400BBL TANKS

Certifications & MTR's

- Flange
- Elbows
- Thief Hatch

Manufactured By:

HIGHLAND PROJECTS

For

Husky

METALFAR
PRODOTTI INDUSTRIALI S.P.A.
STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI

Sede Amministrativa e Stabilimento:
23861 CESANA BRIANZA (LC) - Italy
Via G. Parini, 28
Tel. +39 031.655441
Fax +39 031.655149
quality.mff@tiscali.com

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

Certif. N. 5971	Del/Dated 18.12.2012	Fattura / Invoice N. 4115	Del/Dated 18.12.2012
DDT / Del Note N. 4628	Del/Dated 18.12.2012	Ns.Ord. / Our ref. N.	Del/Dated

CE FRANKLIN LTD, A Division of NOV
WILSONCANADA ULC
1800, 635 - 8TH Avenue S.W.
T2P 3M3 CALGARY, ALBERTA CA

Dest.: CE Franklin Ltd - DISTRIBUTION CEN.
2603 - 76 Avenue
T6P 1P6 EDMONTON, ALBERTA CA

COD. COL. / HEAT CODE	COLATA / HEAT	POS. / ITEM	VS.ORDINE / YOUR REFERENCE	Q.TA' / Q.TY	DESCRIZIONE / DESCRIPTION		DIM.IN ACC. A / DIM. ACCORDANCE TO	VISIVO E DIMENS. / VIS. & DIMENS.
	12/34052	034	3147665-OR-2100	510,00	S/O 150 RF 3"	A105N	ASME/ANSI B16.5 -2009	SATISFACTORY

MATERIALE / MATERIAL	C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
ASTM A105 (LADLE)	0,200	0,220	0,980	0,008	0,011	0,100	0,050	0,010	0,010	0,140	0,001	0,001	0,009	0,010	0,396	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 / SECT. mm2	LUNG. mm / LENGHT mm	FORMA / SHAPE 1=O 2=□	SNERVAMENTO / YIELD POINT N/mm2 >=0,2%	ROTTURA / TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO / ELONGATION %>=	CONTRAZIONE / REDUCTION OF AREA %>=	DUREZZA / HARDNESS HBW	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO / YIELD POINT N/mm2 >=1,0%	Ns.Rif. / OUR REF.
126,60	50,80	1	343,0	525,0	30,0	58,0	159,0 - 163,0	KV	20	82	88	84	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO
ASTM/ASME A 105/SA 105 M - 11 ASME CODE SECT. II, PART A, ED. 2010 ADD. 2011a
CSA CAN3 Z245.12-09 GRADE 248 CAT.I SOUR SERVICE

TRATTAMENTO TERMICO / HEAT TREATMENT
NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE
ELECTRIC FURNACE

ORIGINE / ORIGIN OF STEEL
EUROPEAN UNION

COD. COL. / HEAT CODE	COLATA / HEAT	POS. / ITEM	VS.ORDINE / YOUR REFERENCE	Q.TA' / Q.TY	DESCRIZIONE / DESCRIPTION		DIM.IN ACC. A / DIM. ACCORDANCE TO	VISIVO E DIMENS. / VIS. & DIMENS.
	12/32830	034	3147665-OR-2100	45,00	S/O 150 RF 3"	A105N	ASME/ANSI B16.5 -2009	SATISFACTORY

MATERIALE / MATERIAL	C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
ASTM A105 (LADLE)	0,200	0,240	0,970	0,006	0,009	0,080	0,060	0,010	0,019	0,140	0,001	0,002	0,009	0,026	0,395	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 / SECT. mm2	LUNG. mm / LENGHT mm	FORMA / SHAPE 1=O 2=□	SNERVAMENTO / YIELD POINT N/mm2 >=0,2%	ROTTURA / TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO / ELONGATION %>=	CONTRAZIONE / REDUCTION OF AREA %>=	DUREZZA / HARDNESS HBW	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO / YIELD POINT N/mm2 >=1,0%	Ns.Rif. / OUR REF.
126,60	50,80	1	345,0	530,0	30,0	58,0	159,0 - 163,0	KV	20	86	80	84	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO
ASTM/ASME A 105/SA 105 M - 11 ASME CODE SECT. II, PART A, ED. 2010 ADD. 2011a
CSA CAN3 Z245.12-09 GRADE 248 CAT.I SOUR SERVICE

TRATTAMENTO TERMICO / HEAT TREATMENT
NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE
ELECTRIC FURNACE

ORIGINE / ORIGIN OF STEEL
EUROPEAN UNION

NOTE 100% MANUFACTURED IN ITALY
NOTES MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION
MATERIAL IN ACCORDANCE WITH NACE MR-0175/2009 ISO 15156-2009 - SOUR SERVICE
MATERIAL IN ACCORDANCE WITH NACE MR-0103/2012 - SOUR SERVICE

UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTEMENT	ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY	MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL
S. Erigadoi		MFF

CapProducts, Ltd.
25 Winnipeg St
Vanastra, ON N0M 1L0

Phoenix * Capitol * Camco

Cap Products

Commanding a Higher Standard℠

Certified Mill Test Report

8/21/2013

Customer
MRC CANADA ULC
7072 - 112 AVE SE
CALGARY, AB T2C 4Z1

P.O. S 759 226088
Tag

Heat No 2F5415
Heat Code 6L8
Phoenix Order # 965437

Material ASTM A106-2011 / ASME SA106-2010 Edition

Part Number
15111508

Description
1-1/2 X 4" XHSML BK STL NIPL

Chemical Properties

C	Mn	P	S	Si	Cu	Ni	Cr
0.2600	0.7800	0.0150	0.0070	0.2200	0.2300	0.1100	0.1500

C Eq. Long
0.4457

Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0100	0.0050								

Additional Chemical Properties

Cr + Cu + Ni
0.4900

Mechanical Properties

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
87,000	53,000	22.0%			

Charpy Minimum Impact - ft/lbs

Test 1	Test 2	Test 3	Average
N/A	N/A	N/A	N/A

* Eddy Current test passed.
* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements
We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the hardness requirements of the latest editions of NACE MR0175 and NACE MR0103. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession

Meets Hardness Requirments of ISO 15156 latest editions. Meets ASME SA 106 Grade B Requirements.

