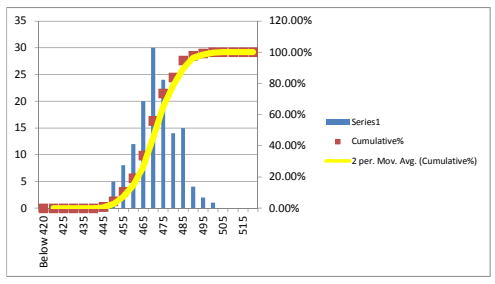
Campaign Length: 01.09.16 to 02.09.16
Total Production: 1574.684 MT
Billet Rolled: BIS-202
Product: G420-DWR (2x16 mm)

YIELD STRENGTH

Mean	471.324
Median	470
Mode	470
Std. Dev.	10.545
Min	445
Max	500
Count	136

Bin	Frequency	%	Cumulative%
Below 420	0	0.00%	0.00%
420	0	0.00%	0.00%
425	0	0.00%	0.00%
430	0	0.00%	0.00%
435	0	0.00%	0.00%
440	0	0.00%	0.00%
445	1	0.74%	0.74%
450	5	3.68%	4.41%
455	8	5.88%	10.29%
460	12	8.82%	19.12%
465	20	14.71%	33.82%
470	30	22.06%	55.88%
475	24	17.65%	73.53%
480	14	10.29%	83.82%
485	15	11.03%	94.85%
490	4	2.94%	97.79%
495	2	1.47%	99.26%
500	1	0.74%	100.00%
505	0	0.00%	100.00%
510	0	0.00%	100.00%
515	0	0.00%	100.00%
520 & Above	0	0.00%	100.00%
Total	136		



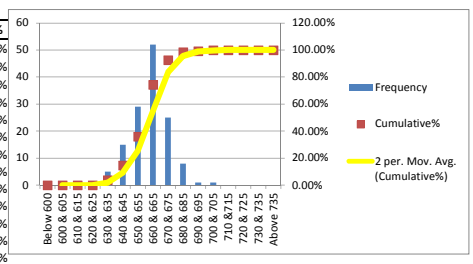
MINIMUM REQUIREMENTS

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

ULTIMATE STRENGTH

Mean	660.551
Median	660
Mode	665
Std. Dev.	12.30
Min	635
Max	700
Count	136

Bin	Frequency	%	Cumulative%
Below 600	0	0.00%	0.00%
600 & 605	0	0.00%	0.00%
610 & 615	0	0.00%	0.00%
620 & 625	0	0.00%	0.00%
630 & 635	5	3.68%	3.68%
640 & 645	15	11.03%	14.71%
650 & 655	29	21.32%	36.03%
660 & 665	52	38.24%	74.26%
670 & 675	25	18.38%	92.65%
680 & 685	8	5.88%	98.53%
690 & 695	1	0.74%	99.26%
700 & 705	1	0.74%	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		



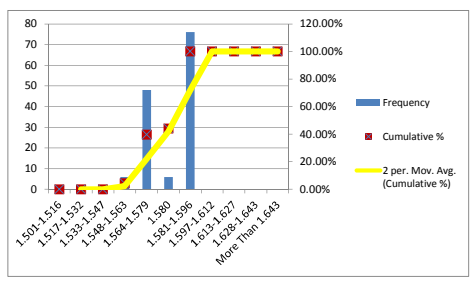
MINIMUM REQUIREMENTS

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

UNIT WEIGHT

Mean	1.580
Median	1.582
Mode	1.584
Std. Dev.	0.008
Min	1.550
Max	1.595
Count	136

	Bin	Frequency	%	Cumulative %
	Less Than 1.501	0	0.00%	0.00%
-5%	1.501-1.516	0	0.00%	0.00%
-4%	1.517-1.532	0	0.00%	0.00%
-3%	1.533-1.547	0	0.00%	0.00%
-2%	1.548-1.563	6	4.41%	4.41%
-1%	1.564-1.579	48	35.29%	39.71%
0%	1.580	6	4.41%	44.12%
1%	1.581-1.596	76	55.88%	100.00%
2%	1.597-1.612	0	0.00%	100.00%
3%	1.613-1.627	0	0.00%	100.00%
4%	1.628-1.643	0	0.00%	100.00%
5%	More Than 1.643	0	0.00%	100.00%
	Total	136		



