ऑयल इंडिया लिमिटेड
(भारत सरकार का उद्यम)
Oil India Limited
(A Government of India Enterprise)

BAGHJAN – MADHUBAN PIPELINE PROJECT (ASSAM)

BID DOCUMENT FOR PROCUREMENT OF

ASSORTED VALVES

.....

COMPETITIVE BIDDING

Tender no. **CPG1698P20**

VOLUME II OF II

MECON
मेकान
ISO 9001:2000 Company

PREPARED AND ISSUED BY
MECON LIMITED
(A Govt. of India Undertaking)
Delhi, India

CONTENTS LIST – ASSORTED VALVES

OIL & GAS SBU, DELHI

MATERIAL REQUISITION

1.0 **SCOPE OF SUPPLY**

The scope of supply includes Plug & Globe Valves conforming to design standard API-6D/ ISO:15761/ BS 1873 and meeting other technical requirements as specified in bid document (i.e. as per MR, Data Sheets & Technical Specifications), getting approvals from Purchaser/ Consultant, procurement of raw material, manufacturing, testing & inspection, packing & forwarding & transportation to Assam as per tender terms & conditions. The details of valves to be supplied are in Table 1 below:

Table-1

CARBON STEEL PLUG VALVES - Design Standard: API-6D, MECON's specification no. MEC/TS/05/62/003, Rev-2 and Data Sheets given below:-

MR Item No.	Size NB, mm (inches)	ANSI Pressure Rating	Pattern	Ends	Stem Extension	Installation	Valve Operation	Data Sheet No.	Qty. (nos.)	Remarks
A.1	250 (10")	300 #	Regular	BW	YES	UG	Manual with Gear Box	MEC/23U1/05/28/M/001/DS/PV/01	10	----
A.2	250 (10")	300 #	Regular	BW	NO	AG	Manual with Gear Box	MEC/23U1/05/28/M/001/DS/PV/02	05	----
A.3	250 (10")	300 #	Regular	Flanged (RF)	NO	AG	Manual with Gear Box	MEC/23U1/05/28/M/001/DS/PV/03	05	----
A.4	100 (4 ")	300 #	Short	BW	NO	AG	Manual Lever Operated	MEC/23U1/05/28/M/001/DS/PV/04	05	----
A.5	100 (4 ")	300 #	Short	Flanged (RF)	NO	AG	Manual Lever Operated	MEC/23U1/05/28/M/001/DS/PV/05	02	----

GROUP – B: CARBON STEEL GLOBE VALVES -Design Standard : ISO:15761/ BS 1873

Item No.	Size NB, mm (inches)	ANSI Pressure Rating	Ends	Stem Extension	Valve Operation	Data Sheet No.	Qty. (nos.)	Remarks
B.1	100 (4")	300 #	Flanged (RF)	No	Manual	MEC/23U1/05/28/M/001/DS/|GV/01	04	----

Note: Proposed Delivery Location / Destination is Duliajan, Assam or any other location within radius of 50 KM.

LEGEND

BW = Butt Welded
RF = Raised Face (Flanged)
UG = Under Ground
AG = Above Ground

2.0 DOCUMENTS & DATA REQUIREMENTS

2.1 The table hereunder specifies the quantities and the nature of the documents to be submitted by the Package Contractor to Purchaser.

2.1.1 The documents required at the inquiry stage and to be included in the bid are listed under column A of clause 2.6 below.

2.1.2 The documents required after award of the Contract and subject to the written approval of the Purchaser are listed under column B of clause 2.6 below.

2.1.3 The final and certified documents are listed under column C of clause 2.6 below.

2.2 Any document, even when preliminary, shall be binding and therefore duly identified and signed by the Vendor. It shall bear the Purchaser's Project reference, the Material Requisition number and the identification number.

2.3 The drawings/documents shall be reviewed, checked, approved and duly signed/stamped by successful Bidder/supplier before submission. Revision number shall be changed during submission of the revised successful Bidder/supplier documents and all revisions shall be highlighted by clouds. Whenever the successful Bidder/supplier require any sub-supplier drawings to be reviewed by MECON, the same shall be submitted by the supplier after duly reviewed, approved and stamped by the successful Bidder/supplier. Direct submission of the sub-supplier's drawings without contractor's approval shall not be entertained.

2.4 Review/Approval of the successful Bidder/supplier drawings by MECON would be only to review the compatibility with basic designs and concepts and in no way absolve the successful Bidder/supplier of his responsibility/contractual obligation to comply with tender requirements, applicable codes, specifications and statutory rules/regulations. Any error/deficiency noticed during any stage of manufacturing/execution/installation shall be promptly corrected by the successful Bidder/supplier without any extra cost or time, whether or not comments on the same were received from MECON during the drawing review stage.

2.5 The successful Bidder/ Supplier shall submit a prerecorded Training CDs/DVDs and it shall comprise the basic theories and fundamentals, related standards, design parameters, scanned copies of approved drgs./docs., manufacturing & inspection methods, operating & maintenance instructions and other relevant details. The CDs/DVDs shall have to be self-contained, user-friendly using animation/videos and other multimedia techniques.

2.6 THE DOCUMENTS ARE FULLY PART OF THE SUPPLY WHICH SHALL BE COMPLETE ONLY IF AND WHEN THE DOCUMENTS COMPLYING FULLY WITH THE TENDER REQUIREMENTS ARE RECEIVED BY THE PURCHASER.

Item	Documents & Data	A	B		C	
		No. of Copies	No. of Copies	Required Date (from FOI)	No. of Copies	Required Date (before Dispatch)
1.	Completed Data Sheets	3	3	2 Weeks	3	2 Weeks (with final technical file)
2.	Drawing / Data Submittal list / schedule	-	3	2 Weeks + monthly	3	2 Weeks
3.	Fabrication, test and delivery schedule (per item)	3	3	2 Weeks + monthly	3	2 Weeks
4.	Fire Safe certificate as per API 6FA & API 607	3	-	-	-	-
5.	Progress Report	-	3	2 Weeks + monthly	3	2 Weeks
6.	Catalogues / References	3	-	-	3	With final technical file
7.	GA drawings + Sectional drawings + Material specification + Unit weight. + Unit volume + Package dimensions per unit (all above per valve and actuator)	3	3	2 Weeks	3	With final technical file
8.	"Way of Shipping" as per Notes to Material Requisition	-	3	7 days	-	-
9.	Packing / shipping list with weights and dimensions	-	3	2 Weeks before shipping	3	2 Weeks (with final technical file)
10.	Design calculations for pressure containing parts	-	3	2 Weeks	3	2 Weeks (with final technical file)
11.	Welding details for the pups	-	3	2 Weeks	3	2 Weeks (with final technical file)
12.	Torque curves + Torque calculations	3	3	2 Weeks	3	2 Weeks (with final technical file)
13.	Bill of materials (on drawings)	-	3	2 Weeks	3	2 Weeks (with final technical file)
14.	Recommended spare parts list (for erection and commissioning)	3	-	-	3	2 Weeks (with final technical file)
15.	Recommended spares parts list (for 2 years operation)	3	-	-	3	2 Weeks (with final technical file)

16.	Welding procedure specification and records WPS / PQR	-	3	2 Weeks	3	2 Weeks (with final technical file)
17.	QA / QC program	3	3	2 Weeks	3	2 Weeks (with final technical file)
18.	Inspection and Test Procedures along with Quality Assurance Plan	3	3	2 Weeks	3	2 Weeks (with final technical file)
19.	Test Reports	-	-	-	3	2 Weeks (with final technical file)
20.	NDE / NDT Reports	-	-	-	3	2 Weeks (with final technical file)
21.	Heat Treatment Reports	-	-	-	3	2 Weeks (with final technical file)
22.	Hydrotest and air test report	-	-	-	3	2 Weeks (with final technical file)
23.	Maintenance and operating manuals	-	-	-	3	2 Weeks (with final technical file)
24.	Installation instructions & Site inspection procedure	-	-	-	3	2 Weeks (with final technical file)
25.	Material certificate as per EN 10204 - 3.2	-	-	-	3	2 Weeks (with final technical file)
26.	Painting system description & procedure	3	3	2 weeks	3	2 Weeks (with final technical file)
27.	List of sub-vendors with their scope	3	3	2 weeks		
28.	Training CDs/DVDs covering design, operation & maintenance	-	-	-	3	2 Weeks (with final technical file)
29.	Final technical file, preliminary copy for approval (in soft & hardcopy)	-	3	2 weeks before dispatch/ shipping	-	-
30.	Final technical file (hardcopy)	-	-	-	3	Before shipping
31.	Final technical file (softcopy – .pdf - Acrobat files in CD ROM / DVD)	-	-	-	6	

NOTES

1) In case of e-bids, only single copy of documents / drawings / data under column A need be uploaded.

2) Durations in column B (required date) are weeks after FOI or as indicated in Table.

3) Durations in column C (required date) are weeks after document approval or as indicated in Table. Due date of each document may be proposed.

4) The above documents & data requirements shall also be supplemented by all requirements of clause 10.0 of MECON's T.S. No. MEC/TS/05/28/002.

5) For documents & data requirements of GAS OVER OIL ACTUATORS valve actuators refer specification no. MEC/TS/05/E5/002 (Technical specification for GAS OVER OIL ACTUATORS).

1.0 Introduction

Oil India Limited intend to procure Ball, Plug and Globe valves for BAGHJAN – MADHUBAN PIPELINE PROJECT (ASSAM) project as listed in the MR.

2.0 Price Evaluation Basis: As per Bidder's Eligibility Criteria (BEC)

3.0 Compliance with Specification: The Vendor shall be completely responsible for the design, materials, manufacture & fabrication, testing, inspection, preparation for shipment and transport of the above equipment strictly in accordance with the MR and all attachments thereto. Minimum all pressure containing and pressure controlling parts of Valves and Actuators shall be provided with EN 10204-3.2 certificates.

4.0 Vendor's Scope: Vendor scope of work includes the equipment with all internals and accessories shown on the datasheets, specifications and all unmentioned parts necessary for a satisfactory operation and testing, except those which are indicated to be out of the vendor's supply.

5.0 Inspection:

"The Successful Vendor shall propose minimum four (4) nos. of TPIA's from the below listed TPIA's along with QAP submission. OIL/MECON shall approve any one TPIA out of the four (4) nos. proposed TPIA's. The Successful Vendor shall appoint the approved TPIA for inspection purpose and mention name of the approved TPIA in QAP.

i. Det Norske Veritas (DNV)
ii. BVQI
iii. Technische Ulierwachungs Verein (TUV)
iv. LIoyds
v. RITES
vi. I.R.S.
vii. Tuboscope Vetco

Apart from inspection by TPIA, inspection shall also be performed by MECON / OIL's delegate, as set out and specified in the codes and particular documents forming this MR.

Vendor must note that stage wise inspection for complete fabrication, testing including the raw material inspection to be carried out.

6.0 For all valves to be used in Gaseous Hydrocarbons service, impact & hardness tests / values as per clause 3.4, 3.5 & 3.6 of specification no. MEC/TS/05/21/002 shall be applicable.

7.0 Vendor shall quote separately spares for two years normal operation for valves & actuators as per price schedule Performa. List of spares quoted shall be furnished as per attached Format.

8.0 Vendor to include the start up and commissioning spares for valves & actuators (if applicable) in the quoted price for Ball Valves. However, list of spares (start up and commissioning) to be made available without prices as per attached Format.

9.0 Vendor to indicate in his offer the gross weight (in kg or Metric Tonne) per unit, volume (in m3) per unit and dimensions (L x B x H) of package (wooden box, etc.) to accommodate unit quantity or number of quantities (as applicable).