SAN ENG STEEL FORGING CO LTD
311, Jen Hsin Road, Jen Wu District
Kaohsiung, Taiwan, R.O.C.
TEL:07-3724249 ; FAX:07-3712923
URL: www.saneng.com.tw
e-mail: saneng@ms15.seed.net.tw

MILL TEST CERTIFICATE

EN10204-3.1.B(DIN50049/3.1.B)

Customer: W.F.F.FITTINGS & FLANGES (CANADA) LTD.

Order No.: D000275/S759117678

Certificate No.: SE102383
Date: 09/28/2012
Page: 1 OF 1

PRODUCT	MATERIAL SPECIFICATIONS	DIMENSIONAL SPECIFICATIONS
FORGED CARBON STEEL FLANGES	ASTM A105-11a/ASME SA105-11a	ASME B16.5-09 CSA Z245.12

Item No.	CODE NO	DESCRIPTION	QUANTITY	CHEMICAL COMPOSITION (%) C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	N			CE(*3)
		Min Max		- 0.350	0.100 0.350	0.600 1.050	- 0.035	- 0.040	- 0.400	- 0.300	- 0.400	- 0.120	- 0.080	- 0.020	- -			
1		150 SORF 4" A105N	3,000 PCE	0.210	0.210	1.160	0.021	0.006	0.007	0.020	0.010	0.003	0.006	0.001	0.006			0.410
2		150 WNRF STD 2" A105N	1,470 PCE	0.210	0.220	1.150	0.017	0.008	0.007	0.010	0.010	0.003	0.006	0.001	0.006			0.407
3		1500 WNRF S160 1 1/2" A105N	12 PCE	0.211	0.240	1.000	0.013	0.014	0.005	0.019	0.054	0.002	0.007	0.005	0.004			0.387
4		1500 WNRF XS 2" A105N	38 PCE	0.207	0.270	1.080	0.011	0.011	0.007	0.049	0.044	0.005	0.042	0.005	0.005			0.410
5		1500 WNRF XS 2" A105N	34 PCE	0.210	0.230	1.080	0.012	0.011	0.090	0.110	0.040	0.020	0.002	0.002	0.007			0.425
6		1500 WNRF STD 2" A105N	30 PCE	0.210	0.230	1.080	0.012	0.011	0.090	0.110	0.040	0.020	0.002	0.002	0.007			0.425
7		1500 WNRF S160 2" A105N	13 PCE	0.210	0.230	1.080	0.012	0.011	0.090	0.110	0.040	0.020	0.002	0.002	0.007			0.425
8		600 WNRF XS 6" A105N	180 PCE	0.210	0.230	1.110	0.013	0.005	0.010	0.010	0.010	0.002	0.004	0.001	0.004			0.400

Item No.	Heat No.	T.S.(*1) (MPA)	Y.S.(*1) (MPA)	E.L.(*1) (%)	Hardness (HB)	R.A.(*1) (%)	Impact Test Temp: Minimum: Joule 1	2	3	Material Supplier
Min		485.0	250.0	22.0	-	30.0				
Max		-	-	-	187	-				
1	4573158	527.0	380.0	37.6	153/151	71.3				ACOMINAS
2	4573165	531.0	370.0	33.2	154/152	69.5				ACOMINAS
3	931272	509.9	319.7	35.2	154/151	66.0				NTMK
4	10984	518.8	348.1	35.2	151/152	69.5				NTMK
5	290114	549.0	372.0	33.6	155/153	66.8				UBE STEEL
6	290114	549.0	372.0	33.6	155/153	66.8				UBE STEEL
7	290114	549.0	372.0	33.6	155/153	66.8				UBE STEEL
8	4554073	525.0	376.0	33.8	153/151	69.5				ACOMINAS

HEAT TREATMENT(*2)
☒ N

REMARKS
880°CX3HRS
CONFORMS WITH NACE MR0103-10 AND NACE MR0175/ISO15156.2-09
CONFORMS WITH Z245.12 CAT I GR.248 SOUR SERVICE-09(FOR USE AS WELDING NECK AND BLIND FLANGES ONLY)

SAN ENG STEEL FORGING CO., LTD. QUALITY ASSURANCE DEPT.

*1: T.S. = Tensile Strength, Y.S.=Yield Strength, E.L=Elongation, R.A.=Reduction of Area.

*2: N=Normalized, A=Annealed, Q=Quenched, T=Temperec, S.T=Solution Treated, S.R=Stress Relieved, A.C=Air Cooled, F.C=Furance Cooled, W.C=Water Cooled, O.C=Oil Cooled.

*3: C.E. Value = C + (Mn /6) + (Cr + Mo +V) / 5 + (Ni + Cu) / 15

We hereby certify that the material has been tested in accordance with the above specification and also with the requirements called for by the above order.

Manager of Quality Assurance Dep't

Phoenix * Capitol * Camco

Cap Products

Commanding a Higher Standard℠

Certified Mill Test Report

9/28/2011

Customer

MRC MIDFIELD
MIDFIELD SUPPLY ULC
1600, 101-6TH AVENUE SW
CALGARY, AB T2P 3P4

P.O. S 759 125530

Heat No 0277G
Heat Code HIX
Phoenix Order # 794764

Material ASTM A106-2008 / ASME SA106-2007 Edition, No Addenda

Part Number
15110708

Description
3/4 X 4" XHSML BK STL NIPL

Chemical Properties

C	Mn	P	S	Si	Cu	Cr	Ni
0.1800	0.8000	0.0190	0.0040	0.2500	0.1700	0.0700	0.0700

C Eq. Long
0.3475

Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0200	0.0006								

Additional Chemical Properties

Cr + Cu + Ni
0.3100

Mechanical Properties

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in.	R of A	HBW	HBW2
64,319	43,899	49.6%		130	

Charpy Minimum Impact - ft/lbs

Test 1	Test 2	Test 3	Average
N/A	N/A	N/A	N/A

* Hydro test passed. at 2500 psi.