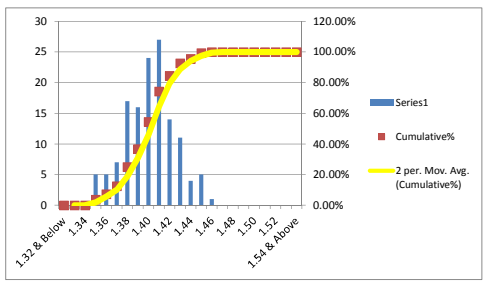
MINIMUM REQUIREMENTS

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

T/Y RATIO

Mean	1.401
Median	1.40
Mode	1.41
Std. Dev.	0.024
Min	1.35
Max	1.46
Count	136

Bin	Frequency	%	Cumulative%
1.32 & Below	0	0.00%	0.00%
1.33	0	0.00%	0.00%
1.34	0	0.00%	0.00%
1.35	5	3.68%	3.68%
1.36	5	3.68%	7.35%
1.37	7	5.15%	12.50%
1.38	17	12.50%	25.00%
1.39	16	11.76%	36.76%
1.40	24	17.65%	54.41%
1.41	27	19.85%	74.26%
1.42	14	10.29%	84.56%
1.43	11	8.09%	92.65%
1.44	4	2.94%	95.59%
1.45	5	3.68%	99.26%
1.46	1	0.74%	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		

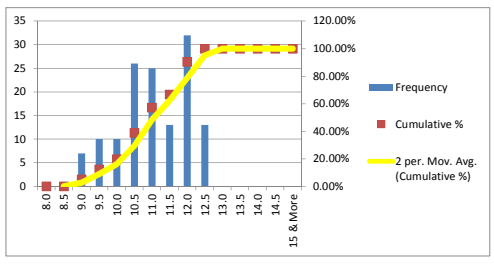


MINIMUM REQUIREMENTS
As per ISO 6935-2: T/Y: 1.25
As per ASTM A-615: Not Required

ELN. AT MAX. FORCE (Agt)(GL-200 mm)

