Date : 20/6/2023
To : Registered Vendors
Number of Pages: part 1 Invitation (10 Pages)
& Part 2 Technical documents (111 pages)

Invitation for Limited Tender # 7241 For Gas Pipeline Project For Supplying Piping Bulk Materials

Introduction:

GASCO as a well known pioneer company in the field of gas processing, transmission & distribution had been established as a subsidiary of the Egyptian Gas Holding Co. (EGAS) whom is responsible to handle natural gas industry companies affairs in the Egyptian Ministry of Petroleum, **GASCO's** mission focuses on the management, operation, maintenance, upgrading, development & modernization of the National Gas Grid as well as gas processing and recovery of components that could be used in domestic & industrial applications.

Though, GASCO is initiating a new projects gas pipeline project in terms of expanding energy efficiency investment in the Egyptian gas pipelines infrastructure

In this regard, GASCO invites **Piping Bulk Materials** Manufacturers & Trade Houses – **whom are already received the Publication Fax** – to show their co-operation in fulfilling Gasco requirements by participating and submitting their optimized quotations ***based on optimized delivery schedule and prices***, noting that the due date for submitting the technical offer envelope should be on **2/8/2023.**

Meanwhile, if you are not interested in submitting an offer in this tender, please take the necessary action to submit your decline for this tender only to the following emails:
sherin_nafe@gasco.com.eg ; ahmed_abdelaziz@gasco.com.eg ; karem_nayef@gasco.com.eg ; mohammad_shahin @gasco.com.eg ; Amr_faramawy@gasco.com.eg , **noting that non submission of the decline will negatively affect your position in Gasco's vendors list as well as your opportunity to be selected and invited in the upcoming tenders.**

Please visit www.gasco.com.eg to review & download the following:

Part A: Invitation for participating in this tender.
Part B: Technical Documents including the following:

1. **Technical Evaluation Documents**
2. **Approved Manufacturer Short Vendor List**
3. **Annex-A Bidder Information Form**
4. **Annex-B Clarifications/Deviations Sheet**
5. **Annex-C Material Requisitions**
6. **Annex-D Material Specifications**
7. **Annex-E Table of Confirmation**

* Important Notes

1. Any technical offer submitted without the arrangement stated in the tender technical document will be totally disqualified with no further clarification.
2. Any technical papers submitted loose and not included inside the technical Binder file will be totally disregarded.
3. A copy of technical offer can be submitted on Flash Memory with the same arrangement.
4. The bidder must mention the main offer and only one alternative offer (if any), in case of more than one alternative offer, the main offer only will be considered.
5. Annex-A, Bidder Information Form (Native file is available as Microsoft word format) shall be digitally filled with verified technical contact emails, moreover any hand written form shall be disregarded. Any unclear, missing information is the bidder own responsibility.
6. Annex-B, Technical Clarification Sheet (Native file is available as Microsoft word format) shall be digitally filled, signed and stamped by manufacturer, moreover any hand written form or not signed and stamped by manufacturer shall be disregarded.
7. Table of confirmation (Native file is available as PDF format) shall be digitally filled with proper technical, moreover any hand written form will disqualify the whole technical offer.

Instructions To Bidders

1-Introduction:

To facilitate bidding and bid evaluation, the hereinafter instructions are to be followed in preparing your proposal.

2-Acknowledgment:

Tender acknowledgment must be submitted within **Max. 3 days** from receiving publication fax, in which this acknowledgment must confirm your receipt of publication & your intention to quote within the launched deadline **or** either an official declination for not being able to quote.

3-Tender Documents:

A set of Tender documents are provided herein and will form the basis of any subsequent awarding form (Order/Contract):

- Invitation for tender "Publication Fax".
- Instructions to bidders.
- General terms & Conditions of purchase.
- Technical Documents including 7 parts

4-Bid Closing Date:

- Bid closing date will be on **2nd of August, 2023 12 O'clock noon Cairo Local Time (any bid received beyond the specified deadline will not be considered).**

Your Quotation should be submitted in a form of **one** sealed envelope (technical envelope only) including **hard and soft copies from the bid**. **The above envelope must bear Tender title and to indicate the words "Sealed Bid Don't Open", and to be submitted to the Purchaser at the following address:**

GASCO'S Head Office
The Ring Road, El Teseen St., Fifth Settlement
New Cairo, Egypt
Fax no. (202) 2538 4651
Attention: Chairman Assistant For Materials & Inventory Control: Eng. Alaa Hassan

Important Note:
GASCO will only notify technically accepted Bidders to submit their commercial bids & bid bonds in a specific date prior to commercial opening as any commercial bids presented without GASCO'S official request will not be considered.

5-Prices:

5.1 All prices should be submitted itemized (per line item) on **CFR Liner Out Alex Seaport** INCOTERMS 2020"**, it is to be noted that lump sum value for the freight charges will not be accepted.**

5.2 Prices to be submitted in the currency of US Dollars/Euro based on the above stated incoterms.

6-Quotation Validity:

- Quotation should be valid for a period **of 90 days at least** from bid closing date.

7-Delivery Period:

- It is to be strictly noted that the quoted delivery period must be counted from **the purchase order receipt date**, although the payment will be affected through Letter of Credit.
- Specific delivery schedule will be determined after the technical evaluation phase termination and upon the invitation for commercial bids.

8-Bid Identification:

Presented bids should be clearly identified stating the tender number, deadline date and identification flag assigning the contents of each envelope as well as the Bidder name which should be indicated clearly on the envelope.

9-Shipping Details:

9.1. Vessels age should not exceed than 15 years as any extra insurance fees will occur due to shipping materials on vessel age exceed 15 years will be beard by your side **and in all cases shipping on vessel age exceed 30 years is not accepted.**

9.2. All shipping details for each consignment as well as number of consignments to be indicated clearly in your commercial envelope i.e. (net weight, gross weight, volume, no. of packages, shipping port, and packing type).

9.3 Trans-Shipment is not allowed.

9.4 Partial Shipment is allowed.

9.5. In case of shipment inside full load container (FCL), the bill of lading should include 21 days free of demurrage starting from receiving date at port of destination.

9.6. Due to the latest instructions received from Egyptian Environmental Authorities & in case of shipping inside wooden boxes / pallets, Bidders should arrange for wooden cases fumigation process at port of loading which should be stamped as fumigated Otherwise, this wooden cases will be returned back to be fumigated at port of loading on Bidder's account.

10- Order Splitting:

GASCO reserves the right to split tender among technically accepted bidders based on the lowest quoted prices.

11- Evaluation Criteria:

A) Technical:

The proposed Bids will be evaluated as technically qualified or not, based on compliance with tender documents specifications and conditions.

B) Commercial:

To be carried out only for technically accepted bidders, based on the following criteria:

- Prices on CFR Liner Out **Alex Seaport**.
- Compliance with the identified delivery schedule in which evaluation criteria will be clearly identified upon the invitation for commercial bids
- Evaluation Exchange rate will be according to the Central Bank of Egypt (Sell / Exchange Rates) in commercial bids closing date.
- Compliance with Commercial terms & conditions stipulated herein.
- In case of any item price or freight charge which was not quoted by the bidder, highest offered price in the tender for this item/freight charge will be considered for evaluation purposes only.

12- Cancellation of Tender:

If the project is cancelled, significantly modified or postponed during bidding evaluation process, **Gasco** reserves the right to cancel the tender without bidders being entitled to any compensations.

13- Language:

-All quotations and any subsequent correspondences shall be in English language.
-It should be noted that in the event of any Purchase Order resulting from this "Invitation for Tender", all documents such as (Drawings, Data Sheets, Manufacturing Procedures, and Test Mill Certificates) shall also be in English language.

14- Acceptance of Instructions:

The submission of a quotation will be considered as a total acceptance by Bidders to these instructions without exceptions, unless the exceptions are clearly stated and quantified.

15- General Instructions:

1. Any Bid received by fax or after the mentioned due date will be considered unacceptable.
2. In case of discrepancy between unit price and total price, the unit price shall prevail.
3. Failure to comply with GASCO Terms & Conditions may result in considering the presented bid unacceptable.
4. Any deviations or exceptions to GASCO Terms & Conditions should be mentioned & highlighted in bold, otherwise it will be implied that all terms & conditions are accepted.
5. The bid shall include all the contact information of the manufacturer / trade house "fax number, telephone number, email address and cellular number" should there be any question of a technical nature that require immediate clarification.
6. The term "to be agreed" for terms of payment and/or quoted delivery is not acceptable.
7. Bids should include Country of Origin & Beneficiary Name, Address as well as complete Banking details.

General Conditions.

1 – Definitions:

In case of Contract/Order, the following terms shall be interpreted as indicated:
(a) The Contract/Order means the agreement entered into between the Purchaser and the Supplier, as recorded in the Contract/Order Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference herein.
(b) The Contract/Order Price means the price payable to the Supplier under the Contract/Order for the full and proper performance of the related contractual obligations.
(c) The Goods means all of the equipment, machinery, and/or other materials which the Supplier is obligated to supply to the Purchaser under the Contract/Order.

(d) Services means site services such as: installation, commissioning & testing, startup, provision of technical assistance, training and all other such obligations of the Supplier which are covered under the Contract/Order

(e) The Purchaser means: The Egyptian Natural Gas Company (Gasco).

(f) The Supplier means the person, firm or company with whom the Contract/Order is placed.

2- Payment:

Payment will be through **100% cash against documents (CAD) or 100% Letter of Credit (L/C) in the presence of 10% unconditional performance guarantee against presentation of the following documents:**

1) **3 originals of Commercial Invoice showing country of origin** (only one original to be stamped from chamber of commerce)
2) **1 original of Certificate of Origin** (to be stamped from chamber of commerce)
3) **3 originals of Itemized Packing List**
4) **1 original of Euro 1 Certificate** (for European community origin items only).
5) **1 copy of Release for shipment note**: endorsed from **GASCO** before shipping upon reviewing & approving original Mill Test Certificate "MTC"/ Certificate of conformity.
6) **3 originals of Bill of lading showing freight prepaid** (should include 21 days free of demurrage for full container load starting from receiving date at port of destination).

N.B - One set of shipping documents including 1 Original Of { B/L , Commercial Invoice, Euro 1 certificate, certificate of origin & Packing List} must be sent to Gasco directly by courier within 5 working days from B/L date, as any demurrages fees may occurred due to the delay of submitting these documents will be beard by the supplier. All other originals and copies shall be sent to a Gasco's bank within 10 days from B/L date.

3 – Delay Penalty & Liquidated Damages:

-If the Supplier fails to deliver any or all of the Goods by the Date(s) of delivery within the period(s) specified in the Purchase Order, the Purchaser may without prejudice to all other remedies under the Purchase Order, deduct from the Purchase Order Price, as liquidated damages, a sum equivalent to the percentage specified below of the delivered price of the delayed Goods for each week or part thereof of delay until actual delivery, up to a maximum deduction of the percentage specified below.

- The liquidated damage shall be 1% per full week or part thereof of delay calculated on the delayed shipment only.
- The maximum amount of liquidated damage shall be 5%.

-After which, the purchaser will specify a predetermined amount of money that must be paid by the supplier as damages for failure to perform under a contract. The amount of the liquidated damages will be determined at the time of "Invitation for Commercial Bids" of the damages that would be caused by a breach.

-Once the maximum amount is reached, the purchaser may at his own decision terminate the contract/order and forfeit the performance guarantee without prior notification to the supplier. In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods similar to those undelivered or not performed, and the Supplier shall be liable to the Purchaser for any additional costs for such similar Goods. However, the Supplier shall continue performance of the Contract to the extent not terminated.

4 – Banking Charges:

In case of order/contract all bank charges outside Egypt will be on supplier's account that is including L/C confirmation charges.

5–Performance Guarantee:

In case of order, Supplier will be obliged to submit a final letter of guarantee in the form of unconditional banking guarantee amounting to **10%** from the total order value issued by first class bank at Egypt and incase of Issuance of performance Bond from foreign bank should be confirmed from first class Egyptian Bank valid for either 12 months from materials commissioning or 18 months from last shipment date, whichever comes earlier.

6- Variation Order:

In case of order/contract **GASCO** will reserve the right to increase/decrease order quantity within **25%** from the purchased quantities with no changes in unit price within order execution period.

7 – Expediting:

The goods supplied under the order/contract, shall be subject to Expediting Process/ Inspection by the purchaser either by himself or by assigning a third party expeditor / inspector to confirm the compliance of the supplied materials to the technical specifications and that the manufacturing schedule is proceeding without any deviations. Purchaser's representatives shall be afforded free access during working hours to supplier's and sub-supplier's plants/mills for Expediting/Inspection purposes. As required by purchaser, supplier shall provide schedules, progress reports and un-priced copies of supplier's purchase orders/contracts to his sub-suppliers for purchaser's use in expediting process. Supplier shall notify purchaser in writing of any action or anticipated delays immediately upon discovery. Such notice shall include an estimated period of delay, causes, and corrective actions being taken.

8- Arbitration:

-If at any time there shall be any dispute or failure to agree between the parties in connection with the order/contract or breach thereof, this shall first be referred to the parties for an amicable settlement and in the event that such referral fails, it shall be referred to arbitration under the Rules of the Regional

Center of International Commercial Arbitration in Cairo, A.R.E. according to the conciliation and arbitration of the Egyptian law no# 27 for the year 1994
-The arbitration shall be held in Cairo, A.R.E. The award of the arbitration shall be final and binding to all parties. The arbitration shall be conducted in English and/or Arabic Language.

9- Warranties:

9.1. The supplier shall guarantee and warrant that all the supplied materials shall be in strict conformity with the agreed upon technical specifications and free from workmanship defects and faulty design, for a period of either twelve (12) months from the relevant date of materials commissioning **or** 18 months from the last date of shipment, whichever comes earlier.
9.2. The supplier shall be responsible for replacing and delivering on CFR/CPT basis any defected materials during the warranty / guarantee period upon the purchaser's notification.
9.3. The warranty / guarantee period for the replaced materials, shall have a new guarantee period of twelve (12) months from the date of putting it into operation.

10- Force Majeure:

10.1. Neither party shall be deemed to be in default of its contractual obligations whilst performance thereof is prevented by Force Majeure and the time limits laid down in the Contract / order for the performance of such obligations shall accordingly be extended by a period equal to that during which a Force Majeure event is operated.
10.2. Force Majeure are events caused by neither of the parties which are unforeseeable at the time of signature of the Contract, uncontrollable and which render the further performance of the contractual obligations impracticable as for instance acts of God, acts of war, acts of government, blockage, revolution and the like provided that any such event is beyond the control of any of the parties invoking the Force Majeure events. On the occurrence and cessation of any of such contingencies the party suffering there from shall immediately give the other party notice in writing of the cause of delay and its cessation respectively. Such notice shall be confirmed by official evidence.

According to new custom procedures(ACID) ,The supplier must provide us with the attached table.

ACID REQUEST FORM

pre #			***ACID #***	
1-	***Importer***			
	Company Name	:		
	Arrival port	:		

2-	***Exporter Information***				
	Name	:			
	Registration Number	:			
	Or Vat #				
	Exporter Country	:			
	Foreign exporter type ***Trade mark Owner** ***Branch** ***Agent** ***Distributer** ***Manufacturer** ***other**	:			
	Contact Information				
	Name	:			
	ID	:			
	Phone #	:			
	Email:	:			
3-	***Shipment Intial Information***				
1 MUST	**P O #**	:		Date	:
	Invoice #				
	Invoice # 1 / Type (Final / inatial)	:		Date	:
	Total / Cur	:			
	Total Package	:		W. Net	
	Invoice # 2 / Type	:		Date	:
	Total / Cur	:			
	Total Package	:		W. Net	
	Invoice # 3 / Type	:		Date	:
	Total / Cur	:			
	Total Package	:		W. Net	

	Port Of Loading	:	
	Port Of Discharging	:	

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Gen. Dept. of Engineering Affairs

Bulk Material
Technical Tender Document
For
GAS PIPELINE PROJECT

JUNE-2023

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Egyptian Natural Gas Co.

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Gen. Dept. of Engineering Affairs

Bulk Material Technical Evaluation Documents:

The following documents must be introduced in BINDER FILE arranged in the following sequence with physical separators:

1. **Bidder Technical offer.**
2. **Bidder Information Form (See Annex-A).**
3. **Clarifications/Deviations/Comments Sheet (See Annex-B).**
4. **GASCO MRQ with Bidder & Manufacturer Stamp for each paper See Annex-C).**
5. **GASCO Specification with Bidder & Manufacturer stamp for each paper (See Annex-D).**
6. **GASCO Table of Confirmation (See Annex-E), the Bidder must submit tables of confirmation completely filled and signed/stamped from Bidder & Manufacturer.**
7. **GASCO technical check list sheets (See Annex-F) must be filled properly and all required documents listed must be submitted.**
8. **Manufacturer Authorization letter.**
9. **Confirmation of accreditation to ISO 9001, 14001 & 18001.**
10. **Design Proof Test Certificate for Butt Welding Fittings.**
11. **Preliminary Drawings for barred tees, sweepolets, line spade and spacers (for information only).**
12. **Reference lists for last 5 years showing Client/Owner, Year of Supply, Diameters, Quantity, Material Grade and value of order for each item separated (merged reference list is not accepted).**
13. **Evidence of experience of production in the last 3 years (relevant P.O's to be submitted) for flanges, butt and branch weld fittings.**
14. **Plant Capabilities (including ranges for diameters, material grades and Annual Production Capacity).**
15. **Preliminary Inspection Test Plan (ITP).**
16. **Manufacturer Quality Plan.**
17. **Evidence for Worldwide Approvals.**
18. **Manufacturer Catalogs.**

Important Note

Any technical offer submitted without GASCO table of confirmation and Technical Check List Sheets for each commodity filled properly (Annex-E&F) will be totally disregarded.

NOTES:

a. **Any technical offer submitted without the above arrangement will be totally disqualified with no further clarification.**

b. **Any papers submitted loose and not included inside the Binder file will be totally disregarded.**

c. **A copy can be submitted on CD or Flash Memory with the same arrangement.**

d. **The bidder must mention the main offer and only one alternative offer (if any), in case of more than one alternative offer, the main offer only will be considered.**

e. **Annex-A, Bidder Information Form (Native file is available as Microsoft word format) shall be digitally filled with verified technical contact emails, moreover any hand written form shall be disregarded. Any unclear, missing information is the bidder own responsibility.**

f. **Annex-B, Technical Clarification Sheet (Native file is available as Microsoft word format) shall be digitally filled, signed and stamped by manufacturer, moreover any hand written form or not signed and stamped by manufacturer shall be disregarded.**

g. **Tables of confirmation (Native files are available as PDF format) shall be digitally filled with proper technical, moreover any hand written form will disqualify the whole technical offer.**

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Annex-A

Bidder Information Form

Annex-A, Bidder Information Form (Native file is available as Microsoft word format) shall be digitally filled with verified technical contact emails, moreover any hand written form shall be disregarded. Any unclear, missing information is the bidder own responsibility.

Bidder Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted.]

Date: *[insert date (as day, month and year) of Bid Submission*]
GASCO Tender No.: *[insert number of bidding process]*
BIDDER Tender No.: *[insert number of bidding process]*

Bidder's information Data: *[insert Bidder's legal name]* Legal Name: *[insert Bidder's name]* Country of origin: *[insert Bidder's origin]* Address: *[insert Bidder's Address]* Web site: *[insert Bidder's numbers]* Email Address: *[insert Bidder's email address]* Tel. no.: Fax no.:
2. Bidder's Authorized Representative Information Name: *[insert Authorized Representative's name]* Address: *[insert Authorized Representative's Address]* Telephone: *[insert Authorized Representative's telephone numbers]* Fax numbers: *[insert Authorized Representative's fax numbers]* Email Address: *[insert Authorized Representative's email address]*
3. Manufacturer's information Legal Name: *[insert manufacturer name]* Country of origin: *[insert manufacturer origin]* Address: *[insert manufacturer Address]* Web site: *[insert manufacturer numbers]* Email Address: *[insert manufacturer email address]*

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Annex-B

Clarifications/Deviations Sheet

G A S C O

Clarifications/Deviations Sheet	Bidder Ref. no.	GASCO PRJ. no.	MRQ. no.	SPECS. no.	C/D Rev.	Date	Page no.
						/ /	of

Sr. no.	Specs. Item no.	GASCO Requirements	Bidder Clarifications/Deviations	GASCO Reply	Remarks

Annex-B, Technical Clarification Sheet (Native file is available as Microsoft word format) shall be digitally filled, signed and stamped by manufacturer, moreover any hand written form or not signed and stamped by manufacturer shall be disregarded.

