

**Nikal Steels Ltd**

Block 3, Unit 14, Hulbert Drive, Grazebrook Industrial Park,

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MANUFACTURER'S TEST CERTIFICATE**DIN 50049-3.1.B/BS-EN 10204-3.1**

Page 1 of 5

Customer			
Your Ref	24533	Date	06/06/2010
IssueNo	201519	Our Ref	34771

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
20	80mm PN16 Blind R/F - ASTM A182F 316/316L (Flange)	82535	0.022	0.08	0.420	0.017	0.038	1.710	16.760	10.030	2.020												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
82535/910907/3	569.13	276.41	56	72.11	149Br	1050	0 0 0 0		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
6	150mm - PN16 Blind R/F - ASTM A182F 316/316L (Flange)	82647	0.020	0.08	0.400	0.024	0.042	1.660	16.500	10.020	2.030												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
82647/910907/4	560.13	261.03	60	74.99	153Br	1050	0 0 0 0		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
30	150mm PN16 Slip-On R/F - ASTM A182F 316/316L (Flange)	82625	0.018	0.074	0.510	0.010	0.041	1.730	16.720	10.100	2.050												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
82625/910907/4	567.95	273.91	60	74.17	154Br	1050	0 0 0 0		

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Page 2 of 5

Customer		Date	06/2010
Your Ref	24533	Our Ref	34771
IssueNo	201519		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
40	100mm - PN16 Slip-On R/F - ASTM A182F 316/316L (Flange)	81227	0.019	0.077	0.450	0.011	0.038	1.760	16.790	10.050	2.030												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
81227/910907/3	551.96	270.25	54.6	69.91	154Br	1050	0 0 0 0		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
15	100mm PN16 Blind R/F - ASTM A182F 316/316L (Flange)	82647	0.020	0.08	0.400	0.024	0.042	1.660	16.500	10.020	2.030												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
82647/910907/4	560.13	261.03	60	74.99	153Br	1050	0 0 0 0		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
30	80mm PN16 Slip-On R/F - ASTM A182F 316/316L (Flange)	82752	0.019	0.078	0.440	0.018	0.039	1.750	16.690	10.050	2.030												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
82752/910907/3	567.69	255.72	57.2	68.62	150Br	1050	0 0 0 0		

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Page 3 of 5

Customer		
Your Ref	24533	Date 06/06/2010
IssueNo	201519	Our Ref 34771

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
30	3" - 150 Slip-On R/F - ASTM A182F 316/316L (Flange)	82534	0.019	0.08	0.460	0.016	0.039	1.730	16.680	10.070	2.020												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
82534/	639.19	295.93	55	67.47	159Br	1050	0 0 0 0		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
20	50mm - PN16 Blind R/F - ASTM A182F 316/316L (Flange)	82734	0.026	0.08	0.440	0.011	0.039	1.740	16.700	10.070	2.040												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
82734/910907/4	543.42	243.76	58	72.73	156Br	1050	0 0 0 0		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
30	1/2" - 150 Slip-On R/F - ASTM A182F 316/316L (Flange)	82428	0.022	0.081	0.450	0.007	0.039	1.700	16.700	10.100	2.020												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
82428/910907/3	562.26	268.74	52.8	73.37	154Br	1050	0 0 0 0		

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Page 4 of 5

Customer		
Your Ref	24533	Date 0/06/2010
IssueNo	201519	Our Ref 34771

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
4	200mm PN16 Slip-On R/F - ASTM A182F 304/304L (Flange)	09/1493	0.022	0.052	0.430	0.016	0.045	1.750	18.350	8.030	0.300												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
09/1493/EXP/0672-30/2009-2010	559	244	59	72	153Br 156Br	1050	0 0 0 0		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
4	3" - 150 Blind R/F - ASTM A182F 316/316L (Flange)	AJ-32	0.024	0.075	0.320	0.012	0.042	1.810	16.710	10.170	2.060												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
AJ-32/S-5744	546	284	64	76.91	14R	0	0 0 0 0		

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
50	25mm PN16 Slip-On R/F - ASTM A182F 304/304L (Flange)	09/14	0.026	0.06	0.540	0.013	0.034	1.700	18.150	8.050	0.170												

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
09/14/EXP/0672-32/2009-2010	590	276	55	71	174Br 177Br	1050	0 0 0 0		

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Page 5 of 5

Customer			
Your Ref	24533	Date	9/06/2010
IssueNo	201519	Our Ref	34771

Chemical Analysis

Qty:	Item	Cast no	C	N	Si	S	P	Mn	Cr	Ni	Mo	Ti	V	Al	Cu	Fe	Nb	Co	Pb	W	B	Zn	Sn
50	40mm PN16 Slip-On R/F - ASTM A182F 304/304L (Flange)	AH-17	0.023	0.090	0.310	0.011	0.035	1.750	18.250	8.250													

Mechanical Properties

Cast/Lot No.	Tensile strength (N/mm ²)	Yield strength (N/mm ²)	Elongation %	Area Redn. %	Hardness min/max (Brinell/Rockwell)	Heat treatment Temp (°C)	Charpy impact	@	Unit
AH-17/S-5492	592	300	72.29	75.79	14R	0	0	0	0

Notes

For and on behalf of Nikal Steels Ltd

Signature

Anon

Print name

ANON

Position

DA