* Bend test passed.

This material meets the requirements of the governing specifications We certify that the above material has been inspected and tested in accordance with the methods prescribed in the governing specification and the results of such inspections and test conform with applicable requirements.
We further certify this material was inspected with independent inspectors conforming to the requirements of EN10204 Section 3.1B.

Comments:

Meets Hardness Requirments of NACE MR0175 latest edition. Meets ASME SA 106 Grade B Requirements. No weld repair was performed on these products. This material was not exposed to Mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our posession

CapProducts. Ltd.
25 Winnipeg St
Vanastra, ON N0M 1L0

Purchaser : CCTF CORPORATION

INSPECTION CERTIFICATE

TO EN10204 3.1

Thai Benkan Co., Ltd.
58 Soi Watkrunai, Bangkru, Prapadaeng,
Samutprakarn, 10130 Thailand.

E-No.	Purchase Order No.	Job No.	D M Y	Certificate No.
MD-020	4810305-00		19/04/2013	T- 2013200301

No.	Hardness Actual data	MFG. No.	Specification for Material Made from Seamless Pipe ASTM A234-11/ASME SA234-10 Gr.WPB CSA Z245.11-09 Gr.280 CAT I SS	Specification for Inspection ASME B16.9-2007 ,B16.25-2007		Visual Examination Good	Dimensional Inspection Good
			Product & Size (T:*1)	Quantity	Heat Treatment (Note 1)	Boron(%)	Item No.
1	HB:135-146	55N00001	90 EL WPB 3 STD	1,808/2,286	N	0.0000	7510381
2	HB:138-145	55N00003	90 EL WPB 4 STD	606	N	0.0000	7510420
3	HB:141-148	55N00005	90 EL WPB 3 XS	328/711	N	<0.0001	7510942
4	HB:142-148	55N00007	90 EL WPB 6 STD	41/849	N	0.0001	7510462
5							

Specification		Chemical Composition %												Tension Test *2			
		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	C.E.	YS	TS	E	
Min.		x 100	x 100	x 100	x 1000	x 1000	x 100	x 100	x 100	x 100	x 1000	x 1000	x 100	MPa.		%	HARDNESS MAX
Max.			10	29										290	415	30	197 HB : GOOD
Material Heat No.		30		106	50	58	40	40	40	15	80	20	45		655		
1	J2KA040	18	21	84	11	6	2	2	5	2	<5	<4	34	320	475	56	
2	J2K8142	18	17	80	7	3	2	1	3	1	<3	<3	32	302	465	40	
3	975581	15	20	76	12	3	15	10	13	4	<3	<3	33	324	474	40	
4	J2K7805	18	18	76	18	6	1	1	4	1	<3	<3	32	323	483	42	
5																	

(Note 1) A : Hot formed with final temperature between 620 °C-980°C, Air Cooling N : Normalizing 910°Cx0.5 HR. Air Cooling

NACE MR0175/ISO 15156-2 R3-2003 & MR0103-2010. The fittings was manufactured,sampled,tested,and inspected in accordance with the specification, and was found to meet the requirements.

C.E. = C+[Mn/6+Si/24+Cu/15+Ni/20+(Cr+Mo+V+Nb)/5+5B] (CSA Spec.)

MAGNETIC PARTICLE EXAMINATION FOR TEE ONLY :

* 1 : "T" symbolized wall thickness in mm. * 2 : YS Yield strength TS = Tensile strength E = Elongation

We hereby certify that the product described herein has been manufactured in accordance with the specifications concerned and also with the purchaser's requirements and that the test results shown herein are correct.

Note for WI each reduction of 0.10% below the specified carbon maximum, an increase of 0.06% manganese above the spe maximum will be permitted up to a maximum of 1.35%

Form TZ-6A-3

Rungnapa Kampiranon
Quality Assurance Manager
Thai Benkan Co., Ltd.

SAN ENG STEEL FORGING CO LTD
311, Jen Hsin Road, Jen Wu District
Kaohsiung, Taiwan, R.O.C.
TEL:07-3724249 ; FAX:07-3712923
URL: www.saneng.com.tw
e-mail: saneng@ksts.seed.net.tw

MILL TEST CERTIFICATE

EN10204-3.1.B(DIN50049/3.1.B)

Customer: SEYBOLD INTERNATIONAL CORP.

Order No.: 7006755(1)-CCTF

Certificate No.: SE-6755A

Date: 07/12/2013

PRODUCT	MATERIAL SPECIFICATIONS	DIMENSIONAL SPECIFICATIONS
FORGED CARBON STEEL FLANGES	ASTM A105-11a/ASME SA-105-11a	ASME B16.5-09 CSA Z245.12

Item No.	CODE NO	DESCRIPTION	QUANTITY	CHEMICAL COMPOSITION (%) C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	N			CE(*3)
			Min	-	0.100	0.600	-	-	-	-	-	-	-	-	-			
			Max	0.350	0.350	1.050	0.035	0.040	0.400	0.300	0.400	0.120	0.080	0.020	-			
1	7535198	150 SORF 3" A105N	400 PCE	0.210	0.230	1.120	0.021	0.003	0.006	0.010	0.010	0.002	0.004	0.001	0.006			0.401
2	7535252	150 SORF 10" A105N	50 PCE	0.210	0.200	1.140	0.020	0.005	0.007	0.020	0.010	0.002	0.005	0.001	0.005			0.407

Item No.	Heat No.	T.S.(*1) (MPA)	Y.S.(*1) (MPA)	E.L.(*1) (%)	Hardness (HB)	R.A.(*1) (%)	Impact Test Temp: Minimum: Joule 1	2	3	Material Supplier	HEAT TREATMENT(*2)
Min		485.0	250.0	22.0	-	30.0					☒ N
Max		-	-	-	187	-					REMARKS
1	4443557	515.8	375.6	35.0	152/149	70.4				ACOMINAS	880°CX3HRS
2	4573205	512.0	343.0	36.0	152/150	72.1				ACOMINAS	CONFORMS WITH NACE MR0103-12 AND NACE MR0175/ISO15156.2-09 CLAUSE 7.2.1.4 REGION 3 AND ANNEX A. CONFORMS WITH Z245.12 CAT I GR248 SOUR SERVICE-09(FOR USE AS WELDING NECK AND BLIND FLANGES ONLY) MN TO C RATIO IS GREATER THAN 3.0"

*1: T.S. = Tensile Strength, Y.S.=Yield Strength, E.L.=Elongation, R.A.=Reduction of Area.

