

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)	50
Spacing between centres of bolts in the direction of load transfer	$p_1$ (mm)	60
Spacing between rows of bolts	$p_2$ (mm)	103
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		UB305x165x40	UC254x254x89
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

Nominal Temperature

20°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 from Reading (kN)	Tension (kN)	Shear (kN)	Moment (kN*m)
0	23.089	-0.005											
1	22.968	0.003											
2	23.024	-0.009											
3	23.000	-0.009	45.71	0.000	0.000	0.000	68.459	1.07	5.46	1.01	0.71	0.72	406.82
4	22.985	1.191	45.77	0.006	0.005	0.001	68.391	0.38	6.33	1.79	1.25	1.28	722.00
5	23.019	2.452	45.76	0.053	0.010	0.043	68.349	-0.60	7.58	2.77	1.93	1.98	1115.75
6	23.010	3.990	45.73	0.115	0.022	0.092	68.323	-2.06	8.65	3.97	2.77	2.84	1598.84
7	22.909	5.563	45.73	0.192	0.030	0.162	68.239	-3.32	9.82	5.12	3.57	3.67	2061.38
8	22.872	7.205	45.71	0.270	0.038	0.233	68.182	4.39	11.09	6.38	4.45	4.56	2566.39
9	22.958	8.935	45.75	0.349	0.045	0.304	68.062	5.85	12.03	7.49	5.23	5.37	3017.46
10	22.983	10.641	45.72	0.451	0.054	0.397	67.996	6.57	12.65	8.36	5.83	5.98	3363.50
11	22.970	12.335	45.68	0.544	0.054	0.490	67.940	7.42	13.00	9.00	6.29	6.44	3620.46
12	22.916	14.010	45.68	0.647	0.058	0.588	67.838	8.08	13.57	9.61	6.72	6.88	3866.57
13	22.934	15.691	45.56	0.748	0.061	0.687	67.856	8.84	14.63	10.59	7.41	7.56	4251.19
14	22.962	17.353	45.57	0.850	0.057	0.793	67.745	9.96	15.30	11.51	8.06	8.22	4622.18
15	23.052	18.854	45.58	0.964	0.058	0.905	67.622	10.72	16.10	12.40	8.68	8.86	4980.52
16	22.986	20.496	45.44	1.084	0.063	1.021	67.637	11.38	16.99	13.13	9.21	9.35	5261.60
17	22.955	22.209	45.41	1.215	0.070	1.145	67.542	12.26	17.13	13.79	9.68	9.82	5525.87
18	23.029	23.741	45.40	1.343	0.074	1.269	67.422	12.84	17.61	14.41	10.12	10.26	5771.27
19	23.030	25.345	45.26	1.492	0.068	1.424	67.418	13.17	17.80	14.77	10.39	10.49	5902.42
20	23.034	26.809	45.17	1.630	0.073	1.556	67.361	13.44	17.78	15.10	10.65	10.71	6028.89
21	22.918	28.315	45.02	1.788	0.079	1.709	67.359	13.46	17.79	15.35	10.85	10.86	6114.69
