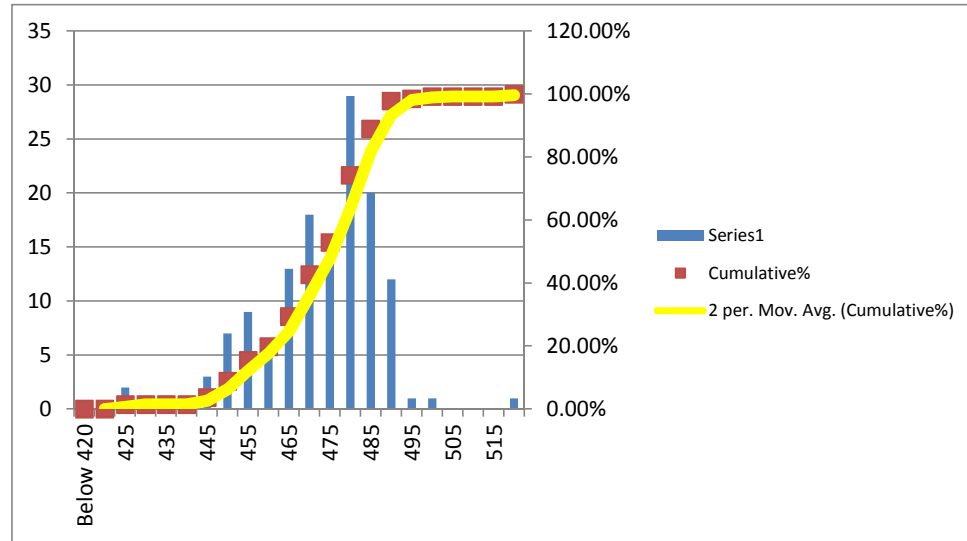


Campaign Length: 26.05.16 to 26.05.16  
 Total Production: 714.315 MT  
 Billet Rolled: BIS-202 & BIS-210  
 Product: G 420-DWR (4x12 mm)

YIELD STRENGTH	
Mean	473.235
Median	475
Mode	480
Std. Dev.	14.097
Min	425
Max	520
Count	136

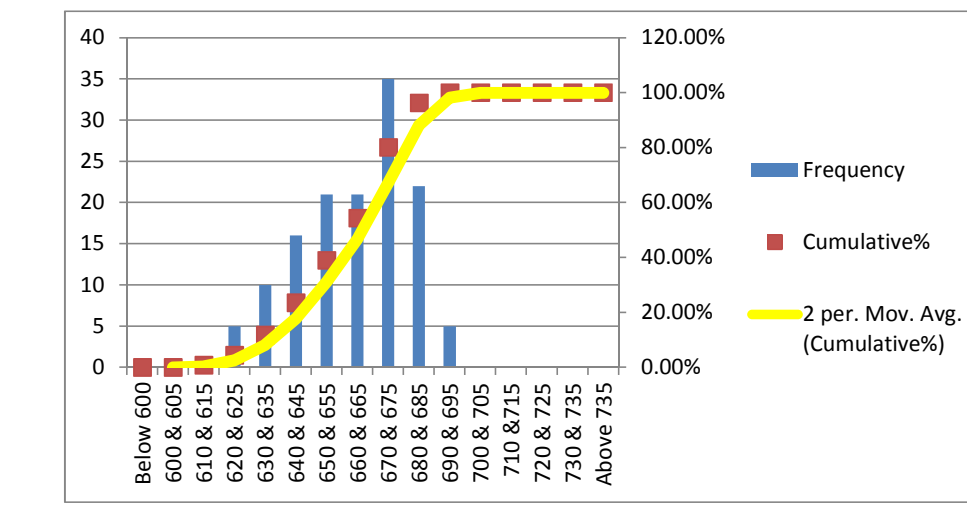
Bin	Frequency	%	Cumulative%
Below 420	0	0.00%	0.00%
420	0	0.00%	0.00%
425	2	1.47%	1.47%
430	0	0.00%	1.47%
435	0	0.00%	1.47%
440	0	0.00%	1.47%
445	3	2.21%	3.68%
450	7	5.15%	8.82%
455	9	6.62%	15.44%
460	6	4.41%	19.85%
465	13	9.56%	29.41%
470	18	13.24%	42.65%
475	14	10.29%	52.94%
480	29	21.32%	74.26%
485	20	14.71%	88.97%
490	12	8.82%	97.79%
495	1	0.74%	98.53%
500	1	0.74%	99.26%
505	0	0.00%	99.26%
510	0	0.00%	99.26%
515	0	0.00%	99.26%
520 & Above	1	0.74%	100.00%
Total	136		