10.0 Vendor must submit duly filled up & signed data sheets, check list and forms along with his offer.

11.0 Vendor shall establish the equivalence/superiority of any material proposed (With justification of material properties and availability) other than that specified in Datasheet. Vendor shall also indicate the ASTM equivalent of his proposed material as well as of all the AISI designated materials specified in datasheets.

12.0 Vendors to note that for minimum inspection and testing requirement of the valves shall be governed by attached QAP with this MR. However, vendor shall submit their QAP for approval covering the requirement specified in attached QAP.

13.0 Bidders to note that all the documents/drawings submitted by them as a part of bid shall be considered only to assess Bidder's technical capability and shall in no way absolve them from complying with all the requirements of the Tender. All items to be supplied by the Bidder shall be strictly in accordance with tender requirements.

14.0 In the event of Conflict/inconsistency among the documents attached/ referred, the following order of precedence generally shall govern in interpretation of various requirements / data.

- Material / Purchase Requisition & Notes to MR
- Datasheets
- Technical Specification
- Codes and Standards
- Vendor's Standards

However, Owner/Consultant reserves the right to consider most stringent requirement among the document attached / referred.

15.0 Bidder/supplier shall submit hard copies of all documents/ drawings to MECON, as listed in columns B & C of table for document and data requirement under Clause 2.0 of MR and also in all technical specifications. The date of receipt of these documents/ drawings at MECON shall be deemed as the date of submission. If any documents/ drawings require re-submission due to any error/ deficiency noticed during review/ approval stage, in that event the additional time required by the bidder/supplier to get the revised document/ drawing reviewed/approved by MECON shall be solely to bidder's/supplier's account and in no case the bidder/ supplier shall be entitled for any time or cost benefit.

16.0 Bidders to note that the valves supplied by them shall be capable to withstand the field hydro test pressure (i.e. 1.5 times of design pressure) for 6 to 24 hours test holding duration under field / site conditions. The valve's ball shall be kept in either partial or full open condition for entire test duration and test medium will be non-corrosive water. The vendor shall be liable for repair/ replacement of valve if found faulty during site hydro test at his risk & cost. All cost for associated activities like packaging, transportation etc. in connection to repair / replacement of valve shall be borne by the bidder. No claim shall be entertained by the Owner / Purchaser in this regard.

17.0 Vendors to note that packing & transportation of the valves shall be done strictly as per attached technical specification for handling and transportation.

18.0 Vendors to note that the entire ordered quantity shall be offered for MECON inspection as per following table. In case no. of visits of MECON engineer become more than as specified in table below for complete order quantity, vendor shall bear the touring expenditure of MECON/OIL engineers as per company rules.
OIL/MECON reserves the right to waive off this requirement in case of project exigencies.

S.No.	Size	Minimum Quantity for one lot
1	30" and higher	Upto 5 valves
2	16" to 28"	Upto 8 valves
3	8" to 14"	Upto 20 valves
4	¾" to 6"	Upto 200 valves

In case of any multiple of the ordered quantity the no. of valves shall be divided by quantity specified for one lot in above mentioned table to arrive at the no. of lots. No. of lots shall be determined by rounding off to next integer.

19.0 Vendors to note that TPI inspection is either to be conducted before MECON inspection or in parallel. In no case TPI inspection shall be permitted after MECON inspection. For the valves where MECON inspection extent is 100% witness, TPI inspection maybe allowed in parallel with MECON. However, for valves requiring 10% MECON witness inspection, vendor has to finish TPI inspection before raising call and upload TPI inspection report in Inspection Management System of MECON.

20.0 Extent of MECON witness during final inspection shall be as follows:

Sl. No.	Size range	Class	Mecon Inspection extent
1.	2" to 8"	150	10% random witness and document review for 100% valves.
2.	10" and more	150	100% witness.
3.	2" to 6"	300 and higher	10% random witness and document review for 100% valves.
4.	8" and more	300 and higher	100% witness.
5.	Below 2"	All classes	10% random witness and document review for 100% valves.

TECHNICAL SPECIFICATION

PROCESS & PIPING DESIGN SECTION
MECON LIMITED

DELHI - 110 092

TECHNICAL SPECIFICATION
FOR
PLUG VALVES
(NB ≥ 2")

SPECIFICATION NO.: MEC/TS/05/62/003, Rev-2

CONTENTS

1.0 SCOPE

This specification covers the minimum requirements for design, manufacture and supply of carbon steel plug valves of size DN 50mm (2") and above and ANSI Class 150# thru 900# for use in onshore pipeline systems handling non sour hydrocarbons in liquid phase or gaseous phase including Liquefied Petroleum Gas (LPG).

2.0 REFERENCE DOCUMENTS

2.1 All valves shall be manufactured and supplied in accordance with the Twenty Second Edition, January, 2002, or the latest edition of American Petroleum Institute (API) Specification 6D, twenty first edition, 1994 including supplement 1 & 2 thereof with additions and modifications as indicated in the following sections of this specification.

2.2 Reference has also been made in this specification to the latest edition of the following Codes, Standards and Specifications :

ASME B 16.5	:	Pipe flanges and flanged fittings
ASME B 16.25	:	Buttwelding ends
ASME B 16.34	:	Valves – Flanged, threaded and welding end
ASME B16.47	:	Large diameter steel flanges
ASME B 31.3	:	Chemical & process plant piping system
ASME B 31.4	:	Liquid transportation systems for hydrocarbons and other liquids
ASME B 31.8	:	Gas transmission and distribution piping systems
ASME Sec.VIII	:	Boiler and pressure vessel code
ASTM A 370	:	Standard test methods and definitions for mechanical testing of steel products
ASTM B 733	:	Autocatalytic nickel phosphorous coating on metals
API 6FA	:	Fire test for valves
API 1104	:	Welding of pipelines and related facilities
BS:6755 (Part-II)	:	Testing of valves – Specification for fire type - testing requirements
MSS-SP-6	:	Standard finishes for contact faces of pipe flanges and connecting-end flanges of valves and fittings

MSS-SP-44 : Steel pipeline flanges

SSPC-VIS-1 : Steel structures painting council-visual standard

2.3 **In case of conflict** between the requirements of this specification, API 6D and the Codes, Standards and Specifications referred in clause 2.2 above, the requirements of this specification shall govern. Order of precedence shall be as follows :

- Data Sheets
- This Specification
- API 6D Specification
- Other Referred Codes & Standards
- Manufacturer's Standard

3.0 MATERIALS & TEST PROCEDURES

3.1 Material for major components of the valves shall be as indicated in Valve Data Sheet. Other components shall be as per Manufacturer's standard which will be subject to approval by Purchaser.

3.2 Carbon steel used for the manufacture of valves shall be fully killed.

3.3 Chemical composition (check analysis) of valve end connection which are subject to further welding by Purchaser shall meet the following requirements for each heat of steel used:

a) Carbon : 0.22% (max.)
b) Manganese : 1.70 % (max.)
c) Silicon : 0.55 % (max.)
d) Phosphorus : 0.030 % (max.)
e) Sulphur : 0.030 % (max.)

Total percentage of Vanadium, Niobium and Titanium shall not exceed 0.20. Residual elements shall not exceed the following limits :

a) Nitrogen : 0.019 %
b) Nickel : 0.30 %
c) Copper : 0.20 %
d) Aluminum : 0.070 %
e) Chromium : 0.15 %
f) Molybdenum : 0.05 %

Carbon equivalent (CE) as calculated by the following shall not exceed 0.45%.

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

3.4 For valves specified for Gas Service or high vapour pressure liquid service, charpy V-Notch test on each heat of base material shall be conducted as per API 6D, for all pressure containing parts such as body, end flanges and welding ends as well as the bolting material for pressure containing parts. Unless specified otherwise in Valve Data Sheets, the Charpy impact test shall be conducted at 0°C. The Charpy impact test specimen shall be taken in the direction of principal grain flow and notched perpendicular to the original surface of plate or forging.

Unless specified otherwise in Valve Data Sheets, the minimum average absorbed energy per set of three specimens shall be 27 J with an individual minimum per specimen of 22 J.

3.5 For valves specified for Gas Service or high vapour pressure liquid service, the hardness of base material of body and principal parts of the valve such as plug, stem, etc., shall not exceed 22 RC.

3.6 Plug for valve size DN 200mm (8") and above or as specified in Valve Data Sheets shall have Electroless Nickel Plating (ENP) or equivalent. The hardness of plating shall be minimum 50 RC. Manufacturer shall ensure that the adhesive strength of plating is sufficient so as to prevent peeling of plating during operation of the valve.

3.7 All process-wetted parts, metallic and non-metallic, shall be suitable for the fluids and service specified by the Purchaser. The service gas composition when applicable shall be as given in Annexure-I.

4.0 DESIGN & CONSTRUCTION

4.1 The Manufacturer shall have a valid license to use API 6D monogram for manufacture of Plug Valves.

4.2 Valve pattern shall be short, regular or venturi as specified in the following table:

Class	Size Range, NB mm (inch)	Pattern
150	50-100 (2-4)	Short
	150-300 (6-12)	Regular
	350 (14) & above	Venturi
300	50-100 (2-4)	Short
	150-250 (6-10)	Regular
	300 (12) & above	Venturi
600	50-250 (2-10)	Regular
	300 (12) & above	Venturi
900	50-250 (2-10)	Regular
	300 (12) & above	Venturi

4.3 Valve shall have an inherent feature using line pressure to ensure that the line pressure cannot cause taper locking of the plug/ plug movement into taper i.e. valves shall be of pressure balanced design.

4.4 Cover shall be bolted to the body and screwed connections are not acceptable.

4.5 Soft seats to achieve a seal between plug and body are not permitted.

4.6 All valves shall have provisions for secondary sealant injection under full line pressure for seat and stem seals. Sealant injection points shall be provided with a ball type check valve or needle valve to replace the sealant injection fitting under full line pressure.

4.7 Valves shall have vent and drain connections as per API 6D.

4.8 When specified in the Valve Data Sheet, valves shall be designed to withstand a sustained internal vacuum of at least one milli-bar in both open and closed position.

4.9 Valve design shall ensure repair of gland packing under full line pressure.

4.10 a) Valve ends shall be either flanged or butt welded or one end flanged and one end butt welded as indicated in Valve Data Sheet. Flanges of the flanged end cast/ forged body valves shall be integrally cast/forged with the body of valve. Face-to-face/ end-to-end dimensions shall conform to API 6D.

b) Flanged end shall have dimensions as per ASME B16.5 for valve sizes upto DN 600mm (24 inches) excluding DN 550mm (22 inches) and as per MSS-SP-44 for valve sizes DN 550mm (22 inches) & for DN 650mm (26 inches) and above. Flange face shall be either raised face or ring joint type as indicated in Valve Data Sheet. Flange face finish shall be serrated or smooth as indicated in Valve Data Sheet. Smooth finish when specified shall be 125 to 200 AARH. In case of RTJ flanges, the groove hardness shall be minimum 140 BHN.

c) Butt weld end preparation shall be as per ASME B16.25. The thickness of the pipe to which the valve has to be welded shall be as indicated in Valve Data Sheet. Valves shall be without transition pups. In case significant difference exists between thickness of welding ends of valve and connecting pipe, the welding ends of valve shall have bevel preparation as per ASME B31.4 or ASME B31.8, as applicable.

4.11 Valves shall be provided with position indicator and stops at the fully open and fully closed positions.

4.12 Valves of size DN 200mm (8") and above shall be equipped with lifting lugs. Tapped holes and eye bolts shall not be used for lifting lugs.