22	22.825	29.837	44.87	1.942	0.071	1.871	67.354	13.64	17.74	15.44	10.94	10.89	6134.11

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23	22.838	31.398	44.79	2.094	0.077	2.017	67.283	13.72	17.61	15.58	11.05	10.97	6181.95
24	22.934	32.944	44.66	2.209	0.084	2.125	67.297	15.55	19.80	17.66	12.56	12.41	6995.61
25	22.944	34.536	44.67	2.315	0.086	2.229	67.180	17.58	21.44	19.55	13.91	13.75	7746.40
26	22.895	36.185	44.56	2.456	0.086	2.370	67.146	18.43	22.07	20.36	14.50	14.28	8051.84
27	22.949	37.875	44.46	2.606	0.092	2.514	67.096	18.59	22.29	20.38	14.55	14.28	8050.47
28	22.923	39.541	44.28	2.752	0.078	2.674	67.136	18.84	22.30	20.38	14.59	14.23	8027.29
29	23.016	41.215	44.26	2.918	0.081	2.837	66.990	18.79	22.46	20.44	14.64	14.27	8046.74
30	22.959	42.895	44.14	3.082	0.087	2.995	66.940	18.65	21.84	20.02	14.37	13.94	7868.17
31	22.985	44.594	44.01	3.270	0.085	3.184	66.883	18.61	21.48	19.75	14.20	13.72	7744.21
32	23.025	46.172	43.92	3.400	0.090	3.310	66.849	20.29	23.16	21.66	15.60	15.03	8482.32
33	23.033	47.725	43.87	3.501	0.101	3.400	66.791	22.46	25.28	23.77	17.14	16.48	9303.08
34	22.969	49.127	43.87	3.584	0.108	3.476	66.716	24.17	26.29	25.02	18.04	17.34	9790.21
35	22.992	50.687	43.81	3.692	0.110	3.582	66.666	25.94	27.77	26.82	19.36	18.57	10484.94
36	23.023	52.249	43.80	3.794	0.124	3.669	66.575	27.41	29.59	28.54	20.60	19.75	11155.18
37	23.019	53.819	43.70	3.916	0.122	3.794	66.548	29.26	31.26	30.42	21.99	21.02	11872.55
38	23.012	55.452	43.57	4.041	0.130	3.910	66.551	31.41	33.24	32.53	23.57	22.42	12668.42
39	23.023	56.966	43.58	4.125	0.146	3.979	66.463	35.07	36.78	36.51	26.45	25.17	14219.62
40	23.033	58.512	43.61	4.185	0.160	4.025	66.374	39.73	41.22	41.06	29.73	28.32	16000.14
41	23.033	60.073	43.56	4.267	0.169	4.098	66.341	44.28	45.70	45.72	33.13	31.51	17801.89
42	23.011	61.675	43.54	4.359	0.202	4.157	66.264	48.40	49.44	49.82	36.11	34.32	19393.67
43	23.047	63.203	43.44	4.451	0.217	4.234	66.271	51.54	53.09	53.34	38.73	36.68	20729.55
44	23.040	64.846	43.48	4.540	0.208	4.332	66.149	53.74	55.10	55.53	40.30	38.21	21593.76
45	22.896	66.583	43.42	4.651	0.216	4.435	66.099	55.57	56.93	57.54	41.79	39.54	22351.23
