

LONG TERM QUALITY LEVEL FOR AS/NZS 4671 PRODUCT

Clause 10.4 in AS/NZS 4671:2019 includes a requirement for tensile test results to be reported on test certificates. Owing to system limitations, InfraBuild Steel is currently unable to provide long-term quality (LTQ) levels directly on our test certificates. However, as an interim measure, we are providing a link from our test certificates to this webpage, where the long-term quality level is published (see tables below).

Test results for Re, Rm/Re and Agt are continually collected from our batch testing program, grouped under the same designation by rolling and by diameter and their long-term characteristic values determined statistically. This determination is made at regular intervals, covering the preceding six month's test results or the last 200 consecutive test results (which ever yields the higher number).

The mean and standard deviation is calculated from the population of test results. Using those values, the lower characteristic value is then calculated from the following formula;

$$C_{vL} = \bar{X}_p - K S_n$$

The upper characteristic value is calculated using the following formula;

$$C_{vU} = \bar{X}_p + K S_n$$

Where \bar{X}_p = mean, K = a multiplying factor based on the sample population and S_n = standard deviation.

Note – for some low volume products, it may not be possible to reach 200 test results in a reasonable time-frame. In this case, a larger multiplying factor is applied in the determination of LTQ level.

Long-term quality data from a facility operating under factory production control provides significantly greater confidence that the material conforms to AS/NZS 4671 when compared with a single batch test result. However, it is recognised that some customers will still want to see the test results for the actual batch supplied against an order. For this reason, we have decided to continue reporting the results of batch testing along with the LTQ data.

InfraBuild Steel NSW LTQ Summary						Re				Rm/Re				Agt				Lab No.	Bar Marking
Mill	Section	Grade	Start Date	Finish Date	No.	Mean	Std Dev	Cv upper	Cv Lower	Mean	Std Dev	Cv upper	Cv Lower	Mean	Std Dev	Cv upper	Cv Lower		
Sydney Rolling Mill	12DBar	250N	01-Jul-20	31-Dec-20	225	309.5	11.5	330.0	288.9	1.39	0.03	1.43	1.36	20.3	2.23	23.4	17.2	279	See Fig. 1
Sydney Rolling Mill	12DBar	500N	01-Jul-20	31-Dec-20	1810	574.6	23.6	615.1	534.2	1.16	0.02	1.18	1.13	8.9	1.05	10.3	7.5	279	See Fig. 2
Sydney Rolling Mill	16DBar	500N	01-Jul-20	31-Dec-20	1532	564.9	19.4	598.0	531.7	1.16	0.01	1.18	1.14	9.5	0.93	10.8	8.3	279	See Fig. 2
Sydney Rolling Mill	20DBar	500N	01-Jul-20	31-Dec-20	566	569.2	15.4	596.0	542.3	1.16	0.01	1.18	1.15	9.8	1.08	11.2	8.3	279	See Fig. 2
Sydney Rolling Mill	24DBar	500N	01-Jul-20	31-Dec-20	625	568.9	16.7	598.0	539.9	1.16	0.01	1.18	1.14	9.9	1.06	11.3	8.4	279	See Fig. 2
Sydney Rolling Mill	28DBar	500N	01-Jul-20	31-Dec-20	344	569.5	23.3	610.7	528.4	1.18	0.03	1.23	1.13	9.0	1.04	10.4	7.5	279	See Fig. 2
Sydney Rolling Mill	32DBar	500N	01-Jul-20	31-Dec-20	342	564.5	17.7	595.8	533.3	1.18	0.02	1.21	1.16	9.0	0.89	10.2	7.8	279	See Fig. 2
Sydney Rolling Mill	36DBar	500N	01-Jul-20	31-Dec-20	381	566.9	19.1	600.7	533.1	1.19	0.03	1.23	1.15	8.8	0.92	10.1	7.5	279	See Fig. 2
Sydney Rolling Mill	40DBar	500N	01-Jan-18	31-Dec-20	549	562.3	21.3	599.4	525.2	1.19	0.02	1.21	1.16	9.1	1.14	10.7	7.5	279	See Fig. 2
Sydney Rolling Mill	12RB	500N	01-Jan-18	31-Dec-20	37	572.2	18.8	611.3	533.0	1.16	0.01	1.18	1.14	10.4	1.48	12.8	7.9	279	See Fig. 3
Sydney Rolling Mill	16RB	500N	01-Jan-18	31-Dec-20	225	573.3	22.9	614.3	532.3	1.17	0.02	1.19	1.15	10.6	2.04	13.5	7.8	279	See Fig. 3
Sydney Rolling Mill	20RB	500N	01-Jan-18	31-Dec-20	124	581.0	20.3	618.7	543.3	1.17	0.02	1.20	1.15	10.5	1.77	13.1	7.9	279	See Fig. 3
Sydney Rolling Mill	25RB	500N	01-Jan-18	31-Dec-20	87	582.8	20.0	620.6	545.0	1.17	0.01	1.20	1.15	10.2	1.09	11.8	8.6	279	See Fig. 3
Sydney Rolling Mill	32RB	500N	01-Jan-18	31-Dec-20	138	573.6	15.4	602.2	544.9	1.19	0.01	1.21	1.16	9.5	1.00	10.9	8.0	279	See Fig. 3
Newcastle Rod Mill	10DBar	MA500N	01-Jan-18	31-Dec-20	360	531.9	15.3	559.0	504.8	1.28	0.03	1.32	1.24	11.3	1.22	13.0	9.6	15352	See Fig. 4
Newcastle Rod Mill	6.5Rod	250N	01-Jan-18	31-Dec-20	12	329.8	9.4	352.9	306.8	1.51	0.06	1.63	1.38	16.3	1.39	19.0	13.5	15352	N/A
Newcastle Rod Mill	10Rod	250N	01-Jan-18	31-Dec-20	139	345.1	20.1	382.6	307.7	1.46	0.04	1.53	1.40	15.9	2.01	18.9	13.0	15352	N/A
ContiStretch	10DBar	CS500N	01-Jul-20	31-Dec-20	78	563.6	16.4	594.8	532.5	1.12	0.01	1.14	1.10	6.9	0.68	7.9	5.8	15352	See Fig. 5
ContiStretch	12DBar	CS500N	01-Jul-20	31-Dec-20	3162	542.3	10.0	558.9	525.7	1.12	0.01	1.13	1.10	7.2	0.62	8.0	6.4	15352	See Fig. 5
ContiStretch	16DBar	CS500N	01-Jul-20	31-Dec-20	3195	541.6	9.7	557.6	525.5	1.12	0.01	1.13	1.11	6.6	0.53	7.3	5.9	15352	See Fig. 6
ContiStretch	20DBar	CS500N	01-Jul-20	31-Dec-20	546	548.0	10.4	566.1	529.8	1.13	0.01	1.15	1.12	6.6	0.68	7.6	5.7	15352	See Fig. 5

