

## Prabin Joshi

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**From:** George Sfeir [georgesfeir@technicalindustries.com]  
**Sent:** Monday, February 04, 2008 2:02 PM  
**To:** Prabin Joshi  
**Subject:** Fw: Tube Supply Estimate 152jts 6" HWDP Flat Bottom Hole FLUT 1-30-2008  
**Attachments:** AR-M550N\_20080129\_174438.pdf

-----Original Message-----

**From:** Tommy Byrne [mailto:T.Byrne@tubesupply.com]  
**Sent:** Tuesday, January 29, 2008 6:05 PM  
**To:** '[bryanfitzgerald@technicalindustries.com](mailto:bryanfitzgerald@technicalindustries.com)'  
**Subject:** FW: Scanned image from Sales Department

Bryan,

Please see the attached PO for the UT requirements we discussed yesterday. This is the PO we issued to Tuboscope that they declined due to not having equipment to do the 1/16" flat bottom hole compression wave. Please verify that you can do this and give us a quote and we'll issue you a Po for the job.

Thanks,  
Tommy Byrne  
Tube Supply  
713-466-4130

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.516 / Virus Database: 269.19.15/1249 - Release Date: 1/29/2008 9:51 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.516 / Virus Database: 269.19.16/1251 - Release Date: 1/30/2008 9:29 AM

**TUBE SUPPLY**  
 5169 ASHLEY COURT  
 HOUSTON, TEXAS 77041  
 (713) 466-4130  
 (Fax) 466-1029

# PURCHASE ORDER

Show this Purchase Order Number on all correspondence, invoices, shipping papers and packages.

NUMBER  
**225202-TB**

DATE OF ORDER  
 01/14/2008

REQUISITION NO.  
 152535-001

**TO:**

~~TUBOSCOPE VETCO  
 P O BOX 2129  
 HOUSTON TX 77252~~

~~JOAN MCLAUGHLIN~~

~~281-456-9000~~

SHIP TO:  
 WILL CALL

DATE REQUIRED	SHIP VIA	F.O.B. POINT	PPD. COLL.	TERMS
01/16/2008	TRUCK	SHIP POINT	X	NET 30
QTY ORDERED	STOCK NUMBER/DESCRIPTION			PRICE
152 @ 34'- 0" M/L 12Y1	REQ #: 152535-001 6.000"OD x 4.000"ID x 1.000"WALL HF 4130 LN80 Q&T HT# X8848 (51 PCS) HT# X8785 (63 PCS) HT# X8577 (38 PCS)  UT TO AKER KAVERNER SPEC MS-578 .0625" FBH 3% NOTCH LCVNS AND TCVNS  NOTIFY RITE INSPECTION SERVICES PRIOR TO UT FOR WITNESS ROB FULLERTON 713-937-4122  **MAINTAIN HEAT NUMBER TRACEABILITY**			TBA

**TOTAL**

BY: Tommy Burns  
 Authorized Signature

**Aker Kvaerner**  
HOUSTON, TEXAS U.S.A.

**TECHNICAL  
SPECIFICATION**

NO. MS-578  
REVISION 1  
DATE: 04/08/06  
PAGE 1 of 5

**SUBJECT: Material**

**LOW ALLOY STEEL  
(4130 Modified)**

Rev	Date	Description	Prepared By:	Checked By:	Approved By:
1	8 April 2006	Low Alloy Steel for C&K line, change P, Sulfur %, add impact requirement, NDE	J. Kinnula	Fang Li	

<b>Aker Kvaerner</b> HOUSTON, TEXAS U.S.A.	<b>TECHNICAL          SPECIFICATION</b>	NO.	MS-578
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<b>SUBJECT: Material</b>			

**SCOPE:**

This specification is intended to cover forgings, bar stock and mechanical Tubing for construction of Choke & Kill Lines.

Material Type: Low alloy steel (e.g. AISI 4130M)  
 Raw Material Form: Forging, bar stock or mechanical tubing  
 Service: Hydrogen Sulfide (H<sub>2</sub>S)

**ADDITIONAL DOCUMENTS:**

**REFERENCE:**

DNV-OS E101,  
 DNV-OS F101, Table 6-15  
 API Specification 16A  
 API Specification 16C  
 NACE Standard MR-0175  
 ASTM A370, A388, A519, E10, E18, E92

**SUB TIER: KOP Technical Specifications:**

QS-030 PS-189

**MATERIAL COMPOSITION (wt%):**

COMPOSITION	<u>C</u>	<u>Mn</u>	<u>P(MAX)*</u>	<u>S(MAX)*</u>
LIMITS	.20/.28	1.00/1.40	.015	.003
	<u>Si</u>	<u>Cr</u>	<u>Mo(MAX)</u>	<u>Ni(MAX)</u>
	.15/.45	.40/.90	.20	.50
				<u>V(MAX)</u>
				.10

**ALLOWABLE MELTING PRACTICE:**

Material produced to this specification shall be made to fine grain practice using one of the following melting practices:

- Electric furnace with vacuum degassing or vacuum processing.
- Electric furnace with argonstirred degassing.
- Electric furnace followed by Argon Oxygen Decarburization (AOD).
- Electric furnace followed by either electroslag remelting (ESR) or vacuum arc remelting (VAR).