*2: N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S.T=Solution Treated, S.R=Stress Relieved, A.C=Air Cooled, F.C=Furnace Cooled, W.C=Water Cooled, O.C=Oil Cooled.

*3: C.E. Value = C + (Mn /6) + (Cr + Mo +V) / 5 + (Ni + Cu) / 15

SAN ENG STEEL FORGING CO., LTD

We hereby certify that the material has been tested in accordance with the above specification and also with the requirements called for by the above order.

Manager of Quality Assurance Dep't

ISO 9001 :2008 Manufacturing Company
Certified by BV. Certificate No. TH004535

Awaji ASK

INSPECTION CERTIFICATE

EN 10204 3.1 : 2004

AWAJI MATERIA (THAILAND) CO.,LTD.
81,MOO4, PRAKASA ROAD, TAMBOL BANGMUANG, AMPHUR MUANG
SAMUTPRAKARN THAILAND 10270. Tel : (662)701-5226

Material manufacturer QMS acc.
PED 97/23/EC. Annex1. Par4.3/AD2000W0
Certified by Lloyd's Register

Date : MAY 28, 2013

Purchaser : THE BROADHEAD GROUP/MCJUNKIN CANADA

MADE FROM SEAMLESS STEEL PIPE

Certificate No T13-51619

Order No.	Job No.	Product	Raw Material Pipe Maker
CS759-094881/WPB/33	-	CARBON STEEL BUTT WELDING FITTINGS	SUMITOMO METAL INDUSTRIES, LTD. (JAPAN)
Inspection Standard	Material Standard		Pipe Heat No. : J2KB666

Inspection Standard	Material Standard	Visual	Dimension	*4 UT Inspection	Magnetic Particle Test
ASME B16.9-07, ASME B16.25-07 ASTM A960-10 NACE MR-0175/ISO 15156-2-09, SS Region3 MR-0103-10	ASTM A234-11a, WPB ASME SA234-10, WPB except nuclear usage CSA Z245.11-09, GR.241 CAT. I -SS	GOOD	GOOD	W.T. INSPECTED	-

Manufacturing No. (Heat code.)	Product Code	Material	Article & Size	Quantity	Note.
34104	-	WPB	STD 180 LONG RADIUS ELBOW 4"	21 Pcs.	

Specification		*1 Chemical Composition (%)																	*2 Mechanical Test			Hardness
		C	Si	*3 Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Ti	B	Ca	N	Al	C.E.	Y.S.	T.S.	E	
Min.		X100	X100	X100	X1000	X1000	X100	X100	X100	X100	X100	X100	X100	X10000	X10000	x1000	X1000	X100	MPa		%	HB
Max.		-	10	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	240	415	25.5	-
Heat No.		30	-	165	50	58	40	40	40	15	8	2	-	-	-	-	-	50	-	-	-	197
J2KB666	L	20	21	68	7	8	2	3	3	1	0	0	0	1	14	5	25	32	308	457	39.4	131
	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				

$$C.E. = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

*4 UT = Ultrasonic thickness inspection

*1 Equivalent for A234 WPB
*2 Y.S.= Yield Strength (0.2% offset). T.S. = Tensile Strength. E = Elongation (in 50mm)
*3 As per foot note D of ASTM A234 Table 1.

L = Ladle Analysis, P = Product Analysis
Weld repair is not applied to our products.
Steel Making by Vacuum degassed, fully silicon aluminium killed & fine grain.

ELBOW / Forming temperature 850°C-945°C and cooled in still air
TEE, REDUCER & CAP / Normalizing : 910°C

AT-24(2)18

"We hereby certify that the material described herein has been duly inspected and conforms to the standard as specified above.

Surveyor to

QA. GM. /Work Inspector S. MAEKAWA

NORMA (INDIA) LIMITED

48,Site IV industrial Area, Sahibabad, Ghaziabad-201010 (U.P) INDIA.
Tel: 91-120-2896091, 2895404 Fax: 91-120-2895930 E-mail: normaindia@gmail. com

Works Test Certificate

NORMA/LAB NO-2837/13-14		INVOICE NO. E-293		DATE:-19-09-13	
P. Order. No:	83213 ONI	Customer:-	ALLIED FTG. L.P. HOUSTON U.S.A	Forging specification	ASME SA105 -09 ASTM A105 -12
Component	3"-150# SORF FLG			Steel Supplier	R.I.N.L
Drawing No.				Mill Heat No.	212026
Machining STD	ANSI B16.5- 2009 ASME B16.5- 2009	Quantity:-	165Nos.	NORMA HEAT NO-467	

TEST RESULTS

CHEMICAL COMPOSTION

Elements %	Specified Composition	Actual	
		NORMA LAB	MILL T.C.
Carbon	0.35max.	0.20	0.21
Manganese	0.60-1.05	0.84	0.81
Silicon	0.10-0.35	0.18	0.16
Sulphur	0.040max.	0.020	0.022
Phosphorous	0.035max.	0.024	0.026
Chromium	0.30max.	0.012	—
Nickel	0.40max.	0.006	—
Copper	0.40max.	0.011	—
Molybdenum	0.12max.	0.002	—
Vanadium	0.080max.	0.003	—
Carbon Equivalent (CE)	0.47max.	0.344	0.345

MECHANICAL PROPERTIES.