**MINIMUM REQUIREMENTS**  
 As per ISO 6935-2: 420 Mpa  
 As per ASTM A-615: 420 Mpa

ULTIMATE STRENGTH	
Mean	661.544
Median	665
Mode	675
Std. Dev.	17.96
Min	610
Max	695
Count	136

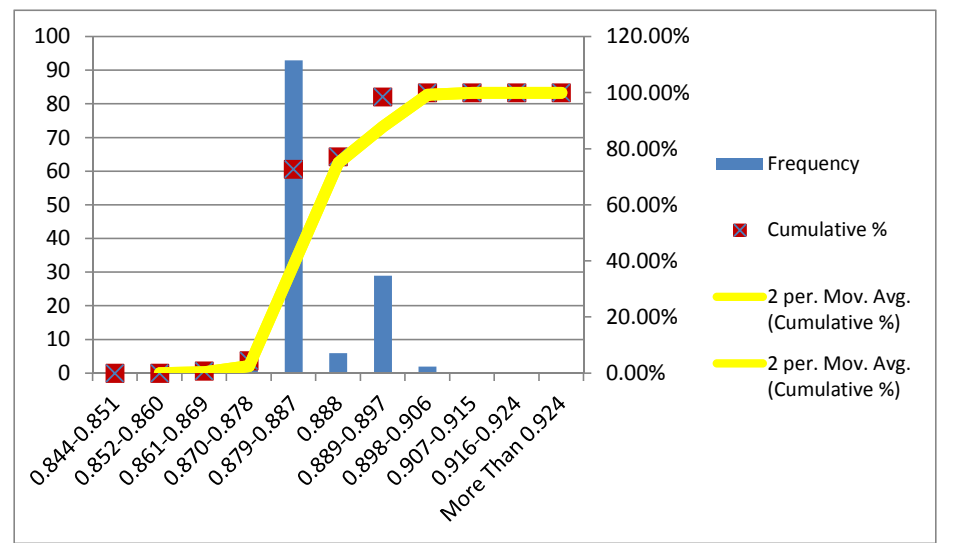
Bin	Frequency	%	Cumulative%
Below 600	0	0.00%	0.00%
600 & 605	0	0.00%	0.00%
610 & 615	1	0.74%	0.74%
620 & 625	5	3.68%	4.41%
630 & 635	10	7.35%	11.76%
640 & 645	16	11.76%	23.53%
650 & 655	21	15.44%	38.97%
660 & 665	21	15.44%	54.41%
670 & 675	35	25.74%	80.15%
680 & 685	22	16.18%	96.32%
690 & 695	5	3.68%	100.00%
700 & 705	0	0.00%	100.00%
710 & 715	0	0.00%	100.00%
720 & 725	0	0.00%	100.00%
730 & 735	0	0.00%	100.00%
Above 735	0	0.00%	100.00%
Total	136		



**MINIMUM REQUIREMENTS**  
 As per ISO 6935-2: 525 Mpa  
 As per ASTM A-615: 620 Mpa

UNIT WEIGHT	
Mean	0.885
Median	0.885
Mode	0.886
Std. Dev.	0.005
Min	0.864
Max	0.906
Count	136

