

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)	10
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		UB305x16 5x40	UC254x25 4x89
Depth of Section	D (mm)	303.4	260.3
Width of Section	B (mm)	165	256.3
Thickness of Web	t (mm)	6	10.3
Thickness of Flange	T (mm)	10.2	17.3
Root Radius	r (mm)	8.9	12.7
Depth between Fillets	d (mm)	265.2	200.3

13 February 2008 End-plate Test Result

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													
1	548.298	-0.479											
2	548.367	-0.473											
3	548.405	-0.482	55.35	0.000	0.000	0.000	59.319	-18.26	-12.97	-15.62	-8.88	-12.85	-7103.32
4	548.528	0.695	55.47	-0.001	0.093	-0.094	59.198	-12.84	-8.82	-10.83	-6.14	-8.93	-4933.33
5	548.521	2.228	55.48	0.035	0.142	-0.107	59.190	-8.87	-5.54	-7.21	-4.08	-5.94	-3282.27
6	548.643	3.759	55.50	0.088	0.171	-0.083	59.173	-5.68	-3.28	-4.48	-2.54	-3.69	-2040.62
7	548.721	5.339	55.50	0.113	0.183	-0.070	59.176	-3.21	-0.45	-1.83	-1.04	-1.51	-832.86
8	548.761	7.218	55.54	0.159	0.230	-0.071	59.131	-0.43	0.38	-0.02	-0.01	-0.02	-9.87
9	548.841	8.835	55.57	0.150	0.217	-0.067	59.106	-0.06	1.30	0.62	0.35	0.51	280.87
10	548.891	10.436	55.76	0.169	0.210	-0.041	58.911	0.18	2.01	1.09	0.62	0.91	500.09
11	549.007	11.608	55.89	0.194	0.223	-0.029	58.778	1.03	2.11	1.57	0.88	1.30	719.85
12	549.077	12.997	56.00	0.226	0.245	-0.019	58.670	2.02	4.36	3.19	1.78	2.64	1458.69
13	549.084	14.438	56.07	0.263	0.273	-0.010	58.598	3.66	6.02	4.84	2.70	4.02	2219.54
14	549.229	15.872	56.07	0.306	0.327	-0.021	58.601	5.80	7.25	6.52	3.64	5.41	2988.98
15	549.294	17.226	56.09	0.356	0.370	-0.014	58.586	6.77	9.39	8.08	4.51	6.70	3702.21
16	549.366	18.771	56.03	0.412	0.407	0.005	58.638	8.45	10.20	9.32	5.21	7.73	4270.87
17	549.496	20.269	56.05	0.454	0.428	0.026	58.619	9.10	12.00	10.55	5.89	8.75	4832.31
18	549.552	21.719	56.02	0.496	0.448	0.048	58.657	9.36	12.00	10.68	5.97	8.85	4890.96
19	549.674	23.297	55.99	0.520	0.502	0.018	58.678	10.00	12.51	11.25	6.29	9.33	5153.08