Mean	11.044
Median	11.0
Mode	12.0
Std. Dev.	0.986
Min	9.0
Max	12.5
Count	136

Bin	Frequency	%	Cumulative %
8.0	0	0.00%	0.00%
8.5	0	0.00%	0.00%
9.0	7	5.15%	5.15%
9.5	10	7.35%	12.50%
10.0	10	7.35%	19.85%
10.5	26	19.12%	38.97%
11.0	25	18.38%	57.35%
11.5	13	9.56%	66.91%
12.0	32	23.53%	90.44%
12.5	13	9.56%	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	20.743
Median	20.5
Mode	20.5
Std. Dev.	1.287
Min	18.0
Max	23.5
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	0	0.00%	0.74%
19.0	13	9.56%	10.29%
19.5	18	13.24%	23.53%
20.0	23	16.91%	40.44%
20.5	28	20.59%	61.03%
21.0	15	11.03%	72.06%
21.5	5	3.68%	75.74%
22.0	6	4.41%	80.15%
22.5	12	8.82%	88.97%
23.0	12	8.82%	97.79%
23.5	3	2.21%	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	16.235
Median	16.0
Mode	16.0
Std. Dev.	0.658
Min	15.0
Max	17.5
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	0	0.00%	0.00%
15.0	8	5.88%	5.88%
15.5	28	20.59%	26.47%
16.0	33	24.26%	50.74%
16.5	33	24.26%	75.00%
17.0	27	19.85%	94.85%
17.5	7	5.15%	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_{eH}	Ultimate Tensile Strength R_m	T/Y Ratio	% Total Elongation at Maximum Force A_{gt}	% 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
16	1.561	500	680	1.36	11.0	15.0	20.0	1.35	0.87
16	1.550	495	670	1.35	12.0	16.0	20.5		
16	1.569	480	650	1.35	12.5	17.0	19.5		
16	1.555	485	655	1.35	11.0	15.5	19.0		
16	1.572	445	650	1.46	12.0	16.0	19.5		
16	1.567	455	650	1.42	12.5	15.5	20.0		
16	1.574	490	665	1.35	11.0	17.0	20.5		
16	1.569	490	660	1.35	12.5	17.0	19.5		
16	1.577	495	680	1.37	12.0	15.0	21.0		
16	1.572	470	650	1.38	11.0	16.0	21.0		
16	1.579	490	670	1.37	12.0	15.5	20.5		
16	1.579	485	660	1.36	11.0	16.0	20.5		
16	1.576	490	670	1.37	12.0	16.5	19.5		
16	1.568	480	675	1.41	11.5	17.0	19.0		
16	1.577	465	645	1.39	11.0	15.5	20.0		
16	1.582	475	650	1.37	11.5	16.5	20.5		
16	1.582	465	635	1.37	11.0	15.0	20.0	1.20	0.77
16	1.577	475	645	1.36	12.0	15.5	19.5		
16	1.583	485	670	1.38	12.0	16.0	19.0		
16	1.577	475	675	1.42	11.0	17.0	20.0		
16	1.583	475	660	1.39	12.0	15.0	19.5		
16	1.578	470	675	1.43	11.0	17.0	20.5		
16	1.585	470	650	1.38	12.0	15.0	20.0		
16	1.579	465	645	1.39	12.0	16.5	20.0		
16	1.586	460	650	1.41	12.0	15.5	19.5		
16	1.573	465	655	1.41	11.5	17.0	19.0		
16	1.588	455	655	1.44	11.0	16.0	20.0		
16	1.576	460	635	1.38	12.0	16.5	20.5		
16	1.586	465	650	1.40	12.0	17.0	20.5		
16	1.568	475	645	1.36	12.5	15.5	20.0		
16	1.562	470	650	1.38	12.0	16.0	20.5		
16	1.576	470	660	1.40	11.0	16.5	19.5		
16	1.576	480	670	1.40	11.0	16.5	20.5	1.30	0.62
16	1.578	475	650	1.37	10.5	16.0	21.0		
16	1.580	485	680	1.40	12.0	15.5	19.5		
16	1.583	485	685	1.41	12.5	17.0	19.0		
16	1.572	470	655	1.39	11.0	15.5	20.5		
16	1.577	475	645	1.36	10.5	16.5	20.0		
16	1.577	470	665	1.41	10.0	17.0	21.0		
16	1.581	465	640	1.38	12.0	15.5	21.0		
16	1.580	485	675	1.39	11.5	16.5	19.5		
16	1.584	485	700	1.44	12.0	16.0	19.0		
16	1.582	480	670	1.40	11.5	16.0	20.0		
16	1.585	485	670	1.38	11.0	15.5	19.5		
16	1.584	485	670	1.38	10.0	17.0	20.5		
16	1.588	485	670	1.38	10.5	17.5	19.0		
16	1.575	480	670	1.40	12.0	15.5	20.0		
16	1.584	480	660	1.38	12.5	16.5	20.5		
16	1.581	475	655	1.38	11.0	16.5	20.0	1.20	0.67
16	1.587	475	660	1.39	10.5	15.5	20.5		
16	1.590	460	665	1.45	12.0	17.0	21.0		
16	1.595	465	650	1.40	10.5	17.0	20.5		
16	1.589	475	665	1.40	10.0	16.5	21.0		
16	1.589	480	690	1.44	10.5	16.5	21.5		
16	1.590	470	650	1.38	12.0	16.0	20.0		
16	1.594	470	655	1.39	11.5	16.0	21.0		
16	1.580	470	650	1.38	11.0	15.5	20.0		
16	1.585	475	660	1.39	12.0	15.0	20.5		
16	1.582	475	660	1.39	11.5	16.5	20.5		
16	1.586	475	660	1.39	12.5	17.0	19.5		
16	1.583	475	665	1.40	10.5	16.0	21.0		
16	1.587	480	660	1.38	11.0	16.5	22.5		
16	1.585	470	670	1.43	12.0	16.0	19.5		
16	1.588	460	665	1.45	12.5	15.5	19.5		
16	1.575	465	665	1.43	10.5	16.0	19.5	1.20	0.67
16	1.577	455	660	1.45	12.0	17.0	19.0		
16	1.578	460	640	1.39	10.5	15.5	19.0		
16	1.580	450	635	1.41	12.0	16.5	18.0		
16	1.579	465	665	1.43	11.5	16.0	20.0		
16	1.584	455	655	1.44	12.0	17.0	19.0		
16	1.578	475	665	1.40	10.5	15.5	20.5		
16	1.583	465	655	1.41	12.0	16.0	20.0		
16	1.580	465	665	1.43	11.5	16.5	21.0		
16	1.586	470	660	1.40	12.5	16.0	20.5		
16	1.582	465	650	1.40	12.0	16.0	19.5		
16	1.586	460	645	1.40	11.5	15.5	19.0		