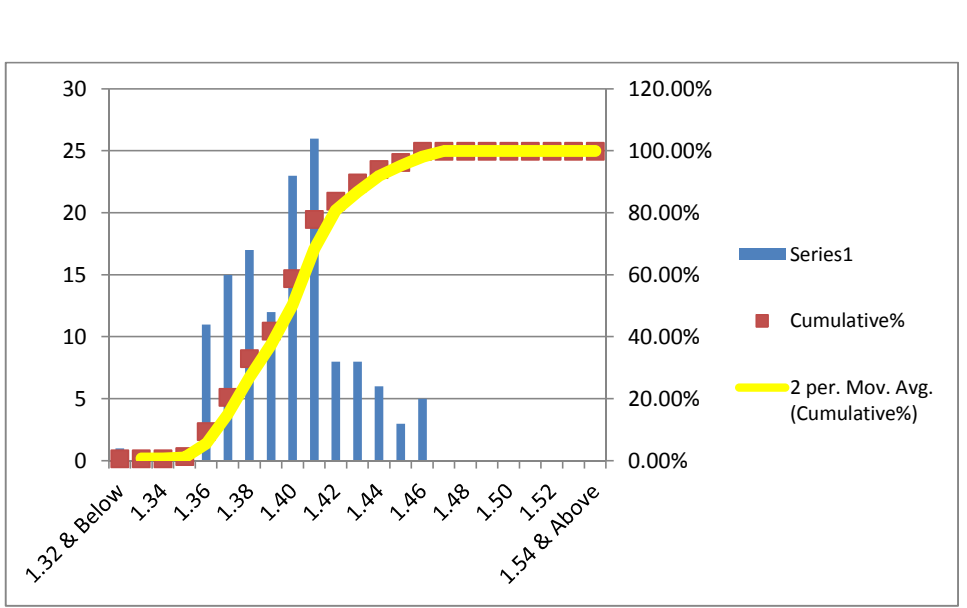
Bin	Frequency	%	Cumulative %
Less Than 0.844	0	0.00%	0.00%
0.844-0.851	0	0.00%	0.00%
0.852-0.860	0	0.00%	0.00%
0.861-0.869	1	0.74%	0.74%
0.870-0.878	5	3.68%	4.41%
0.879-0.887	93	68.38%	72.79%
0.888	6	4.41%	77.21%
0.889-0.897	29	21.32%	98.53%
0.898-0.906	2	1.47%	100.00%
0.907-0.915	0	0.00%	100.00%
0.916-0.924	0	0.00%	100.00%
More Than 0.924	0	0.00%	100.00%
Total	136		



**MINIMUM REQUIREMENTS**  
 As per ISO 6935-2: ± 5%  
 As per ASTM A-615: -6%

T/Y RATIO	
Mean	1.398
Median	1.40
Mode	1.41
Std. Dev.	0.027
Min	1.30
Max	1.46
Count	136

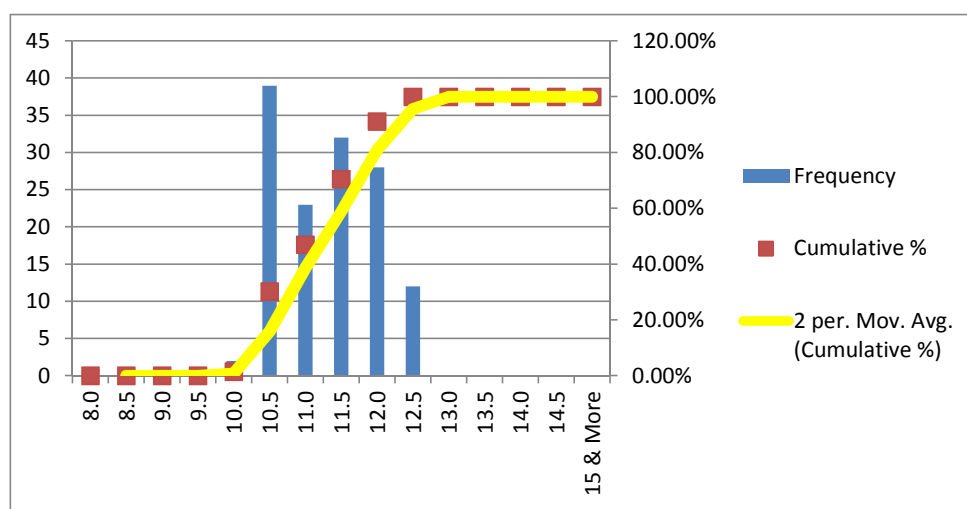
Bin	Frequency	%	Cumulative%
1.32 & Below	1	0.74%	0.74%
1.33	0	0.00%	0.74%
1.34	0	0.00%	0.74%
1.35	1	0.74%	1.47%
1.36	11	8.09%	9.56%
1.37	15	11.03%	20.59%
1.38	17	12.50%	33.09%
1.39	12	8.82%	41.91%
1.40	23	16.91%	58.82%
1.41	26	19.12%	77.94%
1.42	8	5.88%	83.82%
1.43	8	5.88%	89.71%
1.44	6	4.41%	94.12%
1.45	3	2.21%	96.32%
1.46	5	3.68%	100.00%
1.47	0	0.00%	100.00%
1.48	0	0.00%	100.00%
1.49	0	0.00%	100.00%
1.50	0	0.00%	100.00%
1.51	0	0.00%	100.00%
1.52	0	0.00%	100.00%
1.53	0	0.00%	100.00%
1.54 & Above	0	0.00%	100.00%
Total	136		