20	549.707	24.770	55.98	0.554	0.517	0.037	58.693	10.55	13.03	11.79	6.60	9.77	5397.71
21	549.770	26.123	55.96	0.564	0.507	0.057	58.708	10.55	13.56	12.06	6.75	9.99	5518.57
22	549.873	27.547	55.96	0.555	0.535	0.020	58.711	11.33	13.64	12.49	6.99	10.35	5715.71

13 February 2008 End-plate Test Result

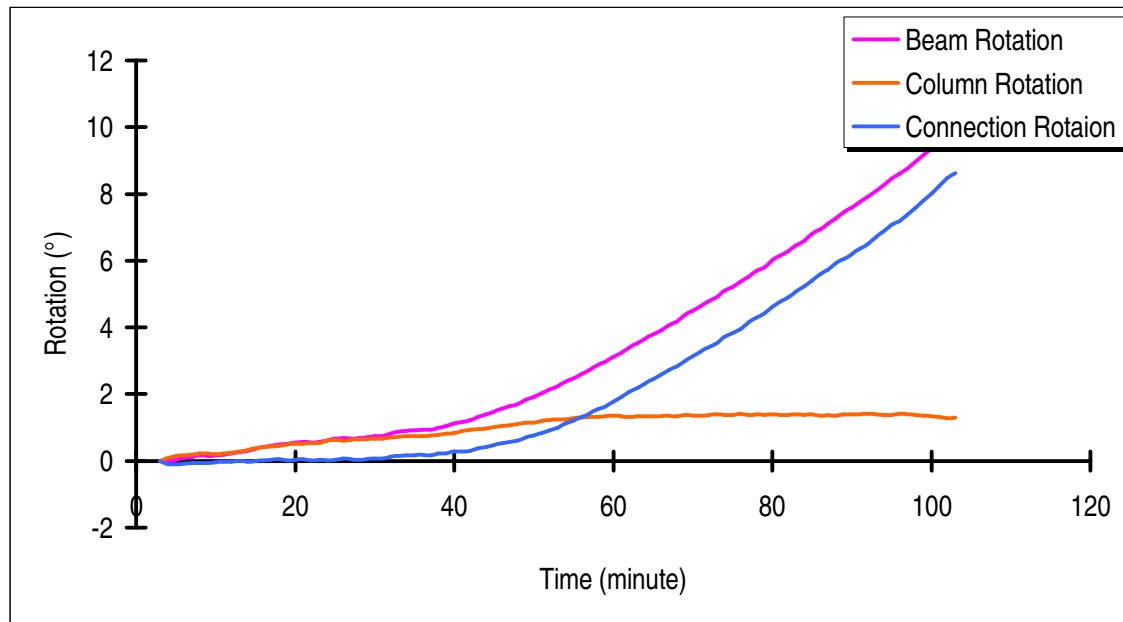
23	549.923	28.750	55.95	0.562	0.534	0.028	58.720	11.09	14.02	12.56	7.03	10.40	5747.60
24	550.061	30.326	55.95	0.616	0.604	0.012	58.725	12.48	15.07	13.78	7.72	11.42	6306.03
25	550.108	31.937	55.95	0.659	0.622	0.037	58.722	13.92	17.29	15.60	8.74	12.93	7140.25
26	550.138	33.818	55.94	0.682	0.606	0.076	58.735	14.04	15.75	14.89	8.34	12.34	6815.81
27	550.229	35.606	55.88	0.666	0.623	0.043	58.788	14.39	16.29	15.34	8.60	12.70	7016.72
28	550.290	36.966	55.88	0.676	0.638	0.038	58.796	14.31	16.89	15.60	8.75	12.92	7135.80
29	550.395	38.447	55.86	0.705	0.647	0.058	58.811	14.73	17.95	16.34	9.17	13.53	7472.09
30	550.458	39.785	55.88	0.734	0.664	0.070	58.791	16.02	18.59	17.30	9.71	14.33	7914.02
31	550.497	41.243	55.89	0.749	0.672	0.077	58.779	17.80	20.73	19.27	10.80	15.95	8813.93
32	550.588	42.829	55.91	0.822	0.700	0.122	58.762	21.56	23.95	22.75	12.75	18.84	10409.08
33	550.576	44.365	55.91	0.873	0.719	0.154	58.765	24.34	27.56	25.95	14.54	21.49	11869.66
34	550.686	45.990	55.94	0.905	0.743	0.162	58.731	27.73	30.11	28.92	16.20	23.96	13234.59
35	550.747	47.632	56.02	0.918	0.747	0.171	58.655	26.61	26.90	26.76	14.96	22.19	12255.61
36	550.674	49.235	55.97	0.935	0.747	0.188	58.700	26.79	28.89	27.84	15.58	23.07	12745.33
37	550.788	50.901	55.94	0.934	0.760	0.174	58.731	28.48	29.98	29.23	16.37	24.21	13375.99
38	550.854	52.134	55.95	0.999	0.783	0.216	58.719	31.35	32.88	32.12	17.98	26.61	14700.27
39	550.974	53.617	55.96	1.053	0.827	0.226	58.713	35.30	37.62	36.46	20.41	30.21	16687.17
40	551.066	54.943	55.95	1.126	0.841	0.285	58.720	39.60	40.98	40.29	22.56	33.38	18440.12