Bidder Sign. & Stamp:	**GASCO Sign. & Stamp:**

1- Bidder shall complete GASCO clarifications/deviations sheet incorporating all deviations and submit along with the tender. All deviations shall be supported with proper reasoning for GASCO review / approval.
2- In case of no deviations on GASCO specification and Material Requisition, the Vendor shall write “No Deviation” on the clarifications/deviations sheet and shall be duly stamped, signed and submitted along with the tender documents.
3- Without the submission of properly completed “Clarifications/Deviations sheet” along with the offer, the Bidder's offer shall be considered as incomplete offer and to be subjected to rejection at the sole discretion GASCO.
4- Deviations listed elsewhere in the proposal (i.e., other than the Deviation sheet) considered as invalid and shall be disregarded.
5- No deviations to the specified requisition/specification shall be considered after order placement.

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Annex-C

Material Requisitions

[See Attached]

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Annex-D

Material Specifications

GENERAL SPECIFICATION FOR LINE PIPES

General Specification For Line Pipes			
Specs. No. / MS / 001 Rev. 15			
Issue	**Aug. 2019**	**No. of Sheets**	**17**

CONTENTS

GENERAL SPECIFICATION FOR LINE PIPES

1. SCOPE

This Specification covers the manufacture, test & inspection and supply of seamless and welded line pipe for construction of natural non-sour gas onshore transmission pipelines.

Line pipe shall be manufactured in accordance with PSL 2 of API 5L, 46th Edition and this Specification.

2.0 PROCESS OF MANUFACTURE

2.1 Pipes furnished to this specification shall be:

a) Seamless process

or

b) Electric resistance welding (ERW). ERW pipe shall be full body normalised in a moving bed furnace following seam welding. Where this is not possible, pipe which has the area of the seam weld and the heat affected zone double normalised will be considered. This normalising heat treatment shall be followed by a hardness test and metallography examination to ensure the grain structure is fully refined.

or

c) Automatic submerged arc welding (SAW). At least one pass shall be made on the inside and at least one pass on the outside.

2.2 The pipes shall be bare and shall be painted by mill coating according to item (16.0) of this specification.

2.3 Pipes furnished to this specification shall be made from fully killed steel using the open hearth, electric furnace or basic oxygen process in accordance with PSL 2 of API 5L, 46th edition.

2.4 One longitudinal seam weld is only accepted.

2.5 Pipes furnished to this specification shall be used for high pressure natural gas pipelines.

2.6 Seamless and electric welded (ERW) Pipes shall be non expanded pipe, and Submerged Arc Welded (SAW) pipe shall be cold expanded for a ratio not less than 0.3% and not more than 1.5% and in accordance with paragraph 8.9.2 of API 5L, 46th edition.

3.0 CHEMICAL PROPERTIES AND TESTS

3.1 The pipe material chemical properties for all Grades shall be in accordance with API 5L, 46th Edition table 5 for PSL 2.

3.2 The manufacturer shall furnish a report giving the heat analysis of each heat of steel used in the manufacture of pipe. The analysis shall conform to the requirements specified in Section 9.2.2 of API 5L, 46th Edition for PSL 2.

3.3 Moreover, the manufacture shall furnish a report for the result of the products analysis which shall be determined as stated in Section 9.2.2 and Table 5 for PSL 2, of API 5L, 46th Edition.

3.4 For carbon mass friction equal to or less than 0.12% of PSL2 product analysis, the carbon equivalent, CE_{pcm} shall be according to the following equation and shall not exceed 0.25%.

$$CE_{pcm} = C + \frac{Si}{30} + \frac{Mn}{20} + \frac{Cu}{20} + \frac{Ni}{60} + \frac{Cr}{20} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

Where symbols for chemical elements represent the mass fraction in percent (table 5 of API 5L, 46th edition)

For carbon mass friction greater than 0.12% of PSL2 product analysis, the carbon equivalent, CE_{iiw} shall be according to the following equation and shall not exceed 0.42%.

$$C_{iiw} = C + \frac{MN}{6} + \frac{Cr + Mo + V}{5} + \frac{Ni + Cu}{15}$$

3.5 Two chemical samples are required from each analysis 3.2 and 3.3.

3.6 A record report of such analysis shall be furnished to the company for items 3.2 and 3.3.

4.0 MECHANICAL PROPERTIES AND TEST

4.1 The mechanical test specified herein shall be carried out according to PSL 2 of API 5L, 46th edition.

4.2 All tests shall be carried on material in its final supplied condition and test samples shall be taken from the same pipes as those used for chemical analysis.

4.3 Test samples and test methods shall comply with the requirements of paragraphs 10.2.3 & 10.2.4 of API 5L, 46th edition.
The pipe material tensile properties for PSL2 pipes shall be in accordance with the requirements of section 9.3.2, Table 7 of API 5L, 46th edition, for all grades.

5.0 HYDROSTATIC TEST

5.1 The test pressure for ERW and SAW pipes for all grades shall be that pressure which produces a fibre stress equivalent to the 90% of the specified minimum yield strength.

5.2 The hydro test pressure shall be calculated using the following formula :-

$$P = \frac{2000 \times S \times t}{O.D.}$$

P = hydrostatic test pressure, kPa

S = fibre stress, in MPa, equal to the stated percentages of the specified minimum yield strength

t = specified wall thickness. mm.

O.D. = minimum specified outside diameter mm.

5.3 The test be carried out using calibrated equipment recommended by API 5L and the duration shall be sufficiently long to allow adequate inspection but in no case shall the duration be less than ten (10) Second holding period.

5.4 The test media shall be fresh water suitably treated to prevent corrosion at a minimum temperature of + 7°C.

5.5 The test pressure and duration of each test shall be recorded on a chart.

6.0 API MONOGRAM AND MARKING

6.1 All identification markings shall be stencilled using a weatherproof paint on the outside surface of the pipe, as defined in API 5L, 46th edition for PSL 2, Section 11.

6.2 The identification markings used on the pipe shall be as follows:

a) Relevant company's order and item number
b) Name or mark of manufacturer
c) Pipe identification number
d) Process of manufacture
e) Outside diameter
f) Nominal wall thickness
g) Material grade
h) Heat treatment
i) Pipe length in metres

6.3 Marking on the pipe shall be made at one end at least and preferably at both ends.

6.4 The pipe shall be die stamped with a unique identification number on the weld bevel at each end of the pipe. In addition the weld seam of ERW pipe shall be marked on pipe weld end and bevel using suitable low stress stamps.

6.5 The pipe manufacturer shall have API Monogram.

7.0 PIPE END PREPARATION

7.1 The pipe ends shall be bevelled to an angle 30 degree with a tolerance of (+5, -0) degree measured from a line drawn perpendicular to the axis of the pipe. The surface finish shall be smooth and free from machining marks to allow for lamination visual inspection. All burrs shall be removed from the inside and outside of the pipe end.

7.2 The root face must be machined to 1/16 inch $\pm$ 1/32 inch.

7.3 Squareness Test

Test shall be made for the squareness of the pipe ends, at least three times during the shift. (8 hours working shift)
The gap at the measuring pipe end for one pipe shall not exceed 1/16 inch at any position when the pipe is rotated.

8.0 LENGTHS

The length of each pipe shall be from 11.0 to 13.0 metres. No pipe shall be less than 7 metre. Not more than 5% of the total number of pipes shall be from 7.0 to 11.0 metre. No jointers are accepted.

9.0 DIMENSIONS, MASS AND TOLERANCES.

Tolerances for diameters and masses shall be in accordance with the requirements of sections 9.11.2, 9.14 & table 10 of API 5L, 46th edition.
Wall thickness and out of roundness tolerances to be according to the followings:

a. Wall Thickness

a.1. Random wall thickness measurements shall be taken over the full length of the pipe using an ultrasonic thickness-measuring device. A minimum of ten (10) readings spaced evenly over the length and around the circumferences of all pipe shall be taken.

a.2. At any location the tolerance of wall thickness shall be (-5%/+15%).

b. Out of Roundness

b.1. The inside diameter shall be measured over a distance of 200 mm. From each end using a calliper or other device capable of measuring accurately the minimum and maximum values.

b.2. Out of Roundness shall be equal to 0.01D (where D is the internal diameter), or 6 mm maximum for diameters up to and included 24" and 8 mm for diameter greater than 24", whichever is the lesser.

The values of these tolerances should be recorded in the test certificates, for verification.

Out of Roundness Definition

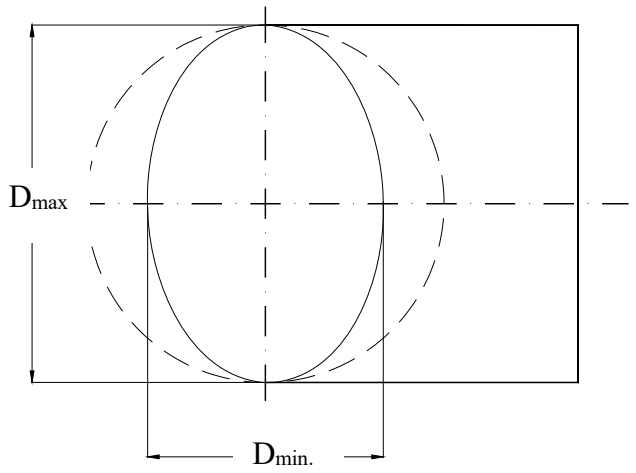
Out of Roundness is the generally obtained by the following calculation formula

$O.O.R = (D_{max.} - D_{min.})/D_{nom.} \times 100$

Where:

$D_{max.}$ = long axis of the section

$D_{min.}$ = short axis of the section



10.0 TESTS AND INSPECTION

Tests and inspection shall be carried out by the Manufacturer, generally in accordance with PSL 2 of API 5L, 46th edition and shall be as follows:

10.1 TESTS REQUIRED FOR SEAMLESS PIPES

a) Longitudinal tensile test for 6" and below.

b) Transverse tensile test for 8" and above.

c) Hydrostatic test according to item 5 of this specification.

d) Full length non destructive test shall be carried out according to and item 10.5 of this specs., and Annex K of API 5L, 46th edition for PSL2.

e) Check tolerances for pipe body, pipe ends, roundness, wall thickness, lengths and weights as stated in item 9.0 of this specification.

f) Squareness test as item 7.3 of this specification

g) Straightness test according to API 5L, 46th edition section 9.11.3.4.

h) Ultrasonic test for lamination at both ends of each pipe shall be performed on a 2 inch width (see table-1 Acceptance criteria for laminar imperfection).

i) Fracture toughness tests according to item 10.4 of this specs.

10.2 TESTS REQUIRED FOR ERW PIPES

a) Hardness test for double normalised pipes.

b) Metallography examination for double normalised pipes

c) Ultrasonic test for steel coil before forming pipes shall be carried out for 2 inch from coil edges (see table-1 Acceptance criteria for laminar imperfection).

d) Pipe body ultrasonic peripheral survey acc. to item 10.5.4 of this spec..

e) Longitudinal tensile test for 6" diameter and below.

f) Transverse tensile test for 8"and above.

g) Weld tensile test.

h) Flattening test.

i) Hydrostatic test according to item 5 of this specification.

j) Full length weld seam non destructive test shall be carried out by Ultrasonic examination, according to item 10.5 of this specification and Annex K of API 5L, 46th edition for PSL2 with acceptance criteria as per GASCO specification table-1.

k) Checking to tolerance for pipe body, pipe ends, roundness, wall thickness, lengths and weights as stated in item 9.0 of this specification.

l) Squareness test as item (7.3) of this specification.

m) Ultrasonic test for lamination at both ends of each pipe shall be performed on a 2 inch width (see table-1 Acceptance criteria for laminar imperfection).

n) Fracture toughness tests according to item 10.4 of this specification.

Note: (location of test samples of tensile tests and fracture toughness tests to be according to table 20 of API 5L, 46th edition).

o) Drop Weight Tear Tests shall be carried out for welded pipes of 20" diameter and larger, grade X52 and higher in accordance with section 9.9 of API 5L, 46th edition for PSL 2 pipes.

Two transverse specimens shall be taken from one length of pipe from each heat supplied in the order.

The specimen for Drop Weight Tear Test shall be tested at 0 degree centigrade with the acceptance limit of shear area ≥ 85% at least.

10.3 TESTS REQUIRED FOR SAW PIPES.

a) Ultrasonic test for steel plates before forming pipes shall be carried out for 2 inch from longitudinal plate edges (see table-1 Acceptance criteria for laminar imperfection).

b) Transverse tensile test.

c) Weld tensile test.

d) Weld guided bend test.

e) Hydrostatic test.

f) Full length weld seam non destructive test shall be carried out according to item 10.5 of this specification and Annex K of API 5L, 46th edition for PSL 2.

g) Pipe body/Plates ultrasonic peripheral survey acc. to item 10.5.4 of this spec.

g-a) At least 10% of plates shall be UT at pipe mills providing that all plates shall be 100% U.T at plates manufacturers.

h) Checking to tolerance for pipe body, pipe ends, roundness, wall thickness, lengths and weights as stated in item 9.0 of this specification.

i) Squareness test as per previous item 7.3 of this specification.

j) Ultrasonic test for lamination at both ends of each pipe shall be performed on a 2 inch width (see table-1 Acceptance criteria for laminar imperfection).

k) Fracture toughness tests according to item 10.4 of this specification.

Note: (location of test samples of tensile tests and fracture toughness tests to be according to table 20 of API 5L, 46th edition)

l) Drop Weight Tear Tests shall be carried out for welded pipes of 20" diameter and larger, grade X52 and higher in accordance with section 9.9 of API 5L, 46th edition for PSL 2 pipes.

Two transverse specimens shall be taken from one length of pipe from each heat supplied in the order.

The specimen for Drop Weight Tear Test shall be tested at 0 degree centigrade with the acceptance limit of shear area ≥ 85 % at least.

Table (1) Acceptance criteria for laminar imperfection

Service condition	Max. Individual Imperfection		Min. imperfection size considered			Max. Population density [a]
	Area Mm^2 (in^2)	Length mm (in)	Area mm^2 (in^2)	Length mm (in)	Width mm (in)	
Pipe body (or strip/plate body)						
Gas Pipeline	100 (0.16)	Not specified	30 (0.05)	5 (0.2)	5 (0.2)	5 [per 500 mm (1.6 ft) x 500 mm (1.6 ft square)] [b]
strip/plate areas adjacent to the weld seam [c]						
Gas Pipeline	100 (0.16)	20 (0.8)	---	10 (0.4)	---	3 [per 1,0 m (3.3 ft) length]

NOTE-1 Four plate bevel edges shall be free of lamination.

NOTE-2 For the purpose of determining the extend of suspect area, adjacent suspect areas separated by less than the smaller of two minor axes of the areas shall be considered as one area.

a Number of imperfection smaller than and greater than the minimum imperfection size.

b For pipe with D < 168.3 mm (6.625 in) or strip/plate widths less than 500 mm (19.7 in), the maximum population density is referred to 0.25 m^2 (2.7 ft^2).

c The maximum imperfection area adjacent to the edge is the product of the maximum imperfection length, where length is the dimension parallel to the material edge and the transverse dimension. An imperfection is considered to be larger than the maximum imperfection size if either the length or transverse dimension is exceeded.

10.4 FRACTURE TOUGHNESS TEST AS FOLLOWS:-

10.4.1 Charpy V - notch impact test according to item 9.8 of API 5L, 46th Edition PSL 2 and ASTM A 370 at 0 degree centigrade (32 degree Fahrenheit).

10.4.2 The minimum absorbed energy acceptable for charpy V notch impact test requirements (joules) as follows:

GRADE	SPECIMEN SIZE mm	LONGITUDINAL SPECIMEN		TRANSVERSE SPECIMEN	
		Min Average	Min Single	Minimum Average	Minimum Single
GRADE B	10 x 10 x 55 10 x 6.7 x 55 10 x 5.0 x 55	61 48 41	46 36 31	36 28 24	27 21 18
X - 52	10 x 10 x 55 10 x 6.7 x 55 10 x 5.0 x 55	61 48 41	46 36 31	36 28 24	27 21 18
X - 60	10 x 10 x 55 10 x 6.7 x 55 10 x 5.0 x 55	70 55 46	53 41 36	41 32 27	31 24 21

Please note that absorbed energy and shear area for grade X56 & X65 must be as mentioned in GASCO specs for grade X60

10.4.3 **FOR SEAMLESS PIPES**

3 Charpy V - notch longitudinal or transverse specimens representing one test shall be taken from the base material.

10.4.4 **FOR ERW AND SAW PIPES**

3 Charpy V-Notch transverse specimen's representing one test shall be taken from the base material and at an angle of 90 degree from the weld line for welded pipes.

10.4.5 **ADDITIONALLY FOR ERW PIPES**

3 Charpy V - notch transverse specimens representing one test shall be taken from each of the following positions:

a) At fusion line.

b) At heat effected zone at 2mm to 5mm from the fusion line.

As shown in Figure 1 of this Specification.

10.4.6 **ADDITIONALLY FOR SAW PIPES**

3 Charpy V - notch transverse specimens representing one test shall be taken from each of the following positions:

a) At weld centre line.

b) At fusion line.

c) At heat effected zone at 2 mm to 5 mm from the fusion line.

As shown in Figure 1 of this Specification.

10.4.7 **FOR ALL SPECIMENS**

The notch shall be perpendicular to the pipe surface and according to ASTM-A 370, para. 20.

10.4.8 **Test procedure according to ASTM - A 370**

10.4.9 For all Test Specimens taken from the base material according to items 10.4.3 and 10.4.4 of this specification. The average shear value of the three specimens should not be less than 85% (according to API 5L, 46th edition for PSL 2).

10.4.10 For all Test Specimens taken from the weld seam line according to items 10.4.5, and 10.4.6 The average shear value of the three specimens will be recorded for information. The minimum acceptable impact test requirements (joules) shall be according to item 10.4.2.

10.5 REQUIREMENTS FOR NON-DESTRUCTIVE TESTING

10.5.1 **ULTRASONIC INSPECTION - CALIBRATION.**

Ultrasonic inspection shall be carried after rolling the plate to check for lamination defects, in accordance with table-1 Acceptance criteria for laminar imperfection Page-10).

The calibration standard shall be located in a test pipe prepared either:

a) From a length of pipe of the same nominal diameter, thickness and surface finish and similar acoustic properties as the pipe to be tested which is long enough, with the addition of extension pieces where necessary to be tested under dynamic conditions similar to those under which the production pipe will be tested

b) From a short length or segment of pipe otherwise satisfying the requirements of (a) above using static calibration.

It shall be demonstrated to the company that, when using static calibration, the calibration standard introduced into the pipe will be detected by the equipment under dynamic conditions similar to those under which the production pipe will be tested.

The calibration of the equipment shall be checked at the commencement of each working shift at intervals not longer than 8 hours, or disturbance of manufacture. If on checking during production testing the calibration requirements are not satisfied, if the sensitivity value is lowered by 2dB, pipe tested since the previous check shall be re-tested after the equipment has been re-calibrated.

10.5.2 CALIBRATION OF SHEAR WAVE PROBES - LONGITUDINAL INSPECTION USED AFTER FINAL PROCESSING OF THE PIPE

Reference standards shall be as specified in API 5L, with the following modifications for inspection of the weld zone:

The reference target shall consists of two parallel sided notches of dimensions showed in API 5L, 46th edition for PSL2 of the following zones.

a) Two notches (N5) of a depth equal to 5% of the pipe thickness for SAW pipes.