PROPERTIES	SPECIFIED	OBTAINED
Yield Strength (mpa)	250.00 min.	301.36
Tensile Strength (mpa)	485.00 min.	537.91
%Elongation in 50mm / 4D	22.00 min	28.60
Hardness HB.	187. max.	149-163
% Reduction of Area	30.00 min.	65.55

Remarks:- We here by certify that the material described here in has been tested in accordance with the applicable specifications referred above and meets the requirements as per EN10204/3.1B & NACE Standard-MR0175-2003.

"As per ASTM A105 Table 1 Note:-For each reduction of 0.01% below the specified carbon maximum(0.35%).an increase of 0.06% manganese above the specified maximum (1.05%)will be permitted up to maximum 1.35%.

No Weld Repair Performed.

Specified carbon as per Purchase Order 0.25max.

Serrated face as per MSS-SP-6 With in limits of 125-250AARH

CARBON EQUIVALENT (CE)

$$CE = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

MARKING AS PER MSS-SP-25-2008
3"-150 SA105 467 B16.5 NORMA INDIA.

Checked by: Metallurgist

Certified by: Quality Control Manager

INSPECTION CERTIFICATE
(MILL TEST CERTIFICATE)

CHARM MING VIETNAM CO., LTD
SAIGON - LINH TRUNG EXPORT PROCESSING ZONE
THU DUC DISTRICT, HO CHI MINH CITY, VIET NAM.
TEL : 84-8-3897 4885
FAX : 84-8-3897 4894

PURCHASER : ALLIED FITTING L.P.
ORDER NO. : 41512CCV
SPEC. FOR RAW MATERIAL : ASTM A106 Gr. B, ASTM A234 Gr. WPB
SPEC. FOR INSPECTION : ASTM A234 Gr. WPB - 2011a
ASME SA- 234 Gr. WPB - 2010
ASME B16.9-2012 / ANSI B16.9
DIN 50049 3.1B/ EN 10204 3.1

JOB NO. : AP12040151
CERTIFICATE NO. : Q1309210151-02
DATE : SEPT. 21, 2013

	Product & Size(Inch)			Heat Code	Quantity	Heat No.	Raw Material Mfg	Certificate No.
6	90 ELBOW LR	6	XH	910	68	W1208910	XIGANG	32120000046003-1
7	90 ELBOW LR	3	STD	565	336	323565	BAOSHAN	BGSAG1302270001200
8	90 ELBOW LR	3	STD	210	93	320210	BAOSHAN	BGSAG1204280002500
9	90 ELBOW LR	3	STD	77V	111	1215877V	HENGYANG	C201244352-1
10	90 ELBOW LR	4	STD	86V	274	1227486V	HENGYANG	C201244722-1

Spe.	Chemical Composition %													Tension Test			HARD NESS TEST	Magnetic Particle Exam.
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Pb	CE	Yield Strength	Tensile Strength	Elongation		
	X100	X100	X100	X1000	X1000	X100	X100	X100	X100	X1000	X1000	X1000	X100	P.S.I	P.S.I	%	H.B	
MIN		10	29											35000	60000	30		
MAX	25		106	50	58	40	40	40	15	80	20		42		95000		197	
6	16	22	87	11	6	11	3	2	1	3	2	*<3	32	42630	69165	39	127	N/A
7	19	24	55	8	8	3	2	4	3	*0	<1	*<3	30	43355	70905	39	152	N/A
8	18	22	52	11	8	6	3	3	2	*0	<1	*<3	28	48285	60900	36	145	N/A
9	15	21	87	12	11	6	2	6	1	3	1	*<3	31	42920	66555	36	142	N/A
10	15	24	84	10	9	6	2	3	1	4	1	*<3	30	41180	67280	36	141	N/A

Visual Examination	Dimensional Inspection	Heat Treatment	(*) Product Analysis by CHARM MING
Acceptable	Good	N/A	

CE = C + Mn/6 + (Cr + Mo + V) / 5 + (Ni + Cu) /15

MATERIAL CONFORMS TO NACE MR0175 - 2007 and NACE MR0103-2007

We hereby certify that the products described here in have been manufactured and tested in accordance with specifications and also the purchaser's requirements concerned.

NOTE:

1. ABOVE - LISTED ELBOWS HAVE BEEN HOT - FORMED AT A TEMPERATURE ABOVE 1150° F (621°C) AND BELOW 1800°F (982° C) AND SUBSEQUENTLY COOLED IN STILL AIR.

2. THE QUALITY MANGEMENT SYSTEM OF ISO 9001-2008 HAS BEEN APPROVED BY LRQA AND PED 97/23/EC, ANNEX I SEC. 4.3 TUV-NORD 0045

Quality Assurance Section/Manager

1102093

NORMA (INDIA) LIMITED

48,Site IV industrial Area, Sahibabad, Ghaziabad-201010 (U.P) INDIA.
Tel: 91-120-2896091, 2895404 Fax: 91-120-2895930 E-mail: normaindia@gmail. com

Works Test Certificate

DATE:-13-08-13

NORMA/LAB NO-2037/13-14	INVOICE NO. E-210A	Forging specification	ASME SA105 -09 ASTM A105 -12
P. Order. No: 40513 DNI	Customer:- ALLIED FTG. L.P. HOUSTON U.S.A	Steel Supplier	R.I.N.L
Component 3"-150# SORF FLG		Mill Heat No.	212026
Drawing No.	Quantity:- 1800Nos.	NORMA HEAT NO-467	
Machining STD ANSI B16.5- 2009 ASME B16.5- 2009			

TEST RESULTS

CHEMICAL COMPOSTION

Elements %	Specified Composition	Actual NORMA LAB	Actual MILL T.C.
Carbon	0.35max.	0.20	0.21
Manganese	0.60-1.05	0.84	0.81
Silicon	0.10-0.35	0.18	0.16
Sulphur	0.040max.	0.020	0.022
Phosphorous	0.035max.	0.024	0.026
Chromium	0.30max.	0.012	—
Nickel	0.40max.	0.006	—
Copper	0.40max.	0.011	—
Molybdenum	0.12max.	0.002	—
Vanadium	0.080max.	0.003	—
Carbon Equivalent (CE)	0.47max.	0.344	0.345

MECHANICAL PROPERTIES.