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Vacuum induction melting.  
 Electric furnace or induction melting followed by a ladle refining process.

**HOT WORKING PRACTICES:**

All wrought materials shall be of pressure vessel quality and shall be formed using a hot working practice which produces a wrought structure.

For material produced as a forging, the minimum acceptable total hot work ratio, relative to ingot size, shall be 3:1.

**HEAT TREATMENT SPECIFICATION:**

Heat treatment shall include austenitizing, liquid quenching and tempering with the minimum tempering temperature shall be 1200°F (650°C).

Forgings shall be heat treated after rough machining.

**MECHANICAL PROPERTY REQUIREMENTS:**

Tensile Strength, minimum.....	95,000 psi
Yield Strength, minimum. ....	80,000 psi
Elongation in 2", minimum....	18%
Reduction in Area, minimum.....	35%
Impact Strength.....	42J/33J, mean/single at -30°C, transversal
Surface Hardness.....	197-235 HB, max 22 HRC, max 248 HV

Mechanical testing shall be in accordance to ASTM A370, hardness testing in accordance to ASTM E10, E18 or E92.

**NDE REQUIREMENTS:**

The forgings shall be ultrasonically tested in accordance with KOPI Technical Specification PS-101.

Extent of testing:  
 -100% ultrasonic examination of the whole bodies of the forgings shall be carried out.

Methods:  
 Ultrasonic examination shall be performed in accordance with the procedures specified in ASTM A388 including flat bottom hole (straight beam technique) and angle beam technique.

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**Calibration:**

Flat Bottom Hole Technique - DAC based on 1/16" (1.6mm) flat bottom hole for metal thickness through 1 1/2" and 1/8" (3.2mm) flat bottom hole for metal thickness exceeding 1-1/2".

Angle Beam technique - DAC shall be based on a v or rectangular notch of a depth equal to the lesser of 1/4 or 3% of the nominal section thickness (1/4 inch maximum), with a length of approximately 1".

**Acceptance criteria:**

Indications interpreted as produced by cracks are not acceptable regardless of the signal amplitude. No single indications higher than the 100% of the DAC curve. No multiple indications exceeding 50% of the DAC.

UT for tubing shall be performed in accordance with procedures as specified in ASME BPVC, Section V, article 5.

**Following shall not be accepted:**

- any indication whose signal amplitude exceeds the reference level of DAC based on 3.2 mm flat bottom hole
- any linear indication interpreted as crack

UT shall be performed 48 hrs after final heat treatment.

**DIMENSIONAL TOLERANCES**

Dimensional tolerances for seamless pipes shall be according to DNV-OS F101, Table 6-15. Forging tolerances shall be in accordance with the drawings.

**TEST SPECIMENS:**

**Bar Stock:** Test specimen shall be taken from representative material of the same heat that has been processed in a similar manner. One test specimen per each furnace charge of each heat is required. Specimens shall be taken at a location 1/2 the bar radius from the surface with the axis of the sample being parallel to that of the bar.

**Forgings:** Test coupons shall be cut from an integral prolongation or sacrificial forging of the same lot. Lot is defined as product from same heat and same heat treatment as the production forgings. One test specimen per each lot of material is required. Test specimens shall be taken longitudinal or parallel to the long axis, unless otherwise specified.

**Mechanical Tubing:** Test specimens shall be taken from prolonged material of the same heat that has been processed in a similar manner. One test specimen per each furnace

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charge is required. For pipes heat treated in continuous furnace the maximum lot size is 60 m.

Specimens shall be located at least 1/4 T from any heat treated surface where "T" is the maximum heat treated thickness of the tubing, with the axis of the sample being parallel to that of the tubing.

Mechanical property testing shall be conducted in accordance with ASTM A370 and hardness testing shall be conducted in accordance with ASTM E10.

**WELD REPAIR REQUIREMENTS:**

WELD REPAIR IS NOT PERMITTED.

**MATERIAL IDENTIFICATION and TRACEABILITY:**

The method of material identification and traceability shall be per KOP Technical Specification QS-030, Appendix C.

**MATERIAL CERTIFICATION:**

Certification shall affirm compliance with the specification and shall be according to EN 10204:2004 Type 3.1B. The inspection certificate shall include the results (or reference to the results) of all specified inspections and tests and the supply condition and the temperature of the final heat treatment.

**QUALITY:**

The surface of the components shall be visually examined per KOP Technical Specification PS-189.