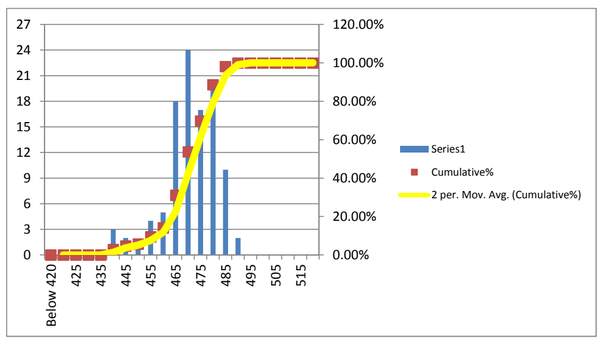
Campaign Length: 18.08.16 to 18.08.16
Total Production: 1214.949 MT
Billet Rolled: BIS-202
Product: G 420-DWR (2x20 mm)

YIELD STRENGTH

Mean	471.085
Median	470
Mode	470
Std. Dev.	10.488
Min	440
Max	490
Count	106

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	3	2.83%	2.83%
445	2	1.89%	4.72%
450	1	0.94%	5.66%
455	4	3.77%	9.43%
460	5	4.72%	14.15%
465	18	16.98%	31.13%
470	24	22.64%	53.77%
475	17	16.04%	69.81%
480	20	18.87%	88.68%
485	10	9.43%	98.11%
490	2	1.89%	100.00%
495	0	0.00%	100.00%
500	0	0.00%	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	106		

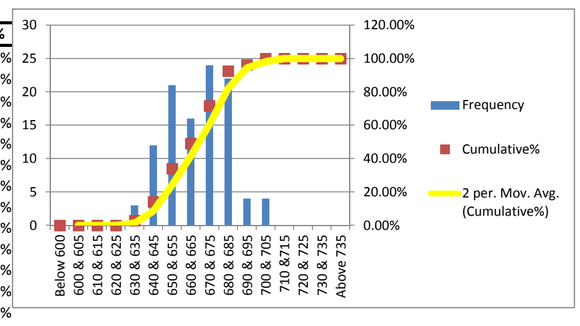


MINIMUM REQUIREMENTS
As per ISO 6935-2: 420 Mpa
As per ASTM A-615: 420 Mpa

ULTIMATE STRENGTH

Mean	665.849
Median	670
Mode	670
Std. Dev.	16.58
Min	630
Max	700
Count	106

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	3	2.83%	2.83%
640 & 645	12	11.32%	14.15%
650 & 655	21	19.81%	33.96%
660 & 665	16	15.09%	49.06%
670 & 675	24	22.64%	71.70%
680 & 685	22	20.75%	92.45%
690 & 695	4	3.77%	96.23%
700 & 705	4	3.77%	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	106		

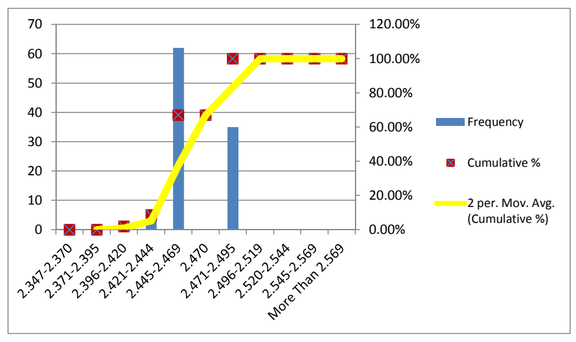


MINIMUM REQUIREMENTS
As per ISO 6935-2: 525 Mpa
As per ASTM A-615: 620 Mpa

UNIT WEIGHT

Mean	2.465
Median	2.4653
Mode	2.463
Std. Dev.	0.013
Min	2.416
Max	2.489
Count	106

	Bin	Frequency	%	Cumulative %
	Less Than 2.347	0	0.00%	0.00%
-5%	2.347-2.370	0	0.00%	0.00%
-4%	2.371-2.395	0	0.00%	0.00%
-3%	2.396-2.420	2	1.89%	1.89%
-2%	2.421-2.444	7	6.60%	8.49%
-1%	2.445-2.469	62	58.49%	66.98%
0%	2.470	0	0.00%	66.98%
1%	2.471-2.495	35	33.02%	100.00%
2%	2.496-2.519	0	0.00%	100.00%
3%	2.520-2.544	0	0.00%	100.00%
4%	2.545-2.569	0	0.00%	100.00%
5%	More Than 2.569	0	0.00%	100.00%
	Total	106		

