25
41	544.202	55.892	41.56	1.991	1.182	0.809	70.720	60.50	58.94	59.72	44.69	39.62	22499.03
42	544.274	57.463	41.52	2.069	1.167	0.902	70.676	62.61	61.25	61.93	46.37	41.05	23316.65
43	544.397	59.040	41.44	2.192	1.222	0.970	70.632	64.49	63.61	64.05	48.01	42.40	24084.61
44	544.411	60.545	41.38	2.301	1.184	1.117	70.588	66.35	64.74	65.54	49.18	43.33	24617.55
45	544.538	62.171	41.37	2.354	1.201	1.153	70.545	67.77	66.14	66.95	50.25	44.25	25143.55
46	544.543	63.725	41.30	2.517	1.224	1.293	70.448	69.50	67.35	68.42	51.40	45.16	25665.10
47	544.616	65.431	41.30	2.616	1.218	1.398	70.356	71.01	69.71	70.36	52.86	46.44	26390.30
48	544.709	66.938	41.25	2.731	1.236	1.495	70.284	72.51	70.23	71.37	53.66	47.06	26749.49
49	544.772	68.468	41.20	2.838	1.248	1.589	70.232	73.91	71.52	72.72	54.71	47.90	27227.12
50	544.918	70.044	41.17	2.928	1.260	1.668	70.170	75.44	73.70	74.57	56.13	49.09	27907.58
51	545.004	71.511	41.09	3.057	1.277	1.780	70.125	76.50	74.18	75.34	56.79	49.51	28155.53
52	545.086	73.023	41.00	3.201	1.275	1.926	70.066	77.79	75.08	76.44	57.69	50.15	28522.62

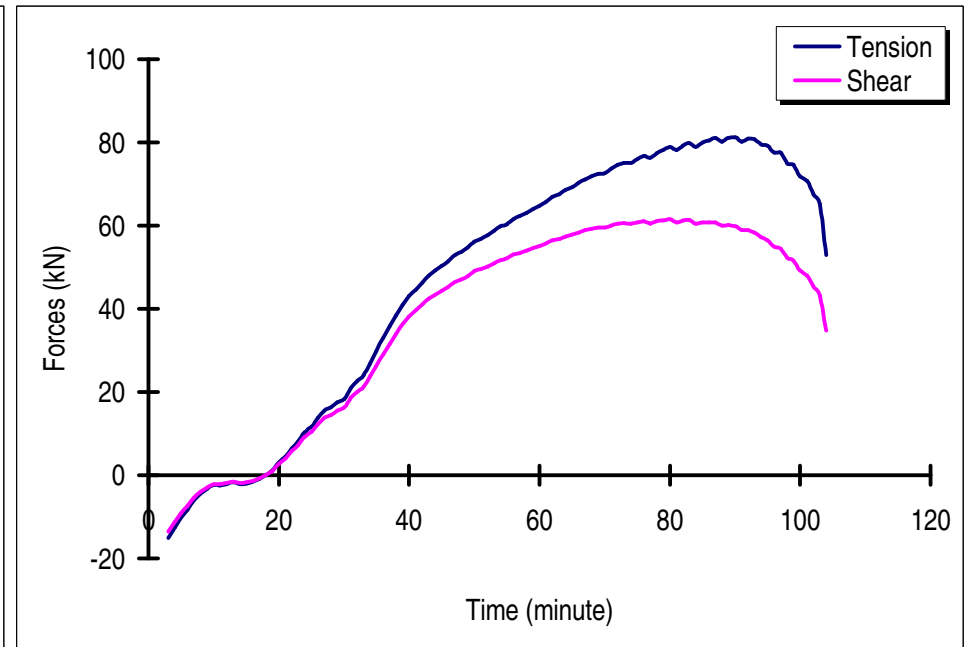
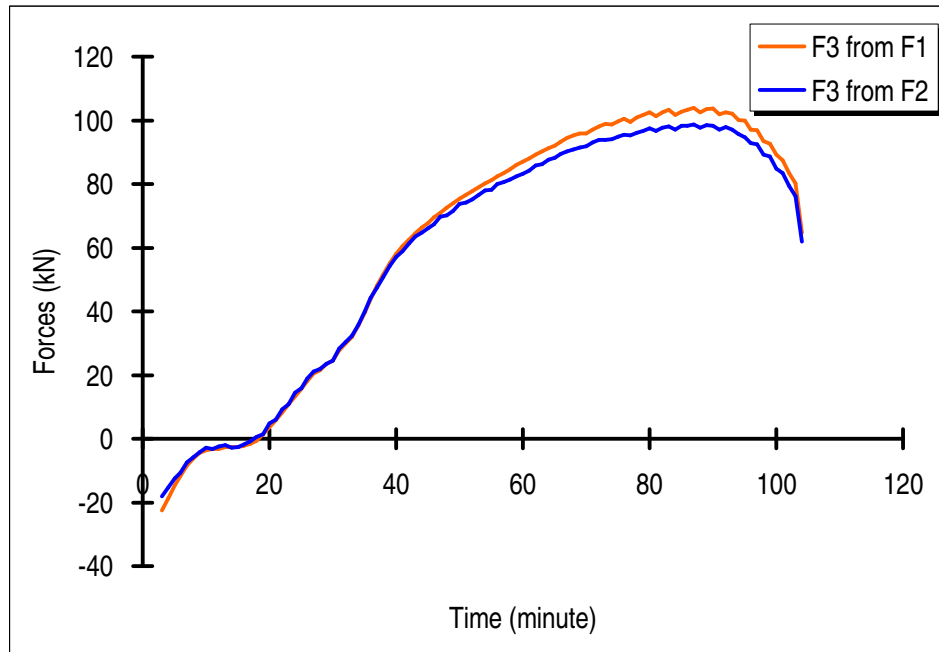
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53	545.170	74.665	40.91	3.333	1.269	2.063	70.027	78.91	76.68	77.80	58.80	50.94	28983.46
54	545.214	76.211	40.88	3.432	1.260	2.171	69.960	80.21	77.95	79.08	59.80	51.75	29446.75
55	545.385	77.788	40.85	3.526	1.264	2.262	69.887	81.27	78.12	79.70	60.28	52.13	29664.24
56	545.429	79.462	40.72	3.672	1.265	2.407	69.879	82.50	80.04	81.27	61.60	53.01	30177.90
57	545.505	81.018	40.60	3.849	1.243	2.606	69.817	83.51	80.62	82.06	62.31	53.40	30409.94
58	545.642	82.611	40.53	3.974	1.286	2.688	69.764	84.63	81.41	83.02	63.10	53.95	30728.13
59	545.674	84.196	40.50	4.076	1.291	2.785	69.696	85.94	82.34	84.14	63.99	54.64	31121.99
60	545.810	85.862	40.40	4.215	1.250	2.965	69.657	86.94	83.12	85.03	64.76	55.10	31396.34
61	545.935	87.432	40.29	4.346	1.262	3.084	69.633	88.03	84.16	86.10	65.67	55.67	31730.09