**MINIMUM REQUIREMENTS**  
 As per ISO 6935-2: T/Y: 1.25  
 As per ASTM A-615: Not Required

ELN. AT MAX. FORCE (Agt)(GL-200 mm)	
Mean	11.298
Median	11.5
Mode	10.5
Std. Dev.	0.681
Min	10.0
Max	12.5
Count	136

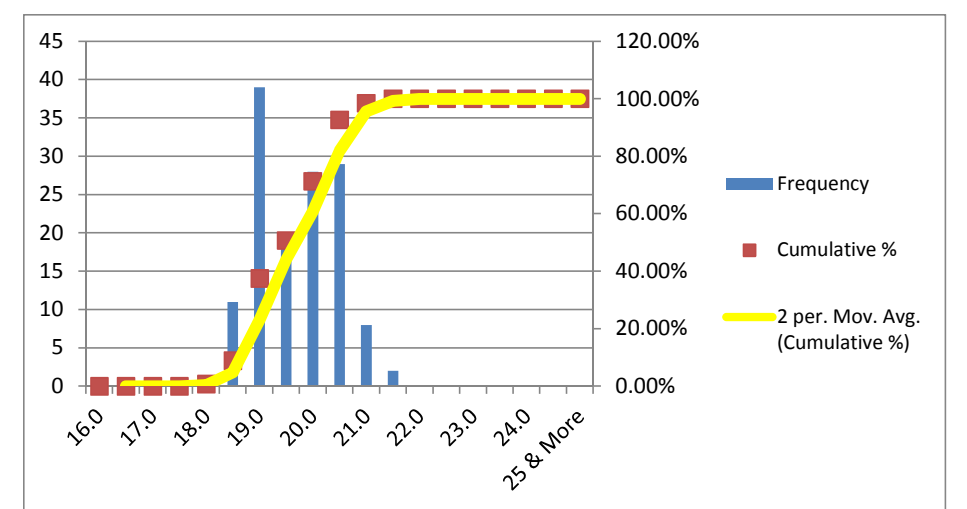
Bin	Frequency	%	Cumulative %
8.0	0	0.00%	0.00%
8.5	0	0.00%	0.00%
9.0	0	0.00%	0.00%
9.5	0	0.00%	0.00%
10.0	2	1.47%	1.47%
10.5	39	28.68%	30.15%
11.0	23	16.91%	47.06%
11.5	32	23.53%	70.59%
12.0	28	20.59%	91.18%
12.5	12	8.82%	100.00%
13.0	0	0.00%	100.00%
13.5	0	0.00%	100.00%
14.0	0	0.00%	100.00%
14.5	0	0.00%	100.00%
15 & More	0	0.00%	100.00%
Total	136		



**MINIMUM REQUIREMENTS**  
 As per ISO 6935-2: 8%  
 As per ASTM A-615: Not Required

ELN. AFTER FRACTURE (A5)(GL-5D)	
Mean	19.699
Median	19.5
Mode	19.0
Std. Dev.	0.768
Min	18.0
Max	21.5
Count	136