41	551.074	56.273	55.96	1.171	0.887	0.284	58.713	43.67	44.75	44.21	24.75	36.63	20236.11
42	551.194	57.538	55.96	1.226	0.925	0.301	58.709	47.15	48.39	47.77	26.74	39.59	21866.90
43	551.188	58.861	55.97	1.316	0.945	0.371	58.703	50.73	52.02	51.38	28.75	42.58	23519.11
44	551.238	60.223	55.98	1.386	0.978	0.408	58.694	54.40	55.32	54.86	30.69	45.47	25115.62
45	551.321	61.686	56.01	1.469	1.003	0.466	58.666	58.05	58.94	58.50	32.71	48.50	26787.90
46	551.325	63.176	56.00	1.565	1.041	0.524	58.670	61.44	62.20	61.82	34.57	51.25	28310.01
47	551.391	64.722	56.02	1.639	1.071	0.568	58.655	64.48	66.21	65.35	36.52	54.19	29928.45
48	551.399	66.252	56.01	1.709	1.103	0.606	58.663	67.32	69.17	68.24	38.15	56.58	31253.52
49	551.439	67.790	56.01	1.839	1.140	0.699	58.660	69.75	71.94	70.85	39.60	58.74	32445.53
50	551.519	69.334	56.03	1.921	1.151	0.770	58.639	72.53	74.27	73.40	41.01	60.87	33622.28
51	551.587	70.928	56.04	2.031	1.199	0.832	58.635	74.86	75.97	75.41	42.13	62.55	34547.03
52	551.694	72.562	56.07	2.151	1.231	0.920	58.604	77.00	78.07	77.53	43.28	64.33	35528.28

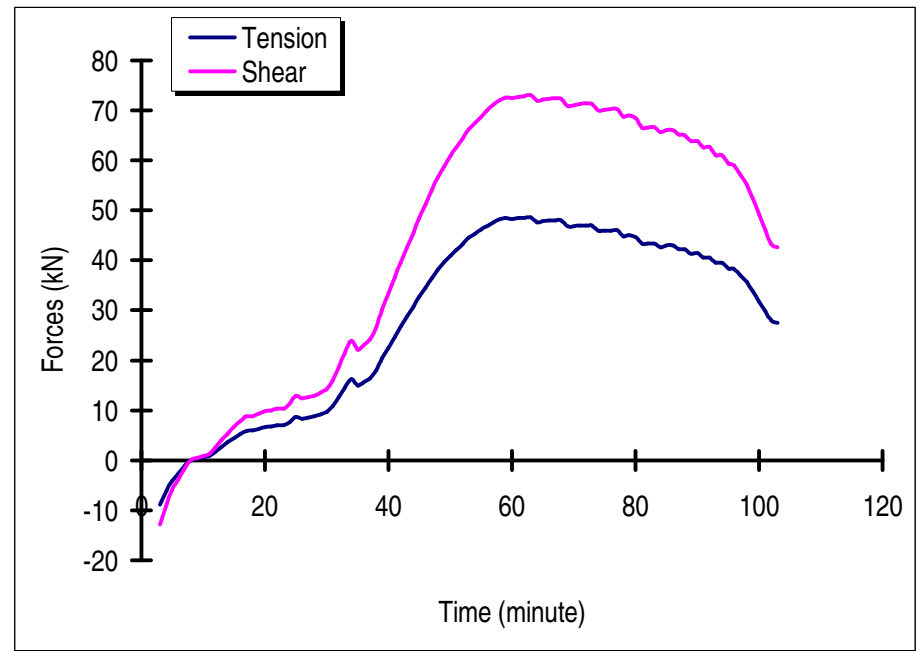
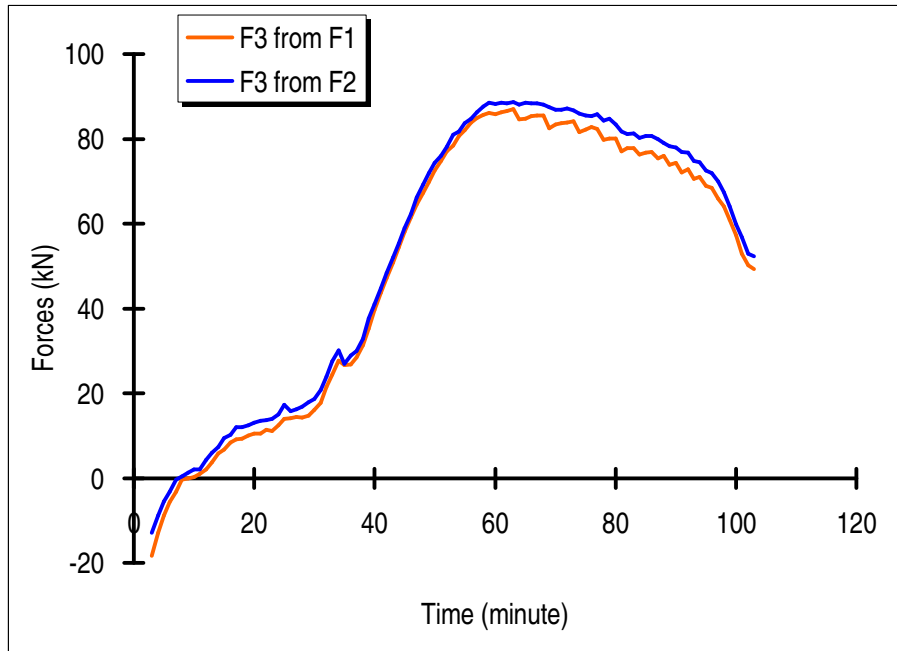
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53	551.700	74.124	56.07	2.234	1.249	0.985	58.605	78.43	80.94	79.68	44.48	66.11	36513.59
54	551.790	75.749	56.12	2.371	1.247	1.124	58.554	80.73	81.67	81.20	45.27	67.41	37226.87
55	551.794	77.302	56.14	2.474	1.276	1.198	58.534	82.03	83.65	82.84	46.16	68.79	37988.56
56	551.829	78.912	56.19	2.605	1.293	1.312	58.487	83.81	84.71	84.26	46.89	70.01	38660.51
57	551.906	80.499	56.19	2.722	1.316	1.406	58.478	84.91	86.24	85.58	47.61	71.11	39265.35
58	551.899	81.996	56.21	2.869	1.322	1.547	58.462	85.58	87.70	86.64	48.18	72.01	39760.55
59	552.001	83.501	56.24	2.958	1.329	1.629	58.437	86.19	88.49	87.34	48.54	72.61	40092.61
60	552.114	85.150	56.33	3.124	1.349	1.775	58.342	85.74	88.28	87.01	48.24	72.42	39980.77