Laverton Steel Mill

DBar Report for the past 6 months ending 31st Dec 2020

Bar Diameter	Test No.	Re				Rm	Rm/Re			Agt %			Bar Marking	
		Mean	Std Dev	Cv upper	Cv lower	Mean	Mean	Std Dev	Cv lower	Mean	Std Dev	Cv lower		
RD12 500N	872	542.9	11.2	562.4	523.3	688.3	1.27	0.02	1.25	12.09	0.6	11.2	See Fig. 7	
RD16 500N	948	537.3	10.9	556.3	518.3	690.1	1.28	0.02	1.26	12.12	0.6	11.3	See Fig. 7	
BD12 250N	200	279.0	13.0	302.3	255.7	389.5	1.40	0.05	1.33	28.18	4.5	21.8	See Fig. 8	
BD12 500N	538	557.6	18.9	590.5	524.8	645.6	1.16	0.02	1.14	8.76	0.9	7.5	See Fig. 9	
BD16 500N	1123	564.5	19.0	596.9	532.1	659.3	1.17	0.02	1.15	8.54	0.7	7.5	See Fig. 9	
BD20 500N	794	557.6	16.5	586.2	528.9	652.1	1.17	0.01	1.15	8.80	0.6	7.9	See Fig. 9	
BD24 500N	675	548.9	13.8	572.8	524.9	648.0	1.18	0.01	1.16	9.41	0.5	8.7	See Fig. 9	
BD28 500N	720	556.7	15.1	583.1	530.4	656.6	1.18	0.01	1.16	9.11	0.6	8.4	See Fig. 9	
BD32 500N	625	572.4	14.4	597.5	547.3	677.6	1.18	0.01	1.16	8.27	0.5	7.7	See Fig. 9	
BD36 500N	402	558.1	15.6	585.5	530.8	668.1	1.20	0.01	1.18	8.30	0.6	7.5	See Fig. 9	
BD40 500N	201	548.6	17.1	579.2	518.0	665.1	1.21	0.02	1.19	8.23	0.9	6.9	See Fig. 9	
BD50 500N	21	548.2	20.9	594.3	502.0	676.9	1.24	0.02	1.19	7.80	0.8	6.4	See Fig. 9	
RD20 500N	221	531.0	16.5	560.6	501.5	694.7	1.31	0.04	1.25	11.52	0.9	10.3	See Fig. 10	
RD10 500N	204	547.1	14.3	572.8	521.5	690.2	1.26	0.02	1.24	12.09	0.7	11.1	See Fig. 7	
RR10 500N	201	575.1	24.6	619.1	531.2	710.9	1.24	0.04	1.18	13.26	3.1	8.8	N/A	
RR10 250N	200	313.0	18.2	345.6	280.4	449.3	1.44	0.04	1.38	23.40	4.4	17.2	N/A	
AS4671 Min Requirements				250N	250				1.08				5.0	
				500N	500				1.08				5.0	