4.13 Valves shall have locking devices to be locked either in full open or full close position when indicated in the Valve Data Sheets. Locking devices shall be permanently attached to the valve operator and shall not interfere with operation of the valve.

4.14 Valves shall be of fire safe design as per BS:6755 (Part-II)/ API 6FA, if indicated in Valve Data Sheet.

4.15 Valves shall be suitable for either buried or above ground installation as indicated in the Valve Data Sheet.

4.16 Valves with stem extension, when indicated in Valve Data Sheet shall have following provisions :

a) Valves provided with stem extension shall have water proof outer casing. Length of stem extension shall be as indicated in the Valve Data Sheet. The length indicated corresponds to the distance between the centreline of the valve opening and the top of the mounting flange for valve operating device (gear operator/ power actuator as applicable).

b) Vent and drain connections shall be terminated adjacent to the valve operator by means of suitable piping anchored to the valve body. Pipe used shall be API 5L Gr. B/ ASTM A106 Gr. B, with Sch. 160. Fittings shall be ASTM A105/ ASTM A 234 Gr. WPB, Socket Welded, ANSI class 6000.

c) Sealant injection lines shall be extended and terminated adjacent to the valve operator in manner as indicated in (b) above.

d) Stem extension and stem housing design shall be such that the complete assembly will form a rigid unit giving a positive drive under all conditions with no possibility of free movements between valve body stem extension or its operator.

e) Outer casing of stem extension shall have 3/8" or ½" NPT plugs at the top and bottom, for draining and filling with oil to prevent internal corrosion.

4.17 **Operating Devices**

a) Valves shall have a power actuator or manual operator as indicated in the Valve Data Sheet. Manual operated valves of size $\leq$ DN 100mm (4") shall be wrench operated and valves of sizes $\geq$ DN 150mm (6") shall be gear operated. Each wrench operated valve shall be supplied with wrench. Valve design shall be such that damage due to malfunctioning of the operator or its controls will only occur in the operator gear train or power cylinder and damaged parts can be replaced without the bonnet being removed.

b) The power actuator shall be in accordance with the specification issued for the purpose and as indicated in the valve and actuator data sheet. Operating time shall be as indicated in valve data sheet. Valve operating time shall correspond to full close to full open / full open to full close under maximum differential pressure corresponding to the valve rating. For actuated valves, the actuator torque shall be atleast 1.25 times the maximum torque required to operate the valve under maximum differential pressure corresponding to the valve class rating.

c) Operating device shall be designed for easy operation of valve under maximum differential pressure corresponding to the valve rating.

d) For manual operation of all valves, the diameter of the hand wheel or the length of operating lever shall be such that under the maximum differential pressure, the total force required to operate the valve does not exceed 350 N. Manufacturer shall also indicate the number of turns of hand wheel (in case of gear operator), required to operate the valve from full open to full close position.

e) Direction of operation of hand wheel or wrench shall be in clock-wise direction while closing the valve. Hand wheels shall not have protruding spokes.

f) Gear operators, if specified, shall have a self locking provision and shall be fully encased in waterproof/ dustproof/ weatherproof/ splashproof enclosure and shall be filled with suitable grease.

4.18 Repair by welding is not permitted for fabricated and forged body valves. However repair by welding as per ASME B16.34 is permitted for cast body valves. Repair shall be carried out before any heat treatment of casting is done. Repair welding procedure qualification shall also include impact test and hardness test when required as per Clause 3.4 and 3.6 of this specification and shall meet the requirements as specified therein.

4.19 The tolerance on internal diameter and out of roundness at the ends for welded ends valves shall be as per connected pipe specification as indicated in the Valve Data Sheet.

4.20 Valve stem shall be capable of withstanding the maximum operating torque required to operate the valve against the maximum differential pressure corresponding to applicable class rating. The combined stress shall not exceed the maximum allowable stresses specified in ASME section VIII, Division-1.

For Power Actuated Valves, the valve stem shall be designed for maximum output torque of the selected power actuator (including gear box, if any) at the valves stem.

5.0 INSPECTION & TESTS

5.1 The Manufacturer shall perform all inspection and tests as per the requirements of this specification and the relevant codes, prior to shipment at his works. Such inspection and tests shall be, but not limited to, the following :

5.1.1 All valves shall be visually inspected.

5.1.2 Dimensional check shall be carried out as per the Purchaser approved drawings.

5.1.3 Chemical composition and mechanical properties shall be checked as per relevant material standards and this specification, for each heat of steel used.

5.1.4 a) Non-destructive examination of individual valve material and component consisting of but not limited to castings, forgings, plates and assembly welds shall be carried out by the Manufacturer.

b) Valves castings shall be radiographically examined at the cover and body portion, seat location, flanged body ends and circumference of ends to be field welded. Procedure and acceptance criteria shall be as per ASME B16.34. The extent of radiography shall be as follows :

ANSI Class 150-	All Sizes	-	Nil
ANSI Class 300-	≤ DN 400mm (16")	-	Nil
	≥ DN 450mm (18")	-	100%
ANSI Class 600- and above	All Sizes	-	100%

All castings shall be wet magnetic particle inspected 100 % of the internal surfaces. Method and acceptance shall comply with ASME B16.34.

c) Valve forgings shall be examined by ultrasonic method. Inspection procedure and acceptance criteria shall be as per Annexure E of ASME B16.34.

5.1.5 Areas which, in Purchaser's Inspector's opinion, cannot be inspected by radiographic methods shall be checked by ultrasonic or magnetic particle methods and acceptance criteria shall be as per ASME Sec-VIII, Division I, Appendix 12 and Appendix 6 respectively.

5.1.6 a) Weld ends of all cast valves shall be 100% radiographically examined and acceptance criteria shall be as per ASME B16.34.

b) After final machining all bevel surfaces shall be inspected by dye penetrant, or wet magnetic particle methods. Any defects longer than 6.35mm shall be rejected and also defects between 6.35mm and 1.59mm that are separated by a distance less than 50 times their greatest length. Weld repair of bevel surface is not permitted. Rejectable defects must be removed.

c) All finished wrought weld ends subject to welding in the field shall be 100% ultrasonically tested for lamination type defects for a distance of 50mm from the end. Laminations shall not be acceptable.

5.1.7 All valves shall be tested in compliance with the requirements of API 6D. Hydrostatic shell testing shall ensure that the whole of the shell is subjected to the test pressure. If necessary, the empty shell shall be pressure tested prior to assembly of the plug. The drain, vent and sealant lines shall be either included in the hydrostatic shell test or tested independently. No leakage is permissible during hydrostatic testing.

5.1.8 A supplementary air seat test as per API 6D shall be carried out for all valves. No leakage is allowed. Test pressure shall be held for at least 15 minutes.

5.1.9 Manufacturer who intends bidding must submit at bid stage, certificate and report for successful fire safe tests for all types of valves in accordance with BS:6755 (Part-II)/ API 6FA, as applicable in Valve Data Sheet.

Failure to comply with the requirement shall be a cause of rejection of the offer.

5.1.10 Valve shall be subjected to Operational Torque Test as per supplementary test requirement of API 6D under hydraulic pressure equal to the maximum differential pressure corresponding to the valve rating. The maximum handwheel force shall not exceed 350 N.

5.1.11 Power actuated valves shall be tested after assembly at the valve Manufacturer's works. Actuator shall be capable to allow minimum five consecutive "opening" and "closing" cycles. To achieve this, the Manufacturer shall provide "closing" and "opening" operations. This test shall be conducted on one valve out of a lot of five valves of the same size, rating and actuator type. In case the test result dose not meet the requirements, retesting/ rejection of the lot shall be as decided by Purchaser's Inspector.

The actuator shall be adjusted to ensure that opening and closing time is within the limits stated in Actuator Data Sheet issued for the purpose.

The hand operator installed on the actuator shall also be checked after the cyclic testing, for satisfactory manual over-ride performance.

5.2 Purchaser reserves the right to perform stagewise inspection and witness tests as indicated in para 5.1 at Manufacturer's works prior to shipment. Manufacturer shall give reasonable access and facilities required for inspection to Purchaser's Inspector.

Purchaser reserves the right to request additional testing at any time to confirm or further investigate a suspected fault. If the suspected fault is confirmed, the cost incurred shall be to Manufacturer's account.

In no case shall any action of Purchaser or his representative relieve the Manufacturer of his responsibility for material, design, quality or operation of valves.

Inspection and tests performed/ witnessed by the Purchaser's Inspector shall in no way relieve the Manufacturer's obligation to perform the required inspection and tests.

6.0 EXTENT OF INSPECTION & TESTING

6.1 Purchaser's Inspector shall perform inspection and witness test on all valves as indicated in the Quality Assurance Plan (QAP) attached with this specification.

6.2 The hydrostatic testing and cyclic opening and closing of the valves with the operator shall be witnessed by Purchaser's Inspector.

7.0 TEST CERTIFICATES

7.1 Manufacturer shall submit the following certificates :

a) Mill test certificates relevant to the chemical analysis and mechanical properties of the materials used for valve construction as per the relevant standards.

b) Test certificates on hydrostatic and pneumatic test complete with records of timing and pressure of each test.

c) Test reports conforming to clause 5.1.9 of this specification, if applicable.

d) Test reports on radiographic and ultrasonic inspection.

e) Test reports on operation of valves conforming to clause 5.1.10 and 5.1.11 of this specification.

f) All other test reports and certificates as required by API 6D and this specification.

The certificates shall be valid only when signed by Purchaser's Inspector. Only those valves which have been certified by Purchaser's Inspector shall be dispatched from Manufacturer's works.

8.0 PAINTING, MARKING & SHIPMENT

8.1 Valve surface shall be thoroughly cleaned, freed from rust and grease and applied with sufficient coats of corrosion resistant paint. Surface preparation shall be carried out by shot blasting to SP 6 in accordance with "Steel Structures Painting Council - Visual Standard - SSPC-VIS-1". For the valves to be installed underground, when indicated in Valve Data Sheet, external surfaces of the buried portion of valves shall be painted with three coats of suitable coal tar epoxy resin with a minimum dry film thickness of 300 microns.

8.2 Manufacturer shall indicate the type of corrosion resistant paint used, in the drawings submitted for approval.

8.3 All valves shall be marked as per API 6D. The units of marking shall be metric except Nominal Diameter which shall be in inches. Marking shall be done by die-stamping on the bonnet or on the housing. However for buried valves the marking shall be done on the above ground portion of the stem housing only.

8.4 Valve ends shall be suitably protected to avoid any damage during transit. All threaded and machined surfaces subject to corrosion shall be well protected by a coat of grease or other suitable material. All valves shall be provided with suitable protectors, for flange faces, securely attached to the valves. Bevel ends shall be protected with metallic bevel protectors.

8.5 All sealant lines and other cavities of the valves shall be filled with sealant before shipment.

8.6 Packaging and shipping instructions shall be as per API 6D.

8.7 Packages shall be marked legibly, with suitable marking ink, the following.

a) Order Number
b) Manufacturer's Name
c) Valve Size and Rating
d) Tag Number
e) Serial Number

9.0 SPARES & ACCESSORIES

9.1 Manufacturer shall recommend and quote separately the spares for valves required for commissioning and two years of normal operation. List of such spares without price shall be indicated alongwith technical bid and separately with price.

9.2 Manufacturer shall recommend and quote unit price separately for the accessories (like wrench, sealant injector, etc.), sealant and special tools required for maintenance of valves.