61	552.145	86.728	56.31	3.243	1.328	1.915	58.359	86.30	88.49	87.40	48.48	72.72	40150.81
62	552.264	88.338	56.34	3.393	1.327	2.066	58.332	86.57	88.32	87.45	48.47	72.79	40184.71
63	552.205	89.915	56.36	3.521	1.343	2.178	58.309	86.96	88.66	87.81	48.64	73.11	40362.27
64	552.277	91.750	56.48	3.657	1.338	2.319	58.196	84.62	88.00	86.31	47.67	71.95	39717.60
65	552.289	93.343	56.47	3.784	1.338	2.446	58.205	84.76	88.48	86.62	47.85	72.20	39856.56
66	552.288	94.912	56.45	3.914	1.336	2.578	58.223	85.28	88.41	86.85	48.00	72.38	39954.81
67	552.393	96.578	56.47	4.064	1.347	2.717	58.205	85.47	88.42	86.95	48.03	72.48	40007.94
68	552.367	98.211	56.46	4.172	1.342	2.830	58.217	85.45	88.04	86.74	47.93	72.30	39909.22
69	552.376	99.974	56.59	4.365	1.376	2.989	58.083	82.44	87.46	84.95	46.78	70.91	39138.82
70	552.539	101.583	56.63	4.492	1.359	3.133	58.038	83.35	86.88	85.12	46.81	71.09	39232.71
71	552.564	103.112	56.64	4.633	1.363	3.270	58.033	83.72	86.93	85.32	46.92	71.26	39329.43
72	552.551	104.674	56.65	4.789	1.381	3.408	58.020	83.90	87.17	85.53	47.02	71.45	39431.85
73	552.559	106.325	56.65	4.909	1.386	3.523	58.024	84.16	86.68	85.42	46.96	71.35	39377.24
74	552.558	108.166	56.78	5.087	1.377	3.710	57.894	81.59	85.89	83.74	45.88	70.05	38653.61
75	552.670	109.688	56.82	5.220	1.384	3.836	57.854	82.14	85.55	83.84	45.89	70.17	38717.65
76	552.659	111.313	56.82	5.360	1.409	3.951	57.854	82.76	85.31	84.03	45.99	70.33	38805.02
77	552.682	112.804	56.79	5.524	1.366	4.158	57.885	82.27	85.76	84.02	46.02	70.29	38785.17
78	552.629	114.588	56.89	5.682	1.389	4.293	57.782	79.80	84.28	82.04	44.81	68.72	37912.21
79	552.634	116.063	56.89	5.807	1.377	4.430	57.785	80.05	84.72	82.39	45.01	69.01	38072.36
80	552.671	117.696	56.86	6.012	1.387	4.625	57.817	80.15	83.37	81.76	44.70	68.45	37768.57
81	552.691	119.497	56.93	6.146	1.370	4.776	57.744	77.06	81.77	79.41	43.34	66.55	36713.26
82	552.710	121.147	56.92	6.291	1.380	4.911	57.750	77.75	81.17	79.46	43.37	66.58	36730.23