All reinforcing bar produced by InfraBuild Steel is supplied in accordance with the standard AS/NZS 4671. Tests are conducted in NATA registered laboratories to specific testing standards. AS1391 for mechanical testing and in-house Quality system procedures to AS/NZS ISO 9001:2015 Licence No. QEC0759.

N.A.T.A. Accredited Steelmaking Laboratory No. 1726
 N.A.T.A. Accredited Mechanical Laboratory No. 1843

Laverton Steel Mill

DBar Report for the past 6 months ending 31st Dec 2020

Bar Diameter	Test No.	Re				Rm	Rm/Re			Agt %			Bar Marking
		Mean	StdDev	Cv upper	Cv lower	Mean	Mean	StdDev	Cv lower	Mean	StdDev	Cv lower	
RD12 500E	200	553.3	15.4	580.9	525.7	692.8	1.25	0.02	1.22	11.8	0.7	10.8	See Fig. 11
RD16 500E	201	541.8	11.8	562.9	520.6	686.9	1.27	0.02	1.23	11.8	0.7	10.8	See Fig. 11
BD12 500E	211	558.8	15.0	585.7	531.8	678.0	1.21	0.01	1.19	11.6	1.1	10.0	See Fig. 12
BD16 500E	173	554.8	15.5	583.0	526.5	677.3	1.22	0.02	1.20	11.7	0.9	10.4	See Fig. 12
BD20 500E	172	559.6	15.6	587.9	531.2	688.9	1.23	0.02	1.21	12.6	1.4	10.6	See Fig. 12
BD25 500E	201	554.9	16.5	584.4	525.3	682.4	1.23	0.02	1.20	12.2	1.3	10.4	See Fig. 12
BD32 500E	211	545.5	17.2	576.3	514.8	670.9	1.23	0.02	1.21	12.6	1.5	10.5	See Fig. 12
BD40 500E	12	519.6	4.1	529.6	509.7	653.0	1.26	0.01	1.24	11.9	0.7	10.5	See Fig. 12
AS4671 Min Requirements		500E		500								1.15	10.0
AS4671 Max Requirements		500E		600								1.40	

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N.A.T.A. Accredited Steelmaking Laboratory No. 1726