10.0 DOCUMENTATION

10.1 At the time of bidding, the bidder shall submit the following documents :

a) General arrangement/ assembly drawings showing all features and relative positions & sizes of vents, drains, gear box & other external parts together with overall dimensions.

b) Sectional drawing showing major parts with reference numbers and material specification.

c) Reference list of similar plug valves manufactured and supplied in last five years, indicating all relevant details including project, year, client, location, size rating, service, etc.

d) Torque curves for the power actuated valves alongwith break torque and maximum allowable stem torque. In addition, sizing criteria and torque calculations shall also be submitted for power actuated valves.

e) Descriptive technical catalogues of the Manufacturer.

f) Copy of valid API 6D certificate, wherever applicable.

g) Details of support foot, including dimensions and distance from valve centre line to bottom of support foot.

h) Quality Assurance Plan enclosed with this tender duly signed, stamped and accepted.

IMPORTANT

The drawings to be submitted alongwith the bid shall be in total compliance with the requirement of technical specification and data sheets of the valves with no exception & deviation.

10.2 Within two weeks of placement of order, the manufacturer shall submit six copies of, but not limited to, the following drawings, documents and specifications for approval :

a) Design drawings and relevant calculations for pressure containing parts and other principle parts.

b) Detailed sectional arrangement drawing showing all parts with reference numbers and materials specification.

c) Assembly drawings with overall dimensions & clearances required and showing all features. Drawing shall also indicate the numbers of turns of handwheel (in case of gear operator) required for operating the valve from full open to full close position and the painting scheme.

d) Welding, heat treatment, testing and quality control procedures.

e) Details of corrosion resistant paint to be applied on the valves.

f) Design calculation for pressure containing parts.

Manufacture of valves shall commence only after approval of the above documents. Once approval has been given by Purchaser, any change in design, material and method of manufacture shall be notified to the Purchaser, whose approval in writing for all changes shall be obtained before the valves are manufactured.

10.3 Within 30 days from the approval date, Manufacturer shall submit one reproducible and six copies of the approved drawings, documents and specification as listed in clause 10.2 of this specification.

10.4 Prior to shipment, Manufacturer shall submit one reproducible and six copies of following :-

a) Test certificates as listed in clause 7.0 of this specification.
b) Manual for installation, erection instructions, maintenance and operation instructions, including a list of recommended spares for the valves.

10.5 All documents shall be in English Language.

11.0 GUARANTEE

11.1 Manufacturer shall guarantee that the materials and machining of valves and fittings comply with the requirements in this specification and in the Purchase Order.

11.2 Manufacturer is bound to replace or repair all valve parts which should result defective due to inadequate engineering or to the quality of materials and machining.

11.3 If valve defect or malfunctioning cannot be eliminated, Manufacturer shall replace the valve without delay.

11.4 Any defect occurring during the period of Guarantee shall be attended to by making all necessary modifications and repair of defective parts free of charge to the Purchaser as per the relevant clause of the bid document.

11.5 All expenses shall be to Manufacturer's account.

TECHNICAL NOTES FOR GATE & GLOBE VALVES

1.0 General

1.1 Valves shall be designed, manufactured, tested, inspected, marked and supplied as per the specifications, applicable design standards & codes and manufacturing standards (latest editions) as specified.

1.2 Material test certificates (Physical property, Chemical composition & Heat treatment report) of the pressure containing parts shall be furnished for the valves supplied. Material test certificates of other parts shall also be furnished for verification during inspection.

1.3 For heavy valves, provision for lifting shall be made by way of lugs, eyebolts, or similar standard devices.

1.4 Unless otherwise stated, all flanged valves shall have end flanges integral with valve body. Weld on flanges are not acceptable. Flange finish shall be serrated finish 250 AARH (250 AARH to 500 AARH) or 125 AARH (125 AARH to 250 AARH) or 63 MRH (32 AARH to 63 AARH) as per valve specification sheet.

1.5 For all weld end valves, with bevel end as per ANSI B 16.25, the bevel contour shall be as follows:

Material	**Wall Thickness**	**Weld Contour**
Carbon Steel (Except Low Temp. Carbon Steel)	Upto 22 mm > 22 mm	Figure 2 Type A Figure 3 Type A
Alloy Steel	Upto 10 mm	Figure 4
Stainless Steel & Low Temp Carbon Steel	> 10 mm & upto 25 mm > 25mm	Figure 5 Type A Figure 6 Type A

1.6 If an overlay weld-deposit is used for the body seat ring, seating surface, the seat ring base material shall be at least equal to the corrosion resistance of the materials of the shell.

1.7 For valve body/ bonnet, forging is acceptable where castings are specified but not vice versa.

1.8 Material of construction of yoke shall be as a minimum equivalent to body/ bonnet material.

1.9 Stem shall be forged or machined from a forged bar. Castings are not permitted except integral stem.

1.10 Stelliting/ hard facing by deposition shall have minimum 1.6mm thickness. Renewable seat rings shall be seal welded.

1.11 Face to face dimension of flanged valves shall conform to ANSI B 16.10 to the extent covered. For valves not covered in the ANSI specification, Contractor shall furnish certified dimensional drawings.

1.12 Flange dimensions of steel, alloy steel and stainless steel flanged valves shall conform to ANSI B 16.5 for sizes up to 24" and API 605 for size 26'' and above.

1.13 Flange dimensions for cast iron flanged valves shall conform to ANSI B 16.1 for size up to 24" class 125 and API 605 with flat face for sizes greater than 24".

1.14 Unless otherwise mentioned, various valves should conform to following standards / codes.

SW gate valves (1 1/2'' and below)	:	API 602
SW Globe valves (1 1/2" and below)	:	BS 5352
Flanged gate valves		API 600 & API-6D
Flanged Globe valves	:	BS 1873

1.15 Wherever stellite is specified, it means facing of seat and disc are welded by Cr-Co-W alloy. Stellite facing shall maintain minimum hardness of 375 BHN at high temperature.

1.16 All weld end valves shall have bevel ends as per ANSI B 16.25.

1.17 If an overlay weld deposit is used for the body seat ring or seating surface, the seat ring base material shall be at least equal to corrosion resistance of the material of the shell.

1.18 <u>By Pass</u>

- Unless otherwise noted, by-pass requirement for gate valves shall be under -

150 Class	:	on sizes 26" and above
300 Class	:	on sizes 16" and above
600 Class	:	on sizes 6" and above
900 Class	:	on sizes 4" and above
1500 Class	:	on sizes 4' and above
2500 Class	:	on sizes 3" and above

- By-pass valve shall be a globe valve.

- Contractor shall supply the by-pass valve duly tested and fitted to the main valve. By-pass attachment to the main valve body shall not be screwed. All fillet welds for by-pass installation shall be 100% examined by DP / MP test.

1.19 Spiral wound bonnet gasket is to be provided with inner / outer ring except when encapsulated gaskets type body bonnet joints are employed. Outer ring may be avoided in case of non-circular spiral wound gasket used in 150# valve provided the outermost layer of spiral touches the bolts ascertaining the centering.

1.20 <u>Pressure Test</u>

- Valves covered under API codes shall be tested as per API 598 unless otherwise specified in the applicable valve code.

- Valves covered under BS code shall be tested as per BS 6755 unless otherwise specified in the applicable valve codes.

1.21 For all austenitic stainless valves, inter-granular corrosion test shall have to be

conducted as per following: -

- ASTM A 262 Practice 'E' with acceptance criteria of "60 mils / year (max.)".

OR

- ASTM A 262 practice 'E' with acceptance criteria of "No cracks as observed from 20X magnification U & Microscopic structure to be observed from 250X magnification".

1.22 When specifically asked for high temperature application of some grades of austenitic stainless steel (like SS 309, 310, 316, 316H etc.) ASTM A 262 practice 'C' with acceptance criteria "15 MILS/YEAR" shall have to be conducted. When testing is conducted as per practice 'E' photograph of microscopic structure shall be submitted for record.

1.23 For the IGC test as described in 1.16.1 & 1.16.2 two sets of samples shall be drawn from each solution treatment lot, one set corresponding to highest carbon content and other set corresponding to the highest rating/ thickness.

2.0 OPERATION

2.1 Valves shall be supplied with gear operations based on the following requirements:

Valve Types	Class	Size Requiring Gear Operation
Gate & Diaphragm Valves	150	14" and larger
	300	14" and larger
	600	12" and larger
	900	6" and larger
	1500	3" and larger
	2500	3" and larger
Globe Valves	900	6" and larger
	1500	3" and larger
	2500	3" and larger

2.2 Gear operator shall be as under with position indicators for open / close positions, with limit stops.

For Gate / Globe / Diaphragm Valves	Totally enclosed bevel gear in grease case with grease nipples/ CHECK

2.3 Gear operators shall be so designed to operate effectively with the differential pressure across the closed valve equal to the cold non-shock pressure rating.

2.4 Hand wheel diameter shall not exceed 750 mm and effort to operate shall not exceed 35 kg at hand wheel periphery. In case these limits cannot be satisfied for any valve, a gear operation shall be provided.

3.0 INSPECTION AND TESTING

3.1 All the mandatory shop tests and inspection required by the respective data sheet and applicable standards & codes etc. shall be carried out.

3.2 The extent of inspection by shall be as under. However the exact extent with hold

points shall be decided during review of the inspection plan to be submitted to Company as part of the post-order documentation.

3.3 Valves under NACE should follow the requirements of MR-01-75

FORGED VALVES

- Visual and dimensional inspection
- Review of material test certificates
- Any mandatory or supplementary test
- Hydrostatic test of all valves
- Strip check on 1% of total ordered quantity of valves at random to verify compliance with specification requirements.

CAST STEEL VALVES

- Visual and dimensional inspection
- Review of material test certificates
- Review of radiographs / radiographic reports and reports of any other NDT tests, wherever applicable as per data sheets
- Any mandatory or supplementary tests
- Hydrostatic test 100% for body
- Strip check on 1% of total ordered quantity of valves at random to verify compliance with specification requirements.

3.4 For motor /actuator operated valves, functional / operational checks as per the requirements of the specifications shall be made on each valve.

4.0 RADIOGRAPHY OF CAST VALVES

4.1 When specifically not mentioned in individual data sheets, valves castings shall undergo radiographic examination as specified hereunder:

MATERIAL	RATING	SIZE RANGE	RADIOGRAPHY
All	150#	24” and below	Nil
	150#	26” and above	100%
	300#	16” and below	Nil
	300#	18” and above	100%
	600# and above	All sizes	100%

4.2 Radiography procedure areas of casting to be radiographed shall be as per ANSI B 16.34 and acceptance criteria shall be as per ANSI B 16.34 Annexure — B. However for areas of casting to be radiographed for types of valve not covered in ANSI B 16.34, Contractor shall enclose details of areas to be radiographed in line with ANSI B 16.34.

5.0 IBR VALVES

5.1 All valves described as “IBR Valves” shall be in accordance with the latest IBR (Indian Boiler Regulations) as well as the other requirements specified in the specification.

5.2 For BW / SW end carbon steel valves under “IBR”, the chemical composition shall conform to the following:

Carbon (Max.) : 0.25%

Others (S, B, Mn) : As per IBR

Above composition is not applicable for non-IBR valves.

5.3 For all "IBR Valves", test certificate in form III-C shall be furnished duly signed by IBR inspection authority or an IBR approved representative.

5.4 All valves shall be painted red.

6.0 **MARKING**

6.1 Valves markings, symbols, abbreviations, etc. shall be in accordance with MSS-SP-25 or the standard referred to in the specifications as applicable Manufacturer's name, valve size and rating, material designation, nominal size, direction of flow (if any) etc. shall be integral on the body.

6.2 Each valve shall have a corrosion resistant tag giving size and valve tag/code no. securely attached on the valve body.