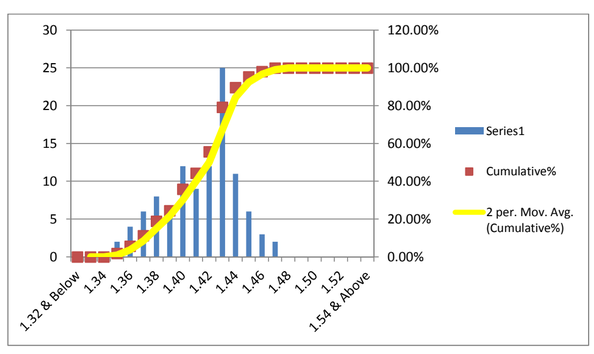


MINIMUM REQUIREMENTS
As per ISO 6935-2: ± 5%
As per ASTM A-615: -6%

T/Y RATIO

Mean	1.414
Median	1.42
Mode	1.38
Std. Dev.	0.028
Min	1.35
Max	1.47
Count	106

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	2	1.89%	1.89%
1.36	4	3.77%	5.66%
1.37	6	5.66%	11.32%
1.38	8	7.55%	18.87%
1.39	6	5.66%	24.53%
1.40	12	11.32%	35.85%
1.41	9	8.49%	44.34%
1.42	12	11.32%	55.66%
1.43	25	23.58%	79.25%
1.44	11	10.38%	89.62%
1.45	6	5.66%	95.28%
1.46	3	2.83%	98.11%
1.47	2	1.89%	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	106		

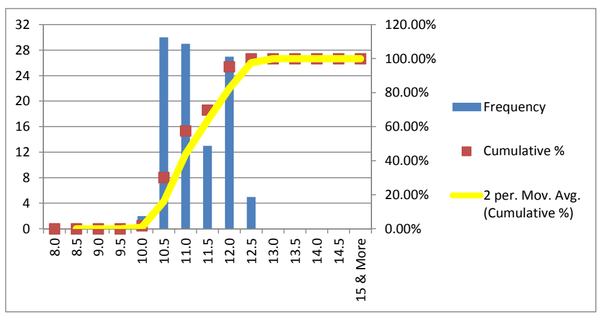


MINIMUM REQUIREMENTS
As per ISO 6935-2: T/Y: 1.25
As per ASTM A-615: Not Required

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

Mean	11.226
Median	11.0
Mode	10.5
Std. Dev.	0.659
Min	10.0
Max	12.5
Count	106

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	1.89%	1.89%
10.5	30	28.30%	30.19%
11.0	29	27.36%	57.55%
11.5	13	12.26%	69.81%
12.0	27	25.47%	95.28%
12.5	5	4.72%	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	106		

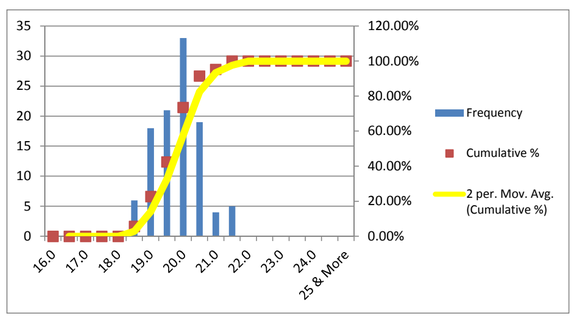


MINIMUM REQUIREMENTS
As per ISO 6935-2: 8%
As per ASTM A-615: Not Required

ELN. AFTER FRACTURE (A5)(GL-5D)

Mean	19.844
Median	20.0
Mode	20.0
Std. Dev.	0.718
Min	18.5
Max	21.5
Count	106

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	0	0.00%	0.00%
18.5	6	5.66%	5.66%
19.0	18	16.98%	22.64%
19.5	21	19.81%	42.45%
20.0	33	31.13%	73.58%
20.5	19	17.92%	91.51%
21.0	4	3.77%	95.28%
21.5	5	4.72%	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	106		