N.A.T.A. Accredited Mechanical Laboratory No. 1843

Figure 1 - SRM_250N.JPG

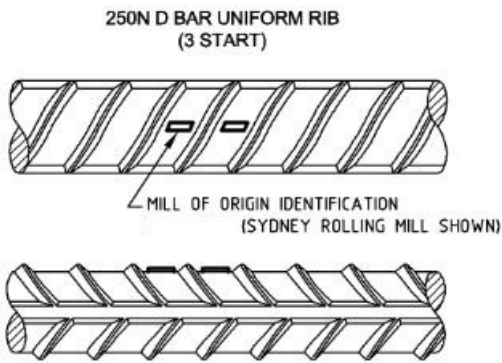


Figure 2 - SRM_QST500N.JPG

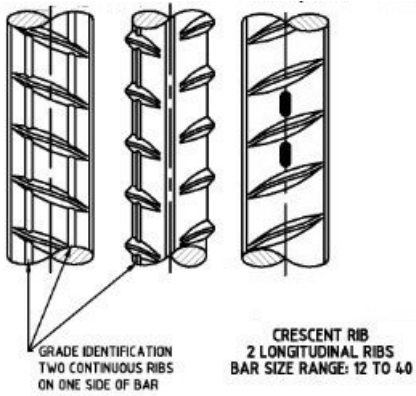


Figure 3 - SRM_RB_500N.JPG

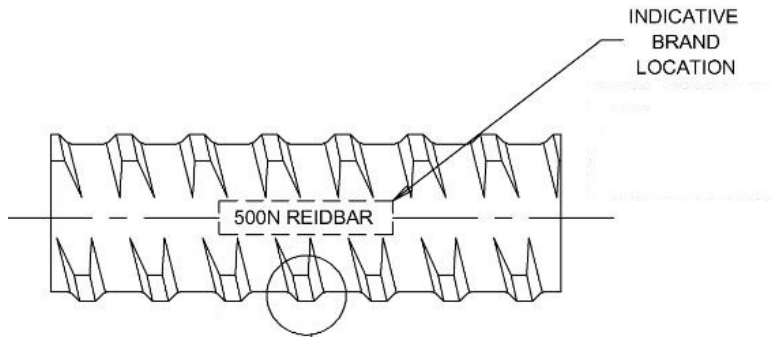


Figure 4 - NRM_DBAR_MA500N.JPG