PROPERTIES	SPECIFIED	OBTAINED
Yield Strength (mpa)	250.00 min.	301.36
Tensile Strength (mpa)	485.00 min.	537.91
%Elongation in 50mm / 4D	22.00 min	28.60
Hardness HB.	187. max.	149-163
% Reduction of Area	30.00 min.	65.55

Specified carbon as per Purchase Order 0.25max.

Serrated face as per MSS-SP-6 With in limits of 125-250AARH

CARBON EQUIVALENT (CE)

$$CE = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

MARKING AS PER MSS-SP-25-2008
3"-150 SA105 467 B16.5 NORMA INDIA.

Remarks:- We here by certify that the material described here in has been tested in accordance with the applicable specifications referred above and meets the requirements as per EN10204/3.1B & NACE Standard-MR0175-2003.

**As per ASTM A105 Table 1 Note:-For each reduction of 0.01% below the specified carbon maximum(0.35%).an increase of 0.06% manganese above the specified maximum (1.05%)will be permitted up to maximum 1.35%.

No Weld Repair Performed.

Checked by: Metallurgist

Certified by: Quality Control Manager

MILL TEST REPORTS

Bonney Forge
14496 Croghan Pike
Mt. Union, PA 17066

CERTIFIED MILL TEST REPORT

Northwest Pipe Fittings 11/1/2013

LOT NO.
6404

CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS
2" 3M A105 Coupling Threaded

C	0.200	MN	1.070	P	0.007	S	0.017	SI	0.240
NI	0.020	CR	0.030	MO	0.005	CU	0.050	CO	0.003
V	0.004	AL	0.027	N	0.002	Nb	0.015		
CE(LONG FORMULA) = 0.391									
T/S(PSI) 78900 Y/S(PSI) 49700 EL(%) 25.000 RA(%) 39.500									
BRINELL HARDNESS 163, 163									

Click here for Original Steel Mill Certification

6402

2" 3M A105 Coupling Threaded

C	0.210	MN	1.050	P	0.006	S	0.020	SI	0.190
NI	0.020	CR	0.030	MO	0.004	CU	0.070	CO	0.003
V	0.003	AL	0.022	N	0.003	Nb	0.012		
CE(LONG FORMULA) = 0.398									
T/S(PSI) 78700 Y/S(PSI) 47600 EL(%) 26.000 RA(%) 43.800									
BRINELL HARDNESS 170, 170									

Click here for Original Steel Mill Certification

1. THE MATERIAL SUPPLIED MEETS THE REQUIREMENTS OF NACE MRO175/ISO 15156-2.
2. THE MATERIAL SUPPLIED WAS INSPECTED AND MANUFACTURED IN ACCORDANCE WITH EN DIN 10204:2004 EDITION TYPE 3.1 INSPECTION DOCUMENT.
3. CERTIFYING ASTM A105-10 / ASME SA105-10 EDITION.

MILL TEST REPORTS

Bonney Forge
14496 Croghan Pike
Mt. Union, PA 17066

CERTIFIED MILL TEST REPORT

Northwest Pipe Fittings 11/1/2013

LOT NO.

CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS

6353

2" 3M A105 Coupling Threaded

C	0.210	MN	1.060	P	0.006	S	0.021	SI	0.190
NI	0.040	CR	0.040	MO	0.006	CU	0.070	CO	0.003
V	0.003	AL	0.029	N	0.004	Nb	0.013		

CE(LONG FORMULA) = 0.404

T/S(PSI) 78400 Y/S(PSI) 47500 EL(%) 25.000 RA(%) 42.400

BRINELL HARDNESS 163, 159

6439

Click here for Original Steel Mill Certification

2" 3M A105 Coupling Threaded

C	0.200	MN	1.060	P	0.007	S	0.023	SI	0.210
NI	0.020	CR	0.030	MO	0.005	CU	0.110	CO	0.004
V	0.004	AL	0.027	N	0.003	Nb	0.016		

CE(LONG FORMULA) = 0.393

T/S(PSI) 76700 Y/S(PSI) 48800 EL(%) 24.500 RA(%) 36.400

BRINELL HARDNESS 158, 159

6421

2" 3M A105 Coupling Threaded

C	0.200	MN	1.030	P	0.009	S	0.019	SI	0.220
NI	0.020	CR	0.040	MO	0.005	CU	0.060	CO	0.003
V	0.003	AL	0.019	N	0.003	Nb	0.015		

CE(LONG FORMULA) = 0.387

T/S(PSI) 77700 Y/S(PSI) 45000 EL(%) 30.000 RA(%) 46.700

BRINELL HARDNESS 149, 149

NORMA (INDIA) LIMITED

48,Site IV industrial Area, Sahibabad, Ghaziabad-201010 (U.P) INDIA.
Tel: 91-120-2896091, 2895404 Fax: 91-120-2895930 E-mail: normaindia@gmail. com

Works Test Certificate

NORMA/LAB NO-2039/13-14		INVOICE NO. E-210A		DATE:-13-08-13	
P. Order. No:	40513 DNI	Customer:-	ALLIED FTG. L.P. HOUSTON U.S.A	Forging specification	ASME SA105 -09 ASTM A105 -12
Component	3"-150# SORF FLG			Steel Supplier	R.I.N.L
Drawing No.					
Machining STD	ANSI B16.5- 2009 ASME B16.5- 2009	Quantity:-	87Nos.	Mill Heat No.	215436

TEST RESULTS — NORMA HEAT NO-447

CHEMICAL COMPOSTION

Elements %	Specified Composition	Actual NORMA LAB	Actual MILL T.C.
Carbon	0.35max.	0.21	0.22
Manganese	0.60-1.05	0.90	0.87
Silicon	0.10-0.35	0.24	0.27
Sulphur	0.040max.	0.015	0.017
Phosphorous	0.035max.	0.022	0.025
Chromium	0.30max.	0.014	---
Nickel	0.40max.	0.009	---
Copper	0.40max.	0.012	---
Molybdenum	0.12max.	0.004	---
Vanadium	0.080max.	0.003	---
Carbon Equivalent (CE)	0.47max.	0.365	0.365

MECHANICAL PROPERTIES.