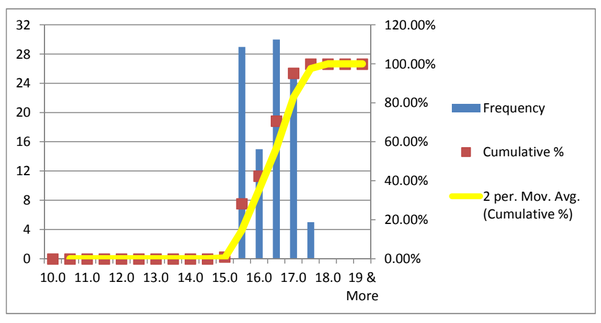


MINIMUM REQUIREMENTS
As per ISO 6935-2: 16%

ELN. AFTER FRACTURE (A)(GL-203.2 mm)

Mean	16.311
Median	16.5
Mode	16.5
Std. Dev.	0.638
Min	15.0
Max	17.5
Count	106

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	1	0.94%	0.94%
15.5	29	27.36%	28.30%
16.0	15	14.15%	42.45%
16.5	30	28.30%	70.75%
17.0	26	24.53%	95.28%
17.5	5	4.72%	100.00%
18.0	0	0.00%	100.00%
18.5	0	0.00%	100.00%
19 & More	0	0.00%	100.00%
Total	106		



MINIMUM REQUIREMENTS
As per ASTM A-615: 9%

BEND TEST:
ALL THE SAMPLES IN THIS CAMPAIGN PASSED THE BEND TEST MAINTAINING MANDREL DIA 5D

MINIMUM REQUIREMENTS
As per ISO 6935-2: 6D
As per ASTM A-615: 5D

REBEND TEST:
ALL THE SAMPLES IN THIS CAMPAIGN PASSED THE REBEND TEST MAINTAINING MANDREL DIA 7D

MINIMUM REQUIREMENTS
As per ISO 6935-2: 8D
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
20	2.420	470	660	1.40	10.5	16.5	21.0		
20	2.422	465	685	1.47	11.0	17.0	21.5		
20	2.442	470	665	1.41	10.5	16.5	20.0		
20	2.443	470	650	1.38	12.0	15.5	20.5		
20	2.451	485	695	1.43	11.0	16.5	20.5		
20	2.463	485	700	1.44	11.5	17.0	20.0		
20	2.468	485	690	1.42	10.5	17.5	20.5		
20	2.471	475	680	1.43	10.0	15.5	19.5		
20	2.473	480	670	1.40	11.0	16.5	20.0	1.25	0.65
20	2.478	465	650	1.40	12.5	17.5	21.5		
20	2.472	465	665	1.43	11.5	17.0	20.5		
20	2.479	475	670	1.41	11.0	16.5	20.5		
20	2.475	455	670	1.47	10.5	16.0	19.5		
20	2.480	465	670	1.44	11.0	15.5	19.0		
20	2.478	460	665	1.45	12.0	17.0	21.5		
20	2.482	460	670	1.46	10.5	16.5	20.5		
20	2.481	465	660	1.42	11.0	17.0	21.0		
20	2.486	465	665	1.43	10.5	16.5	20.0		
20	2.468	480	675	1.41	11.0	16.5	20.5		
20	2.471	470	670	1.43	11.0	16.5	21.0		
20	2.473	485	680	1.40	12.0	15.5	19.0		
20	2.478	480	685	1.43	10.5	16.0	19.5		
20	2.479	475	680	1.43	12.0	16.5	20.0		
20	2.484	470	685	1.46	10.5	17.5	21.5	1.30	0.58
20	2.481	480	700	1.46	12.0	16.5	20.5		
20	2.486	470	680	1.45	11.5	16.0	20.0		
20	2.483	475	665	1.40	12.0	15.5	19.5		
20	2.489	465	670	1.44	10.5	16.0	20.5		
20	2.465	485	695	1.43	10.0	15.0	19.0		
20	2.468	485	700	1.44	10.5	15.5	18.5		
20	2.466	470	675	1.44	12.5	17.5	21.5		
20	2.469	470	650	1.38	12.0	16.5	20.5		
20	2.471	480	680	1.42	11.5	16.0	20.0		
20	2.474	475	680	1.43	11.0	16.5	19.5		
20	2.472	480	685	1.43	10.5	15.5	19.0		
20	2.476	470	675	1.44	12.0	16.0	20.0		
20	2.475	470	675	1.44	10.5	15.5	19.0		
20	2.480	465	660	1.42	11.5	16.5	20.0		
20	2.455	475	675	1.42	10.5	15.5	20.0		
20	2.460	480	675	1.41	12.0	17.0	20.0		
20	2.466	475	655	1.38	12.5	15.5	19.5	1.35	1.22
20	2.456	475	655	1.38	11.0	16.0	18.5		
20	2.457	475	680	1.43	11.0	17.0	20.0		
20	2.460	470	670	1.43	12.0	15.5	20.0		
20	2.464	470	680	1.45	10.5	16.0	20.5		
20	2.466	480	680	1.42	11.0	16.0	19.5		
20	2.462	470	645	1.37	10.5	15.5	18.5		
20	2.474	470	640	1.36	12.0	17.0	19.0		
20	2.479	475	650	1.37	12.0	17.0	20.5		
20	2.416	475	645	1.36	10.5	16.5	20.5		
20	2.430	465	670	1.44	11.0	16.5	20.0		
20	2.439	485	685	1.41	11.0	15.5	19.5		
20	2.455	490	670	1.37	11.5	16.0	20.0		
20	2.444	470	650	1.38	12.0	15.5	19.0		
20	2.450	475	670	1.41	11.0	17.0	20.0		
20	2.444	480	655	1.36	10.5	17.0	20.0		
20	2.459	480	660	1.38	12.0	15.5	19.5	1.45	1.18
20	2.450	440	640	1.45	12.0	16.0	20.0		
20	2.463	445	645	1.45	10.5	15.5	19.5		
20	2.454	470	645	1.37	11.0	16.5	19.0		
20	2.465	465	650	1.40	11.5	17.0	20.0		
20	2.464	465	670	1.44	12.0	15.5	19.0		
20	2.465	475	670	1.41	11.5	16.5	19.5		
20	2.460	475	650	1.37	10.5	17.0	19.5		
20	2.453	480	680	1.42	12.0	17.0	18.5		
20	2.461	470	655	1.39	11.0	15.5	19.5		
20	2.455	485	655	1.35	10.5	17.0	19.0		
20	2.466	480	670	1.40	12.0	17.0	20.0		
20	2.463	470	650	1.38	11.0	16.5	19.5		
20	2.460	470	655	1.39	12.0	16.5	19.5		
20	2.462	450	640	1.42	10.5	17.0	19.5		