Or

b) Two notches (N10) of a depth equal to 10% of the pipe thickness for ERW pipes.

For each case the notches shall be cut in the longitudinal direction, one on the outer and one on the inner surface of the calibration pipe.

The notches shall not exceed 50 mm long, and shall be in line but displaced longitudinally to ensure that two separate and distinguishable signal responses are obtained.

Note 1 Ultrasonic examination shall not be carried out immediately after welding as the couplant will cool the weld quickly resulting in a brittle or hardened surface.

Note 2 For pipe diameters up to and including 20" dia. a corrected surface by a curved shoe shall be used between the probe and pipe curvature.

10.5.3 **WELD AND ADJACENT PARENT PLATE**

The inspection of the weld zone shall be carried out after completion of manufacture and hydrostatic pressure testing as follows:

a) Automatic inspection of the full weld length, the probe assembly shall be arranged so that the pipe wall zone is scanned along its full length and cross-section from both sides of the weld.

Imperfections shall be classified for manual ultrasonic examination of:

For SAW pipes:

1) The signal responses from either side of the weld simultaneously is equal to or greater than the N5 reference signal response, or

For ERW pipes:

2) if the signal response from either side of the weld is equal to or greater than that from the N10 reference standard.

Shear wave probes in the frequency range 4 MHz to 8 MHz shall be used and shall be continuously monitored to ensure that ultrasound coupling is maintained throughout the test.

The probe angle shall be in the range of 45° to 70°. A recorder chart shall be used to record the presence of any defect such that they can be located accurately along the pipe. A paint spray or other marking device shall also be used in conjunction with the recorder chart.

At the discretion of the company, an inspection report of the delivered pipe may be requested to ensure quality of valid indications.

10.5.4 **PIPE BODY - PERIPHERAL SURVEY**

The entire body of the pipe shall be examined for the presence of laminar imperfections according to the requirements of API 5L, 46th edition for PSL2, Imperfections disclosed by ultrasonic inspection shall be classed as unacceptable if they exceed the requirements indicated in (table-1 Acceptance criteria for laminar imperfection).

10.6 **Repair of Defects**

Injurious defects may be removed by grinding providing that wall thickness will not be less than the minimum wall thickness stated in our specification and the N.D.T. shall be carried out after grinding according to API 5L, 46th edition.

Defect in the weld after expansion or cold sizing on grads X-60 and higher

shall not be repaired but rejected.

10.6.1 For plate, skelp or seamless pipe:

The plate, skelp or seamless pipe shall not contain any repair welds according to API 5L, 46th edition for PSL 2 pipe.

10.6.2 For ERW Pipes

Repair in weld seam and Repair welding on parent metal is not accepted.

10.6.3 For SAW Pipes

- Repair in weld seam is not acceptable within 200 mm. From bevel end.
- Repair to the weld seam shall be limited to three per pipe and shall be re-inspected in accordance to appendix C&D of API 5L, 46th edition for PSL 2 pipe.
- Welding repairs shall be carried out before hydrostatic test and cold expansion.
- Repair welding of pipe body is not accepted.
- Welding Repair procedure shall be submitted to principle inspector for approval.

10.7 The supplier shall notify the company, in writing, 30 days in advance of the commencement of the tests

11.0 TEST CERTIFICATES

Test certificates including all test and inspection stated in this specification shall be submitted for verification and shall be according to paragraph 10.1.3 of API 5L, 46th edition for PSL 2.

12.0 THIRD PARTY INSPECTION

The purchaser and/or the inspector representing the purchaser (third party) shall have unrestricted access, at all times, to all parts of the manufacturer's works, or sub-contractors works where the material is sub-contracted, that will concern the manufacture of the pipe ordered. The manufacturer shall afford the purchaser, and the inspector, all reasonable facilities to satisfy that the material is being manufactured in accordance with this Specification. All inspections shall be made at the place of manufacture prior to despatch, unless otherwise specified on the purchase order.

13.0 TRACEABILITY:

According to API 5L, 46th edition for PSL2, the manufacture shall establish and follow procedure for maintaining heat and lot identity of all pipes. The procedure shall provide means for tracing any length of pipe to the proper heat and a lot and to all applicable chemical and mechanical test results.

14.0 END PROTECTORS

All pipes shall be fitted with steel or plastic end covers (cup) to protect the root face and bevel against damage, and to prevent any foreign material from entering inside the pipes during handling in mill, shipment and on site.

15.0 MARKING

Marking shall be in accordance with API 5L, 46th edition for PSL 2 pipe, on each pipe. In addition the weld seam of ERW pipe shall be marked on the pipe weld end bevel, using suitable low stress stamps.

16.0 PAINTING OF BARE PIPES

External surfaces of all Pipes should be given a mill painting to prevent rust during shipment and storage yard and shall be of type which can lasts 6 months at least and can be easily removed by shot blasting ***no chemicals shall be applied*** so as not to affect the field outer coating ***(coating shall be applied within this period)***.

17.0 DELIVERY TOLERANCE

Delivery tolerance shall be + 0 % & - 0.5 % of the total length of each item.

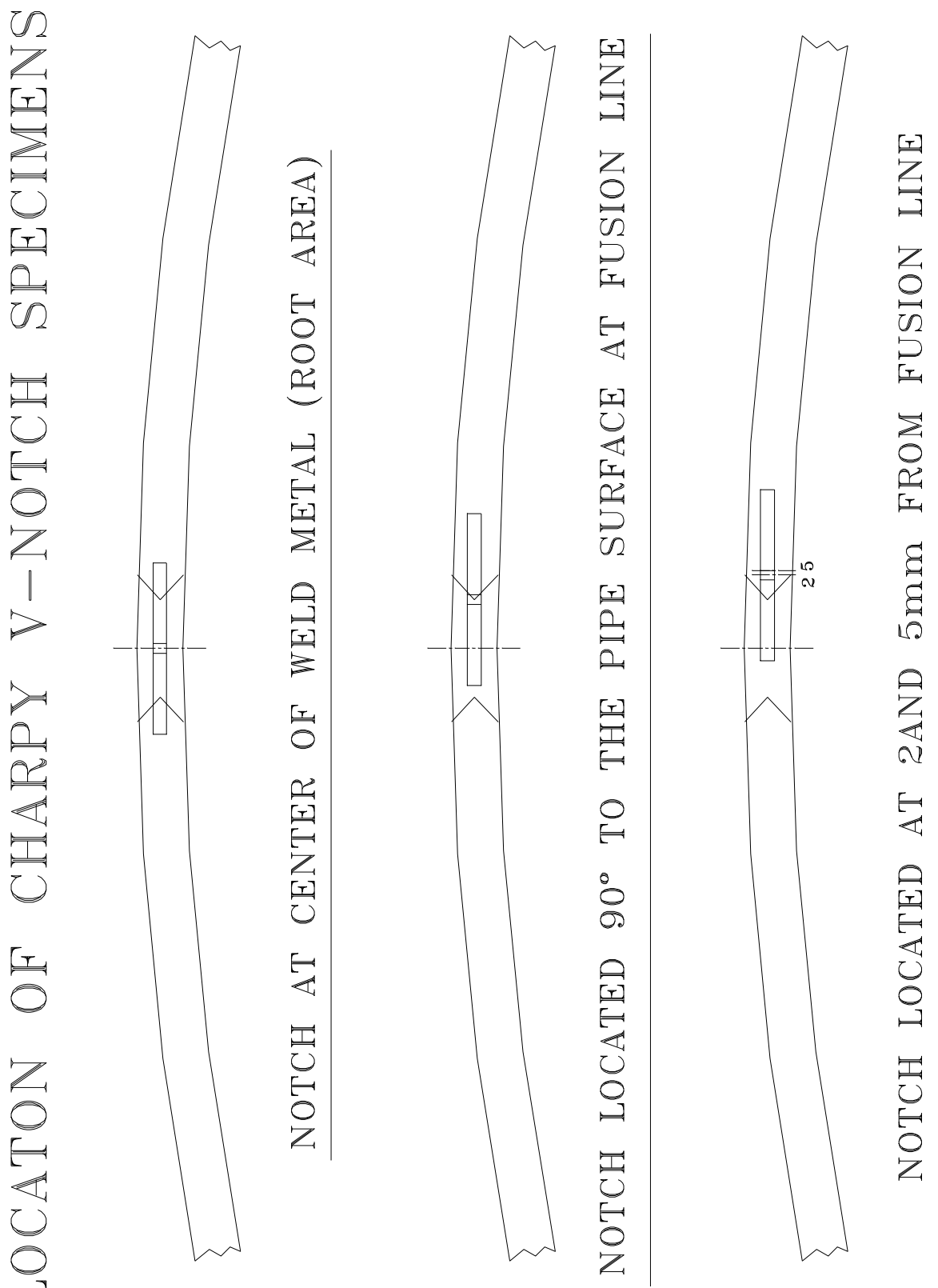
18.0 IMPORTANT NOTES

18.1 Any exception to this specification shall be clearly stated in the offer.

18.2 In case of offering with equivalent standards other than stated here in the specification, the manufacturer shall state the equivalents and submit with the offer the supported documents and standards that prove the equivalence for each item.

18.3 **The table of specifications attached here should be completely filled by the manufacturer and should be attached with the offer.**
The offer shall be rejected if the table of specification is not fully completed.

FIGURE-1 LOCATION FOR CHARPY V-NOTCH SPECIMENS



Egyptian Natural Gas Co.

GASCO

الشركة المصرية لغازات الطبيعية

GENERAL SPECIFICATION

FOR

BUTT WELDING FITTING

General Specification For Butt Welding Fittings			
Specs. No. / MS / 003 Rev. 6			
Issue:	**Aug. 2019**	**No. of Sheets:**	**8**

CONTENTS

GENERAL SPECIFICATION FOR BUTT WELDING FITTINGS

1.0 SCOPE

1.1 This specification covers seamless and electric fusion welded carbon steel welding fittings generally in accordance with MSS SP75 and ANSI B16.9.

1.2 This specification applies to butt welding fittings such as elbows, caps, tees and reducers.

1.3 Fittings shall be suitable for butt welding to other fittings and for pipes manufactured under the specification of API 5L.

1.4 Fittings from 2 inch to 12 inch shall be seamless type.

1.5 Fittings from 14 inch to 24 inch shall be seamless or welded type with one longitudinally seam weld.

1.6 Elbows & Reducers over 24 inch shall be welded type with one or two longitudinal seam welds and other fittings to be one seam weld.

2.0 DESIGN

2.1 Standard codes to be followed:

ANSI/ASME	B16.9	Latest edition
ASME	B31.8	Latest edition
MSS	SP 75	Latest edition
ASTM		Latest edition

2.2 Fittings shall be designed to suit the material, diameter and wall thickness stated in table of requirements.

2.3 All fittings shall be designed to withstand a field hydrostatic test in accordance with MSS SP75, Clause 2.2.

3.0 MATERIALS

Materials shall be in accordance with MSS SP75 or ASTM.

3.1 Steel used in the manufacture of fittings to this specification shall be fully killed and made by the open-hearth electric furnace or basic oxygen processes.

3.2 The chemical composition of each heat of steel shall be determined by the manufacturer and shall be within the maximum element requirements of material according to the Standard Codes as per 2.1 and to match with the pipe to which it will be welded.

3.3 Specific Requirements

The carbon content shall not exceed 0.25%.

The steel shall be refined by one of the following methods:

i) Aluminium treatment in which case the total aluminium content shall be between 0.018% and 0.050%.

ii) The addition of micro-alloying elements, in which case all the ranges of all relevant elements shall be recorded as part of the manufacturing procedure.

iii) The application of specific processing conditions to refine the ferrite grain size, the process being recorded as part of the manufacturing procedure.

3.4 Carbon equivalent of any heat shall be based on ladle analysis and shall not exceed 0.42 percent as determined according to the following equation:

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

3.5 Tensile properties of all fittings supplied to this specification shall be determined in the finished and heat treated condition, in accordance with the requirements of MSS SP 75 & ASTM.

Fittings supplied for attachments to pipes shall meet the tensile requirements of the pipe as specified in API 5L latest edition.

4.0 HEAT TREATMENT

Fittings shall be furnished stress relieved (if of welded construction), and normalised. Details of the heat treatment performed shall be included in the manufacturer's test report.

5.0 FRACTURE TOUGHNESS PROPERTIES

5.1 Fracture toughness properties of each heat of steel shall be determined in accordance with MSS - SP 75 procedure and ASTM.

5.2 Fracture toughness properties of the heat affected zone of welds shall also be determine. One set of three charpy V notch specimens shall be tested for each lot.

5.3 Each set of 3 charpy V - notch specimens shall be impact tested at 0 degrees centigrade with acceptance levels as follows:
The average shear value shall not be less than 60% and no one specimen shall be less than 50%
The percentage shear results shall also be reported.

Material Grade	Full Size		2/3 Size	
	Minimum average	Minimum individual	Minimum average	Minimum individual
X42 & below	27	24	20	18
Above X42	40	36	30	27

6.0 PROCESS OF MANUFACTURE

6.1 Fittings may be manufactured by any of the following processes:

6.1.1. Solid forged.

6.1.2. Extruded branch using heavy wall seamless or welded pipe.

6.2 All shop welding shall be carried out in accordance with the requirements of the ASME. (Boiler and pressure vessel code, sections VIII and IX, latest edition.)

6.3 After order placing the detailed drawing of fitting shall be submitted for approval before manufacturing.

7.0 DIMENSIONS & TOLERANCES

7.1 Dimensions shall be generally in accordance with ANSI B 16.9 and MSS SP.75.

Tolerances of fittings shall be in accordance with Table 3 of MSS-SP.75.

7.2 In all cases fittings shall be suitable for butt welding into the adjacent pipe work with the internal diameter of ends and outlets matching that of the pipe.

7.3 The weld end preparations for ends and outlets of fittings shall be in accordance with Section 13 of MSS-SP75. Figure 1 shall be used for wall thickness of 0.75" and less, and Figure 2 shall be used for thickness above 0.75".

Where the wall of the fitting exceeds that of the matching pipe the transition shall be in accordance with the details given in Figure 3 of MSS-SP 75.

7.4 The wall thickness of welding ends shall be as specified in the table of requirements.

7.5 The squareness tolerance for all weld end preparations shall be not greater than 1.5mm.

8.0 TESTING AND INSPECTION

8.1 All longitudinal seam welds are to be 100% radio graphed.

8.2 A certificate of ladle analysis is required for each heat of steel which shall conform with the chemical requirements of this specification.

8.3 A check analysis shall be furnished for each heat of steel used in producing the fittings.

The presence of alloying and residual elements shall be determined and reported in accordance with the requirements to this specification.

8.4 Tensile tests of all fittings shall be determined in accordance with the requirements of MSS SP 75 and ASTM.

8.5 Transverse guided bend tests of welds shall be carried out and reported as described in MSS - SP 75 and ASTM.

8.6 Fracture toughness tests to be in accordance with MSS-SP 75 and ASTM, and item 5 of this specification.

8.7 Non destructive testing shall be in accordance with:

a) Ultrasonic examination for the whole body.
b) Radiographic examination for the seam weld.

8.8 Longitudinal bead - weld under bead cracking test to be in accordance with Annex A of MSS-SP 75 and ASTM.

8.9 All fittings supplied to this specification shall be subject to inspection by the purchaser or his representative at supplier's works.

9.0 CERTIFICATION

9.1 Certified material test report shall be submitted, listing the actual results of chemical analysis, mechanical properties, notch toughness properties, heat treatment and non-destructive examination for evaluation.

9.2 An approved design proof test certificate (offered material shall be of the same design as the tested fittings and with dimensions ratio as defined MSS SP75)

10.0 PACKING

10.1 All fittings shall be supplied free of oil and grease and packed so as to prevent damage during shipment.

10.2 All fittings shall be fitted with steel or plastic end protectors to protect the root face and bevel against damage during handling in the mill, shipment and on site.

10.3 All fittings should be given a mill painting to prevent rust during shipment and storage and shall be of a type which can be easily removed by shot blasting so as not to affect the field outer coating.

11.0 MARKING

Identification marks shall be paint stencilled on the outside surface. These shall identify specification under which manufactured, material, normal outside diameter, wall thickness and guaranteed minimum yield strength in psi.

12.0 INFORMATION TO BE SUBMITTED WITH TENDER

12.1 Details of tests.

12.2 Any exception to this specification must be stated clearly in the offer.

12.3 Where offers with equivalent standards other than stated here in this specification are made, equivalents proposed shall be stated and the supporting documents and standards that prove the equivalence of each item must be submitted with the offer.

12.4 The offer must include the detailed drawings.

Appendix (A)
Additional Requirements for Barred Tees

A-1 Barred tees shall be in full compliance with latest edition of GASCO specification No. MS/003.

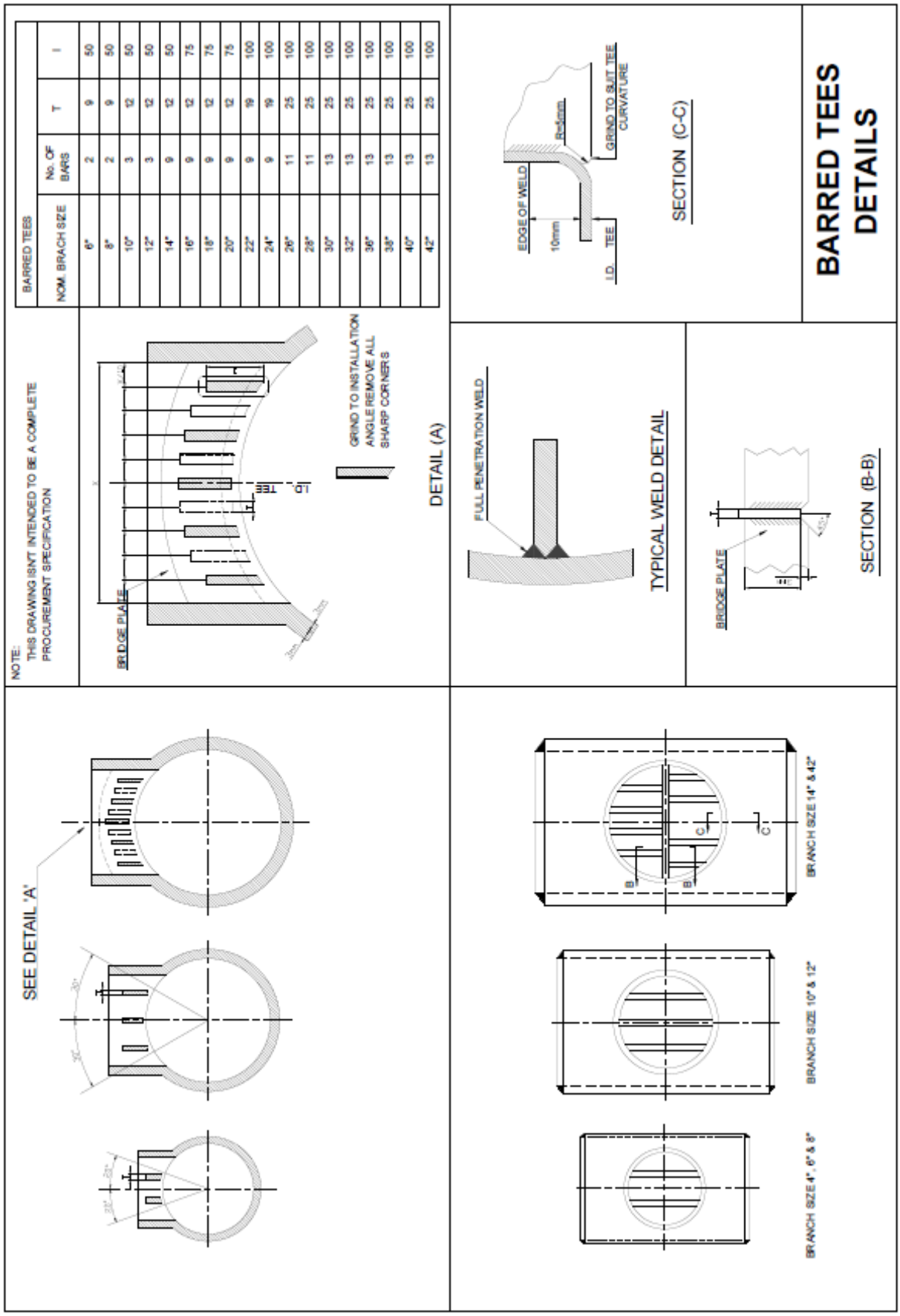
A-2 Barred tees shall be piggable and designed as per ASME B31.8 for branch compensation. Guide bars shall prevent pig entry into the branch. Guide bars shall be made of weldable steel having same chemical composition as per item 3.3 and shall be welded with full penetration welds, Bars are to be flush with the inside bore of the tee.