PROPERTIES	SPECIFIED	OBTAINED
Yield Strength (mpa)	250.00 min.	325.54
Tensile Strength (mpa)	485.00 min.	555.56
%Elongation in 50mm / 4D	22.00 min	27.00
Hardness HB.	187. max.	156-163
% Reduction of Area	30.00 min.	62.38

Specified carbon as per Purchase Order 0.25max.

Serrated face as per MSS-SP-6 With in limits of 125-250AARH

CARBON EQUIVALENT (CE)

$$CE = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

MARKING AS PER MSS-SP-25-2008
3"-150 SA105 447 B16.5 NORMA INDIA.

Remarks:- We here by certify that the material described here in has been tested in accordance with the applicable specifications referred above and meets the requirements as per EN10204/3.1B & NACE Standard-MR0175-2003.
"As per ASTM A105 Table 1 Note:-For each reduction of 0.01% below the specified carbon maximum(0.35%).an increase of 0.06% manganese above the specified maximum (1.05%)will be permitted up to maximum 1.35%.

No Weld Repair Performed.

Checked by: Metallurgist

Certified by: Quality Control Manager

/ 10 / 122

JAI AUTO PVT. LIMITED

B-52, Site IV industrial Area, Sahibabad , Ghaziabad, (U.P)
Tel: +91-120-4380042, 4111732, Fax No. +91-120-4111731, E-Mail:info@jaiauto.in

Works Test Certificate

DATE: 01-12-2012

JAPL/LAB NO: 11-12/11/S.I-323		INVOICE NO.: E-323			
Purchase Order No	92112NJI	Customer	ALLIED FTG. L.P . HOUSTON, U.S.A.	Forging specification	ASME SA 105- 11 ASTM A105- 11a
Component	4" -150# SORF FLG.			Steel Supplier	BHUSHAN STEEL.
Drawing No.					
Machining STD	ANSI B16.5- 2009 ASME B16.5- 2009	Quantity	3206Nos.	Mill Heat No.	12J -220
				JAPL. HEAT NO:	112

TEST RESULTS

CHEMICAL COMPOSTION

Element %	Specified Composition	Actual	
		JAPL LAB	MILL T.C.
Carbon	0.35max	0.225	0.195
Manganese	0.60-1.05	1.00	0.85
Silicon	0.10-0.35	0.25	0.025
Sulphur	0.040max	0.014	0.008
Phosphorous	0.035max	0.023	0.026
Chromium	0.30max	0.050	0.018
Nickel	0.40max	0.012	0.008
Copper	0.40max	0.016	0.012
Molybdenum	0.12max	0.002	0.004
Vanadium	0.08max	0.002	0.004
Carbon Equivalent (CE)	0.47max	0.402	0.342

MECHANICAL PROPERTIES

PROPERTIES	SPECIFIED	OBTAINED
Yield Strength (mpa)	250.00min.	345.79
Tensile Strength (mpa)	485.00min.	550.83
%Elongation in 50mm / 4D	22.00min.	28.94
Hardness HBW	187max.	156-159
% Reduction of Area	30.00min.	60.46

Remarks:- We hereby certify that the product Satisfies the requirement of ASTM A105 -05 and Material described here in has been tested in accordance with the applicable specifications referred above and meets the requirements as per EN10204/3.1B & NACE MRO-103-2010 & ISO 15156.

Specified carbon as per Purchase Orde: 0.25%max.

Serrated face as per MSS-SP-6 With in limits of 125-250AARH

CARBON EQUIVALENT (CE)

$$CE = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

MARKING AS PER MSS-SP-25-2008

4"- 150 SA105 112 B16.5 JAPL INDIA

Checked by: Metallurgist

Certified by: Quality Control Manager

INSPECTION CERTIFICATE
(MILL TEST CERTIFICATE)

CHARM MING VIETNAM CO., LTD
SAIGON - LINH TRUNG EXPORT PROCESSING ZONE
THU DUC DISTRICT, HO CHI MINH CITY, VIET NAM.
TEL : 84-8-3897 4885
FAX : 84-8-3897 4894

PURCHASER : ALLIED FITTING L.P.
ORDER NO. : 92212NCV
SPEC. FOR RAW MATERIAL : ASTM A106 Gr.B, ASTM A234 Gr. WPB
SPEC. FOR INSPECTION : ASTM A234 Gr.WPB - 2010
ASME SA- 234 Gr.WPB - 2010
ASME B16.9-2007 / ANSI B16.9
DIN 50049 3.1B/ EN 10204 3.1

JOB NO. : AF1209042B
CERTIFICATE NO. : Q130816042B-02
DATE : AUG 16, 2013

	Product & Size(Inch)			Heat No.	Quantity	Heat No.	Raw Material Mfg	Certificate No.
6	90 ELBOW LR	3	STD	58V	643	1227358V	HENGYANG	C201244346-1
7	91 ELBOW LR	3	STD	565	1341	323565	BAOSHAN	BGSAG1302270001200
8	90 ELBOW LR	3	STD	982	652	316982	BAOSHAN	BGSAG1110110006000
9	90 ELBOW LR	3	STD	77V	438	1215877V	HENGYANG	C201244346-1
10	90 ELBOW LR	4	STD	901	3457	323901	BAOSHAN	BGSAG1302270002300