20	2.466	460	650	1.41	11.0	15.5	19.0	1.20	1.15
20	2.462	480	670	1.40	10.5	16.5	19.0		
20	2.467	465	650	1.40	12.0	17.0	20.0		
20	2.463	470	670	1.43	11.5	15.5	20.0		
20	2.465	455	650	1.43	10.5	16.5	21.0		
20	2.463	465	660	1.42	11.0	17.0	19.0		
20	2.467	480	685	1.43	12.0	17.0	20.0		
20	2.465	455	660	1.45	11.5	15.5	20.0		
20	2.463	470	670	1.43	10.5	17.0	20.5		
20	2.462	475	680	1.43	11.0	16.5	19.5	1.25	1.15
20	2.463	465	645	1.39	11.0	17.0	20.5		
20	2.465	440	630	1.43	11.0	15.5	20.0		
20	2.465	465	645	1.39	12.0	16.5	20.5		
20	2.463	470	640	1.36	12.0	16.5	19.0		
20	2.461	475	640	1.35	10.5	15.5	19.0		
20	2.463	465	645	1.39	11.0	16.0	20.5		
20	2.461	480	680	1.42	10.5	16.0	20.5		
20	2.465	480	685	1.43	12.0	15.5	20.0		
20	2.463	470	650	1.38	11.5	16.5	20.0		
20	2.467	475	650	1.37	11.0	16.0	19.5		
20	2.465	480	680	1.42	12.0	16.0	20.0		
20	2.476	480	675	1.41	11.5	15.5	20.0		
20	2.466	480	665	1.39	10.5	16.5	20.5		
20	2.475	440	630	1.43	11.0	17.0	19.5		
20	2.466	445	635	1.43	12.0	15.5	20.0		
20	2.472	480	685	1.43	11.5	16.5	20.0	1.40	1.09
20	2.463	490	685	1.40	10.5	17.0	19.0		
20	2.474	485	690	1.42	12.0	17.0	20.0		
20	2.466	485	700	1.44	12.5	15.5	19.0		
20	2.473	460	660	1.43	11.0	17.5	18.5		
20	2.468	455	655	1.44	11.0	16.5	19.0		
20	2.475	465	650	1.40	10.5	15.5	19.5		
20	2.466	460	660	1.43	12.5	16.5	20.0		
20	2.473	470	660	1.40	10.5	15.5	18.5		
20	2.466	465	665	1.43	11.0	17.0	19.5		