46	22.847	68.224	43.37	4.767	0.227	4.540	66.026	57.58	58.60	59.43	43.20	40.81	23069.30
47	22.889	69.779	43.27	4.874	0.228	4.645	66.022	59.03	60.54	61.21	44.57	41.95	23721.89
48	22.979	71.355	43.22	4.978	0.238	4.740	65.966	60.62	62.14	62.88	45.82	43.06	24350.43
49	22.932	73.052	43.26	5.069	0.246	4.822	65.836	62.47	63.34	64.49	46.97	44.20	24991.69
50	22.960	74.574	43.13	5.194	0.249	4.944	65.839	63.95	65.01	66.05	48.20	45.16	25541.82
51	22.939	76.144	43.04	5.306	0.251	5.055	65.824	65.49	66.19	67.55	49.38	46.10	26082.13
52	22.991	77.681	43.02	5.416	0.257	5.159	65.726	66.88	67.64	69.08	50.51	47.13	26667.65

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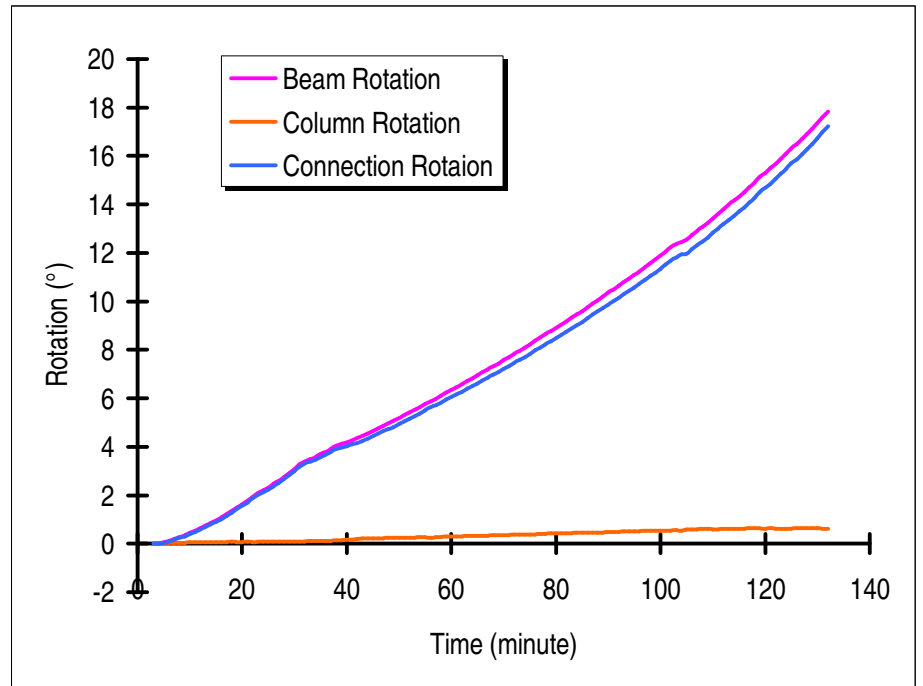
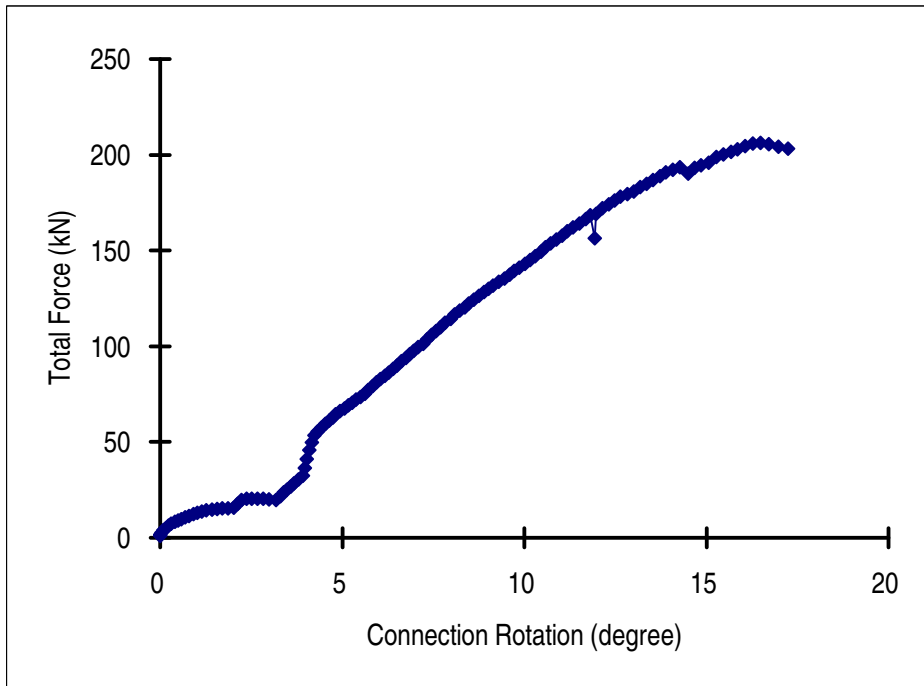
53	23.053	79.386	42.95	5.523	0.254	5.269	65.692	68.42	68.82	70.61	51.68	48.11	27225.94
54	23.114	80.981	42.92	5.637	0.260	5.376	65.612	69.66	70.43	72.14	52.83	49.12	27799.87
55	23.074	82.670	42.85	5.758	0.263	5.495	65.558	71.44	71.69	73.70	54.03	50.12	28367.85
56	23.051	84.304	42.82	5.877	0.257	5.620	65.470	73.17	73.01	75.36	55.27	51.22	28992.36
57	23.111	85.873	42.74	5.989	0.270	5.718	65.434	74.98	74.93	77.21	56.70	52.40	29668.52
58	23.047	87.635	42.66	6.109	0.281	5.828	65.396	77.33	76.71	79.36	58.36	53.78	30453.02
59	23.063	89.300	42.58	6.236	0.295	5.941	65.348	79.31	78.81	81.34	59.89	55.04	31175.29
60	23.100	90.894	42.47	6.349	0.298	6.051	65.342	81.12	80.61	83.00	61.22	56.05	31753.35
61	23.074	92.544	42.42	6.464	0.296	6.167	65.285	82.99	82.44	84.71	62.54	57.14	32377.59
62	23.101	94.129	42.40	6.588	0.309	6.279	65.174	84.93	84.15	86.34	63.75	58.22	32993.21
63	23.093	95.706	42.25	6.707	0.317	6.390	65.210	86.86	86.30	88.21	65.30	59.31	33620.90
64	23.085	97.307	42.24	6.825	0.321	6.504	65.105	88.72	88.07	89.92	66.58	60.44	34264.79
65	23.094	98.774	42.18	6.949	0.330	6.619	65.037	91.15	90.03	92.27	68.38	61.96	35129.68
66	23.100	100.423	42.09	7.075	0.326	6.749	65.005	92.91	91.97	94.03	69.79	63.03	35743.85
67	23.039	102.104	42.09	7.186	0.330	6.856	64.886	95.14	93.68	95.82	71.10	64.23	36426.70