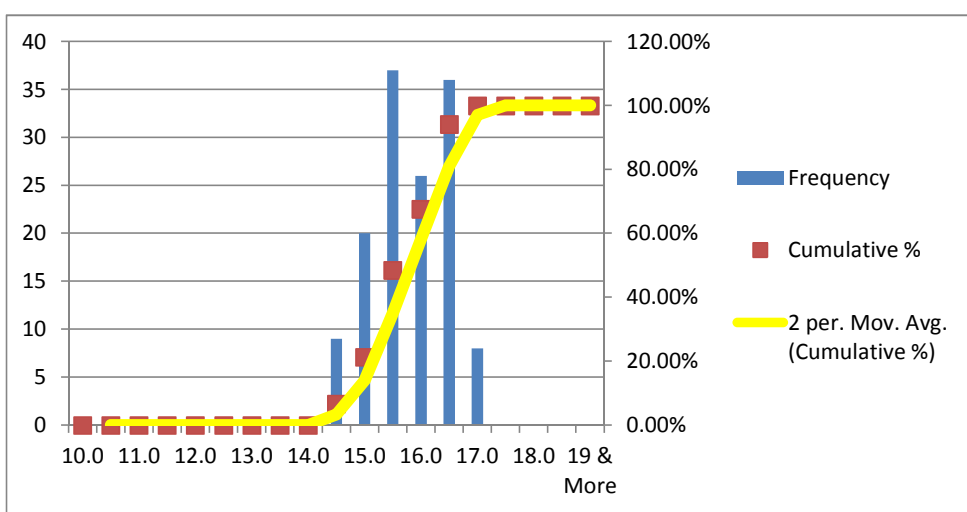
Bin	Frequency	%	Cumulative %
16.0	0	0.00%	0.00%
16.5	0	0.00%	0.00%
17.0	0	0.00%	0.00%
17.5	0	0.00%	0.00%
18.0	1	0.74%	0.74%
18.5	11	8.09%	8.82%
19.0	39	28.68%	37.50%
19.5	18	13.24%	50.74%
20.0	28	20.59%	71.32%
20.5	29	21.32%	92.65%
21.0	8	5.88%	98.53%
21.5	2	1.47%	100.00%
22.0	0	0.00%	100.00%
22.5	0	0.00%	100.00%
23.0	0	0.00%	100.00%
23.5	0	0.00%	100.00%
24.0	0	0.00%	100.00%
24.5	0	0.00%	100.00%
25 & More	0	0.00%	100.00%
Total	136		



**MINIMUM REQUIREMENTS**  
 As per ISO 6935-2: 16%

ELN. AFTER FRACTURE (A)(GL-203.2 mm)	
Mean	15.809
Median	16.0
Mode	15.5
Std. Dev.	0.675
Min	14.5
Max	17.0
Count	136

Bin	Frequency	%	Cumulative %
10.0	0	0.00%	0.00%
10.5	0	0.00%	0.00%
11.0	0	0.00%	0.00%
11.5	0	0.00%	0.00%
12.0	0	0.00%	0.00%
12.5	0	0.00%	0.00%
13.0	0	0.00%	0.00%
13.5	0	0.00%	0.00%
14.0	0	0.00%	0.00%
14.5	9	6.62%	6.62%
15.0	20	14.71%	21.32%
15.5	37	27.21%	48.53%
16.0	26	19.12%	67.65%
16.5	36	26.47%	94.12%
17.0	8	5.88%	100.00%
17.5	0	0.00%	100.00%
18.0	0	0.00%	100.00%
18.5	0	0.00%	100.00%
19 & More	0	0.00%	100.00%
Total	136		