62	545.975	89.019	40.20	4.481	1.276	3.205	69.591	89.29	85.79	87.54	66.87	56.50	32208.57
63	546.103	90.620	40.07	4.644	1.278	3.365	69.558	90.27	86.16	88.22	67.51	56.78	32382.82
64	546.118	92.150	39.94	4.769	1.275	3.494	69.560	91.32	87.60	89.46	68.60	57.43	32765.79
65	546.264	93.768	39.84	4.910	1.283	3.627	69.521	92.15	88.25	90.20	69.26	57.78	32976.26
66	546.370	95.282	39.69	5.078	1.272	3.806	69.501	93.29	89.43	91.36	70.30	58.34	33310.31
67	546.405	96.827	39.66	5.174	1.266	3.908	69.438	94.37	90.26	92.32	71.07	58.91	33639.08
68	546.506	98.380	39.53	5.327	1.270	4.057	69.415	95.37	90.79	93.08	71.80	59.24	33838.20
69	546.587	100.055	39.43	5.464	1.289	4.175	69.375	95.94	91.50	93.72	72.39	59.52	34009.57
70	546.695	101.553	39.35	5.618	1.267	4.351	69.304	95.96	91.86	93.91	72.63	59.54	34028.19
71	546.782	103.171	39.19	5.773	1.279	4.494	69.302	97.08	92.97	95.02	73.64	60.05	34334.57
72	546.783	104.820	39.03	5.927	1.289	4.639	69.310	98.18	93.85	96.01	74.59	60.46	34589.47
73	546.925	106.253	38.90	6.082	1.298	4.784	69.287	98.89	93.95	96.42	75.04	60.55	34651.12
74	546.961	107.926	38.86	6.198	1.284	4.914	69.207	98.60	94.15	96.37	75.04	60.47	34611.24
75	547.048	109.472	38.68	6.386	1.311	5.074	69.202	99.79	94.88	97.34	75.99	60.83	34838.28
76	547.178	111.107	38.50	6.540	1.305	5.235	69.223	100.57	95.46	98.01	76.70	61.02	34966.14
77	547.191	112.747	38.43	6.690	1.307	5.383	69.146	99.55	95.18	97.36	76.27	60.52	34686.59
78	547.313	114.334	38.28	6.845	1.321	5.524	69.140	100.83	96.18	98.51	77.32	61.03	34994.96
79	547.426	115.832	38.07	7.039	1.323	5.715	69.163	101.77	96.63	99.20	78.10	61.16	35096.12
80	547.501	117.455	37.96	7.121	1.316	5.805	69.187	102.45	97.57	100.01	78.85	61.52	35312.12
81	547.610	119.089	37.83	7.354	1.334	6.020	69.084	101.32	96.65	98.99	78.18	60.71	34863.50
82	547.636	120.642	37.69	7.501	1.322	6.179	69.078	102.51	97.74	100.13	79.24	61.21	35170.57

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83	547.729	122.196	37.50	7.686	1.330	6.356	69.079	103.29	98.15	100.72	79.90	61.32	35251.22