6.3 Paint or ink used for marking shall not contain any harmful metal or metal salts such as zinc, lead or copper which may result in corrosive attack on heating.

6.4 Carbon steel valves shall be painted with two coats of red oxide zinc chromate primer.

6.5 All alloy steel high temp valves shall be painted with heat resistant silicone paint suitable for intended temperature.

7.0 **DESPATCH**

7.1 Valves shall be dry, clean and free from moisture, dirt and loose foreign material of any kind.

7.2 Valves shall be protected from rust, corrosion and any mechanical damage during transportation, shipment, and storage.

7.3 Rust preventative applied on machined surfaces to be welded shall be easily removable with a petroleum solvent or shall not be harmful to welding.

7.4 Each end of valves shall be protected as follows:

Flange Face	:	Wood, plastic or metal cover
Beveled End	:	Wood, plastic or metal cover
SW / Screwed End	:	Plastics cap

7.5 End protectors to be used on flange faces shall be attached by at least three bolts or wires through bolt holes and shall not be smaller than the outside diameter of the flange. Plastic caps for SW / Screwed and valves shall be press fit type.

7.6 End protectors to be used on beveled ends shall be securely attached.

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STANDARD TECHNICAL SPECIFICATION FOR PACKING, TRANSPORTATION AND HANDLING OF VALVES

SPECIFICATION NO.: MEC/TS/05/21/061

(OIL & GAS SBU)
MECON LIMITED
DELHI 110 092

PREPARED BY:	CHECKED BY:	APPROVED BY:	ISSUE DATE :
(ASHISH MATHUR) SDE	(HARSH KUMAR) MGR	(A. K. GUPTA) DGM	11.09.2018

AMENDMENT STATUS

Sl. No.	Clause / Paragraph / Annexure / Exhibit / Drawing Amended	Page No.	Rev.	Date	BY		Verified	
					Name	Sig.	Name	Sig.

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1.0 SCOPE

This specification covers the minimum requirements for Packing, Handling & transportation of valves and actuators. Though this specification covers the minimum requirement for packing, handling and transportation of valves, it is to be noted that any defect/ damage arising out of improper packing, handling & transportation shall be the responsibility of vendor. The delay due to rectification of such faults shall be to vendor's account. The date of delivery of material at site shall be considered as the day on which last such rectified material is delivered/ rectified at designated store.

2.0 PACKING

2.1 All valves shall be completely drained of test fluid and thoroughly dried after hydrotesting. The machined surfaces shall be coated with a light film of high viscosity rust inhibiting oil which will not become fluid and run off at temperatures below 80°C.

2.2 Flanged valves NPS 6" and smaller in Class 150 and Class 300 shall be fitted with UV resistant plastic covers. For other sizes, valve end flanges shall be fitted with plywood covers. The cover diameter shall be the same as the outside diameter of the flange and shall be at least 10 mm thick for valves up to NPS 24" and 12 mm thick for valves NPS 26" and larger. The cover shall be attached by machine bolts with a nut and washer fitted on the inside of the flange. There shall be minimum four (4) bolts on valves up to NPS 24" nominal size and eight (8) bolts on valves NPS 26 inch and larger. The bolts diameter shall not be less than ¼ the size of the flange bolt hole.

2.3 In addition to the above, all flange facings (ring joint, raised and flat) shall be covered with NBR (based) rubber Self-Adhesive protection (see fig below) that meets the following:

- Oil, ozone and weather resistant
- Minimum thickness of 1.5 mm
- Withstand temperatures up to 75°C
- Non deforming, loosening or detaching
- Proof against sand blasting
- No glue residue
- Chloride free

2.4 Buttweld end valves shall be blanked on each end by high impact plastic bevel protectors, so that bevels are protected from possible mechanical damage during transportation.

2.5 The ends of threaded and socket weld end valves shall be protected with tight fitting plastic caps.

2.6 Packing shall be strong and sturdy such that it can withstand loading/unloading, pushing and crane lifting etc. All packaging shall be done in such a manner as to reduce volume and weight as much as possible without jeopardizing the safety of the material. All packing materials shall be new.

2.7 Stacking of multiple valves in single box is permitted upto 4" NB. However, in such case suitable partitions are to be made inside packing box.

2.8 Where height limitations restrict transportation of valve with actuator in assembled condition, actuator should be dismantled after successful testing at shop. However, the same need to be proposed by valve manufacturer during inspection of said valves and take the approval for Client/ PMC.

2.9 When valve, extended stem and actuators are transported in dismantled condition, the same shall be reassembled after fitment of valve at site. Valve vendor to deploy their representative within 3 days once the intimation is sent from site. Any delay beyond 3 days shall be to supplier's account.

2.10 Valve manufacturers to note that the safe transportation of assembled valve with actuator is in their scope of work. It is therefore required that the valve manufacturer should order actuator meeting the packing guidelines given in this specification. No claim shall be entertained on account of actuator manufacturer's non compliance of requirements specified in this specification, and the valve with actuator shall leave manufacturer's workshop after meeting the terms given in this specification.

2.11 Valves shall not be packed in poly wrap irrespective of the increase in shipping/ transport volume. Box of wood/ ply board etc. shall only be used to pack the valves with/ without actuator irrespective of the size/ rating of the valve.

2.12 The packing shall have suitable lifting arrangement to enable the lifting of valve with the packing. Suitable provisions/ supports shall be provided from support foot/ lifting lugs to enable to lift the valve with packing.

2.13 Where it is required to transport valve and actuator separately, above clauses shall be individually applicable for valve and actuator.

2.14 Assembled Valves shall be properly secured inside packing in order to avoid any contact with packing material during transport.

2.15 For extended stem valves, it is permissible to dismantle stem extension and actuator and as such the valve may be transported in three parts, each part complying individually the requirements of this specification.

2.16 Actuators shall be packed in wooden box with proper cushioning of damage prone parts like sockets, tubing, panel boxes etc.

2.17 Actuator cylinders shall be mounted on base with the help of metallic U-clamps/ welding on reinforcement plate. Metallic U-clamps to be used with double bolts on either side of U clamp.

2.18 Actuator components layout shall be such that to minimize packing volume. Back-up tank shall be put in horizontal position only, wherever feasible.

2.19 The manufacturer shall exhibit the packing meeting to the requirement of this specification during inspection and take clearance.

3.0 HANDLING

3.1 Manufacturer to ensure that during lifting hooks for assembly are attached to body/ end piece casting/ forging only and not on the pup piece. Any pup piece having hook attachment mark may be rejected.

3.2 Assmebled valves, at all times, shall be lifted through lifting lugs only and not from the pup pieces.

3.3 Support foot shall be provided on body only in bolted design. In no case, the support foot shall be fastened in body bolting.

3.4 Lifting Lugs shall be provided on body/ tail piece in bolted design. In no case, the lifting lugs shall be fastened in body bolting.

3.5 Valve vendor to work in close coordination with actuator vendor to ensure that the sling put in lifting lug of valve do not interfere with the actuator/ tubing during lifting at site. Any breakage during site lifting due to fouling of tubing/

actuator components during site lifting shall be in supplier' account.

3.6 Extended Stem valves shall have placement of lifting lugs to ensure the lifting of valve in stem vertical condition only. Under no condition the valve is to be lifted in Stem horizontal/ inclined position.

4.0 TRANSPORTATION

4.1 If the valve and actuator in assembled condition can be accommodated on low bed trailer, low bed trailer shall only be used for inland transportation. Dismantling of valve and actuator shall not be permitted under such case.

4.2 Valve shall be secured on trailer/ truck bed with ropes suitably attached with valve boxes. Type of rope selection shall depend upon weight of valve.

4.3 Tack welds on trailer/ truck bed shall not be used as a fastening method.

4.4 Bolting may be used to securely fasten the valve base on trailer if the provision is available. No. and diameter of bolts shall be suitably chosen as per weight of valve to ensure that bolts do not shear off during transportation.

4.5 For large size valves, Loading shall be done preferably by hanging the valve in position and moving the vehicle to valve sitting position.

4.6 Since unloading of valves is under valve manufacturer's scope, it is to be ensured that valve manufacturer's representative shall be available at designated store to facilitate the same. Valve manufacturer has to keep the track of vehicle movement accordingly. If due to project exigency/ time constraint the unloading has to be done during manufacturer's representative's absence, any damage during such unloading shall be attributable to manufacturer only.

DATA SHEETS

DATA SHEET FOR PLUG VALVE

MR Item nos. : A.1

1.0 Valve Manufacturer :

2.0 Valve Size (NB) (inch) : 10" ANSI Rating : 300# **Design Standard** : API 6D

3.0 MECON's Technical Specification No. : **MEC/TS/05/62/003, Rev-2** **Design Temperature, °C** : -29°C to 65°C

4.0 Connecting Pipeline Design Pressure, Kg/cm2(g) : 49

5.0	**Connecting Pipe Specification**	10"
5.1	Material	API 5L, Gr. B PSL2
5.2	Diameter (OD), mm (inch)	273 mm
5.3	Thickness, mm	12.7 mm

6.0 **Valve Construction Design**

6.1. Pattern : Short [ ] Regular [√] Venturi [ ]

6.2. End Connections : **Flanged both ends** [ ] Flanged as per ASME B 16.5

: **Butt Weld both ends** [√] Butt Weld as per ASME B16.25

: **Flanged one end, butt weld other end** [ ]

6.3. Flanges (wherever applicable) : a) RF [ ] FF [ ] RTJ [ ] NA [√]

b) Serrated [ ] Smooth (125 to 200 microinches AARH) [ ] NA [√]

7.0 **Valve Material Specification**

	Part	Material	Material Offered (Equivalent or Superior)
7.1	Body	**A 216 Gr. WCB/A 234 Gr. WPB/A105**	
7.2	Plug	**(A 216 Gr.WCB/A 234 Gr.WPB/A105)+75 µENP coating/AISI410**	
7.3	Cover	**ASTM A216 Gr. WCB/ A234 Gr. WPB**	
7.4	Stem (No Casting)	**(AISI 4140 + 75 microns ENP Coating)/ AISI 410**	
7.5	Stem Seal	**PTFE/Graphite**	
7.6	Stud Bolts/ Nuts	**ASTM A193 Gr. B7/ A194 Gr. 2H**	

8.0 Corrosion Allowance : 5 mm Service : NATURAL GAS / RLNG

9.0 Location : Above Ground [ ] Buried [√]

10.0 Stem Extension Requirement : Yes [√] [ ] Length of stem extension shall be 2750+ or -250mm which shall be finalized during drawing approval stage.

11.0 Gear Operator Requirement : Yes [√] No [ ]

12.0 Gas Powered Actuator Requirement : Yes [ ] No [√]

13.0 Fire Resistant Design Requirement : **Type-Test as per Standard API 6FA/ BS EN: 10497**

14.0 **Valve Testing Requirement**

			Test Pressure (min.), kg/cm2(g)	Minimum Duration, minutes
14.1	Hydrostatic Test	Body	**76**	**As per API 6D**
		Seat	**57**	**As per API 6D**
14.2	Air Test		**5.6 - 7**	**As per API 6D**

15.0 **Valve Painting Specification**

15.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.

15.2 For under ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 600 micron Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage.