**MINIMUM REQUIREMENTS**  
 As per ASTM A-615: 9%

**BEND TEST:**  
 ALL THE SAMPLES IN THIS CAMPAIGN PASSED THE BEND TEST MAINTAINING MANDREL DIA 3D

**MINIMUM REQUIREMENTS**  
 As per ISO 6935-2: 3D  
 As per ASTM A-615: 3.5D

**REBEND TEST:**  
 ALL THE SAMPLES IN THIS CAMPAIGN PASSED THE REBEND TEST MAINTAINING MANDREL DIA 4D

**MINIMUM REQUIREMENTS**  
 As per ISO 6935-2: 5D  
 As per ASTM A-615: Not Required

Nominal Diameter D	Unit Weight	Yield or Proof Strength R <sub>eH</sub>	Ultimate Tensile Strength R <sub>m</sub>	T/Y Ratio	% Total Elongation at Maximum Force A <sub>gt</sub>	% Elongation after Fracture A	% Elongation after Fracture A	Height of Transverse Rib	Height of Longitudinal Rib
(mm)	(Kg/m)	(MPa)	(MPa)		GL:200mm	GL: 203.2 mm	GL: 5D	mm	mm
10	0.906	460	670	1.46	11.0	15.0	19.0	1.00	1.05
10	0.873	495	675	1.36	12.0	15.0	19.5		
10	0.888	520	675	1.30	12.0	15.5	20.0		
10	0.892	490	680	1.39	11.5	16.0	20.0		
10	0.903	455	665	1.46	11.5	15.5	19.5		
10	0.885	425	620	1.46	12.0	16.5	20.5		
10	0.892	470	675	1.44	12.0	15.5	20.5		
10	0.892	455	655	1.44	11.5	15.0	19.5		
10	0.889	425	610	1.44	11.5	16.0	19.0		
10	0.892	450	640	1.42	10.5	15.5	19.0		
10	0.886	450	645	1.43	11.5	16.5	20.5		
10	0.888	445	650	1.46	10.5	16.0	19.5		
10	0.890	500	675	1.35	11.0	16.5	20.0		
10	0.890	450	655	1.46	11.0	15.0	20.5		
10	0.884	480	670	1.40	10.5	15.5	20.5		
10	0.886	470	665	1.41	11.5	16.5	20.0		
10	0.885	485	670	1.38	10.5	16.5	20.0		
10	0.890	490	685	1.40	10.5	16.0	20.5		
10	0.886	490	675	1.38	11.5	15.5	19.0		
10	0.881	485	675	1.39	11.0	16.5	19.0		
10	0.892	485	660	1.36	11.5	16.5	20.0		
10	0.884	480	670	1.40	10.5	16.5	20.5		
10	0.882	490	675	1.38	11.5	15.5	20.0		
10	0.886	490	670	1.37	11.5	16.5	19.5		
10	0.894	480	675	1.41	11.0	15.5	19.0		
10	0.888	490	690	1.41	12.0	16.5	20.0		
10	0.887	490	680	1.39	12.0	16.5	19.0		
10	0.886	485	685	1.41	12.0	15.5	20.0		
10	0.892	485	685	1.41	11.5	16.0	19.0		
10	0.883	470	660	1.40	10.5	16.5	20.5		
10	0.887	475	670	1.41	11.0	15.0	19.0		
10	0.884	480	670	1.40	11.5	15.5	20.5		
10	0.876	480	675	1.41	10.5	16.5	20.0		
10	0.890	480	675	1.41	10.5	16.5	19.0		
10	0.880	465	670	1.44	11.5	16.5	19.0		
10	0.883	475	680	1.43	11.5	15.5	20.0		
10	0.877	480	660	1.38	10.5	16.0	19.5		
10	0.891	480	670	1.40	10.5	16.5	20.0		
10	0.882	480	680	1.42	10.5	16.5	20.5		
10	0.885	480	680	1.42	11.0	15.5	20.0		
10	0.877	480	675	1.41	11.0	16.5	19.0		
10	0.885	475	680	1.43	10.5	15.0	19.0		
10	0.886	470	670	1.43	10.5	15.5	20.5		
10	0.889	470	670	1.43	11.5	16.0	19.5		
10	0.879	475	680	1.43	11.5	15.5	20.0		
10	0.881	480	685	1.43	12.0	16.0	20.5		
10	0.882	485	685	1.41	11.5	15.5	20.5		
10	0.883	475	675	1.42	11.0	16.0	20.0		
10	0.881	450	625	1.39	10.5	15.5	19.5		
10	0.887	460	640	1.39	11.0	16.0	20.0		
10	0.885	460	635	1.38	12.0	16.5	20.5		
10	0.884	455	625	1.37	12.5	14.5	19.0		
10	0.886	465	650	1.40	11.0	15.5	20.5		
10	0.891	480	685	1.43	10.5	16.0	20.0		
10	0.888	480	690	1.44	10.0	15.5	19.0		
10	0.887	480	695	1.45	12.0	15.0	20.0		
10	0.864	460	655	1.42	10.5	14.5	19.0		
10	0.880	470	660	1.40	11.0	14.5	19.0		
10	0.874	470	655	1.39	10.5	15.0	18.5		
10	0.880	465	635	1.37	11.5	15.5	19.0		
10	0.880	480	660	1.38	12.0	16.0	19.0		
10	0.885	470	645	1.37	12.5	15.0	18.5		
10	0.879	475	650	1.37	11.0	16.5	18.5		
10	0.882	485	680	1.40	10.5	16.0	19.0		
10	0.881	480	675	1.41	12.0	14.5	18.5		
10	0.884	485	680	1.40	11.5	15.5	18.0		
10	0.890	475	670	1.41	10.5	16.0	18.5		
10	0.886	470	640	1.36	10.5	16.0	20.0		
10	0.887	460	630	1.37	10.5	15.5	20.5		
10	0.883	460	635	1.38	12.0	15.5	21.0		
10	0.886	465	640	1.38	12.0	15.0	20.0		