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83	552.744	122.813	56.90	6.459	1.385	5.074	57.773	77.81	81.28	79.55	43.44	66.64	36763.24
84	552.819	124.478	56.98	6.599	1.370	5.229	57.692	76.28	80.20	78.24	42.63	65.60	36188.34
85	552.845	126.128	56.95	6.794	1.397	5.397	57.724	76.82	80.64	78.73	42.94	65.99	36403.55
86	552.843	127.770	56.93	6.943	1.355	5.588	57.745	76.86	80.75	78.81	43.01	66.04	36431.95
87	552.941	129.467	57.01	7.105	1.377	5.728	57.659	75.44	79.89	77.66	42.28	65.14	35934.39
88	552.913	131.069	56.97	7.267	1.354	5.913	57.706	75.96	79.03	77.49	42.24	64.96	35837.98
89	552.915	132.743	57.04	7.449	1.388	6.061	57.631	73.86	78.25	76.06	41.38	63.82	35200.42
90	552.969	134.345	57.01	7.595	1.398	6.197	57.658	74.31	77.94	76.12	41.44	63.85	35222.82
91	552.947	136.140	57.06	7.754	1.392	6.362	57.609	72.07	76.93	74.50	40.51	62.53	34490.04
92	553.011	137.765	57.08	7.924	1.422	6.502	57.595	72.78	76.69	74.73	40.62	62.73	34601.22
93	553.032	139.420	57.09	8.094	1.393	6.701	57.582	70.63	74.83	72.73	39.51	61.06	33677.07
94	553.053	141.006	57.07	8.255	1.377	6.878	57.603	71.05	74.52	72.79	39.57	61.09	33696.64
95	553.141	142.650	57.11	8.445	1.376	7.069	57.564	68.89	72.56	70.72	38.41	59.39	32755.03
96	553.038	144.211	57.05	8.600	1.411	7.189	57.621	68.49	72.00	70.24	38.21	58.95	32514.06
97	553.073	145.932	57.06	8.759	1.386	7.373	57.611	65.91	70.02	67.96	36.96	57.04	31462.04
98	553.073	147.533	57.10	8.973	1.382	7.591	57.571	64.06	67.35	65.71	35.69	55.17	30428.69
99	552.980	149.136	57.11	9.163	1.365	7.798	57.566	60.85	64.10	62.47	33.93	52.46	28933.51
100	553.057	150.738	57.16	9.348	1.333	8.015	57.513	57.28	59.91	58.59	31.77	49.23	27149.68
101	553.063	152.644	57.13	9.559	1.323	8.236	57.538	52.91	56.87	54.89	29.79	46.10	25427.38
102	553.068	154.341	57.15	9.742	1.278	8.464	57.527	50.18	52.88	51.53	27.96	43.29	23875.25
103	553.085	156.007	57.12	9.929	1.301	8.628	57.548	49.27	52.28	50.78	27.56	42.65	23520.87





Photographs after Test