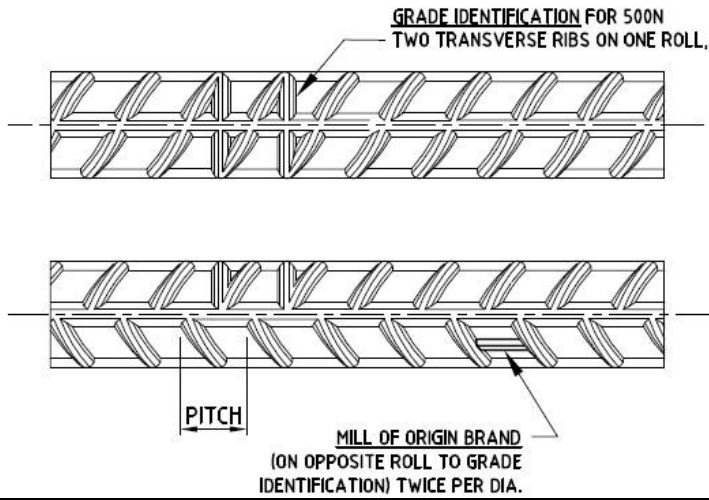


Figure 5 - CST_10-12-20_CS500N.JPG

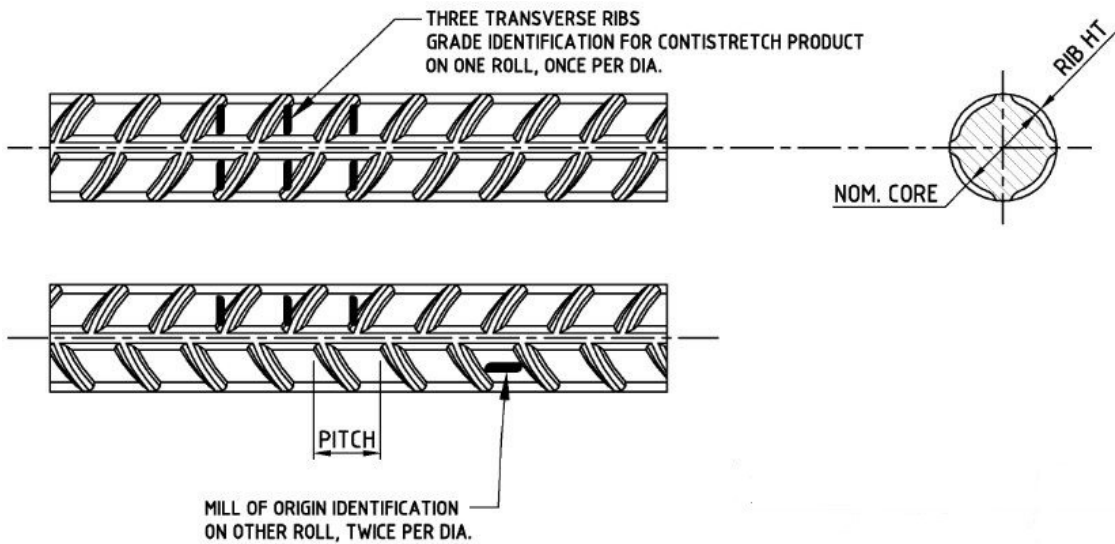


Figure 6 - CST_16_CS500N.JPG

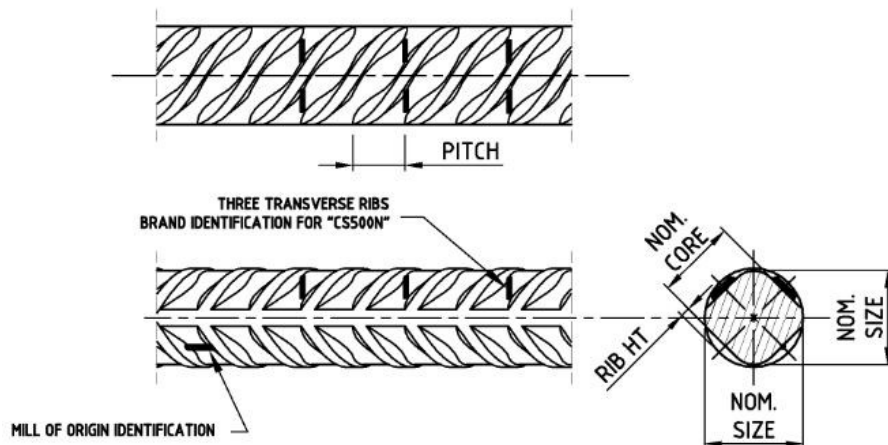


Figure 7 - LRM_RD10-16_500N

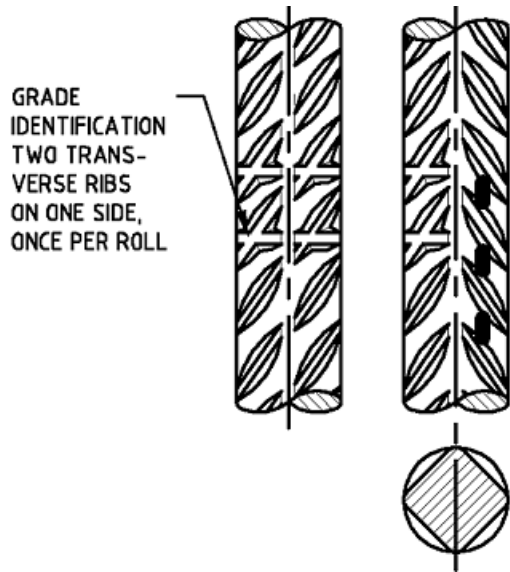


Figure 8 - LBM_BD12_250N