0

10	0.884	485	685	1.41	11.5	16.0	19.5	1.05	0.95
10	0.881	455	630	1.38	11.0	16.0	21.0		
10	0.880	485	680	1.40	11.0	16.5	19.0		
10	0.887	470	680	1.45	10.5	15.5	19.0		
10	0.888	485	685	1.41	12.0	17.0	21.5		
10	0.882	485	680	1.40	12.5	15.5	20.5		
10	0.886	480	665	1.39	10.5	16.5	21.0		
10	0.884	490	690	1.41	10.5	15.0	20.5		
10	0.885	475	665	1.40	11.0	16.0	19.5		
10	0.880	470	665	1.41	10.5	15.5	20.0		
10	0.881	480	675	1.41	11.5	16.5	20.0		
10	0.883	475	670	1.41	11.0	17.0	21.0		
10	0.886	480	660	1.38	10.5	15.5	19.5		
10	0.882	480	660	1.38	12.0	16.0	19.0		
10	0.884	490	665	1.36	12.5	14.5	18.5		
10	0.887	470	675	1.44	12.0	15.0	19.0		
10	0.886	455	635	1.40	11.5	14.5	19.0		
10	0.889	480	660	1.38	11.0	15.5	20.0		
10	0.887	470	655	1.39	12.5	15.0	20.5		
10	0.882	480	655	1.36	11.5	16.0	19.0		
10	0.880	480	655	1.36	10.5	17.0	20.0		
10	0.884	485	690	1.42	10.0	15.5	20.5		
10	0.885	480	675	1.41	11.5	16.5	18.5		
10	0.881	485	680	1.40	12.0	16.5	19.0		
10	0.883	485	670	1.38	12.5	15.5	19.0		
10	0.884	490	675	1.38	10.5	15.0	18.5		
10	0.887	480	675	1.41	12.5	14.5	20.0		
10	0.889	485	665	1.37	12.0	15.0	19.0		
10	0.886	485	665	1.37	11.5	15.5	19.0		
10	0.885	485	675	1.39	10.5	16.0	20.5		
10	0.881	455	640	1.41	11.5	16.5	20.0		
10	0.882	450	635	1.41	12.0	15.5	20.5		
10	0.880	465	650	1.40	12.5	17.0	21.0		
10	0.884	455	660	1.45	12.0	16.5	20.5		
10	0.886	470	645	1.37	10.5	15.5	19.5		
10	0.887	450	635	1.41	11.0	15.0	20.5		
10	0.884	465	640	1.38	10.5	14.5	21.0		
10	0.889	485	665	1.37	11.5	15.0	18.5		
10	0.891	465	650	1.40	11.0	15.5	19.0		
10	0.890	480	655	1.36	10.5	16.5	19.0		
10	0.892	490	670	1.37	12.0	16.0	19.5		
10	0.890	490	665	1.36	10.5	15.5	19.0		
10	0.887	470	645	1.37	11.0	16.0	18.5		
10	0.887	485	665	1.37	10.5	16.5	19.0		
10	0.884	445	625	1.40	11.5	16.0	19.5		
10	0.882	465	640	1.38	12.0	17.0	20.0		
10	0.881	455	635	1.40	12.0	16.5	20.5		
10	0.886	475	645	1.36	12.5	17.0	21.5		
10	0.887	445	625	1.40	10.5	16.5	21.0		
10	0.889	455	635	1.40	11.5	15.5	20.5		
10	0.891	465	650	1.40	11.0	16.0	19.0		
10	0.890	480	665	1.39	12.5	16.5	19.5		
10	0.889	465	655	1.41	11.5	14.5	19.0		
10	0.892	450	640	1.42	10.5	16.5	18.5		
10	0.887	465	645	1.39	12.0	15.0	19.0		
10	0.888	475	650	1.37	12.5	16.5	19.5		
10	0.889	470	650	1.38	12.0	16.0	19.0		
10	0.885	475	650	1.37	10.5	15.5	19.5		
10	0.886	480	680	1.42	11.5	15.0	20.5		
10	0.884	475	670	1.41	11.0	17.0	21.0		
10	0.881	470	655	1.39	12.0	16.5	20.5		
10	0.880	465	650	1.40	10.5	16.5	20.0		
10	0.879	465	655	1.41	11.5	15.5	19.5		
10	0.881	475	645	1.36	12.5	15.0	19.0		
10	0.882	470	640	1.36	12.0	17.0	20.5		