Spe.	Chemical Composition %													Tension Test			HARD NESS TEST	Magnetic Particle Exam.
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Pb	CE	Yield Strength	Tensile Strength	Elongation		
	X100	X100	X100	X1000	X1000	X100	X100	X100	X100	X1000	X1000	X1000	X100	P.S.I	P.S.I	%	H.B	
MIN		10	29											35000	60000	30		
MAX	25		106	50	58	40	40	40	15	80	20		42		95000		197	
6	16	23	90	10	8	9	3	6	1	3	1	*<3	33	41615	70180	36	135	N/A
7	19	24	55	8	8	3	2	4	3	*0	<1	*<3	30	43355	70905	39	152	N/A
8	20	24	57	9	3	7	3	4	3	*0	<1	*<3	32	52200	63365	38	125	N/A
9	15	21	87	12	11	6	2	6	1	3	1	*<3	31	42920	66555	36	138	N/A
10	19	22	54	8	8	4	2	5	2	*0	<1	*<3	30	42920	66555	39	144	N/A

Visual Examination	Dimensional Inspection	Heat Treatment	(*) Product Analysis by CHARM MING
Acceptable	Good	N/A	

CE = C + Mn/6 + (Cr + Mo + V) / 5 + (Ni + Cu) /15

MATERIAL CONFORMS TO NACE MR0175 - 2007 and NACE MR0103-2007

We hereby certify that the products described here in have been manufactured and tested in accordance with specifications and also the purchaser's requirements concerned.

NOTE:

1. ABOVE - LISTED ELBOWS HAVE BEEN HOT - FORMED AT A TEMPERATURE ABOVE 1150^0 F (621^{0}C) AND BELOW 1800^{0}F (982^0 C) AND SUBSEQUENTLY COOLED IN STILL AIR.

2. THE QUALITY MANGEMENT SYSTEM OF ISO 9001-2008 HAS BEEN APPROVED BY LRQA.

Quality Assurance Section/Manager

INSPECTION CERTIFICATE

PANTECH STEEL INDUSTRIES SDN. BHD. (509731-A)
LOT 13258 & 13259, Jalan Haji Abd. Manan,
Off Jalan Meru, 42200 Klang, Selangor, Malaysia.
Tel: 603-3393 1633 Fax: 603-3393 1733 E-mail: pantech2@streamyx.com

Cert. No.: KLR 0403926
PED 97/23/EC Annex 1 Clause 4.3
Cert. No.: 0038/PED/MUM/0210070/1

WROUGHT CARBON STEEL BUTTWELDING FITTINGS

INSPECTION DOCUMENT: EN10204:2004 Type 3.1

Purchaser : ALLIED FITTING CORP

Certificate No : PSI 87692
Date : 9-Sep-13

Order No.	Invoice No.	Starting Material	Specification for Fittings	Specification for Inspection
82013DPS-4	E 000009973	Seamless Pipe	ASTM A234 -11a WPB / ASME SA234 -10 WPB NACE MR0175/ NACE MR 0103/ ISO15156*	ASME B16.9 - 12 / ASTM A960 - 10

Heat No.	Product & Size	Quantity (pcs)	Visual Examination	Dimensional Inspection	Heat Treatment	Magnetic Particle Testing
NK 627	5" 90 DEG LR XS ELBOW	30	GOOD	GOOD	H	N.A
CX 403	2" 180 DEG LR STD ELBOW	94	GOOD	GOOD	H	N.A
CV 308	2" 180 DEG LR STD ELBOW	6	GOOD	GOOD	H	N.A
K 301	2 1/2" 180 DEG LR STD ELBOW	15	GOOD	GOOD	H	N.A
CV 604	4" 180 DEG LR STD ELBOW	25	GOOD	GOOD	H	N.A

Specification	Chemical Composition (%)												Tensile Test *1			Hardness	
	C x100	Si x100	Mn x100	P x1000	S x1000	Ni x100	Cr x100	Mo x100	Cu x100	V x1000	Pb	CE x100	YS (KSI / MPa)	TS	E (%)	(HB) 1	(HB) 2
Min	-	10	29	-	-	-	-	-	-	-	-	-	240	415	22	-	
Max	30	-	106	50	58	40	40	15	40	80	-	50	-	-	-	197	
Heat No.																	
NK 627	15	27	50	11	8	3	2	0	5	2	< 0.10	25	321	472	39.6	126	128
CX 403	19	25	49	13	6	0.2	0.3	1	0.2	1	< 0.10	28	262	475	30.0	124	120
CV 308	19	20	49	18	11	0.7	2	0	0.4	0	< 0.10	28	325	445	26.0	123	124
K 301	14	25	64	17	7	3	2	1	10	6	< 0.10	27	356	482	40.0	129	132
CV 604	21	24	58	11	18	4	4	0	8	0	< 0.10	32	320	498	31.0	123	120

WE CERTIFY THAT ALL PRODUCTS WERE MANUFACTURED,SAMPLED,TESTED, AND INSPECTED SOLELY BY THE MANUFACTURER LISTED AT THE ADDRESS ABOVE IN ACCORDANCE WITH INDICATED SPECIFICATION AND FOUND TO MEET REQUIREMENTS. MATERIAL IS FREE FROM MERCURY AND RADIOACTIVE CONTAMINATION.
TENSILE REQUIREMENT: CONFORMS TO ASTM A370 STANDARD, LONGITUDINAL DIRECTION, GAUGE LENGTH 2" (50mm)
* HARDNESS ACCORDING TO NACE MR0175/ NACE MR 0103/ ISO15156

NOTE:
C: Cold formed at temperature below 620°C
S: Stress relieved in temperature between 595°C - 690°C and cooled in still air.
H : Hot formed in temperature between 845°C - 945°C and cooled in still air.
N: Normalised at 910°C
Q: Heated to 910°C and quench in water.
T: Temper between 590°C - 690°C.

*1: YS = Yield strength TS=Tensile strength E = Elongation

Made in Malaysia

PANTECH STEEL INDUSTRIES SDN. BHD. QA / QC MANAGER HOI YS * 509731-A *

Quality Assurance Manager