68	23.085	103.714	42.02	7.310	0.342	6.968	64.834	97.16	95.36	97.49	72.43	65.26	37019.31
69	23.007	105.307	41.96	7.435	0.345	7.090	64.770	99.13	97.15	99.44	73.94	66.49	37720.16
70	23.035	106.789	41.85	7.575	0.349	7.226	64.741	101.28	99.13	101.36	75.50	67.62	38374.77
71	23.045	108.493	41.80	7.684	0.362	7.321	64.679	103.82	101.36	103.67	77.28	69.11	39221.63
72	23.017	110.038	41.73	7.821	0.368	7.453	64.610	106.55	103.42	105.94	79.06	70.52	40032.60
73	23.027	111.674	41.64	7.959	0.377	7.581	64.565	108.76	105.37	108.01	80.72	71.77	40751.71
74	23.076	113.329	41.60	8.079	0.376	7.702	64.484	111.34	107.34	110.11	82.34	73.11	41515.55
75	22.956	114.996	41.52	8.210	0.388	7.822	64.437	113.58	109.26	112.34	84.11	74.47	42295.69
76	22.777	116.630	41.37	8.367	0.386	7.980	64.433	115.74	111.39	114.33	85.81	75.56	42932.98
77	22.834	118.191	41.29	8.500	0.415	8.084	64.371	117.89	113.58	116.50	87.53	76.88	43695.81
78	22.876	119.761	41.21	8.638	0.415	8.223	64.319	120.56	115.58	118.65	89.26	78.16	44434.12
79	22.969	121.315	41.05	8.781	0.418	8.362	64.339	122.72	117.49	120.39	90.80	79.06	44962.13
80	23.024	122.978	40.89	8.901	0.421	8.479	64.375	124.93	119.44	122.45	92.57	80.16	45608.34
81	22.950	124.493	40.70	9.034	0.424	8.609	64.435	126.72	121.54	124.17	94.14	80.97	46092.73
82	22.915	126.070	40.66	9.176	0.425	8.751	64.329	129.35	123.27	126.28	95.79	82.28	46845.68

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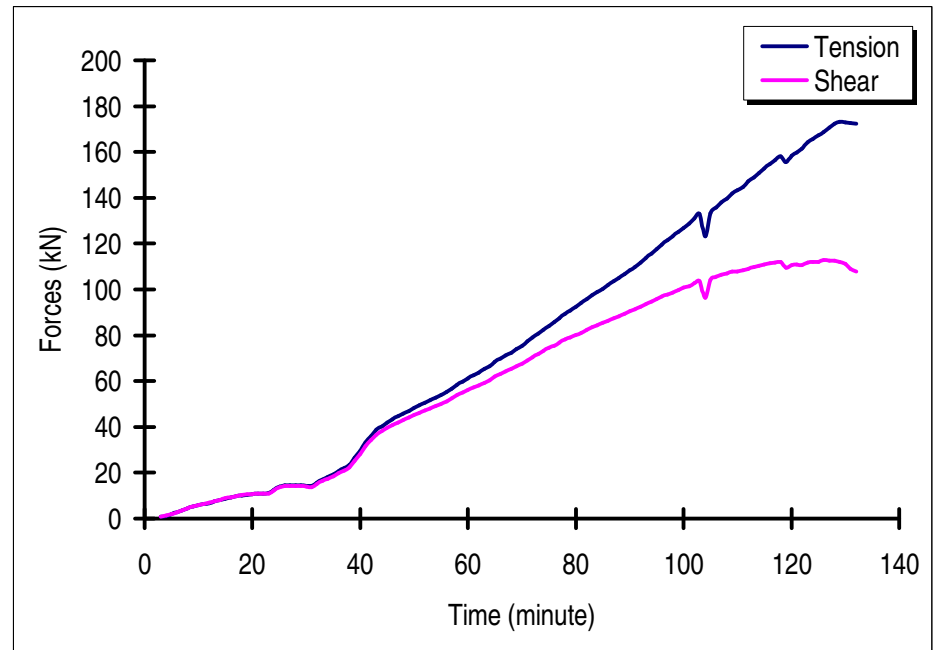
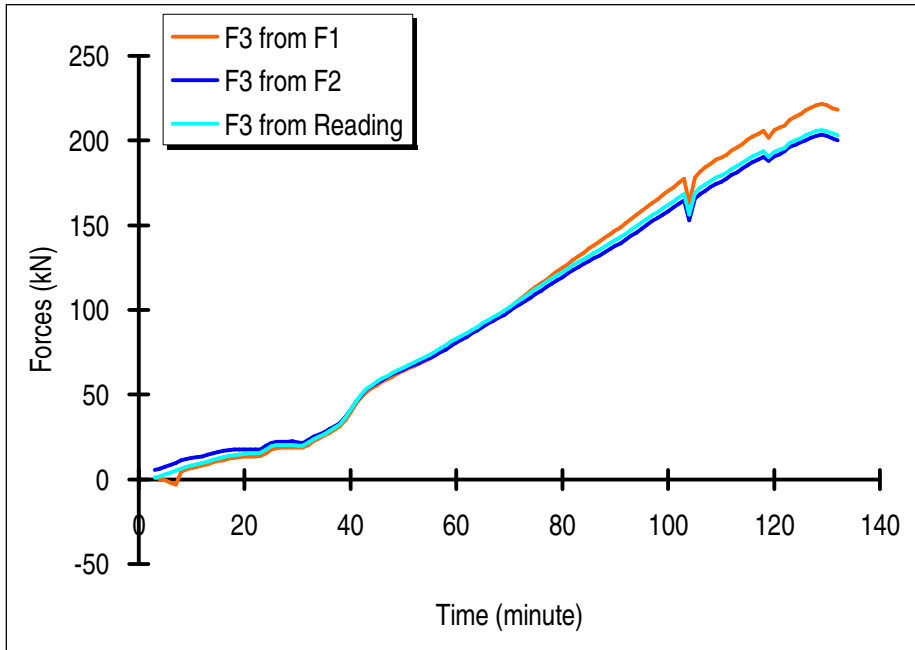
83	23.029	127.657	40.58	9.321	0.433	8.888	64.263	131.78	125.17	128.23	97.39	83.41	47502.52
84	23.012	129.233	40.44	9.464	0.448	9.015	64.260	133.76	127.06	129.91	98.87	84.27	48008.21
85	22.959	130.812	40.44	9.593	0.446	9.147	64.134	136.27	128.58	131.83	100.34	85.51	48714.55
86	23.105	132.317	40.19	9.749	0.458	9.291	64.225	138.22	130.73	133.59	102.05	86.21	49150.15
87	23.133	133.928	40.12	9.906	0.454	9.451	64.135	140.36	132.26	135.46	103.58	87.30	49779.29
88	23.233	135.705	40.07	10.050	0.459	9.591	64.050	142.68	134.01	137.24	105.03	88.34	50380.71
89	23.213	137.314	39.92	10.192	0.465	9.727	64.050	144.67	135.91	139.26	106.80	89.37	50991.74