A-3 In barred tee, welds shall be made by welding procedure specifications (WPS) qualified as per ASME Sec. IX or API 1104 using welders/welding operators qualified by above codes. Weld procedure qualification record (PQR) on similar material of past supplies is acceptable subject to COMPANY approval.

A-4 Where stress relieving (PWHT) of fittings will be performed, e.g. for field welding, additional tensile testing of the fitting shall be performed on stress relieved specimens.

A-5 For barred tee, guide bars and tee shall be with the same material/chemical composition as per item 3.3. The bar and Tee shall be the same grade of material.

A-6 All barred tees shall have the configuration of bars as shown in Figure (A) below.


BARRED TEES
NOM. BRACH SIZE
No. OF BARS
T
I
6" 2 9 50
8" 2 9 50
10" 3 12 50
12" 3 12 50
14" 9 12 50
16" 9 12 75
18" 9 12 75
20" 9 12 75
22" 9 19 100
24" 9 19 100
26" 11 25 100
28" 11 25 100
30" 13 25 100
32" 13 25 100
36" 13 25 100
38" 13 25 100
40" 13 25 100
42" 13 25 100
NOTE:
THIS DRAWING ISNT INTENDED TO BE A COMPLETE PROCUREMENT SPECIFICATION
BRIDGE PLATE
I.D.
TEE
GRIND TO INSTALLATION ANGLE REMOVE ALL SHARP CORNERS
DETAIL (A)
EDGE OF WELD
10mm
R=5mm
GRIND TO SUIT TEE CURVATURE
I.D. TEE
SECTION (C-C)
BARRED TEES DETAILS
FULL PENETRATION WELD
TYPICAL WELD DETAIL
BRIDGE PLATE
SECTION (B-B)
SEE DETAIL 'A'
BRANCH SIZE 14" & 42"
BRANCH SIZE 10" & 12"
BRANCH SIZE 4", 6" & 8"

GENERAL SPECIFICATION
FOR
BRANCHED WELDED FITTINGS

General Specification For Branched Welded fittings			
Specs. No. / MS / 004 Rev. 5			
Issue:	**Aug. 2019**	**No. of Sheets:**	**9**

CONTENTS

1. Scope

This specification relates to patented types of welded fittings suitable for use with:

a) Gas transmission Pipelines and Associated Installations operating up to 100 bar.

b) Pressure vessels such as Pig Traps and Filter/Separators using API 5L line pipes material

2. General

2.1 The patented forged steel welding fittings types shall comprise of:-

a) Extruded welded forged branch fitting e.g. Sweepolet type.

b) Welding branch fittings e.g. Weldolets or Long Neck Weldolet type

c) Socket Welded branch fittings e.g. Sockolet Type

d) Threaded welded branch fitting e.g. Nipolet (Male Thread) or Threadolet (Female Thread) type.

3. Design

3.1 The fittings called for in this purchasing specification shall relate to the following standards: -

a) ANSI/ASME B16.9 - "Factory made wrought steel butt-welding fittings"

b) ANSI/ASME B1.20.1 - "Pipe Threads - General Purpose" (ins)

c) M.S.S. SP - 75 latest edition Part - "Specification for High Test Wrought Butt Welding Fittings"

d) ANSI/ASME B16.11 - Forged Steel Fittings - Socket Welding and Threaded

e) M.S.S. SP - 97 latest edition Part - "Specification for small branch Fittings"

3.2 The designed and dimensioned of branch-welded fitting shall be in accordance to ANSI/ASME B16.9, with end bevelled according to ASNI B16-25. The minimum mechanical properties for forging should be according to Table 1 attached. For extruded welded fitting (sweepolet) must match the wall thickness and dimensions with the same grade as shown in Fig. 1, of this specification

3.3 The bore diameter of socket welded and threaded fittings shall be to ANSI B16.11

3.4 The welding fitting shall be designed to ensure the component is suitable for operation at a max. Pressure of 100 bar and in a temperature range -5 to 100^{o}C and under such conditions provide adequate compensation when fitted directly or indirectly to the grades of line pipe specified as per API 5L.

3.5 The compensation available for the fitting should be adequate to meet the requirements of ASME VIII Section 2 for a single branch connection.

3.6 The forging shall be produced by hammering, drop forging pressing, and extruding or a combination of these methods. The forging should be brought as close as practicable to the finished shape and size by hot working. It should be so worked as to cause metal flow in the direction most favourable for resisting service stresses.

3.7 Where considered necessary, the max. service stresses e.g. Pig Trap connections shall be made known to the manufacturer.

3.8 Grade of material of fittings shall be equivalent, and of suitable dimensions to match the pipe to which it is to be welded.

3.9 Actual tensile strength of the steel of any component shall not exceed the minimum 0.2% proof stress by more than 150N/mm^2.

3.10 In terms of sizing the extruded tee or sweepolet type fitting shall not exceed d/D ratio of 0.6.

All other fittings embraced in this specification shall not exceed 50mm in size.

3.11 Fracture toughness properties shall be in accordance with Item 6 of this specification.

3.12 Mechanical testing shall be carried out after hot forming and final heat treatment, and shall be in accordance with Table 1 attached.

4. Material

4.1 Materials shall be in accordance with MSS.SP75 - WPHY, and ASTM. A694-Forging, Carbon & Alloy Steel for Pipe Flanges, Fittings and Parts for High Pressure Transmission Service.

4.2 Steel shall be produced by an electric hearth process or one of the basic oxygen processes.

4.3 Steel shall be fully killed and type of deoxidisation practice shall be the option of the manufacturer.

4.4 The composition of the steel shall be determined by heat analysis. Certificates of such analysis shall be supplied to purchaser prior to delivery of the fittings.

4.5 Chemical composition of the steel shall relate to MSS. SP-75 (1993) - Table 1 giving max. limit of chemical elements.

4.6 Maximum carbon content of welded fittings shall be as follows:

Grade B: 0.22%

Grades F42, F46, F52, F60 & F65: 0.20%

4.7 The manufactures shall ensure that the resultant carbon content of any fitting shall not result in weldability problems at in-situ conditions.

4.8 For all new sources of supply of welded fittings the manufacturer may be subjected to weldability tests where considered necessary.

4.9 Carbon equivalent of any heat shall be based on product analysis and shall not exceed 0.42 percent as determined according to the following equation:

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

4.10 When fittings include for extensions by the manufacturer e.g. weld neck flange welded to a weldolet, all fittings shall be post weld treated in accordance with ASME Section VIII or alternatively heat treated in accordance with MSS - 75 (1993) Para 9.

4.11 Any unspecified elements offered shall be agreed by the company.

5. Heat Treatment

5.1 Heat treatment of forging shall comply with MSS. SP-75 Section 9, and shall be cooled in such a manner that no damage results to the forging.

5.2 Details of the heat treatment performed shall be included in the manufacturers test report.

6.0 Fracture Toughness Properties

6.1 Fracture toughness properties of each heat of steel shall be determined in accordance with MSS - SP 75 procedure, and Table 1 attached.

6.2 Each set of 3 charpy V - notch specimens shall be impact tested at 0 degrees centigrade with acceptance levels as follows:

6.2.1 The average shear value shall not be less than 60% and no one specimen shall be less than 50%

6.2.2 The percentage shear results shall also be reported.

6.2.3 The minimum energy absorbed is:

Material Grade	Full Size		2/3 Size	
	Minimum average J	Minimum individual J	Minimum average J	Minimum individual J
X42 & below	27	24	20	18
Above X42	40	36	30	27

7. Machining - Welding Fittings

7.1 The surface condition of the forging shall be free from such segregation cracks, laminars or flaws that will preclude their use for the purpose for which they were intended.

7.2 Details of any proposed repair procedure and of subsequent heat treatment shall be agreed by the company.

7.3 All burrs and sharp edges shall be removed.

7.4 For sweepolets the weld end preparations shall be square to the axis of the fitting within the following tolerances, as measured across the diameter of the branch:

a) Up to and including 100 mm nominal size - 1.0 mm.

b) Equal to or greater than 150 mm nominal size - 1.5 mm.

7.5 For threadolets, nipolets, sockolets and weldolets, the weld end preparation shall be square to the axis within 0.5mm, as measured across the diameter of the fittings.

7.6 Weld / socket end and thread areas of fittings shall be machine surface finished.

8. Test and Inspection

8.1 A certificate of ladle analysis is required for each heat of steel which shall conform with the chemical requirements of this specification.

8.2 A check analysis shall be furnished for each heat of steel used in producing the fittings.

The presence of alloying and residual elements shall be determined and reported in accordance with the requirements to this specification.

8.3 Tensile tests of all fittings shall be determined in accordance with the requirements of MSS SP 75.

8.4 Fracture toughness tests to be in accordance with MSS-SP 75 and Item 6 of this specification.

8.5 Non destructive testing shall be in accordance with:

a) Ultrasonic examination for the whole body.

9. Marking

9.1 All forged components / fittings shall where practical, be suitably marked.

9.2 Where steel stamps are used the marking shall be positioned on the bevel, as required by MSS SP-75.

9.3 Low stress round nosed stamps shall be used.

10. Manufacture Procedure Qualification

10.1 The manufacturing, quality control and inspection procedures shall be presented with the offer.

11. Certification

Certified material test report shall be submitted listing the actual results of chemical analysis, mechanical properties, notch toughness properties, heat treatment and non destructive examination.

12. Packing and Protection

12.1 All fittings shall be supplied free of oil and grease.

12.2 Finished forgings and fittings shall be suitably protected against corrosion and damage to weld end preparations, threaded connections and other machined surfaces during transport and storage. Plastic bevel protectors are preferred, but other forms of bevel protection may be used by agreement with the company.

12.3 All fittings may be given a mill painting to prevent rust during shipment and storage and shall be of a type which can be easily removed by shot blasting so as not to affect the field outer coating.

12.4 Manufacturers who offer fittings from stock that have been coated with a rust preventative may be considered, provided they state in the quotation the nature of the coating and how it can be removed.

TABLE 1 - Minimum mechanical properties for forgings

API material grade* **		**B**	**X42**	**X46**	**X52**	**X56**	**X60**	**X65**
Tensile strength, Minimum	N/mm^2 PSI	415 60,200	415 60,200	435 63,100	460 66,700	490 71,100	520 75,400	535 77,600
0.2% proof stress,	N/mm^2 PSI	245 35,500	290 42,100	320 46,400	360 52,200	390 56,600	415 60,200	450 65300
Elongation, minimum ***	%	22	22	22	20	20	20	20
Average of three Charpy V-notch Specimens at 0^oC	Full size J	---	27	40	40	40	40	40
	Half size**J	---	19	28	28	28	28	28
Minimum of three Charpy V-notch Specimens at 0^oC	Full size J	---	20	30	30	30	30	30
	Half size**J	---	14	21	21	21	21	21
Brinell Hardness		118 to 170	118 to 170	125 to 175	140 to 200	145 to 205	150 to 210	

NOTES -

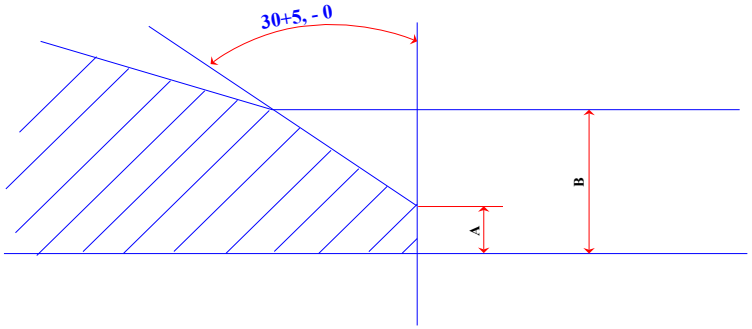
** When full size specimens cannot be obtained, 10 mm x 5 mm specimens shall be used.

*** The API material grade is relaxed to the grade of the associated pipe.

**** Elongation is calculated on a gauge length equal to 5.65_S_o (where S_o = original cross-sectional area)

FIG 1 WELD END OPERATION DIMENSIONS FOR EXTRUDED WELDING FITTINGS

NOMINAL SIZE OF HEADER mm	ROOT FACE DIMENSION A mm	THICKNESS AT WELD END PREPARATION B mm
150	1.5 ± 0.8	8
200		9
250		9
300		10
350		11
400		12
450		
600	1.5 +1 - 0	15
750		16
900		18
1050		19



GENERAL SPECIFICATION
FOR
FORGED STEEL FLANGES

General Specification For Forged Steel Flanges			
Specs. No. / MS / 006 Rev. 4			
Issue:	**Aug. 2019**	**No. of Sheets:**	**13**

CONTENTS

GENERAL SPECIFICATION FOR FORGED STEEL FLANGES

1.0 GENERAL

All flanges covered by this specification shall be carbon steel high strength, welded neck.

Flanges shall be provided with:

a) Raised face.

Or

b) Ring type joint face

As stated in the data sheet.

2.0 SCOPE

2.1 This specification covers the manufacture, testing and inspection of steel pipeline flanges, for use on pipelines and associated installations.

2.2 All welding neck flanges shall comply with ASME B 31.8 - Gas Transmission and Distribution Piping Systems and with requirements of this specification.

2.3 Design, manufacture and testing shall be in accordance with ANSI B.16.5, MSS - SP 44 and with the requirements of this specification.

2.4 Flanges to this specification will be for high pressure natural gas.

2.5 Service Conditions

Product:	Natural Gas
Max. Operating Temperature:	$+70^0$C
Min. Operating Temperature:	-20^0C
Ambient Temperature:	-5^0C to 50^0C

3.0 GOVERNING SPECIFICATION

3.1 Strict temperature control shall be observed during forging so that physical properties of the material are not impaired.

4.0 MATERIAL

4.1 The flange material shall be of carbon steel the composition being recorded as part of the manufacturing process. Steel to ASTM A105 & ASTM A694 shall be used according to what is stated in the requirements – item 14. The material grade used shall meet the relevant properties given in Table 1. The Grade will match that of the pipe stated in the data sheet.

4.2 All flanges should be suitable for field welding to other fittings and pipes manufactured under the specification of ASTM A106, API 5L GR. B. API 5LX, as stated in the data sheet.

4.3 Specific Requirements

The carbon content shall not exceed 0.25%.

The steel shall be refined by one of the following methods:

i) Aluminium treatment in which case the total aluminium content shall be between 0.018% and 0.050%.

ii) The addition of micro-alloying elements, in which case all the ranges of all relevant elements shall be recorded as part of the manufacturing procedure.

iii) The application of specific processing conditions to refine the ferrite grain size, the process being recorded as part of the manufacturing procedure.

4.4 The carbon equivalent of any heat shall not exceed a value of 0.42 percent as determined by the formula.

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

On ladle analysis.

4.5 Tensile properties shall conform to the mechanical properties for the relevant grade in Table 1, and in accordance to the requirements of ASTM 105 and ASTM A694.

5.0 WELDABILITY

The manufacturer shall furnish evidence of satisfactory weldability without special procedure.

6.0 MECHANICAL TESTING AND CHEMICAL ANALYSIS

6.1 The frequency and procedure for chemical check analysis and mechanical tests to determine yield strength, tensile and elongation shall be made in accordance with the provisions of ASTM A105 or ASTM A694 as required by this specification.

6.2 The samples shall be taken at a rate of not less than one for each batch of forgings of the same cast and of similar action size, heat treated together. The minimum rate of testing shall be as follows:-

a) One sample for up to 200 forgings for forgings equal to or less than 250mm nominal size.

b) One sample for up to 100 forgings for forgings 300mm to 400mm inclusive nominal size.

c) One sample for up to 50 forgings for forgings equal to or greater than 450mm nominal size.

6.3 The nominal sizes referred to above is the nominal size of the pipe to be joined to flanges.

6.4 Test samples shall be taken from material which has mechanical properties which are representative of the properties of the most significant sections of the forgings which they represent.

6.5 In the case of test samples cut from complete forgings for flanges, the test samples shall be taken as shown in figures 1, 2 &3 and the dimensions of samples shown in Table 2.

6.6 Test samples shall have their length parallel to the principle direction of grain flow. Test pieces shall be taken with their axis approximately mid-way between the surface and the centre of the test sample i.e. mid-radius location. Test pieces shall be cut with their axis parallel to the length of the test sample i.e. usually parallel to the principle direction of grain flow.

6.7 The results of tensile tests shall comply with Table 1 for the relevant material grade.

6.8 Charpy Impact Tests

For material grades given in table 1, Charpy impact tests are required except where the size of forging means that it is not practicable to produce Charpy specimens. Three Charpy V-notch test pieces shall be machined from each test sample taken. The test pieces shall be notched with the axis of the notch perpendicular to the nearest surface of the forging. Full size test pieces shall be used, except where the material is too thin to allow them to be produced, when the largest of the test pieces sizes given in table 1 shall be used. Positions for test specimens are shown in figures 1, 2 & 3.

Important Note:

As an alternative tensile and charpy impact test samples can be taken forged bar or prolongation specimen of same heat number and same heat treatment with the test results to comply completely with the requirements of GASCO specs table-1

6.9 Manufacturing procedure qualification

6.9.1 Test samples for tensile and Charpy impact test pieces shall be taken at 120 degree intervals round the forged component. Where practicable, test pieces shall be taken in the principle direction of grain flow, with other test pieces in positions transverse and radial to the direction as shown in Figures 1, 2 and 3.

6.9.2 Where, after manufacture, acceptance of an identified batch is considered, then the tests can be performed on a flanges randomly selected by the company from the offered batch.

6.9.3 Hardness Test

Brinell hardness tests shall be carried out to check the properties of forgings within a batch. The results shall comply with table 1.

7.0 HEAT TREATMENT

7.1 All flanges shall be furnished in the heat treatment condition by normalising.

7.2 Details of the heat treatment employed shall be reported on the manufacturers material test certificates.

8.0 DIMENSIONS

All flanges up to and including 24 inch size shall conform to the flange dimensions given in ANSI B16.5 latest edition, for sizes 22 inch and above 24 inch shall be in accordance with MSS SP 44.

The weld end preparations shall comply with ANSI B 16.5 and MSS SP-44 as appropriate to suit the matching pipe as stated in the data sheet.

The surface finish of contact faces of varied face flanges shall be as specified in MSS SP-44. Other machined surfaces of flanges shall meet the following surface texture:

a) Weld end preparations - 3.2µm Ra.

b) RTJ groove side faces - 1.6µm Ra.

c) Machined bores - 3.2µm Ra.

d) All other machined faces - 3.2µm Ra.

All burrs and sharp edges shall be removed.

Dimensions and tolerances of flanges shall be as specified in MSS SP-44 and ANSI B 16.5, as appropriate.

The peripheries of the flanges shall be machined within a diametrical tolerance

of ±2mm.

Unless otherwise specified by the company, the values for G given in table 2 shall also apply to the bore of the flange, except that for flanges equal to or greater-than 600mm nominal size, the tolerance on the bore shall be +3, -2mm.

The off squareness tolerance for all weld end preparations and joint faces shall be not greater than the following values.

a) Equal to or less than 100mm nominal size -1mm.

b) Equal to or greater than 150mm nominal size - 1.5mm.

The bolt pitch circle shall be concentric with the bore of the flange within tolerance limits of ±1.5mm. The chordal pitch of adjacent bolt holes shall be within tolerance limits of ±1.5mm.