0

16	1.581	460	650	1.41	11.0	17.0	20.0		
16	1.584	475	665	1.40	12.5	17.0	21.0		
16	1.583	475	665	1.40	10.5	16.5	21.5		
16	1.587	475	670	1.41	10.5	16.5	20.5		
16	1.584	480	665	1.39	10.5	17.5	20.0	1.25	0.62
16	1.589	470	665	1.41	11.0	16.5	20.5		
16	1.584	465	655	1.41	11.0	15.5	19.5		
16	1.588	470	655	1.39	10.5	15.0	20.0		
16	1.583	470	670	1.43	12.0	16.0	21.5		
16	1.589	485	675	1.39	12.5	16.5	22.0		
16	1.582	475	675	1.42	10.5	17.0	20.5		
16	1.586	470	665	1.41	11.5	17.5	22.0		
16	1.583	485	670	1.38	11.0	16.5	19.5		
16	1.587	475	670	1.41	10.5	16.0	21.0		
16	1.585	480	685	1.43	12.0	16.0	20.0		
16	1.590	470	665	1.42	12.0	15.5	20.5		
16	1.588	480	665	1.39	12.5	15.5	19.0		
16	1.593	470	665	1.41	10.5	16.0	20.5		
16	1.590	475	675	1.42	11.0	17.0	20.5		
16	1.594	480	665	1.38	10.5	16.0	22.0		
16	1.592	485	670	1.38	10.5	17.0	20.0	1.25	0.62
16	1.594	475	670	1.41	11.0	15.5	21.0		
16	1.577	480	685	1.43	11.5	17.5	20.0		
16	1.581	470	665	1.41	12.0	17.5	20.5		
16	1.579	480	665	1.39	10.5	16.5	19.0		
16	1.582	470	665	1.42	12.5	16.0	20.5		
16	1.580	460	665	1.45	12.0	15.5	21.0		
16	1.584	465	650	1.40	10.5	16.5	20.5		
16	1.585	465	665	1.43	10.5	17.5	23.0	1.35	0.77
16	1.592	450	635	1.41	11.0	17.0	22.5		
16	1.560	455	640	1.41	10.5	17.0	23.0		
16	1.566	460	650	1.41	10.0	16.5	22.5		
16	1.562	460	645	1.40	9.5	16.5	23.0		
16	1.565	470	660	1.40	10.5	17.0	23.5		
16	1.572	485	665	1.37	10.0	16.0	22.5		
16	1.575	470	665	1.41	11.0	17.0	23.5		
16	1.576	470	665	1.42	11.5	17.5	23.5		
16	1.575	470	660	1.40	10.0	16.5	22.5		
16	1.579	475	680	1.43	10.5	17.0	23.0		
16	1.573	475	675	1.42	10.0	16.5	23.0		
16	1.576	485	685	1.41	10.0	16.5	23.0		
16	1.582	470	660	1.40	9.5	16.0	22.5		
16	1.573	465	660	1.42	10.0	16.5	23.0		
16	1.585	470	660	1.40	9.5	16.5	23.0		
16	1.584	465	660	1.42	10.5	17.0	23.0	1.15	0.62
16	1.581	465	660	1.42	9.5	16.0	22.5		
16	1.579	470	665	1.41	9.5	16.5	23.0		
16	1.581	465	655	1.41	9.0	16.0	22.0		
16	1.574	470	665	1.41	9.5	16.0	22.5		
16	1.579	450	645	1.42	9.0	15.5	21.5		
16	1.578	455	640	1.41	9.0	15.5	21.5		
16	1.584	465	650	1.40	9.0	15.0	21.0		
16	1.577	460	665	1.45	9.5	16.5	22.5		
16	1.581	455	645	1.42	9.0	15.5	22.0		
16	1.582	450	640	1.42	10.0	16.5	23.0		
16	1.589	455	640	1.41	9.5	16.0	22.5		
16	1.583	470	660	1.40	9.5	16.0	22.5		
16	1.586	470	660	1.40	9.0	15.5	22.5		
16	1.587	450	635	1.41	9.0	15.5	22.0		
16	1.589	460	660	1.43	9.5	16.0	23.0		