90	23.222	138.884	39.85	10.356	0.493	9.863	63.955	147.01	137.70	141.21	108.40	90.49	51640.29
91	23.034	140.454	39.74	10.498	0.484	10.014	63.931	148.85	139.35	142.91	109.90	91.35	52151.76
92	22.910	142.081	39.59	10.650	0.492	10.158	63.921	151.32	141.53	145.06	111.78	92.45	52800.56
93	22.890	143.673	39.46	10.804	0.506	10.298	63.903	153.59	143.67	147.16	113.62	93.52	53432.58
94	22.954	145.362	39.34	10.954	0.504	10.450	63.870	156.23	145.77	149.46	115.59	94.75	54154.08
95	23.043	146.892	39.19	11.093	0.515	10.578	63.882	158.62	148.10	151.63	117.52	95.82	54788.93
96	23.032	148.510	39.04	11.243	0.515	10.728	63.882	160.85	150.28	153.80	119.46	96.88	55420.16
97	23.087	150.119	38.83	11.417	0.539	10.878	63.918	163.25	152.35	155.89	121.44	97.75	55955.04
98	23.031	151.809	38.67	11.571	0.531	11.040	63.921	165.39	154.33	157.87	123.25	98.65	56499.84
99	23.010	153.442	38.59	11.726	0.542	11.184	63.851	168.07	156.28	160.01	125.07	99.80	57175.51
100	23.010	155.044	38.44	11.885	0.541	11.344	63.839	170.30	158.30	162.01	126.90	100.73	57731.86
101	23.073	156.621	38.23	12.062	0.545	11.517	63.878	172.27	160.60	164.02	128.85	101.49	58208.60
102	23.040	158.270	38.11	12.228	0.548	11.680	63.826	175.19	162.54	166.33	130.87	102.66	58902.06
103	22.990	159.823	37.94	12.373	0.558	11.815	63.851	177.39	164.74	168.57	132.94	103.64	59500.04
104	22.484	161.570	38.00	12.460	0.525	11.935	63.708	162.56	152.87	156.45	123.29	96.31	55281.49
105	22.607	162.972	37.98	12.559	0.584	11.975	63.628	178.18	165.84	169.12	133.31	104.07	59737.60
106	22.820	164.548	37.88	12.727	0.579	12.148	63.563	181.79	168.41	172.01	135.78	105.60	60638.79
107	22.874	166.094	37.62	12.905	0.586	12.319	63.636	184.31	170.32	174.22	137.99	106.36	61120.70
108	22.966	167.705	37.47	13.084	0.602	12.482	63.616	186.23	172.38	175.97	139.67	107.04	61547.37
109	23.022	169.361	37.26	13.248	0.605	12.643	63.654	188.68	174.41	178.15	141.78	107.87	62063.81
110	23.006	170.979	36.99	13.436	0.601	12.835	63.737	189.96	175.74	179.35	143.25	107.92	62152.09
111	23.033	172.644	36.82	13.609	0.596	13.013	63.732	191.46	177.42	180.90	144.81	108.42	62479.73