9.0 INSPECTION NON-DESTRUCTIVE TESTING, REPAIR OF DEFECTS

9.1 Each flange shall be visually examined internally and externally for surface defects.

9.2 Repair by welding of injurious defects shall not be permitted.

9.3 All flanges shall be subject to Ultrasonic and Magnetic Particle Inspection at suppliers works by the purchaser or his representative.

9.4 Weld end preparations and the inside and outside surfaces of the finished forging or forged component shall be examined by magnetic particle inspection and ultrasonic flaw detection and in accordance with ASME VIII

9.5 Final non-destructive testing shall be carried out after all processing and heat treatment of the forging including machining by the forging manufacturer, where applicable.

9.6 As part of the manufacturing procedure test or as part of the agreed identified batch acceptance test, a minimum of six specimens shall be extracted from locations to the chosen by the company and these shall be polished and etched for micro examination. The specimens shall represent the expected range of microstructures present and shall be related to the position within the forging and the mechanical properties at that point. Examinations of each specimen shall be on a surface parallel to the principle direction of grain flow, and shall show a microstructure acceptable to the company.

10.0 MARKING

10.1 The information to be given to identify the forgings shall be as follows:

a) The information specified in, ANSI B16.5 and MSS SP44.

b) Relevant company's order or item number.

c) Actual material grade of forging (for material grades covered in table 1).

The information specified above shall be applied using paint stencils on forgings greater than 150mm nominal size and a durable weather resistant tag attached to forgings equal to or less than 150mm nominal size.

10.2 Flanges shall be marked with a unique identification number notified by the company. The number shall be stamped on the periphery of flanges equal or greater than 50mm nominal size and vibro etched on the periphery of flanges less than 50mm nominal size.

11.0 PACKING

11.1 Flanges shall be supplied free from oil and grease and coated with removable skin for protection against corrosion. This protective skin shall be easily removed on the site.

11.2 Flanges shall be packed so as to prevent damage during shipment particular attention shall be paid to the protection of weld bevels.

12.0 CERTIFICATION

The supplier shall furnish test certificates covering all tests carried out and shall certify compliance with relevant specifications.

All ladle analysis, results of mechanical tests and unique identification numbers as item 10.0 above and the manufacturing procedure.

13.0 INFORMATION TO BE SUBMITTED WITH OFFER

13.1 Details of tests

13.2 Any exception to this specification should be stated

13.3 Specifications, equivalents proposed should be stated and the supporting documents and standards that prove the equivalence of each item should be submitted with the offer.

13.4 The offer should include detailed drawings.

TABLE 1 - Mechanical properties of finished forgings

Material grade (see Note 1)	Yield strength R_s (minimum) N/mm^2	Tensile Strength R_m (minimum) (To MSS SP75) N/mm^2	Elongation A (minimum) (To MSS SP75) %	Charpy V-notch impact energy at 0^{o}c (See Note 2 and 3)						Hardness HB
				Full size		2/3 size		1/2 size		
				Minimum average J	Minimum individual J	Minimum average J	Minimum individual J	Minimum average J	Minimum individual J	
A105	248	482	22	27	20	20	15	19	14	137 - 187
A 694 F.52	360	455	20	40	30	30	22	28	21	139 to 230
Grade B	241	414	25	27	20	20	15	19	14	118 to 170
X42	290	414	25	27	20	20	15	19	14	118 to 170
X46	317	434	25	40	30	30	22	28	21	125 to 175
X52	358	455	25	40	30	30	22	28	21	140 to 200
X60	414	517	20	40	30	30	22	28	21	150 to 210
X65	448	531	20	40	30	30	22	28	21	155 to 215

NOTES

1. The 'X' grades given in this table have equivalent yield strengths to the 'F' grades of the same number given in MSS SP-44- Grade B is similar to API 5L.
2. The Charpy V-notch impact energy values given here only apply to forgings for which impact testing is specified in accordance to item 6.0.
3. The Charpy V-notch specimen sizes are as follows:
Full size - 10 mm x 10 mm
2/3 size - 6.7 mm x 10 mm
1/2 size - 5 mm x 10 mm

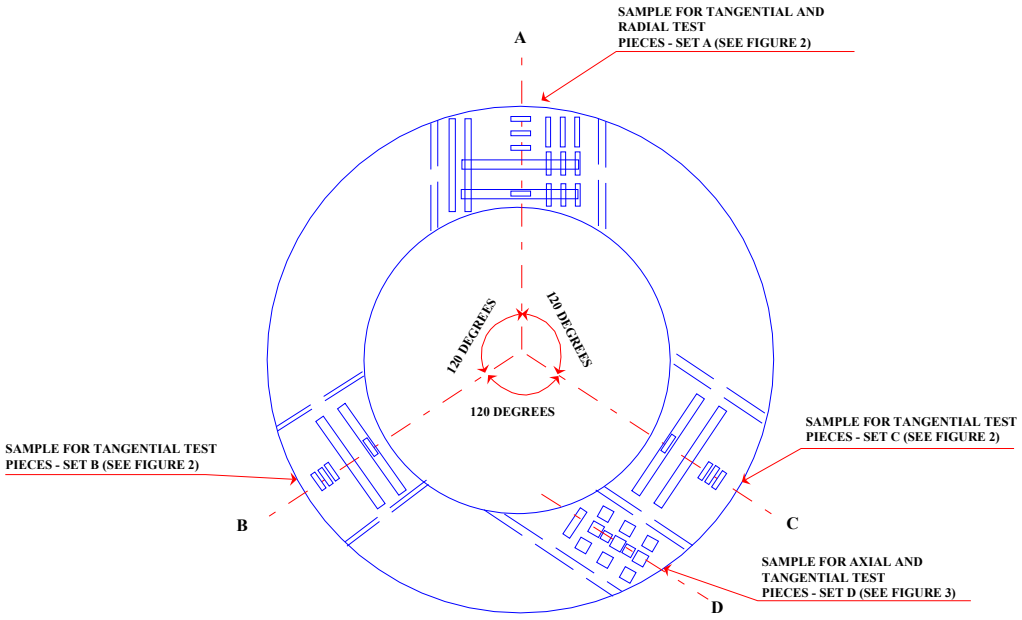
TABLE 2 - Sizes of separate test samples for flanges

Nominal size of forging	Minimum dimensions of each separate test sample after reduction	
	Diameter	**Length**
$\geq$100 to $\leq$ 250	50	255
> 250 to < 750	115	255
$\geq$ 750 to $\leq$ 1050	160	305

NOTES

1. All dimensions in mm.

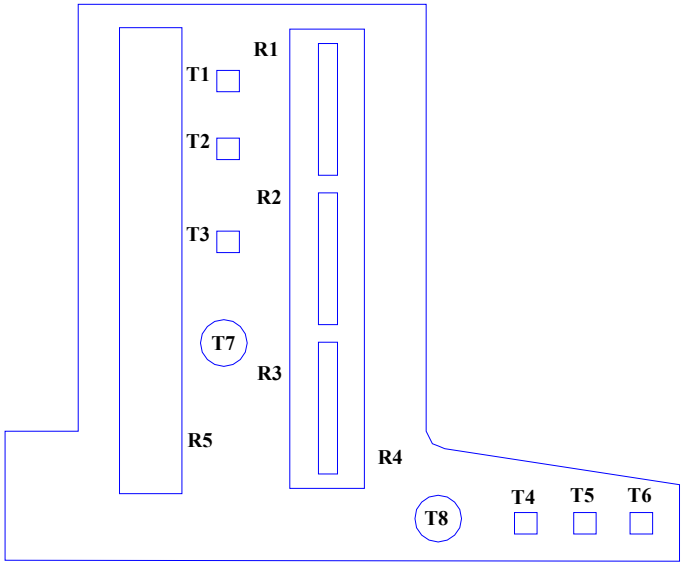
POSITIONS OF TEST SAMPLES IN FLANGE - MANUFACTURING PROCEDURE QUALIFICATION TEST



AS A"HOOPED STRESSED" ITEM TANGENTIAL SPECIMENS NEED TO BE TAKEN FROM MORE THAN ONE POSITION POSITIONS ARE REQUIRED AT 120 DEGREES. AT POSITION "A" ADDITIONAL TEST PIECES ARE TAKEN RADIALLY TO COMPARE WITH TANGENTIAL TEST RESULTS. AT POSITION "D", ONE LOCATION ONLY ADJACENT TO "C" AXIAL TEST PIECES NEED TO BE TAKEN ONCE AGAIN TO COMPARE WITH THE TANGENTIAL TESTS.

FIGURE 1

POSITIONS OF TANGENTIAL AND RADIAL TEST PIECES IN FLANGE - MANUFACTURING PROCEDURE QUALIFICATION TESTS



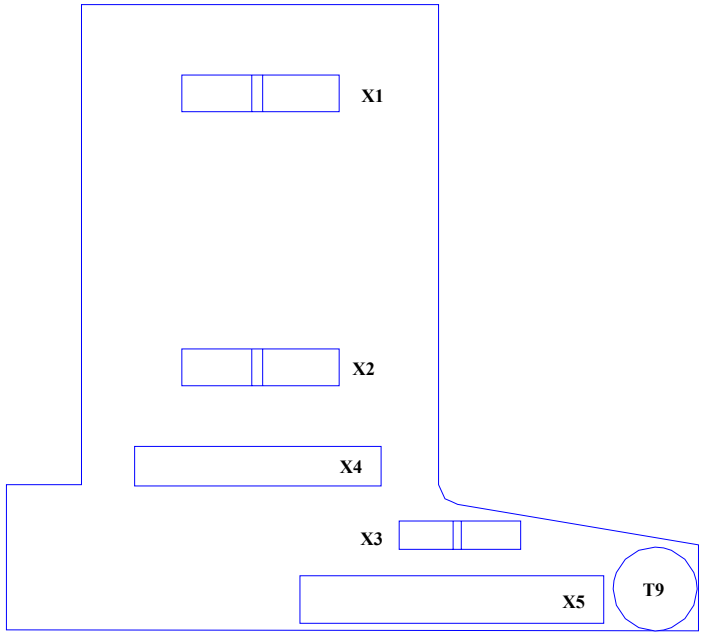
NOTES :-

1- THE FOLLOWING TANGENTIAL TEST PIECES SHOULD BE TAKEN AT POSITIONS A,B AND C SHOWN IN FIGURE 1 :
   a) CHARPY IMPACT TEST PIECES -T 1 TO T6 NOTCHED AS SHOWN.
   b) TENSILE TEST PIECES -T7 AND T8.

2-THE FOLLOWING RADIAL TEST PIECES SHOULD BE TAKEN AT POSITION A SHOWN IN FIGURE 1 :
   a) CHARPY IMPACT TEST PIECES -THREE SETS OF THREE SPECIMENS, ONE AT EACH OF R1,R2 AND R3 POSITIONS, NOTCHED AS SHOWN.
   b) TENSILE TEST PIECES -R4 AND R5.

Figure-2

POSITIONS OF AXIAL AND TANGENTIAL TEST PIECES IN MANUFACTURING PROCEDURE QUALIFICATION TESTS



NOTES :-

1- AXIAL TEST PIECES SHOULD BE TAKEN AT POSITION D SHOWN IN FIGURE 1 :
   a) CHARPY IMPACT PIECES -THREE SETS OF THREE SPECIMENS,
      ONE AT EACH OF X1,X2 AND X3 POSITIONS, NOTCHED AS SHOWN.
   b) TENSILE TEST PIECES -X4 AND X5.
2-TANGENTIAL TENSILE TEST PIECES T9 SHOULD BE TAKEN AT
   POSITION D SHOWN IN FIGURE 1.

Figure-3

GENERAL SPECIFICATION FOR FORGED STEEL PLUGS

General Specification For Forged Steel Plugs			
Specs. No. / MS / 005 Rev. 3			
Issue:	**2019**	**No. of Sheets:**	**5**

CONTENTS

GENERAL SPECIFICATION FOR FORGED STEEL PLUG

1. Scope

1.1 This specification embraces the requirement for the procurement of forged threaded plugs for use at Gas Installations operating at pressures up to 100 bar and at a temperature range of 0 to 100°C.

2. General

2.1 The male threaded plug type called for in this specification shall be used as a secondary pressure isolation facility.

3. Design

3.1 The plug fittings called for shall be in accordance with ANSI B 16.11 standard, which relates to:

Dimensions
Tolerances
Finish
Testing
Marking

3.2 Male threads shall be the taper type to ANSI/ASME B1.20.1 (NPT) and shall be threaded concentrically except that the actual and theoretical axis of the thread may diverge by not more than 1 in 200.

3.3 Dimensions of plugs shall be in accordance with the attached table. These dimensions are nominal and are subject to normal manufacturing tolerances (see table +/- 0.4mm of nominal size).

3.4 Forged plug profile shall be either

a) Square Head (preferred)

b) Hexagonal Head

4. Materials

4.1 Plug fitting material shall be of forged carbon and alloy steel to ASTM A181 - Grade 2, as a minimum. For low temperature application the plug fitting material shall be to ASTM A350 LF1/LF2. or ASTM A 694.

4.2 Where hot dipped galvanised finish plugs are required, Standard ASTM A153 shall apply.

4.3 All threading operations shall be completed prior to heat treatment, where appropriate.

4.4 Plug fittings may be manufactured by forging or machining from bar stock.

5. Workmanship and Finish

5.1 Forged plug fittings to this Specification shall be free from harmful defects, and shall have a workmanlike finish.

6. Marking

6.1 Any marking shall be applied prior to any final heat treatment, where appropriate.

6.2 As a Minimum, marking shall consist of :

a) Manufacturer's name or trade mark

b) Nominal size (inches)

6.3 Stamping is permissible only by roller stamping or by the use of a soft nosed stamp. Stamp to be placed on head of plug so as to be visible when plug is screwed into fitting.

7. Documentation and Certification

7.1 A certificate relating to the material specification is required issued by an approved Inspection Authority (third party).

This certificate shall be defined as the statement of conformity to the material standards, along with a report of the results of chemical analysis, mechanical and non-destructive tests witnessed by the inspection authority.

APPENDIX

GUIDANCE NOTES
FOR THE APPLICATION OF
THE GENERAL SPECIFICATION FOR STEEL PLUGS

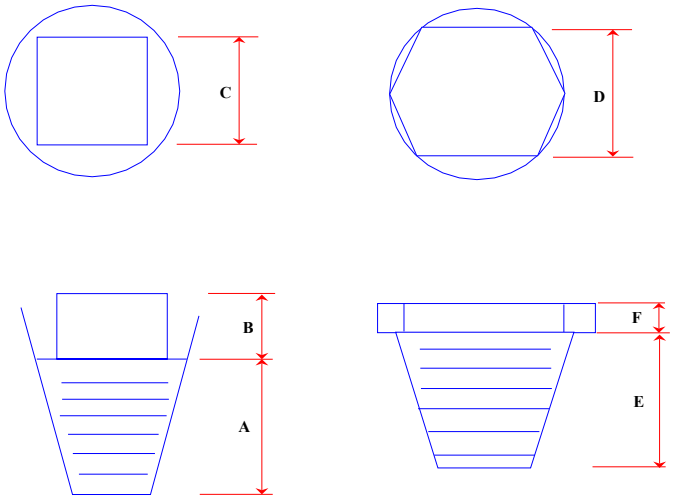
1. The maximum nominal size covered by this specification shall be 1" (25mm)

2. In certain operational situations for example, at vibration conditions where a parallel thread may be advantageous, forged plugs, bushings and lock-nuts, shall be manufactured to ANSI/ASME B16.14.

DIMENSIONS OF FORGED PLUGS

RATING = 3000 ibf/in (SCHEDULE 40)

SIZE OF PLUG FOR NOMINAL PIPE SIZE INCHES	TOLERANCE OF DIAM.OF NOMINAL PIPE THREAD,NPT	SQUARE HEAD (mm) A	B	C	HEXAGONAL HEAD (mm) A	B	C
1/8	+/- 0.4mm OF NOMINAL SIZE	10	6	7	11	10	6
1/4		11	6	10	16	15	6
3/8	DITTO	13	8	11	18	16	8
1/2	DITTO	14	10	14	22	20	8
3/4	DITTO	16	11	16	27	21	10
1	DITTO	19	13	21	35	25	10



GENERAL SPECIFICATION

FOR

GASKETS

General Specification for Gaskets			
Specs. No. / MS / 007 Rev.-4			
Issue:	**Aug. 2019**	**No. of Sheets:**	**5**

CONTENTS

GENERAL SPECIFICATION FOR GASKETS

1.0 SCOPE

This specification covers the supply of gaskets suitable for use with high pressure Natural Gas working from -20 °C to 70 °C.

2.0 GENERAL REQUIREMENTS

2.1 COMPRESSED FIBRE GASKETS

2.1.1 Gasket Material

Compressed fiber gaskets shall be manufactured from non-asbestos material in accordance with BS 7531 or equivalent. The material shall consist of fibers and inorganic fillers bonded with a suitable elastomer or blend of elastomers, and shall be manufactured in the form of sheets. The fibers shall be uniformly dispersed throughout the jointing. (examples of the type of fibers that may be used, singly or in combination, are aramid, carbon and glass). Asbestos fibers must not be used.

2.1.2 Thickness, Sizes, etc.

The dimension of the compressed fiber gaskets shall be to API 601 Table 2 thickness.

2.2 SPIRAL WOUND GASKETS

2.2.1 Spiral wound gaskets shall have stainless steel winding complete with inside retainer and outside stainless steel 316 L centering rings.

2.2.2 Spiral wound gaskets shall be in accordance with API 601.

2.2.3 The gaskets shall have stainless steel windings. The filler material shall consist of fibers and inorganic fillers bonded with a suitable elastomer or blend of elastomers. The fibers shall be uniformly dispersed throughout the filler material.

The filler material shall not contain any asbestos compound.

2.3 RING TYPE JOINTS

2.3.1 Ring type joints shall be of soft iron of octagonal cross section.

2.3.2 Ring type joints shall be manufactured in accordance with ANSI B16.20 from soft iron of octagonal cross-section.

2.3.3 The order shall state the quantity required together with the corresponding flange nominal size and class rating in accordance with ANSI B 16.5 or MSS SP- 44 as appropriate. The ring groove identification number shall also be stated on the order.

3.0 PRESSURE AND TEMPERATURE RATING

3.1 The gaskets shall be capable of withstanding the maximum pressure and maintaining its physical and chemical properties at temperature to which it might reasonably be subjected in service as outlined in the data sheet.

3.2 The gaskets shall withstand the required bolt loading without injurious crushing.

3.3 Design and tolerances shall conform to API 601 or ASME B16.20

4.0 DIMENSIONS

4.1 Dimensions of the gasket proper and the centering rings (including tolerance) shall apply with table 2 in API 601

4.2 Gaskets up to and including 24" size shall conform to the flange dimensions given in ASNI B16.5 (latest edition) and Gaskets for above 24" shall conform to the flange dimensions given in MSS SP44.

4.3 All gaskets shall be of the thickness and finish suitable for use at the design and service conditions specified.

4.4 All gaskets shall offer a continuous face to their adjacent flanges.

4.5 The order shall state the quantity required along with the corresponding flange nominal size and class rating in accordance with ANSI B 16.5 or MSS SP-44 latest editions as appropriate. For compressed fiber and spiral wound gaskets the inner ring diameter shall be confirmed with the order. For ring type joints the ring groove identification number shall also be stated on the order.

4.6 The rings and gaskets covered by this specification shall be suitable for use with ANSI and MSS raised face and ring type flanges as covered in the company specification for flanges. The pressure and temperature rating specifications are covered in the relevant data sheets.

5.0 MARKING

5.1 Marking shall conform to API 601

5.2 Each gasket shall be clearly tagged by the manufacturer with:

a) Gasket size

b) Gasket rating

c) Gasket thickness

d) Inside and outside centering ring material

e) Filler material

f) Manufacturer name

6.0 PACKING

All gaskets shall be supplied free of oil and grease and packed so as to prevent damage during shipment.

7.0 INFORMATION TO BE SUBMITTED WITH OFFER

7.1 Details of tests

7.2 Any exception to this specification should be stated.

7.3 In case of offering with equivalent standards other than stated here in the specifications, you should state the equivalents and submit with the offer the supported documents and standards that prove the equivalent per each item.