16.0 Lock Open/ Lock Close Requirement : **N. A.**

Notes:

1. This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/62/003, Rev2
2. Inspection and Testing shall be as per attached QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards.
3. Stops shall be provided for positive alignment of plug with ports and ensure proper installation of handle.
4. Charpy V- notch & Hardness test for body, plug, cover, stem & studs/nuts shall be conducted as per Clause No.: 3.4 & 3.5 of TS respectively.
5. Minimum all pressure containing and controlling parts of the valve shall be provided with EN 10204-3.2 certificate.
6. Attached generic QAP shall be submitted for approval after making necessary changes considering 3.2 certification aspect.
7. Material for body shall have a guaranteed minimum yield strength of 35000 psi. In case the same cannot be guaranteed, valves shall be provided with a 500 mm pup piece (integrally welded to the valve on each side) with strength equivalent to that of the connecting pipe. **- N.A.**
8. For welding end, the out of roundness (i. e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD.
9. Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate **"AGREED".**
10. Minimum thickness of valve body / adapter shall not be less than that specified in ASME B16.34 plus corrosion allowance specified in this datasheet .

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	NAME	DATE	CHKD	DATE
SECTION OIL & GAS				
DSGN	Sachin	14.06.19	Harsh	14.06.19
DRWN				

APPROVED AK Gupta DGM

CLIENT : Oil India Limited

PROJECT: **BAGHJAN – MADHUBAN PIPELINE PROJECT**

DATA SHEET FOR PLUG VALVES (NB ≥ 2")

REFERENCES DRG. NO.

MECON LIMITED

SCALE :

DATA SHEET NO.: MEC/23U1/05/28/M/001/DS/PV/01

REV 0

DATA SHEET FOR PLUG VALVE

MR Item nos. : A.2

1.0 Valve Manufacturer :

2.0 Valve Size (NB) (inch) : 10" ANSI Rating : 300# **Design Standard** : API 6D

3.0 MECON's Technical Specification No. : **MEC/TS/05/62/003, Rev-2** **Design Temperature, °C** : -29°C to 65°C

4.0 Connecting Pipeline Design Pressure, Kg/cm2(g) : 49

5.0	**Connecting Pipe Specification**	10"
5.1	Material	API 5L, Gr. B PSL2
5.2	Diameter (OD), mm (inch)	273 mm
5.3	Thickness, mm	12.7 mm

6.0 **Valve Construction Design**

6.1. Pattern : Short [ ] Regular [√] Venturi [ ]

6.2. End Connections : **Flanged both ends** [ ] Flanged as per ASME B 16.5

: **Butt Weld both ends** [√] Butt Weld as per ASME B16.25

: **Flanged one end, butt weld other end** [ ]

6.3. Flanges (wherever applicable) : a) RF [ ] FF [ ] RTJ [ ] NA [√]

b) Serrated [ ] Smooth (125 to 200 microinches AARH) [ ] NA [√]

7.0 **Valve Material Specification**

	Part	Material	Material Offered (Equivalent or Superior)
7.1	Body	**A 216 Gr. WCB/A 234 Gr. WPB/A105**	
7.2	Plug	**(A 216 Gr.WCB/A 234 Gr.WPB/A105)+75 µENP coating/AISI410**	
7.3	Cover	**ASTM A216 Gr. WCB/ A234 Gr. WPB**	
7.4	Stem (No Casting)	**(AISI 4140 + 75 microns ENP Coating)/ AISI 410**	
7.5	Stem Seal	**PTFE/Graphite**	
7.6	Stud Bolts/ Nuts	**ASTM A193 Gr. B7/ A194 Gr. 2H**	

8.0 Corrosion Allowance : 5 mm Service : NATURAL GAS / RLNG

9.0 Location : Above Ground [√] Buried [ ]

10.0 Stem Extension Requirement : Yes [ ] NO [√]

11.0 Gear Operator Requirement : Yes [√] No [ ]

12.0 Gas Powered Actuator Requirement : Yes [ ] No [√]

13.0 Fire Resistant Design Requirement : **Type-Test as per Standard API 6FA/ BS EN: 10497**

14.0 **Valve Testing Requirement**

			Test Pressure (min.), kg/cm2(g)	Minimum Duration, minutes
14.1	Hydrostatic Test	Body	**76**	**As per API 6D**
		Seat	**57**	**As per API 6D**
14.2	Air Test		**5.6 - 7**	**As per API 6D**

15.0 **Valve Painting Specification**

15.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.

15.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage.

16.0 Lock Open/ Lock Close Requirement : **N. A.**

Notes:

1. This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/62/003, Rev2
2. Inspection and Testing shall be as per attached QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards.
3. Stops shall be provided for positive alignment of plug with ports and ensure proper installation of handle.
4. Charpy V- notch & Hardness test for body, plug, cover, stem & studs/nuts shall be conducted as per Clause No.: 3.4 & 3.5 of TS respectively.
5. Minimum all pressure containing and controlling parts of the valve shall be provided with EN 10204-3.2 certificate.
6. Attached generic QAP shall be submitted for approval after making necessary changes considering 3.2 certification aspect.
7. Material for body shall have a guaranteed minimum yield strength of 35000 psi. In case the same cannot be guaranteed, valves shall be provided with a 500 mm pup piece (integrally welded to the valve on each side) with strength equivalent to that of the connecting pipe. **- N.A.**
8. For welding end, the out of roundness (i. e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD.
9. Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate **"AGREED".**
10. Minimum thickness of valve body / adapter shall not be less than that specified in ASME B16.34 plus corrosion allowance specified in this datasheet .

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	NAME	DATE	CHKD	DATE
SECTION OIL & GAS				
DSGN	Sachin	14.06.19	Harsh	14.06.19
DRWN				

APPROVED AK Gupta DGM

CLIENT : Oil India Limited

PROJECT: BAGHJAN – MADHUBAN PIPELINE PROJECT

DATA SHEET FOR PLUG VALVES (NB ≥ 2")

REFERENCES DRG. NO.

MECON LIMITED

SCALE :

DATA SHEET NO.: MEC/23U1/05/28/M/001/DS/PV/02

REV 0

DATA SHEET FOR PLUG VALVE

MR Item nos. : A.3

1.0 Valve Manufacturer :

2.0 Valve Size (NB) (inch) : 10" ANSI Rating : 300# **Design Standard** : API 6D

3.0 MECON's Technical Specification No. : **MEC/TS/05/62/003, Rev-2** **Design Temperature, °C** : -29°C to 65°C

4.0 Connecting Pipeline Design Pressure, Kg/cm2(g) : 49

5.0 **Connecting Pipe Specification** N.A.
5.1 Material
5.2 Diameter (OD), mm (inch)
5.3 Thickness, mm

6.0 **Valve Construction Design**
6.1. Pattern : Short [ ] Regular [√] Venturi
6.2. End Connections : **Flanged both ends** [√] Flanged as per ASME B 16.5
: **Butt Weld both ends** [ ] Butt Weld as per ASME B16.25
: **Flanged one end, butt weld other end** [ ]
6.3. Flanges (wherever applicable) : a) RF [√] FF [ ] RTJ [ ] NA [ ]
b) Serrated [ ] Smooth (125 to 200 microinches AARH) [√] NA [ ]

7.0 **Valve Material Specification**

	Part	Material	Material Offered (Equivalent or Superior)
7.1	Body	**A 216 Gr. WCB/A 234 Gr. WPB/A105**	
7.2	Plug	**(A 216 Gr.WCB/A 234 Gr.WPB/A105)+75 µENP coating/AISI410**	
7.3	Cover	**ASTM A216 Gr. WCB/ A234 Gr. WPB**	
7.4	Stem (No Casting)	**(AISI 4140 + 75 microns ENP Coating)/ AISI 410**	
7.5	Stem Seal	**PTFE/Graphite**	
7.6	Stud Bolts/ Nuts	**ASTM A193 Gr. B7/ A194 Gr. 2H**	

8.0 Corrosion Allowance : 5 mm Service : NATURAL GAS / RLNG

9.0 Location : Above Ground [√] Buried [ ]

10.0 Stem Extension Requirement : Yes [ ] NO [√]

11.0 Gear Operator Requirement : Yes [√] No [ ]

12.0 Gas Powered Actuator Requirement : Yes [ ] No [√]

13.0 Fire Resistant Design Requirement : **Type-Test as per Standard API 6FA/ BS EN: 10497**

14.0 **Valve Testing Requirement**

			Test Pressure (min.), kg/cm2(g)	Minimum Duration, minutes
14.1	Hydrostatic Test	Body	**76**	**As per API 6D**
		Seat	**57**	**As per API 6D**
14.2	Air Test		**5.6 - 7**	**As per API 6D**

15.0 **Valve Painting Specification**
15.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.
15.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage.
16.0 Lock Open/ Lock Close Requirement : **N. A.**

Notes:
1. This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/62/003, Rev2
2. Inspection and Testing shall be as per attached QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards.
3. Stops shall be provided for positive alignment of plug with ports and ensure proper installation of handle.
4. Charpy V- notch & Hardness test for body, plug, cover, stem & studs/nuts shall be conducted as per Clause No.: 3.4 & 3.5 of TS respectively.
5. Minimum all pressure containing and controlling parts of the valve shall be provided with EN 10204-3.2 certificate.
6. Attached generic QAP shall be submitted for approval after making necessary changes considering 3.2 certification aspect.
7. Material for body shall have a guaranteed minimum yield strength of 35000 psi. In case the same cannot be guaranteed, valves shall be provided with a 500 mm pup piece (integrally welded to the valve on each side) with strength equivalent to that of the connecting pipe. **- N.A.**
8. For welding end, the out of roundness (i. e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD.
9. Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate **"AGREED".**
10. Minimum thickness of valve body / adapter shall not be less than that specified in ASME B16.34 plus corrosion allowance specified in this datasheet .

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SECTION OIL & GAS				
	NAME	DATE	CHKD	DATE
DSGN	Sachin	14.06.19	Harsh	14.06.19
DRWN				

APPROVED AK Gupta DGM

CLIENT : Oil India Limited

PROJECT: BAGHJAN – MADHUBAN PIPELINE PROJECT

DATA SHEET FOR PLUG VALVES (NB ≥ 2")

REFERENCES DRG. NO.

MECON LIMITED

SCALE :

DATA SHEET NO.: MEC/23U1/05/28/M/001/DS/PV/03

REV 0

DATA SHEET FOR PLUG VALVE

MR Item nos. : A.4

1.0 Valve Manufacturer :

2.0 Valve Size (NB) (inch) : 4" ANSI Rating : 300# **Design Standard** : API 6D

3.0 MECON's Technical Specification No. : **MEC/TS/05/62/003, Rev-2** **Design Temperature, °C** : -29°C to 65°C

4.0 Connecting Pipeline Design Pressure, Kg/cm2(g) : 49

5.0	**Connecting Pipe Specification**	4"
5.1	Material	API 5L, Gr. B PSL2
5.2	Diameter (OD), mm (inch)	114.3
5.3	Thickness, mm	8.56 mm

6.0 **Valve Construction Design**

6.1. Pattern : Short [√] Regular [ ] Venturi

6.2. End Connections : **Flanged both ends** [ ] Flanged as per ASME B 16.5

: **Butt Weld both ends** [√] Butt Weld as per ASME B16.25

: **Flanged one end, butt weld other end** [ ]

6.3. Flanges (wherever applicable) : a) RF [ ] FF [ ] RTJ [ ] NA [√]

b) Serrated [ ] Smooth (125 to 200 microinches AARH) [ ] NA [√]

7.0 **Valve Material Specification**

	Part	Material	Material Offered (Equivalent or Superior)
7.1	Body	**A 216 Gr. WCB/A 234 Gr. WPB/A105**	
7.2	Plug	**(A 216 Gr.WCB/A 234 Gr.WPB/A105)+75 µENP coating/AISI410**	
7.3	Cover	**ASTM A216 Gr. WCB/ A234 Gr. WPB**	
7.4	Stem (No Casting)	**(AISI 4140 + 75 microns ENP Coating)/ AISI 410**	
7.5	Stem Seal	**PTFE/Graphite**	
7.6	Stud Bolts/ Nuts	**ASTM A193 Gr. B7/ A194 Gr. 2H**	

8.0 Corrosion Allowance : 5 mm Service : NATURAL GAS / RLNG

9.0 Location : Above Ground [√] Buried [ ]

10.0 Stem Extension Requirement : Yes [ ] NO [√]

11.0 Gear Operator Requirement : Yes [ ] No [√] LEVER OPERATED

12.0 Gas Powered Actuator Requirement : Yes [ ] No [√]

13.0 Fire Resistant Design Requirement : **Type-Test as per Standard API 6FA/ BS EN: 10497**

14.0 **Valve Testing Requirement**

			Test Pressure (min.), kg/cm2(g)	Minimum Duration, minutes
14.1	Hydrostatic Test	Body	**76**	**As per API 6D**
		Seat	**57**	**As per API 6D**
14.2	Air Test		**5.6 - 7**	**As per API 6D**

15.0 **Valve Painting Specification**

15.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.