84	547.731	123.782	37.44	7.826	1.349	6.477	69.002	101.68	97.14	99.41	78.93	60.43	34751.15
85	547.777	125.344	37.26	8.002	1.357	6.645	69.008	102.69	98.25	100.47	79.97	60.83	34997.44
86	547.922	126.801	37.04	8.199	1.341	6.858	69.033	103.41	98.35	100.88	80.53	60.76	34987.26
87	547.966	128.369	36.84	8.362	1.331	7.031	69.062	103.94	98.66	101.30	81.07	60.74	34998.70
88	548.116	130.037	36.79	8.499	1.354	7.145	68.975	102.47	97.74	100.10	80.16	59.95	34551.80
89	548.131	131.718	36.58	8.690	1.356	7.334	68.997	103.43	98.58	101.00	81.11	60.19	34715.01
90	548.227	133.318	36.39	8.849	1.343	7.506	69.028	103.62	98.30	100.96	81.27	59.90	34567.97
91	548.248	134.968	36.28	9.040	1.361	7.679	68.945	101.89	97.09	99.49	80.20	58.88	33991.93
92	548.237	136.634	36.06	9.232	1.315	7.917	68.971	102.42	97.85	100.14	80.95	58.95	34060.48
93	548.357	138.237	35.83	9.398	1.306	8.092	69.042	102.19	97.05	99.62	80.77	58.31	33722.34
94	548.404	139.853	35.71	9.608	1.317	8.290	68.950	100.15	95.73	97.94	79.53	57.17	33073.29
95	548.552	141.414	35.48	9.774	1.316	8.458	69.014	99.85	94.77	97.31	79.24	56.48	32704.20
96	548.657	143.039	35.33	9.976	1.325	8.651	68.959	97.05	92.86	94.95	77.47	54.91	31815.50
97	548.662	144.649	35.07	10.170	1.327	8.843	69.024	96.98	92.43	94.71	77.51	54.42	31561.43
98	548.785	146.361	34.87	10.394	1.330	9.064	69.001	93.56	89.17	91.37	74.96	52.24	30320.23
99	548.797	148.060	34.64	10.582	1.343	9.239	69.042	92.75	88.69	90.72	74.64	51.57	29958.89
100	548.892	149.717	34.41	10.826	1.291	9.535	69.035	89.16	84.88	87.02	71.79	49.17	28591.48
101	548.986	151.431	34.12	11.032	1.281	9.751	69.116	87.46	83.41	85.44	70.73	47.92	27898.33
102	549.013	153.071	33.88	11.291	1.273	10.018	69.096	83.38	79.38	81.38	67.56	45.36	26434.40
103	549.074	154.763	33.52	11.529	1.252	10.277	69.221	80.18	76.13	78.15	65.16	43.16	25186.03
104	549.175	156.604	33.31	11.821	1.243	10.578	69.135	64.67	61.91	63.29	52.89	34.76	20303.24





Photographs after Test