7.4 The offer should include detailed drawings for the type offered.

Egyptian Natural Gas Co.

GASCO

الشركة المصرية لتغازات الطبيعية

SPECIFICATION

FOR

SCREWED BAR AND NUTS, AND WASHERS

General Specification For Screwed Bar and Nuts, and Washers			
Specs. No. / MS / 008 Rev. 3			
Issue:	**Aug. 2019**	**No. of Sheets:**	**4**

CONTENTS

SPECIFICATION

OF SCREWED BARS AND NUTS

1.0 SCOPE

This specification covers the supply of screwed bars and nuts which are used for connecting carbon and alloy steel pipe flanges on high pressure pipelines and associated facilities.

2.0 SIZES

Screwed bars shall be 72 inch lengths.

3.0 DIMENSIONS

Dimensions shall be in accordance with ANSI B18.2

4.0 MATERIALS

4.1 SCREWED BARS

Screwed bars shall be alloy steel to ASTM A193, grade B7, threaded full length.

4.2 NUTS

Nuts shall be carbon steel to ASTM A194, grade 2H.

4.3 WASHERS

Steel Washers shall be made from bright mild steel and shall be chamfered 30^{o}. Material, finish and coating shall be in accordance with BS 3410 as follows :

4.3.1 Steel washers shall be made from En2 cold rolled steel in the hard condition in accordance with BS 1449 "Steel strip plate, sheet and strip".

Brass washers shall be made from material in the hard condition in accordance with BS 265 "Cold rolled brass sheet, strip and foil content 61.5 per cent minimum and under 64 per cent minimum".

If the purchaser requires the washers to be manufactured from steel or brass in any other condition, or of any other material, he shall specify his requirements in his enquiry or order.

4.3.2 Finish

The washers shall be reasonably flat and free from burrs. Standard washers will normally be supplied unchamfered.

If chamfered washers are required this should be specified by the purchaser in his enquiry or order.

4.3.3 Coating

If the washers are required to have a protective or decorative finish, this shall be specified by the purchaser in his enquiry or order."

The washers shall be reasonably flat and free from burrs and any required protective coating or decorative finish shall be specified by the company at the time of procurement.

Dimensions shall be to BS 3410, table 3, except for washers below. Table 3 of BS 3410 is included in the Appendix.

Dimensions of washers 1 5/8 ", 1 7/8" and 2 1/2 " nominal size are not covered by BS 3410, and shall be in accordance with the above and the table below.

NOMINAL SIZE	OUTSIDE DIAMETER MAX	OUTSIDE DIAMETER MIN	INSIDE DIAMETER MAX	INSIDE DIAMETER MIN	THICKNESS
1 5/8	3.125	3.095	1.656	1.651	0.212
1 7/8	3.5	3.470	1.906	1.901	0.212
2 1/2	4.5	4.095	2.531	2.526	0.25

5 THREADS

a) Screwed bars shall be threaded in accordance with ASME B 1.1

b) Screwed bars shall have class 2 A dimensions

c) Nuts shall have class 2B dimension

6 TEST CERTIFICATES

Test certificates shall be required for screwed bars and nuts for components formed individually, heat treated and machined. Test certificates shall include all testing and inspection information carried out by the steel maker.

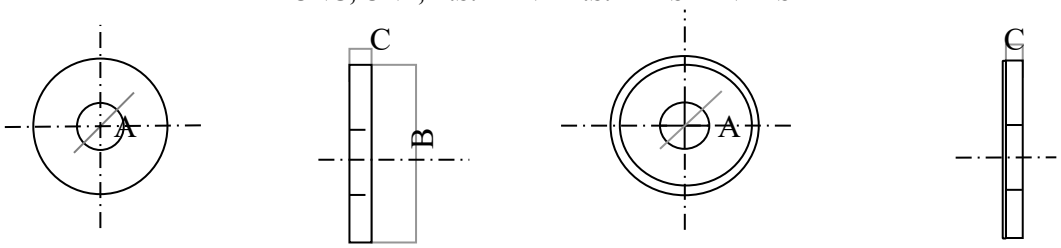
7 PACKING

All screwed bars and nuts shall be suitably protected so as to prevent rust and/or mechanical damage during transportation.

APPENDIX

BS 3410: 1961

TAPLE 3. SAMLL BRIGHT WASHERS FOR USE WITH UNC, UNF, B.S.F AND B.S.F FASTENERS



1	2	3	4	5	6		7	
NOMINAL SIZE OF BOLT OR SCREW	DIAMETER OF HOLE (A)		OUTSIDE DIAMETER (B)		Thickness(C)			
	MAX.	MIN.	MAX.	MIN.	HEAVY GAUGE		LIGHT GAUGE	
in	in	in	In	in	S.W.	in	S.W.G	in
1/4	0.270	0.265	0.562	0.557	17	0.056	20	0.036
3/16	0.333	0.328	0.625	0.620	15	0.072	19	0.040
3/8	0.395	0.390	0.750	0.745	15	0.072	18	0.048
7/16	0.458	0.453	0.875	0.870	13	0.092	18	0.048
1/2	0.520	0.515	1.000	0.995	13	0.092	17	0.056
9/16	0.593	0.588	1.125	1.115	12	0.104	17	0.056
5/8	0.656	0.651	1.250	1.240	11	0.116	15	0.072
3/4	0.781	0.776	1.500	1.450	10	0.128	15	0.072
7/6	0.906	0.901	1.625	1.615	9	0.144	15	0.072
1	1.031	1.026	1.875	1.865	8	0.160	15	0.072
1 1/6	1.156	1.151	2.125	2.115	7	0.176	13	0.092
1 1/4	1.281	1.276	2.375	2.355	7	0.176	11	0.116
1 3/8	1.406	1.401	2.625	2.605	6	0.192	-	-
1/2	1.531	1.528	2.855	2.855	6	0.192	-	-
1 3/4	1.781	1.776	3.375	3.345	5	0.212	-	-
2	2.031	2.028	3.625	3.595	5	0.212	-	-

*** Subject to the normal manufacturing tolerances on the sheet or strip as specified in the appropriate British standards.**

Note: Attention is drawn to the fact that when small fractional size washers not tabulated here are required. the following B.A. sizes, for which dimensions are given in table 1, are suitable.

FOR INCH SIZE	FOR B.A SIZE	FOR INCH SIZE	FOR B.A SIZE
3/32	7	3/16	2
1/8	5	7/32	1
5/32	3	-	-

Egyptian Natural Gas Co.
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Annex-E

Table of Confirmation

SPECIFICATION CONFIRMATION TABLE FOR BUTT WELDED FITTINGS

INQUIRY NO.: .....
QUOTATION NO.: .....
MANUFACTURER NAME: .....

SPECIFICATION	Confirmation		NOTES
	YES	NO	
PROCESS OF MANUFACTURE			
Welded or Seamless (State Type).			
One longitudinal seam weld for ERW or SAW material.			
MATERIAL & CHEMICAL PROPERTIES			
State material grade.			
Chemical analysis as per items 3.2, 3.3 & 3.4 of this specification.			
Carbon content shall not exceed 0.25%.			
Carbon equivalent - Maximum 0.42%			
PHYSICAL PROPERTIES			
Min. Yield strength Min. Tensile strength			State the value
Elongation as per item 3.5			
WELD END PREPARATION			
In acc. with item 7.3 of this specification & MSS SP75, as appropriate.			
HEAT TREATMENT			
Acc. to item 4 of our specs.			
TEST OF SQUARENESS			
As per item 7.5 of this specification			
DIMENSIONS & TOLERANCES			
As per item 7.1 and the Requirements of this specification.			
TEST AND INSPECTION			
As per item 8.0 of this specification.			
TEST & INSPECTION CERTIFICATES			
As required in item 9.0 for verification.			
*An approved design proof test certificate (mandatory item)			
MARKING AND PACKING			
As per items 10 &11 of this specification			
Drawing shall be submitted for approval before manufacturing.			
Barred tee comply with appendix A			

IMPORTANT NOTES:-

1- The vendor must submit table of confirmation completely filled, signed and stamped with **manufacturer** stamp with the offer otherwise the offer will be cancelled.
2- Sign by (√) for confirmed item and (X) for unconfirmed items

3- Barred tee drawing shall be submitted in technical offer
4- Any technical deviation to this spec. must be stated clearly.

GENERAL NOTES:-

1. Fittings with nominal diameters not mentioned in MSS SP75 or ASME b 16.9 must have dimensions & tolerances equal to the next larger diameter.

SPECIFICATION CONFIRMATION TABLE FOR BRANCH WELDED FITTINGS

INQUIRY NO. :.....
QUOTATION NO. :.....
MANUFACTURER NUMBER: .....

SPECIFICATION	Confirmation			NOTES
	Item (1)	Item (2)	Item (3)	
Design				
According to item 3.				
Material				
* Yield strength (as per STD)				
* tensile strength (as per STD)				
* elongation (as per STD)				
* fully killed steel				
Chemical Properties				
* According to Mss. Sp 75				
* Carbon content as per item 4.6				Gr. B≤0.22% F42:65≤0.2%
* Carbon equivalent ≤ 0.42				
Heat Treatment				
* According to item 5				
Fracture Toughness Properties				
* According to item 6				
Machining of Welding Fitting				
* According to item 7				
Tests and Inspection				
* According to item 8				
Marking				
* According to item 9				
Tests Inspection Certificates				
* According to item 11				
Packing and Protection				
* According to item 12				

* Sign by (√) for confirmed item and (X) for unconfirmed items.

IMPORTANT NOTE:-

1. The vendor must submit table of confirmation completely filled and signed with the offer otherwise the offer will be cancelled.
2. Any technical deviation from this spec. must be stated clearly.

SPECIFICATION CONFORMATION TABLE FOR FORGED STEEL FLANGES

INQUIRY NO. :.....
QUOTATION NO. : .....
MANUFACTURER NUMBER: .....

SPECIFICATION	Confirmation		NOTES
	YES	NO	
Dimensions and Tolerances			
To be in acc. with item 8 and the requirements of this specification and MSS-SP44 & ANSI B16.5, as appropriate.			
Material			
To be in acc. with item 4 of this spec.			
Carbon content not to exceed 0.25%			
Carbon equivalent Maximum 0.42%			
Physical Properties			
Tensile Strength :			State the Value
Yield Strength :			State the Value
Elongation % min. 2" acc. to table 1 of this specification			
Mechanical Testing & Chemical Analysis			
To be in acc. with item 6 of this spec. and A694 & A105, as appropriate.			
- Charpy impact test to item 6.8			
- Hardness test to item 6.9.3			
- Test samples according to item 6..9.1 and figs. 1,2,3			
- Heat treatment to item 7			
Inspection and N.D.T. according to item 9			
Weld End Preparation			
To be in acc. with MSS-SP44 & ANSI B16.5 State relevant sections.			
Marking & Packing			
To be in acc. with items 10 & 11 of this specification			
Certification			
To be in acc. with item 12 of this specification.			
Flange Protectors			
To be in acc. with item 11 of this specification.			

Note: Sign by (√) for confirmed item and (X) for unconfirmed items.

IMPORTANT NOTE:-

1- **The vendor must submit table of confirmation completely filled and signed with the offer otherwise the offer will be cancelled.**

2- **Any technical deviation to these specs. must be stated clearly.**

TABLE OF STEEL PLUGS SPECIFICATION

INQUIRY NO. : .....

QUOTATION NO.: .....

MANUFACTURER NUMBER: .....

SPECIFICATION	Confirmation of Requirements		NOTES
	YES	NO	
Design			
To ANSI B 16.11 and ANSI B16.14			
Male threads tapered to ASME B1.20.1			
Dimension			
According to the attached table			
Forged Plug Profile shall be square head			
Plug Fitting Material			
According to ASTM A694 F52			
Workmanship and Finish			
According to item 5.1			
Marking			
According to item 6			

Note: Sign by (√) for confirmed item and (X) for unconfirmed items.

IMPORTANT NOTE:-
The vendor must submit table of confirmation completely filled and signed with the offer otherwise the offer will be cancelled. Any technical deviation to these specs. must be stated clearly.

TABLE OF GASKETS SPECIFICATION CONFORMATION

TENDER NO.: .....

OFFER NO.:.....

MANUFACTURER NAME: .....

SPECIFICATION	Confirmation		NOTES
	YES	NO	
Design			
According to API 601			
Working temperature -20 to 70°C			
Material			
- Filler material			State the material
- Spiral wound gasket (316L stainless steel)			
- Inner ring (316L stainless steel)			
- Outer ring (316L stainless steel)			
- The filler material shall not contain any asbestos compound			
- Gasket dimension shall confirm flange dimension according to item 4.2 of the specs.			
Marking			
According to item 5			
Packing			
According to item 6			

Note: Sign by (√) for confirmed item and (X) for unconfirmed items.

IMPORTANT NOTE:-

1- **The vendor must submit table of confirmation completely filled and signed with the offer otherwise the offer will be cancelled.**

2- **Any technical deviation to these specs. must be stated clearly.**

TABLE OF SPECIFICATION FOR SCREWED BARS, NUTS AND WASHERS

INQUIRY NO. : .....

QUOTATION NO. : .....

MANUFACTURES NAME : .....

Error! Bookmark not defined.SPECIFICATION	CONFIRMATION		NOTES
	YES	NO	
SCREWED BAR:			
DIMENSIONS:			
- Acc to ANSI B 18.2			
MATERIALS:			
- Acc to ASTM A 193 Grade B7			
THREADS :			
- Acc to class 2A Dimension			
- Acc to ANSI B 1.1			
NUTS :			
DIMENSIONS :			
- Acc.to ANSI B 18.2			
MATERIALS:			
- Acc to ASTM A 194 Grade 2H			
THREADS :			
- Acc to class 2B Dimension			
- Acc to ANSI B 1.1			
WASHERS:			
DIMENSIONS:			
-Acc to BS 3410 Table 3 & item 4.3.3 of MS/008 Rev.2			
MATERIALS:			
-Acc to BS 3410			

Note: Sign by (√) for confirmed item and (X) for unconfirmed items.

IMPORTANT NOTE:-

1- The vendor must submit table of confirmation completely filled and signed with the offer otherwise the offer will be cancelled.

2- Any technical deviation to this specs. must be stated clearly.

Egyptian Natural Gas Co.

G A S C O

Gen. Dept. of Engineering Affairs

Annex-F

Technical Check List

PROJECT:	**GAS PIPELINE PROJECT**		**GASCO**
PROJECT No:		**TECHNICAL QUERY NO. 01 to V1**	
SUBJECT:	**Technical Query Against the bid of pipes**	**Technical Query for pipes**	

MATERIAL REQUISITION for GASCO specs No. MS/001 Rev-15			**BIDDER QUOTATION**		
Sr. No.	**Description**	**As per Inquiry Specification**	**TECNOFORGE**	**Bidder Response**	
1	**Quotation Summary**				
1.1	Quotation Reference				
1.2	Manufacurer name\location		Bidder to Confirm (Note-2)		
1.3	Vendor reference list for last 5 years	Vendor to provide reference list for last five years showing Client/Owner, Year of Supply,Diameters, Material Grade and value of order.	Bidder to submit		
2	**Scope of Supply**				
2.1	All pipes shall be as per material requisitions for GASCO specs No . MS/001 Rev-15	as per material requisitions for GASCO specs No . MS/001 Rev-15	Bidder to Confirm (Note-2)		
3	**Quantity**				
3.1	Quantities for all pipes	as per material requisitions for GASCO specs No . MS/001 Rev-15	Bidder to Confirm (Note-2)		
4	**Technical Requirements**				
4.1	process of manufacture shall be as per item (2) of GASCO specs No. MS/001 Rev-15	As per item (2) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
5	**Material of Construction**				
5.1	Material for pipes	As per item (3) of GASCO specs No. MS/001 Rev-15 and material requisitions	Bidder to Confirm (Note-2)		
5.2	Chemical composition	As per item (3) of GASCO specs No. MS/001 Rev-15 material requisitions	Bidder to Confirm (Note-2)		
5.3	Carbon contents	As per item (3) of GASCO specs No. MS/001 Rev-15 material requisitions	Bidder to Confirm (Note-2)		
5.4	Carbon equivalent	As per item (3) of GASCO specs No. MS/001 Rev-15 material requisitions	Bidder to Confirm (Note-2)		
6	**pipes Specification Requirement**				
6.1	Mechanical properties	As per item (4) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
6.2	Hydrostatic test	As per item (5) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
6.3	API monogram and marking	As per item (6) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
6.4	Pipe end preparation	As per item (7) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
6.5	pipe length	As per item (8) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
6.6	dimensions and tolerances	As per item (9) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
7	**Compliance for MR Requirement**				
7.1	Bidder Information Form	As per Annex-A for Bulk material technical evaluation documents	Bidder to submit		
7.2	Clarifications/Deviations/Comments Sheet	As per Annex -B for Bulk material technical evaluation documents	Bidder to submit		
7.3	GASCO MRQ with Bidder & Manufacturer Stamp for each paper .	As per Annex-C for Bulk material technical evaluation documents	Bidder to submit		
7.4	GASCO Specification with Bidder & Manufacturer stamp for each paper .	As per Annex-D for Bulk material technical evaluation documents	Bidder to submit		
7.5	GASCO Table of Confirmation, the Bidder must submit tables of confirmation completely filled and signed/stamped from Bidder & Manufacturer	As per Annex-E for Bulk material technical evaluation documents	Bidder to submit		
7.6	Manufacturer Authorization letter.	As per Bulk material technical evaluation documents	Bidder to submit		
7.7	Confirmation of accreditation to API 5L, ISO 9001, 14001 & 18001.	As per Bulk material technical evaluation documents	Bidder to submit		
7.10	Evidence of experience of production for sizes equal to or greater than 24" in the last 3 years (relevant P.O's to be submitted) .	As per Bulk material technical evaluation documents	Bidder to submit		
7.11	Plant Capabilities (including ranges for diameters, material grades and Annual Production Capacity).	As per Bulk material technical evaluation documents	Bidder to submit		
7.12	Preliminary Inspection Test Plan (ITP).	As per Bulk material technical evaluation documents	Bidder to submit		
7.13	Manufacturer Quality Plan.	As per Bulk material technical evaluation documents	Bidder to submit		
7.14	Evidence for Worldwide Approvals.	As per Bulk material technical evaluation documents	Bidder to submit		
8	**Inspection & Testing Requirements**				
8.1	Test and inspection for pipes	As per item (10) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
9	**Packing, Marking & Documentation**				
9.1	Certification and test reports	As per item (11) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
9.2	Traceability	As per item (13) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
9.3	End protection for pipes	As per item (14) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
9.4	Marking for pipes	As per item (15) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
9.5	Painting for bare pipes	As per item (16) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
9.6	Delivery Tolerance	As per item (17) of GASCO specs No. MS/001 Rev-15	Bidder to Confirm (Note-2)		
10	**Deviation from Project**	Shall be "No Deviation"	Note-3		
11	**Additional Clarification**				

Notes :

1) As per bidder's quotation, Client understands that these clauses are "Complied" against requirement in this document. Bidder to reconfirm the compliance against each clause for more clarity.
2) Bidder to confirm and comply requirement for final evaluation.
3) Bidder shall mentioned "Complied" for all evaluation clause, and if Bidder has any issue mention reason for not Complied.