15.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage.

16.0 Lock Open/ Lock Close Requirement : **N. A.**

Notes:

1. This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/62/003, Rev2
2. Inspection and Testing shall be as per attached QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards.
3. Stops shall be provided for positive alignment of plug with ports and ensure proper installation of handle.
4. Charpy V- notch & Hardness test for body, plug, cover, stem & studs/nuts shall be conducted as per Clause No.: 3.4 & 3.5 of TS respectively.
5. Minimum all pressure containing and controlling parts of the valve shall be provided with EN 10204-3.2 certificate.
6. Attached generic QAP shall be submitted for approval after making necessary changes considering 3.2 certification aspect.
7. Material for body shall have a guaranteed minimum yield strength of 35000 psi. In case the same cannot be guaranteed, valves shall be provided with a 500 mm pup piece (integrally welded to the valve on each side) with strength equivalent to that of the connecting pipe. **- N.A.**
8. For welding end, the out of roundness (i. e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD.
9. Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate **"AGREED".**
10. Minimum thickness of valve body / adapter shall not be less than that specified in ASME B16.34 plus corrosion allowance specified in this datasheet .

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	NAME	DATE	CHKD	DATE
SECTION OIL & GAS				
DSGN	Sachin	14.06.19	Harsh	14.06.19
DRWN				

APPROVED AK Gupta DGM

CLIENT : Oil India Limited

PROJECT: BAGHJAN – MADHUBAN PIPELINE PROJECT

DATA SHEET FOR PLUG VALVES (NB ≥ 2")

REFERENCES DRG. NO.

MECON LIMITED

SCALE :

DATA SHEET NO.: MEC/23U1/05/28/M/001/DS/PV/04

REV 0

DATA SHEET FOR PLUG VALVE

MR Item nos. : A.5

1.0 Valve Manufacturer :

2.0 Valve Size (NB) (inch) : 4" ANSI Rating : 300# **Design Standard** : API 6D

3.0 MECON's Technical Specification No. : **MEC/TS/05/62/003, Rev-2** **Design Temperature, °C** : -29°C to 65°C

4.0 Connecting Pipeline Design Pressure, Kg/cm2(g) : 49

5.0 **Connecting Pipe Specification** N.A.
5.1 Material
5.2 Diameter (OD), mm (inch)
5.3 Thickness, mm

6.0 **Valve Construction Design**
6.1. Pattern : Short [√] Regular [ ] Venturi
6.2. End Connections : **Flanged both ends** [√] Flanged as per ASME B 16.5
: **Butt Weld both ends** [ ] Butt Weld as per ASME B16.25
: **Flanged one end, butt weld other end** [ ]
6.3. Flanges (wherever applicable) : a) RF [√] FF [ ] RTJ [ ] NA [ ]
b) Serrated [ ] Smooth (125 to 200 microinches AARH) [√] NA [ ]

7.0 **Valve Material Specification**

	Part	Material	Material Offered (Equivalent or Superior)
7.1	Body	**A 216 Gr. WCB/A 234 Gr. WPB/A105**	
7.2	Plug	**(A 216 Gr.WCB/A 234 Gr.WPB/A105)+75 µENP coating/AISI410**	
7.3	Cover	**ASTM A216 Gr. WCB/ A234 Gr. WPB**	
7.4	Stem (No Casting)	**(AISI 4140 + 75 microns ENP Coating)/ AISI 410**	
7.5	Stem Seal	**PTFE/Graphite**	
7.6	Stud Bolts/ Nuts	**ASTM A193 Gr. B7/ A194 Gr. 2H**	

8.0 Corrosion Allowance : 5 mm Service : NATURAL GAS / RLNG

9.0 Location : Above Ground [√] Buried [ ]

10.0 Stem Extension Requirement : Yes [ ] NO [√]

11.0 Gear Operator Requirement : Yes [ ] No [√] LEVER OPERATED

12.0 Gas Powered Actuator Requirement : Yes [ ] No [√]

13.0 Fire Resistant Design Requirement : **Type-Test as per Standard API 6FA/ BS EN: 10497**

14.0 **Valve Testing Requirement**

			Test Pressure (min.), kg/cm2(g)	Minimum Duration, minutes
14.1	Hydrostatic Test	Body	**76**	**As per API 6D**
		Seat	**57**	**As per API 6D**
14.2	Air Test		**5.6 - 7**	**As per API 6D**

15.0 **Valve Painting Specification**
15.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.
15.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage.
16.0 Lock Open/ Lock Close Requirement : **N. A.**

Notes:
1. This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/62/003, Rev2
2. Inspection and Testing shall be as per attached QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards.
3. Stops shall be provided for positive alignment of plug with ports and ensure proper installation of handle.
4. Charpy V- notch & Hardness test for body, plug, cover, stem & studs/nuts shall be conducted as per Clause No.: 3.4 & 3.5 of TS respectively.
5. Minimum all pressure containing and controlling parts of the valve shall be provided with EN 10204-3.2 certificate.
6. Attached generic QAP shall be submitted for approval after making necessary changes considering 3.2 certification aspect.
7. Material for body shall have a guaranteed minimum yield strength of 35000 psi. In case the same cannot be guaranteed, valves shall be provided with a 500 mm pup piece (integrally welded to the valve on each side) with strength equivalent to that of the connecting pipe. **- N.A.**
8. For welding end, the out of roundness (i. e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD.
9. Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate **"AGREED".**
10. Minimum thickness of valve body / adapter shall not be less than that specified in ASME B16.34 plus corrosion allowance specified in this datasheet .

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SECTION OIL & GAS				
	NAME	DATE	CHKD	DATE
DSGN	Sachin	14.06.19	Harsh	14.06.19
DRWN				

APPROVED AK Gupta DGM

CLIENT : Oil India Limited

PROJECT: BAGHJAN – MADHUBAN PIPELINE PROJECT

DATA SHEET FOR PLUG VALVES (NB ≥ 2")

REFERENCES DRG. NO.

MECON LIMITED

SCALE :

DATA SHEET NO.: MEC/23U1/05/28/M/001/DS/PV/05

REV 0

DATA SHEET FOR GLOBE VALVES

MR Item nos. : B.1

1. Valve Manufacturer :

2. Size : **4"** **Rating : ANSI 300#** Design Standard **:ISO:15761/ BS 1873**

3. Purchaser's Specification **:** **Refer Technical notes for Gate & Globe Valves**

4. Design Pressure **: 49 kg/cm^2(g)** Design Temperature **: -29^{o}C to + 65°C**

5. Corrosion Allowance **: 5 mm** Service **: Natural Gas / RLNG**

6. End Connections :
   - Flanged both ends as per ASME B 16.5 [√]
   - Butt Weld both ends as A-16.25 [ ]
   - Flanged one end butt weld other end [ ]
   - Socket weld both ends as per ASME B16.11 [ ]

7. Flanges (where applicable) : a) RF [√] FF [ ] RTJ [ ]

   b) Serrated [ ] Smooth (125 to 200 AARH) [√]

8. Connecting Pipe Specification **:**

9. Valve Material Specification :

	Part	Material	Material Offered (Equivalent or Superior)
9.1	Body	**ASTM A 216 Gr.WCB**	
9.2	Bonnet (Bolted)	**ASTM A 216 Gr.WCB**	
9.3	Stem (Rising)	**13% Cr. Steel (No Casting)**	
9.4	Disc(Loose Plug/Ball Type)	**(ASTM A 216 Gr. WCB + 13% Cr Steel Facing) /**	
		13% Cr Steel (Stellited)	
9.5	Body Seat Ring	**ASTM A 216 Gr. WCB+13% Cr Steel Facing (Stellited)**	
9.6	Stem Packing (Renewable	**Corrosion inhibited die formed flexible**	
	with valve open on stream)	**graphite with braided anti extrusion rings**	
9.7	Hand Wheel (Rising)	**Malleable Iron/ Cast Steel/ Fab. Steel**	
9.8	Bonnet Bolts	**A 193 Gr. B7**	
9.9	Bonnet Nuts	**A194 Gr. 2H**	
9.10	Bonnet Gasket	**Spiral Wound SS 316 + Grafoil**	

10. Hydrostatic Test Pressure
    - a) Body **: 79 kg/cm^2(g)**
    - b) Seat **: 57 kg/cm^2(g)**

11. PnuematicTest Pressure with Air **: 5.6 - 7 kg/cm2 (g).**

12. Painting Specifications:

i) Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.

ii) For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron).

Notes:

1. Valve specification sheet shall be read in conjunction with technical notes for Gate and Globe valves.
2. Valve shall be designed for intrinsically fire safe.
3. Testing shall be as per BS EN 12266-1,approved QAP,this specification and other relevant standards.
4. Bidder shall clearly write all/ any deviation against each part/ material of valve in the space provided for . Wherever bidder agrees with MECON's data sheet, bidder shall clearly indicate "agreed".
5. Charpy 'V' notch test on each heat of base material shall be conducted for all pressure containing parts such as body, end flange, welding ends as well as the bolting material as per ASTM A370. The test shall be conducted at 0°C. The minimum average absorbed energy per set of three specimen shall be 27 J with an individual minimum per specimen of 22 J.
6. Hardness test shall be carried out on each heat of base material for all pressure containing parts of the valve. A full thickness cross section shall be taken for this purpose and the maximum hardness shall not exceed 248 HV10 based on minimum four measurements representing the entire thickness.
7. Stem packing shall be renewable with valve open on stream .
8. Painting procedure of the valves shall be as per Manufacturer's Standard.
9. Material Test Certificates and Hydro Test Reports shall be furnished prior to dispatch.
10. Minimum thickness of valve body / adapter shall not be less than that specified in ASME B16.34 plus corrosion allowance specified in this datasheet .

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD

SECTION PROCESS & PIPING				
	NAME	DATE	CHKD	DATE
DSGN	Sachin	14.06.2019	Harsh Kumar	14.06.2019
DRWN				

APPROVED AK Gupta DGM

CLIENT : Oil India Limited

PROJECT: **BAGHJAN – MADHUBAN PIPELINE PROJECT**

DATA SHEET FOR GLOBE VALVES ≥ 2"

REFERENCES DRG. NO.

MECON LIMITED

SCALE : REV

DATA SHEET NO.: MEC/23U1/05/21/M/001/DS/GV/01 0

LIST OF COMMISSIONING SPARES AND ACCESSORIES FOR START-UP & COMMISSIONING FOR PLUG VALVES

Sl. No.	Item No.	Description	Quantity
1.		Sealant Gun for PLUG VALVES	One No.
2.		Sealant for PLUG VALVES	One lot
3.			
4.			
5.			