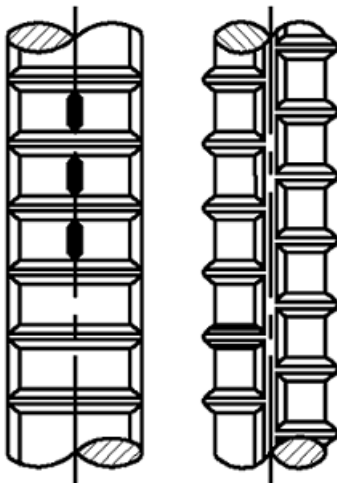


Figure 9- LBM_BD12-50_QST500N

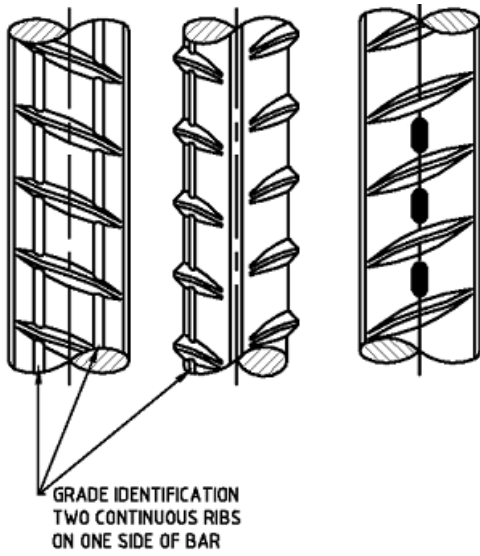


Figure 10 - LRM_RD20_MA500N

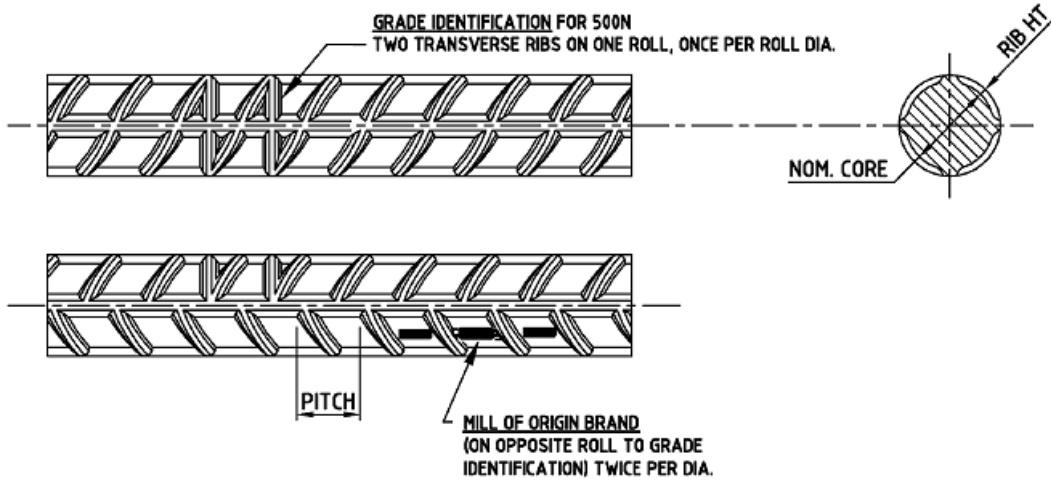


Figure 11 - LRM_RD12&16_500E

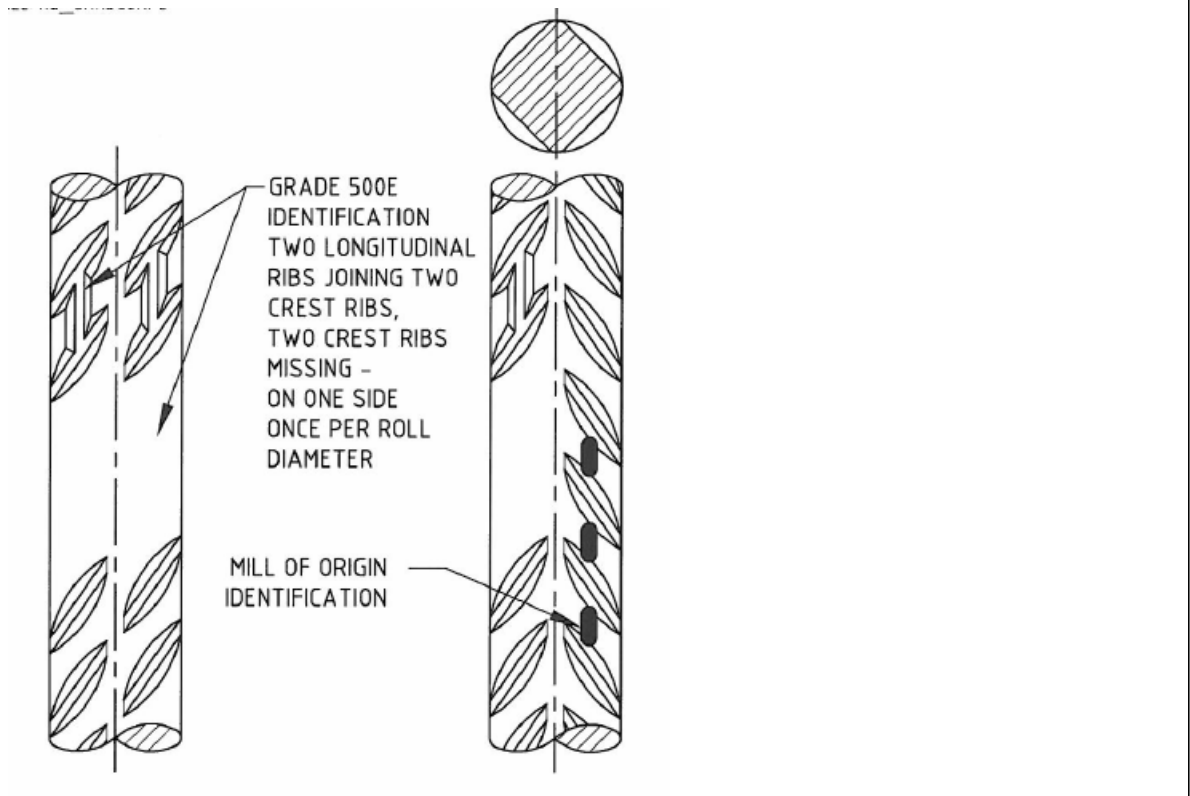


Figure 12 - LBM_BD12-32_500E