112	22.963	174.286	36.55	13.786	0.605	13.181	63.834	193.92	179.61	183.15	147.14	109.06	62906.63

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113	22.873	175.985	36.39	13.970	0.612	13.358	63.810	196.02	181.41	184.98	148.91	109.73	63330.83
114	23.002	177.513	36.15	14.155	0.616	13.539	63.856	197.98	183.50	186.86	150.87	110.24	63677.56
115	22.925	179.171	35.98	14.334	0.616	13.718	63.849	200.55	185.36	188.84	152.81	110.95	64127.82
116	22.781	180.905	35.73	14.512	0.627	13.885	63.921	202.47	187.33	190.79	154.88	111.42	64459.71
117	23.007	182.494	35.52	14.710	0.629	14.081	63.934	204.06	188.80	192.18	156.42	111.66	64646.74
118	22.979	184.112	35.30	14.904	0.632	14.272	63.961	205.72	190.31	193.61	158.01	111.88	64831.21
119	22.983	185.863	35.15	15.132	0.629	14.503	63.883	201.64	188.21	190.32	155.62	109.57	63530.75
120	22.943	187.545	34.94	15.307	0.625	14.682	63.914	206.05	190.53	193.19	158.36	110.65	64207.41
121	22.962	189.227	34.75	15.499	0.641	14.858	63.919	207.78	191.98	194.47	159.79	110.84	64364.67
122	22.990	190.820	34.46	15.677	0.616	15.061	64.032	208.74	193.77	195.71	161.38	110.73	64375.00
123	22.902	192.333	34.23	15.891	0.618	15.273	64.047	212.28	196.23	198.78	164.36	111.81	65063.85
124	22.979	193.983	34.05	16.084	0.622	15.462	64.028	214.07	197.57	200.08	165.77	112.04	65241.89
125	22.929	195.673	33.82	16.310	0.627	15.683	64.034	215.67	198.99	201.38	167.30	112.09	65334.41
126	23.028	197.283	33.74	16.482	0.633	15.849	63.941	217.73	200.27	202.99	168.80	112.75	65743.69
127	22.960	198.892	33.41	16.695	0.633	16.062	64.064	219.37	201.67	204.39	170.62	112.53	65705.17
128	22.881	200.221	33.18	16.906	0.628	16.278	64.084	220.80	202.89	205.84	172.29	112.63	65832.02
129	22.862	200.318	32.93	17.120	0.637	16.483	64.114	221.63	203.45	206.18	173.05	112.08	65580.13
130	22.920	200.325	32.70	17.349	0.630	16.719	64.119	220.88	202.68	205.58	173.00	111.05	65043.61
131	22.915	200.325	32.27	17.603	0.623	16.980	64.295	219.15	201.20	204.23	172.69	109.03	63983.58
132	22.951	200.324	32.02	17.838	0.605	17.233	64.307	218.34	200.18	203.30	172.37	107.79	63327.80







Photographs after Test