PROJECT:	GAS PIPELINE PROJECT		GASCO
PROJECT No:		TECHNICAL Check List	
SUBJECT:	Technical Check List Against the bid of Butt welded fittings	Technical Check List for Butt welded fittings	

MATERIAL REQUISITION for GASCO specs No. MS/003 Rev-6			BIDDER QUOTATION		
Sr. No.	**Description**	**As per Inquiry Specification**	**Insert "Bidder Name"**	**Bidder Response**	
1	**Quotation Summary**				
1.1	Quotation Reference				
1.2	Manufacurer name\location	Manufacturer Name	Bidder to specify		
1.3	Vendor reference list for last 5 years	Vendor to provide reference list for last five years showing Client/Owner, Year of Supply,Diameters, Material Grade and value of order.	Bidder to submit		
2	**Scope of Supply**				
2.1	All butt welded fittings shall be as per material requisitions for GASCO specs No. MS/003 Rev-6	as per material requisitions for GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
3	**Quantity**				
3.1	Quantities for all butt welded fittings	as per material requisitions for GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
4	**Technical Requirements**				
4.1	Fitting design shall be as per item (2) of GASCO specs No. MS/003 Rev-6	As per item (2) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
5	**Material of Construction**				
5.1	Material for butt welded fitting	As per item (3) of GASCO specs No. MS/003 Rev-6 and material requisitions	Bidder to Confirm (Note-2)		
5.2	Chemical composition	As per item (3) of GASCO specs No. MS/003 Rev-6 material requisitions	Bidder to Confirm (Note-2)		
5.3	Carbon contents	As per item (3) of GASCO specs No. MS/003 Rev-6 material requisitions	Bidder to Confirm (Note-2)		
5.4	Carbon equivalent	As per item (3) of GASCO specs No. MS/003 Rev-6 material requisitions	Bidder to Confirm (Note-2)		
6	**Butt welded Fittings Specification Requirement**				
6.1	Heat treatment	As per item (4) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
6.2	Fracture toughness Properties	As per item (5) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
6.3	Process of manufacture	As per item (6) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
6.4	dimensions and tolerances	As per item (7) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
7	**Compliance for MR Requirement**				
7.1	Bidder Information Form	As per Annex-A for Bulk material technical evaluation documents	Bidder to submit		
7.2	Clarifications/Deviations/Comments Sheet	As per Annex -B for Bulk material technical evaluation documents	Bidder to submit		
7.3	GASCO MRQ with Bidder & Manufacturer Stamp for each paper .	As per Annex-C for Bulk material technical evaluation documents	Bidder to submit		
7.4	GASCO Specification with Bidder & Manufacturer stamp for each paper .	As per Annex-D for Bulk material technical evaluation documents	Bidder to submit		
7.5	GASCO Table of Confirmation, the Bidder must submit tables of confirmation completely filled and signed/stamped from Bidder & Manufacturer	As per Annex-E for Bulk material technical evaluation documents	Bidder to submit		
7.6	Manufacturer Authorization letter.	As per Bulk material technical evaluation documents	Bidder to submit		
7.7	Confirmation of accreditation to ISO 9001, 14001 & 18001.	As per Bulk material technical evaluation documents	Bidder to submit		
7.8	Design Proof Test Certificate	As per Bulk material technical evaluation documents	Bidder to submit		
7.9	Preliminary Drawings for barred tees, sweepolets, line spade and spacers (for information only).	As per Bulk material technical evaluation documents	Bidder to submit		
7.10	Evidence of experience of production for sizes equal to or greater than 24" in the last 3 years (relevant P.O's to be submitted) .	As per Bulk material technical evaluation documents	Bidder to submit		
7.11	Plant Capabilities (including ranges for diameters, material grades and Annual Production Capacity).	As per Bulk material technical evaluation documents	Bidder to submit		
7.12	Preliminary Inspection Test Plan (ITP).	As per Bulk material technical evaluation documents	Bidder to submit		
7.13	Manufacturer Quality Plan.	As per Bulk material technical evaluation documents	Bidder to submit		
7.14	Evidence for Worldwide Approvals.	As per Bulk material technical evaluation documents	Bidder to submit		
8	**Inspection & Testing Requirements**				
8.1	Test and inspection for butt welded fittings	As per item (8) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
9	**Packing, Marking & Documentation**				
9.1	Certification and test reports	As per item (9) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
9.2	Packing and protection for butt welded fittings	As per item (10) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
9.3	Marking for butt welded fittings	As per item (11) of GASCO specs No. MS/003 Rev-6	Bidder to Confirm (Note-2)		
10	**Deviation from Project**	Shall be "No Deviation"	Note-3		
11	**Additional Clarification**				

Notes :

1) As per bidder's quotation, Client understands that these clauses are "Complied" against requirement in this document. Bidder to reconfirm the compliance against each clause for more clarity.
2) Bidder to confirm and comply requirement for final evaluation.
3) Bidder shall mentioned "Complied" for all evaluation clause, and if Bidder has any issue mention reason for not Complied.

PROJECT:	**GAS PIPELINE PROJECT**		
PROJECT No:		**TECHNICAL QUERY NO. 01 to V1**	
SUBJECT:	**Technical Query Against the bid of Branch welded fittings**	**Technical Query for Branch welded fittings**	

MATERIAL REQUISITION for GASCO specs No. MS/004 Rev-5			**BIDDER QUOTATION**		
Sr. No.	**Description**	**As per Inquiry Specification**	**TECNOFORGE**	**Bidder Response**	
1	**Quotation Summary**				
1.1	Quotation Reference				
1.2	Manufacurer name\location		Bidder to Confirm (Note-2)		
1.3	Vendor reference list for last 5 years	Vendor to provide reference list for last five years enclosed awarded orders with sizes and material equivalent to GASCO requirements as per material requisitions for GASCO specs No. MS/004 Rev-5	Bidder to submit		
2	**Scope of Supply**				
2.1	All branch welded fittings shall be as per material requisitions for GASCO specs No. MS/004 Rev-5	as per table of requirements for GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
3	**Quantity**				
3.1	Quantities for all branch welded fittings	as per material requisitions for GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
4	**Technical Requirements**				
4.1	Fitting design shall be as per item (3) of GASCO specs No. MS/004 Rev-5	As per item (3) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
4.2	Pressure Class / Rating for branch welded fittings	as per material requisitions for GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
5	**Material of Construction**				
5.1	Material for branch welded fitting	As per item (4) and table of requirements for GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
5.2	Chemical composition	As per item (4) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
5.3	Carbon contents	As per item (4) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
5.4	Carbon equivalent	As per item (4) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
6	**Brnch welded Fittings Specification Requirement**				
6.1	Heat treatment	As per item (5) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
6.2	Fracture toughness Properties	As per item (6) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
6.3	Machining - welding fittings	As per item (7) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
7	**Compliance for MR Requirement**				
7.1	Bidder Information Form	As per Annex-A for Bulk material technical evaluation documents	Bidder to submit		
7.2	Clarifications/Deviations/Comments Sheet	As per Annex -B for Bulk material technical evaluation documents	Bidder to submit		
7.3	GASCO MRQ with Bidder & Manufacturer Stamp for each paper .	As per Annex-C for Bulk material technical evaluation documents	Bidder to submit		
7.4	GASCO Specification with Bidder & Manufacturer stamp for each paper .	As per Annex-D for Bulk material technical evaluation documents	Bidder to submit		
7.5	GASCO Table of Confirmation, the Bidder must submit tables of confirmation completely filled and signed/stamped from Bidder & Manufacturer	As per Annex-E for Bulk material technical evaluation documents	Bidder to submit		
7.6	Manufacturer Authorization letter.	As per Bulk material technical evaluation documents	Bidder to submit		
7.7	Confirmation of accreditation to ISO 9001, 14001 & 18001.	As per Bulk material technical evaluation documents	Bidder to submit		
7.8	Evidence of experience of production for sizes equal to or greater than 24" in the last 3 years (relevant P.O's to be submitted) .	As per Bulk material technical evaluation documents	Bidder to submit		
7.9	Plant Capabilities (including ranges for diameters, material grades and Annual Production Capacity).	As per Bulk material technical evaluation documents	Bidder to submit		
7.10	Preliminary Inspection Test Plan (ITP).	As per Bulk material technical evaluation documents	Bidder to submit		
7.11	Manufacturer Quality Plan.	As per Bulk material technical evaluation documents	Bidder to submit		
7.12	Evidence for Worldwide Approvals.	As per Bulk material technical evaluation documents	Bidder to submit		
8	**Inspection & Testing Requirements**				
8.1	test and inspection for branch welded fittings	As per item (8) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
9	**Packing, Marking & Documentation**				
9.1	Marking for branch welded fittings	As per item (9) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
9.2	Packing and protection for branch welded fittings	As per item (12) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
9.3	Compliance for Protective Coating for Storage & Transportation	As per item (12) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
9.4	Certification and test reports	As per item (11) of GASCO specs No. MS/004 Rev-5	Bidder to Confirm (Note-2)		
10	**Deviation from Project**	Shall be "No Deviation"	Note-3		

Notes :

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PROJECT:	GAS PIPELINE PROJECT		GASCO
PROJECT No:		Technical Check List	
SUBJECT:	Technical Check List Against the bid of flanges	Technical Check List for flanges	

	MATERIAL REQUISITION for GASCO specs No. MS/006 Rev-4		BIDDER QUOTATION		
Sr. No.	Description	As per Inquiry Specification	TECNOFORGE	Bidder Response	
1	**Quotation Summary**				
1.1	Quotation Reference				
1.2	Manufacurer name\location		Bidder to Confirm (Note-2)		
1.3	Vendor reference list for last 5 years	Vendor to provide reference list for last five years showing Client/Owner, Year of Supply,Diameters, Material Grade and value of order.	Bidder to submit		
2	**Scope of Supply**				
2.1	All flanges shall be as per material requisitions for GASCO specs No. MS/006 Rev-4	as per material requisitions for GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
3	**Quantity**				
3.1	Quantities for all flanges	as per material requisitions for GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
4	**Technical Requirements**				
4.1	Flanges design shall be as per item (2) of GASCO specs No. MS/006 Rev-4	As per item (2) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
5	**Material of Construction**				
5.1	Material for flanges	As per item (4) of GASCO specs No. MS/006 Rev-4 and material requisitions	Bidder to Confirm (Note-2)		
5.2	Chemical composition	As per item (4) of GASCO specs No. MS/006 Rev-4 material requisitions	Bidder to Confirm (Note-2)		
5.3	Carbon contents	As per item (4) of GASCO specs No. MS/006 Rev-4 material requisitions	Bidder to Confirm (Note-2)		
5.4	Carbon equivalent	As per item (4) of GASCO specs No. MS/006 Rev-4 material requisitions	Bidder to Confirm (Note-2)		
6	**flanges Specification Requirement**				
6.1	Weldability	As per item (5) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
6.2	Mechanical testing and chemical analysis	As per item (6) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
6.3	charpy impact tests	As per item (6) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
6.4	Manufacturing procedure qualification	As per item (6.9) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
6.5	Heat treatment	As per item (7) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
6.6	dimensions and tolerances	As per item (8) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
7	**Compliance for MR Requirement**				
7.1	Bidder Information Form	As per Annex-A for Bulk material technical evaluation documents	Bidder to submit		
7.2	Clarifications/Deviations/Comments Sheet	As per Annex -B for Bulk material technical evaluation documents	Bidder to submit		
7.3	GASCO MRQ with Bidder & Manufacturer Stamp for each paper .	As per Annex-C for Bulk material technical evaluation documents	Bidder to submit		
7.4	GASCO Specification with Bidder & Manufacturer stamp for each paper .	As per Annex-D for Bulk material technical evaluation documents	Bidder to submit		
7.5	GASCO Table of Confirmation, the Bidder must submit tables of confirmation completely filled and signed/stamped from Bidder & Manufacturer	As per Annex-E for Bulk material technical evaluation documents	Bidder to submit		
7.6	Manufacturer Authorization letter.	As per Bulk material technical evaluation documents	Bidder to submit		
7.7	Confirmation of accreditation to ISO 9001, 14001 & 18001.	As per Bulk material technical evaluation documents	Bidder to submit		
7.8	Evidence of experience of production for sizes equal to or greater than 24" in the last 3 years (relevant P.O's to be submitted) .	As per Bulk material technical evaluation documents	Bidder to submit		
7.9	Plant Capabilities (including ranges for diameters, material grades and Annual Production Capacity).	As per Bulk material technical evaluation documents	Bidder to submit		
7.10	Preliminary Inspection Test Plan (ITP).	As per Bulk material technical evaluation documents	Bidder to submit		
7.11	Manufacturer Quality Plan.	As per Bulk material technical evaluation documents	Bidder to submit		
7.12	Evidence for Worldwide Approvals.	As per Bulk material technical evaluation documents	Bidder to submit		
8	**Inspection , NDT and Repair of defects**				
8.1	Inspection, NDT and repair of defects for flanges	As per item (9) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
9	**Packing, Marking & Documentation**				
9.1	Marking for flanges	As per item (10) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
9.2	Packing and protection for flanges	As per item (11) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
9.3	Certification and test reports	As per item (12) of GASCO specs No. MS/006 Rev-4	Bidder to Confirm (Note-2)		
10	**Deviation from Project**	Shall be "No Deviation"	Note-3		
11	**Additional Clarification**				

Notes :

1) As per bidder's quotation, Client understands that these clauses are "Complied" against requirement in this document. Bidder to reconfirm the compliance against each clause for more clarity.
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PROJECT:	**GAS PIPELINE PROJECT**		
PROJECT No:		**TECHNICAL QUERY NO. 01 to V1**	
SUBJECT:	**Technical Query Against the bid of Steel plugs**	**Technical Query for Steel plugs**	

MATERIAL REQUISITION for GASCO specs No. MS/005 Rev-3			**BIDDER QUOTATION**	
Sr. No.	**Description**	**As per Inquiry Specification**	**TECNOFORGE**	**Bidder Response**
1	**Quotation Summary**			
1.1	Quotation Reference			
1.2	Manufacurer name\location		Bidder to Confirm (Note-2)	
1.3	Vendor reference list for last 5 years	Vendor to provide reference list for last five years enclosed awarded orders with sizes and material equivalent to GASCO requirements as per material requisitions for GASCO specs No. MS/005 Rev-3	Bidder to submit	
2	**Scope of Supply**			
2.1	Al l steel plugs shall be as per material requisitions for GASCO specs No. MS/005 Rev-3	as per material requisitions for GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
3	**Quantity**			
3.1	Quantities for al l steel plugs	as per material requisitions for GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
4	**Technical Requirements**			
4.1	design for steel plugs shall be as per item (3) of GASCO specs No. MS/005 Rev-3	As per item (3) of GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
4.2	Pressure Class / Rating forsteel plugs	as per material requisitions for GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
4.3	Dimensions and tolerance for steel plugs	As per item (3) and table / drawing (at page 6) of GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
5	**Material of Construction**			
5.1	Material for steel plugs	As per item (4) and material requisitions for GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
6	**Specification Requirement**			
6.1	workmanship and finish	As per item (5) of GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
7	**Compliance for MR Requirement**			
7.1	Bidder Information Form	As per Annex-A for Bulk material technical evaluation documents	Bidder to submit	
7.2	Clarifications/Deviations/Comments Sheet	As per Annex -B for Bulk material technical evaluation documents	Bidder to submit	
7.3	GASCO MRQ with Bidder & Manufacturer Stamp for each paper .	As per Annex-C for Bulk material technical evaluation documents	Bidder to submit	
7.4	GASCO Specification with Bidder & Manufacturer stamp for each paper .	As per Annex-D for Bulk material technical evaluation documents	Bidder to submit	
7.5	GASCO Table of Confirmation, the Bidder must submit tables of confirmation completely filled and signed/stamped from Bidder & Manufacturer	As per Annex-E for Bulk material technical evaluation documents	Bidder to submit	
7.6	Manufacturer Authorization letter.	As per Bulk material technical evaluation documents	Bidder to submit	
7.7	Confirmation of accreditation to ISO 9001, 14001 & 18001.	As per Bulk material technical evaluation documents	Bidder to submit	
7.8	Evidence of experience of production for sizes equal to or greater than 24" in the last 3 years (relevant P.O's to be submitted) .	As per Bulk material technical evaluation documents	Bidder to submit	
7.9	Plant Capabilities (including ranges for diameters, material grades and Annual Production Capacity).	As per Bulk material technical evaluation documents	Bidder to submit	
7.10	Preliminary Inspection Test Plan (ITP).	As per Bulk material technical evaluation documents	Bidder to submit	
7.11	Manufacturer Quality Plan.	As per Bulk material technical evaluation documents	Bidder to submit	
7.12	Evidence for Worldwide Approvals.	As per Bulk material technical evaluation documents	Bidder to submit	
8	**Packing, Marking & Documentation**			
8.1	Marking for steel plugs	As per item (6) of GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
8.2	Certification and documentation	As per item (7) of GASCO specs No. MS/005 Rev-3	Bidder to Confirm (Note-2)	
9	**Deviation from Project**	Shall be "No Deviation"	Note-3	

Notes :

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PROJECT:	**GAS PIPELINE PROJECT**		**GASCO**
PROJECT No:		**TECHNICAL QUERY NO. 01 to V1**	
SUBJECT:	**Technical Query Against the bid of Gaskets**	**Technical Query for Gaskets**	

MATERIAL REQUISITION for GASCO specs No. MS/007 Rev-4			**BIDDER QUOTATION**		
Sr. No.	**Description**	**As per Inquiry Specification**	**TECNOFORGE**	**Bidder Response**	
1	**Quotation Summary**				
1.1	Quotation Reference				
1.2	Manufacurer name\location		Bidder to Confirm (Note-2)		
1.3	Vendor reference list for last 5 years	Vendor to provide reference list for last five years enclosed awarded orders with sizes and material equivalent to GASCO requirements as per material requisitions for GASCO specs No. MS/007 Rev-4	Bidder to submit		
2	**Scope of Supply**				
2.1	Al l gaskets shall be as per material requisitions for GASCO specs No. MS/007 Rev-4	as per material requisitions for GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
3	**Quantity**				
3.1	Quantities for al l gaskets	as per material requisitions for GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
4	**Technical Requirements**				
4.1	Design for gaskets shall be as per item (2),(3) and (4) of GASCO specs No. MS/007 Rev-4	As per item (2), (3) and (4) of GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
4.2	Dimensions and tolerance for gaskets	As per item (4) of GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
	Design temperature shall be from -20º C to 70º C	As per item (1) of GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
5	**Material of Construction**				
5.1	Material for gaskets	As per item (2) and material requisitions for GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
6	**Specification Requirement**				
6.1	Pressure and temperature rating for gaskets	As per item (3) of GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
7	**Compliance for MR Requirement**				
7.1	Bidder Information Form	As per Annex-A for Bulk material technical evaluation documents	Bidder to submit		
7.2	Clarifications/Deviations/Comments Sheet	As per Annex -B for Bulk material technical evaluation documents	Bidder to submit		
7.3	GASCO MRQ with Bidder & Manufacturer Stamp for each paper .	As per Annex-C for Bulk material technical evaluation documents	Bidder to submit		
7.4	GASCO Specification with Bidder & Manufacturer stamp for each paper .	As per Annex-D for Bulk material technical evaluation documents	Bidder to submit		
7.5	GASCO Table of Confirmation, the Bidder must submit tables of confirmation completely filled and signed/stamped from Bidder & Manufacturer	As per Annex-E for Bulk material technical evaluation documents	Bidder to submit		
7.6	Manufacturer Authorization letter.	As per Bulk material technical evaluation documents	Bidder to submit		
7.7	Confirmation of accreditation to ISO 9001, 14001 & 18001.	As per Bulk material technical evaluation documents	Bidder to submit		
8	**Packing, Marking & Documentation**				
8.1	Packing for gaskets	As per item (6) of GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
8.2	Certification and documentation	As per item (7) of GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
8.3	Marking for gaskets	As per item (5) of GASCO specs No. MS/007 Rev-4	Bidder to Confirm (Note-2)		
9	**Deviation from Project**	Shall be "No Deviation"	Note-3		
10	**Additional Clarification**				

Notes :

1) As per bidder's quotation, Client understands that these clauses are "Complied" against requirement in this document. Bidder to reconfirm the compliance against each clause for more clarity.

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PROJECT:	**GAS PIPELINE PROJECT**		
PROJECT No:		**TECHNICAL QUERY NO. 01 to V1**	
SUBJECT:	**Technical Query Against the bid of SCREWED BARS, NUTS AND WASHERS**	**Technical Query for Screwed bars, nuts and washers**	

MATERIAL REQUISITION for GASCO specs No. MS/008 Rev-3			**BIDDER QUOTATION**		
Sr. No.	**Description**	**As per Inquiry Specification**	**TECNOFORGE**	**Bidder Response**	
1	**Quotation Summary**				
1.1	Quotation Reference				
1.2	Manufacurer name\location		Bidder to Confirm (Note-2)		
1.3	Vendor reference list for last 5 years	Vendor to provide reference list for last five years enclosed awarded orders with sizes and material equivalent to GASCO requirements as per material requisitions for GASCO specs No. MS/008 Rev-3	Bidder to submit		
2	**Scope of Supply**				
2.1	Al l screwed bars with nuts and washers shall be as per material requisitions for GASCO specs No. MS/008 Rev-3	as per material requisitions for GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
3	**Quantity**				
3.1	Quantities for al l screwed bars with nuts and washers	as per material requisitions for GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
4	**Technical Requirements**				
4.1	Design for screwed bars with nuts and washers shall be as per item (3) &(4) of GASCO specs No. MS/008 Rev-3	As per item (3) & (4) of GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
4.2	Dimensions and tolerance for screwed bars and nuts	As per item (3) of GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
4.3	Dimensions and tolerance for washers	As per BS 3410, item (4.3.3) and table (3) of GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
5	**Material of Construction**				
5.1	Material for screwed bars with nuts and washers	As per item (4) and material requisitions for GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
6	**Specification Requirement**				
6.1	threads for screwed bars and nuts	As per item (5) of GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
7	**Compliance for MR Requirement**				
7.1	Bidder Information Form	As per Annex-A for Bulk material technical evaluation documents	Bidder to submit		
7.2	Clarifications/Deviations/Comments Sheet	As per Annex -B for Bulk material technical evaluation documents	Bidder to submit		
7.3	GASCO MRQ with Bidder & Manufacturer Stamp for each paper .	As per Annex-C for Bulk material technical evaluation documents	Bidder to submit		
7.4	GASCO Specification with Bidder & Manufacturer stamp for each paper .	As per Annex-D for Bulk material technical evaluation documents	Bidder to submit		
7.5	GASCO Table of Confirmation, the Bidder must submit tables of confirmation completely filled and signed/stamped from Bidder & Manufacturer	As per Annex-E for Bulk material technical evaluation documents	Bidder to submit		
7.6	Manufacturer Authorization letter.	As per Bulk material technical evaluation documents	Bidder to submit		
7.7	Confirmation of accreditation to ISO 9001, 14001 & 18001.	As per Bulk material technical evaluation documents	Bidder to submit		
8	**Packing, Marking & Documentation**				
8.1	Packing for screwed bars with nuts and washers	As per item (7) of GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
8.2	Certification and documentation	As per item (6) of GASCO specs No. MS/008 Rev-3	Bidder to Confirm (Note-2)		
9	**Deviation from Project**	Shall be "No Deviation"	Note-3		

Notes :

1) As per bidder's quotation, Client understands that these clauses are "Complied" against requirement in this document. Bidder to reconfirm the compliance against each clause for more clarity.

2) Bidder to confirm and comply requirement for final evaluation.

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Egyptian Natural Gas Co.
G A S C O
Gen. Dept. of Engineering Affairs

Material Requisition

Project name:	PL42_198 & PL42_228 GAS PIPELINE PROJECT

Material	Specs no.	Project no.
PIPING BULK MATERIALS Part-A: BUTT WELDING FITTINGS	MS 003	PL42_198 & PL42_228
	Specs. Rev.	Requisition no.
	6	7241

Material Requisition Status

Rev. no.	Date	Revisions	Originator	Approval		
0	30/3/2023	Issue for Tender		E.F.	KH.B.	Y.M.

GASCO					
Continuation Sheet		**REQN. no.**	**PRJ. no.**	**Rev.**	**Date**
		7241	**PL42_198 & PL42_228**	**0**	**30/3/2023**
Item	**Description**	**Unit**	**QTY.**	**Unit Price**	**Total Price**
1	42" BARRED TEE, MSS SP75, ASTM A860 WPHY 65, W.Thk=0.812", One Seam Weld.	Each	12		
2	32" Barred TEE, MSS SP75, ASTM A860 WPHY 60, W.Thk=0.688", One Seam Weld.	Each	2		
3	24" Barred TEE, MSS SP75, ASTM A860 WPHY 56, W.Thk=0.562", One Seam Weld.	Each	2		
4	42" TEE, MSS SP75, ASTM A860 WPHY 65, W.Thk=0.812", One Seam Weld.	Each	11		
5	42"/36" TEE, MSS SP75, ASTM A860 WPHY 65, W.Thk=0.812"/0.688", One Seam Weld.	Each	4		
6	42"/32" TEE, MSS SP75, ASTM A860 WPHY 65, W.Thk=0.812"/0.688", One Seam Weld.	Each	2		
7	42"/24" TEE, MSS SP75, ASTM A860 WPHY 65, W.Thk=0.812"/0.562", One Seam Weld.	Each	2		
8	32" TEE, MSS SP75, ASTM A860 WPHY 60, W.Thk=0.688", One Seam Weld.	Each	1		
9	24" TEE, MSS SP75, ASTM A860 WPHY 56, W.Thk=0.562", One Seam Weld.	Each	3		
10	10" TEE, ASME B16.9, ASTM A234 WPB, W.Thk=0.438", Seamless.	Each	7		
11	10" TEE, MSS SP75, ASTM A860 WPHY 52, W.Thk=0.365", Dimensions as per ASME B16.9, Seamless.	Each	8		

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REQN. no.	PRJ. no.	Rev.	Date
7241	PL42_198 & PL42_228	0	30/3/2023

Item	Description	Unit	QTY.	Unit Price	Total Price
12	4" TEE, ASME B16.9, ASTM A234 WPB, W.Thk=0.237", Seamless.	Each	12		
13	4"/2"TEE, ASME B16.9, ASTM A234 WPB, W.Thk=0.237"/0.218", Seamless.	Each	12		
14	46"/42" Eccentric reducer, MSS SP75, ASTM A860 WPHY 65, W.Thk=0.875"/0.812", One Seam Weld.	Each	12		
15	2"/1" Concentric reducer, MSS SP75, ASTM A860 WPHY 52, W.Thk=218"/0.250", Dimensions as per ASME B16.9, Seamless.	Each	12		
16	42" Elbow, 90°, R=1.5D, MSS SP75, ASTM A860 WPHY 65, W.Thk=0.812", One Seam Weld.	Each	20		
17	36" Elbow, 90°, R=1.5D, MSS SP75, ASTM A860 WPHY 65, W.Thk=0.688", One Seam Weld.	Each	15		
18	32" Elbow, 90°, R=1.5D, MSS SP75, ASTM A860 WPHY 60, W.Thk=0.688", One Seam Weld.	Each	10		
19	24" Elbow, 90°, R=1.5D, MSS SP75, ASTM A860 WPHY 56, W.Thk=0.562", one seam weld.	Each	10		
20	12" Elbow, 90°, R=1.5D, MSS SP75, ASTM A860 WPHY 52, W.Thk=0.375", Dimensions as per ASME B16.9, Seamless.	Each	36		
21	10" Elbow, 90°, R=1.5D, MSS SP75, ASTM A860 WPHY 52, W.Thk=0.365", Dimensions as per ASME B16.9, Seamless.	Each	10		
22	10" Elbow, 90°, R=1.5D, ASME B16.9, ASTM A234 WPB, W.Thk=0.438", Seamless.	Each	65		

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Continuation Sheet		**REQN. no.**	**PRJ. no.**	**Rev.**	**Date**
		7241	**PL42_198 & PL42_228**	**0**	**30/3/2023**
Item	**Description**	**Unit**	**QTY.**	**Unit Price**	**Total Price**
23	4" Elbow, 90°, R=1.5D, MSS SP75, ASTM A860 WPHY 52, W.Thk=0.237", Dimensions as per ASME B16.9, Seamless.	Each	24		
24	4" Elbow, 90°, R=1.5D, ASME B16.9, ASTM A234 WPB, W.Thk=0.237", Seamless.	Each	24		
25	2" Elbow, 90°, R=1.5D, MSS SP75, ASTM A860 WPHY 52, W.Thk=0.218", Dimensions as per ASME B16.9, Seamless.	Each	180		
26	42" End cap, MSS SP75, ASTM A860 WPHY 65 W.Thk=0.812".	Each	8		

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Material Requisition

Project Name:	PL42_198 & PL42_228 GAS PIPELINE PROJECT

Material	Specs no.	Project no.
PIPING BULK MATERIALS Part-B BRANCH WELDED FITTINGS	MS 004	PL42_198 & PL42_228
	Specs. Rev.	Requisition no.
	5	7241

Material Requisition Status

Rev. no.	Date	Revisions	Originator	Approval		
0	30/3/2023	Issue for Tender		E.F.	KH.B.	Y.M.

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REQN. no.	PRJ. no.	Rev.	Date
7241	PL42_198 & PL42_228	0	30/3/2023

Item	Description	Unit	QTY.	Unit Price	Total Price
1	46"x12" Sweepolet, MSS SP97, ASTM A694 F65, W.Th=0.875"/0.375".	Each	12		
2	46"x4" Sweepolet, MSS SP97, ASTM A694 F65, W.Th=0.875"/0.237".	Each	24		
3	46"x2" Sweepolet, MSS SP97, ASTM A694 F65, W.Th=0.875"/0.218".	Each	24		
4	42"x12" Sweepolet, MSS SP97, ASTM A694 F65, W.Th=0.812"/0.375".	Each	12		
5	42"x10" Sweepolet, MSS SP97, ASTM A694 F65, W.Th=0.812"/0.365".	Each	28		
6	42"x4" Sweepolet, MSS SP97, ASTM A694 F65, W.Th=0.812"/0.237".	Each	12		
7	42"x2" Sweepolet, MSS SP97, ASTM A694 F65, W.Th=0.812"/0.218".	Each	100		
8	36"x2" Sweepolet, MSS SP97, ASTM A694 F65, W.Th=0.688"/0.218".	Each	12		
9	32"x2" Sweepolet, MSS SP97, ASTM A694 F60, W.Th=0.688"/0.218".	Each	4		
10	24"x2" Sweepolet, MSS SP97, ASTM A694 F56, W.Th=0.562"/0.218".	Each	12		
11	12"x2" Sweepolet, MSS SP97, ASTM A694 F52, W.Th=0.375"/0.218".	Each	36		
12	10"x2" Sweepolet, MSS SP97, ASTM A694 F52, W.Th=0.365"/0.218".	Each	8		

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Continuation Sheet		**REQN. no.**	**PRJ. no.**	**Rev.**	**Date**	
		7241	**PL42_198 & PL42_228**	**0**	**30/3/2023**	
Item	**Description**	**Unit**	**QTY.**	**Unit Price**	**Total Price**	
14	36"/1" Nipolet, MSS SP 97, ASTM A694 F65, 3000#, SCH160, MNPT (ASME B1.20.1, Taper type), L=4".	Each	4			
15	32"/1" Nipolet, MSS SP 97, ASTM A694 F60, 3000#, SCH160, MNPT (ASME B1.20.1, Taper type), L=4".	Each	1			
16	24"/1" Nipolet, MSS SP 97, ASTM A694 F56, 3000#, SCH160, MNPT (ASME B1.20.1, Taper type), L=4".	Each	1			
17	12"/1" Nipolet, MSS SP 97, ASTM A694 F52, 3000#, SCH160, MNPT (ASME B1.20.1, Taper type), L=4".	Each	36			
18	10"/1" Nipolet, MSS SP 97, ASTM A694 F52, 3000#, SCH160, MNPT (ASME B1.20.1, Taper type), L=4".	Each	20			
19	2"/1" Nipolet, MSS SP 97, ASTM A694 F52, 3000#, SCH160, MNPT (ASME B1.20.1, Taper type), L=4".	Each	25			
20	2"/1/2" Nipolet, MSS SP 97, ASTM A694 F52, 3000#, SCH160, MNPT (ASME B1.20.1, Taper type), L=4".	Each	235			

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Material Requisition

Project name:	PL42_198 & PL42_228 GAS PIPELINE PROJECT

MATERIAL	Specs no.	Project no.:
PIPING BULK MATERIALS	MS 006	PL42_198 & PL42_228
	Specs. Rev.	Requisition no.
Part-C FORGED STEEL FLANGES	4	7241

Material Requisition Status

Rev. no.	Date	Revisions	Originator	Approval		
0	30/3/2023	Issue for Tender		E.F.	KH.B.	Y.M.

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Continuation Sheet		**REQN. no.**	**PRJ. no.**	**Rev.**	**Date**
		7241	**PL42_198 & PL42_228**	**0**	**30/3/2023**
Item	**Description**	**Unit**	**QTY.**	**Unit Price**	**Total Price**
1	42" Flange, W.N., R.F., Rating 600#, MSS SP44, ASTM A694 F65, W.Thk=0.812".	Each	35		
2	36" Flange, W.N., R.F., Rating 600#, MSS SP44, ASTM A694 F65, W.Thk=0.688".	Each	2		
3	32" Flange, W.N., R.F., Rating 600#, MSS SP44, ASTM A694 F60, W.Thk=0.688".	Each	1		
4	24" Flange, W.N., R.F., Rating 600#, MSS SP44, ASTM A694 F56, W.Thk=0.562".	Each	7		
5	12" Flange, W.N., R.F., Rating 600#, MSS SP44, ASTM A694 F52, W.Thk=0.375".	Each	24		
6	10" Flange, W.N., R.F., Rating 600#, ASME B16.5, ASTM A105, W.Thk=0.438".	Each	13		
7	4" Flange, W.N., R.F., Rating 600#, MSS SP44, ASTM A694 F52, W.Thk=0.237", Dimensions as per ASME B16.5.	Each	36		
8	4" Flange, W.N., R.F., Rating 600#, ASME B16.5, ASTM A105, W.Thk=0.237".	Each	36		
9	2" Flange, W.N., R.F., Rating 600#, MSS SP44, ASTM A694 F52, W.Thk=0.218", Dimensions as per ASME B16.5.	Each	120		
10	2" Flange, W.N., R.F., Rating 150#, MSS SP44, ASTM A694 F52, W.Thk=0.218", Dimensions as per ASME B16.5.	Each	12		
11	1" Flange, W.N., R.F., Rating 600#, MSS SP44, ASTM A694 F52, W.Thk=0.250", Dimensions as per ASME B16.5.	Each	12		

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Continuation Sheet		**REQN. no.**	**PRJ. no.**	**Rev.**	**Date**
		7241	**PL42_198 & PL42_228**	**0**	**30/3/2023**
Item	**Description**	**Unit**	**QTY.**	**Unit Price**	**Total Price**
12	36" Blind Flange, R.F., Rating 600#, MSS SP44, ASTM A694 F65.	Each	4		
13	42" Line Spade & Spacer, R.F, Rating 600#, ASTM A694 F65, Dimensions Suitable for MSS SP44 flanges.	Each	5		
14	36" Line Spade & Spacer, R.F, Rating 600#, ASTM A694 F65, Dimensions Suitable for MSS SP44 flanges.	Each	2		
15	32" Line Spade & Spacer, R.F, Rating 600#, ASTM A694 F60, Dimensions Suitable for MSS SP44 flanges.	Each	1		
16	24" Line Spade & Spacer, R.F, Rating 600#, ASTM A694 F56, Dimensions Suitable for MSS SP44 flanges.	Each	5		

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Material Requisition

Project name:	PL42_198 & PL42_228 GAS PIPELINE PROJECT

Material	Specs no.	Project no.
PIPING BULK MATERIALS	MS 005	PL42_198 & PL42_228
	Specs. Rev.	Requisition no.
Part-D Steel Plug	3	7241

Material Requisition Status

Rev. no.	Date	Revisions	Originator	Approval		
0	30/3/2023	Issue for Tender		E.F.	KH.B.	Y.M.

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Continuation Sheet		**REQN. no.**	**PRJ. no.**	**Rev.**	**Date**	
		7241	**PL42_198 & PL42_228**	**0**	**30/3/2023**	
Item	**Description**	**Unit**	**QTY.**	**Unit Price**	**Total Price**	
1	1" Hex. Plug, Threaded (MNPT, ASME B1.20.1, Taper type), ASME A694 F52, 3000#, SCH80, ASME B16.11.	Each	85			
2	1/2" Hex. Plug, Threaded (MNPT, ASME B1.20.1, Taper type), ASME A694 F52, 3000#, SCH80, ASME B16.11.	Each	235			
3	1" Cap, Threaded (FNPT, ASME B1.20.1, Taper type), ASME A694 F52, 3000#, SCH160, ASME B16.11.	Each	25			

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Material Requisition

Project name:	PL42_198 & PL42_228 GAS PIPELINE PROJECT

Material	Specs no.	Project no.
PIPING BULK MATERIALS Part-E GASKETS	MS 007	PL42_198 & PL42_228
	Specs. Rev.	Requisition no.
	4	7241

Material Requisition Status

Rev. no.	Date	Revisions	Originator	Approval		
0	30/3/2023	Issue for Tender		E.F.	KH.B.	Y.M.

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REQN. no.	PRJ. no.	Rev.	Date
7241	PL42_198 & PL42_228	0	30/3/2023

Item	Description	Unit	QTY.	Unit Price	Total Price
1	42" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	40		
2	36" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	40		
3	32" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	10		
4	24" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	20		
5	12" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	12		
6	10" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	13		
7	4" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	96		
8	2" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	125		
9	2" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 150#.	Each	15		
10	1" Spiral Wound Gasket For Raised Face Flange With Inner & Outer 316L S.S. Rings, ASME B16.20, Suitable for ASME B16.5, Flange Rating 600#.	Each	24		

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Material Requisition

Project name:	PL42_198 & PL42_228 GAS PIPELINE PROJECT

Material	Specs no.	Project no.
PIPING BULK MATERIALS Part-F STUD BOLTS	MS 008	PL42_198 & PL42_228
	Specs. Rev.	Requisition no.
	3	7241

Material Requisition Status

Rev. no.	Date	Revisions	Originator	Approval		
0	30/3/2023	Issue for Tender		E.F.	KH.B.	Y.M.

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REQN. no.	PRJ. no.	Rev.	Date
7241	PL42_198 & PL42_228	0	30/3/2023

Item	Description	Unit	QTY.	Unit Price	Total Price
1	2 1/2", L=690mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	28		
2	2 1/2", L=690mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	392		
3	2 1/2", L=530mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	56		
4	2 1/2", L=445mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	56		
5	2 1/4", L=535mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	28		
6	2 1/4", L=420mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	28		
7	1 7/8", L=455mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	120		
8	1 7/8", L=370mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	24		
9	1 1/4", L=240mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	424		
10	7/8", L=165mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	592		
11	5/8", L=125mm Stud Bolt with 2 Nuts & 2 Washers, ASME B18.2/ASME B 1.1 (Class 2 A/2B dimensions), A193 B7/A 194 2H/BS 3410.	Each	1080		

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Material Requisition

Project name:	PL42_198 & PL42_228 GAS PIPELINE PROJECT

Material	Specs no.	Project no.
PIPING BULK MATERIALS Part-G Small Pipes	MS 001	PL42_198 & PL42_228
	Specs. Rev.	Requisition no.
	15	7241

Material Requisition Status

Rev. no.	Date	Revisions	Originator	Approval		
0	30/3/2023	Issue for Tender		E.F.	KH.B.	Y.M.

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Continuation Sheet		**REQN. no.**	**PRJ. no.**	**Rev.**	**Date**	
		7241	**PL42_198 & PL42_228**	**0**	**30/3/2023**	
Item	**Description**	**Unit**	**QTY.**	**Unit Price**	**Total Price**	
1	12" Pipe, API 5L X52N PSL2, W.Thk=0.375" SEAMLESS.	Each	500			
2	10" Pipe, API 5L X52N PSL2, W.Thk=0.365" SEAMLESS.	Each	250			
3	10" Pipe, API 5L GR.BN PSL2, W.Thk=0.438" SEAMLESS.	Each	1000			
4	2" Pipe, API 5L X52N PSL2, W.Thk=0.218" SEAMLESS.	Each	500			