NOTES:

1. Bidder to include the start-up and commissioning spares for valves in the quoted price for Plug Valves.
2. Vendor shall provide sufficient amount of sealant to cater one filling of all the ordered valves.
3. Each successful bidder shall supply above mentioned commissioning spares as detailed in the TS.

To be filled, signed and stamped by Bidder.

Bidder's Seal **Signature of Bidder**

LIST OF SPARES AND ACCESSORIES FOR TWO YEARS OF NORMAL OPERATION FOR VALVE

Sl. No.	Item No.	Description	Quantity
1.			
2.			
3.			
4.			
5.			

NOTE:

Bidder shall quote separately spares for two years normal operation for valves as per price schedule proforma.

To be filled, signed and stamped by Bidder.

Bidder's Seal **Signature of Bidder**

QULITY ASSURANCE PLAN

MECON ISO 9001 Company	CONTRACTOR		**QUALITY ASSURANCE PLAN FOR** STRUCTURAL AND MECHANICAL EQUIPMENT	PROJECT : BAGHJAN –MADHUBAN PIPELINE PROJECT
	ORDER NO. & DATE			
	SUB-CONTRACTOR			PLUG VALVES,GLOBE VALVES
	ORDER NO. & DATE			

INSTRUCTIONS FOR FILLING UP :

1. QAP shall be submitted for each of the equipment separately with break up of assembly/sub-assembly & part/component or for group of equipment having same specification.
2. Use numerical codes as indicated for extent of inspection & tests and submission of test certificates & documents. Additional codes & description for extent of inspection & tests may be added as applicable for the plant and equipment
3. Separate identification number with quantity for equipment shall be indicated wherever equipment having same specifications belonging to different facilities are grouped together.
4. Weight in kilograms must be indicated under Column-5 for each item. Estimated weights may be indicated wherever actual weights are not available.

ABBREVIATIONS USED :

SV : SUB VENDOR
MFR : MANUFACTURER
TPI : DESIGNATED THIRD PARTY INSPECTION AGENCY
H : HOLD
R : REVIEW
W : WITNESS

KEY TO SYMBOLS :

* : TO BE FILLED BY VENDOR
** : TEST TO BE PERFORMED, IF APPLICABLE

CODES FOR EXTENT OF INSPECTION, TESTS, TEST CERTIFICATES & DOCUMENTS :

Code	*Description*
1.	Visual
2.	Dimensional
3.	Fitment & Alignment
4.	Physical Test (Sample)
5.	Chemical Test (Sample)
6.	Ultrasonic Test
7.	Magnetic Particle Test (MPI)
8.	Radiography Test
9.	Dye Penetration Test
10.	Metallographic Exam.
11.	Welder's Qualification & Weld Procedure Test
12.	Approval of Test and Repair Procedure
13.	Heat Treatment
14.	Pressure Test
15.	Leakage Test
16.	Balancing
17.	Vibration Test
18.	Amplitude Test
19.	Sponge Test
20.	Dust/ Water Ingress Test
21.	Friction Factor Test
22.	Adhesion Test
23.	Performance Test/Characteristic Curve
24.	No Load/ Free Running Test
25.	Load/ Overload Test
26.	Measurement of Speeds
27.	Accoustical Test
28.	Geometrical Accuracy
29.	Repeatability and Positioning Accuracy
30.	Proving Test
31.	Surface Preparation
32.	Manufacturer's Test Certificates for bought-out items
33.	IBR/ Other Statutory agencies compliance certificate
34.	Internal Inspection Report by Contractor
35.	Hardness Test
36.	Spark Test for Lining
37.	Calibration
38.	Safety Device Test
39.	Ease of Maintenance
40.	Fire Test (Type Test)
41.	Charpy V-Notch Test
42.	Operational Torque Test
43.	ENP (Electroless Nickel Plating) Execution
44.	Painting
45.	Anti-Static Test
46.	Hydrostatic Double Block & Bleed Test
47.	Functional Test
48.	Pneumatic Double Block & Bleed Test
49.	Cyclic Test

Code	*DOCUMENTS:*
D1.	Approved GA drawings
D2.	Information and other reference drg/ stamped drgs released for mfg.
D3.	Relevant catalogues
D4.	Bill of matl./Item no./ Identification
D5.	Matchmarks details
D6.	Line/ Layout diagram
D7.	Approved erection procedures
D8.	Unpriced sub P.O. with specification and amend-ments, if any
D9.	Calibration Certificate of all measuring instruments and gauges
D10.	X-Ray Reports

EQUIPMENT DETAILS							INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	REMARKS/ SAMPLING PLAN
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No. (MR Item No.)	Quantity No./M	Unit Weight (Kg)	Manufacturer's Name and Address	Expected Schedule of Final Inspn.	Raw Material and In-Process Stage Inspection			Final Inspection/ Test by					
							MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.0	PLUG Valves 10", 4" #300 GLOBE Valves 4" #300	A.1 to A.5 B.1	As Per MR	*	*	*	As per attached sheet 2 to 10								

For MECON (Stamp & Signature)

For CONTRACTOR/ SUB-CONTRACTOR (Stamp & Signature)

QAP NO. MEC/23U1/05/28/M/001/S003/QAP

REV **0**

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
1.01	Body	Material As per MR/ Alternate Material accepted by MECON			1,2	-	-	-	-	-	1. D1 2. Report	1. D1 2. Relevant Material Standard 3. Manufacturer's Specification	H	R	R	
					4	4	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's D.S.	H	H	R	
					5	5	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					6 **	6 **	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	H	W	R	Forgings, welds, wrought weld ends
					7 **	7 **	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	H	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)
					8 **	8 **	-	-	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	H	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	H	R	R	
					35	35	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					41	41	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
1.02	Closure/ Body Adapter/ Tail Piece	Material Manufacturer to indicate (to be approved by MECON)			1,2	-	-	-	-	-	1. D1 2. Report	1. D1 2. Relevant Material Standard 3. Manufacturer's Specification	H	R	R	
					4	4	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's D.S.	H	H	R	
					5	5	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	H	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	H	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	H	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	H	R	R	
					35	35	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					41	41	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
1.03	Top Cover	Material Manufacturer to indicate (to be approved by MECON)			1,2	-	-	-	-	-	1. D1 2. Report	1. D1 2. Relevant Material Standard 3. Manufacturer's Specification	H	R	R	
					4	4	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's D.S.	H	H	R	
					5	5	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					6 **	6 **	-	-	-	-	Test Report	1. ASME B16.34, Annex-E 2. MECON's T.S.	H	W	R	Forgings, welds, wrought weld ends
					7 **	7 **	-	-	-	-	Test Report	1. ASME B16.34, Annex-C 2. MECON's T.S.	H	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)
					8 **	8 **	-	-	-	-	Test Report	1. ASME B16.34 Annex-B 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	R	R	R	
					35	35	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					41	41	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	R	H	R	
1.05	Obturator	Material As per MR/ Alternate Material accepted by MECON			1,2	1,2	-	-	-	-	1. D1 2. Report	1. D1 2. Relevant Material Standard 3. Manufacturer's Specification	H	R	R	
					4	4	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's D.S.	H	H	R	

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					5	5	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	H	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	H	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	H	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	H	R	R	
					35	35	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					41	41	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					43	43	-	-	-	-	1. Test Report 2. Material Test Certificates for composition, hardness, thickness & integrity	1. MECON's T.S. 2. MECON's D.S. 3. ASTM B733 Std. 4. Manufacturer's Specification	H	H	R	
1.06	Stem	Material As per MR/ Alternate Material accepted by MECON			1,2	1,2	-	-	-	-	1. D1 2. Report	1. D1 2. Relevant Material Standard 3. Manufacturer's Specification	H	R	R	
					4	4	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's D.S.	H	H	R	
					5	5	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	H	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	H	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	H	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	H	R	R	
					35	35	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					41	41	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					43	43	-	-	-	-	1. Test Report 2. Material Test Certificates for composition, hardness, thickness & integrity	1. MECON's T.S. 2. MECON's D.S. 3. ASTM B733 Std. 4. Manufacturer's Specification	H	H	R	
1.07	Seats	Material As per MR/ Alternate Material accepted by MECON			1,2	1,2	-	-	-	-	1. D1 2. Report	1. D1 2. Relevant Material Standard 3. Manufacturer's Specification	H	R	R	
					4	4	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's D.S.	H	H	R	
					5	5	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	H	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	H	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	H	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	H	R	R	
					35	35	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					41	41	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					43	43	-	-	-	-	1. Test Report 2. Material Test Certificates for composition, hardness, thickness & integrity	1. MECON's T.S. 2. MECON's D.S. 3. ASTM B733 Std. 4. Manufacturer's Specification	H	H	R	
1.08	Bolting Material (Studs & Nuts)	Material As per MR/ Alternate Material accepted by MECON			1,2	1,2	-	-	-	-	1. D1 2. Report	1. D1 2. Relevant Material Standard 3. Manufacturer's Specification	H	R	R	Alongwith thickness measurement for ENP Coating.
					4	4	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's D.S.	H	H	R	
					5	5	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	H	W	R	Forgings, welds, wrought weld ends

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	H	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	H	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	H	R	R	
					41	41	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	H	H	R	
1.09	Assembled Valves				-	-	-	1,2	1,2	1,2	Report	1. D1 2. MECON's T.S.	H	H	W	
					-	-	-	3	3	3	Report		H	H	W	
					-	-	-	14	14	14	1. Report 2. Test Certificates	1. D1 2. MECON's T.S. 3. MECON's D.S. 4. API 6D Std./ BS EN 12266 (as applicable)	H	H	W	
					-	-	-	15	15	15	1. Report 2. Test Certificates	1. D1 2. MECON's T.S. 3. MECON's D.S. 4. API 6D Std./ BS EN 12266 (as applicable)	H	H	W	
								40	40	40	1. Report 2. Test Certificates	1. API 607/ API 6FA / BS EN ISO 10497 (as applicable) 2. MECON's T.S. 3. MECON's D.S.	R	R	R	
								42	42	42	1. Report 2. Test Certificates	1. MECON's T.S. 2. MECON's D.S. 3. API 6D Std. (as applicable)	H	H	W	
					-	-	-	37	37	37	Certificates		-	R	R	
					-	-	-	44	44	44	1. Report 2. Test Certificates	1. MECON's T.S. 2. MECON's D.S. 3. Manufacturer's Specification	H	W	R / W	

EQUIPMENT DETAILS					INSPECTION AND TESTS						Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and Documents	Inspection Codes & Sampling Plan			REMARKS
Sl. No.	Description (with equipment heading, place of use and brief specifications)	Identification No.	Quantity No./M	Unit Weight (Kg)	Raw Material and In-Process stage inspection			Final Inspection/ Test by								
					MFR/SV	TPI	MECON	MFR/SV	TPI	MECON			MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					-	-	-	45	45	45	1. Report 2. Test Certificates	1. MECON's T.S. 2. MECON's D.S. 3. API 6D Std. / BS EN ISO 17292 (as applicable)	H	H	R	
					-	-	-	47	47	47	1. Report 2. Test Certificates	1. MECON's T.S. 2. API 6D Std. / BS EN ISO 17292 (as applicable)	H	H	W	
					-	-	-	49	49	49	1. Report 2. Test Certificates	1. MECON's T.S. 2. MECON's D.S.	H	H	W	
1.10	Complete documentation check and compilation										1. Final Report 2. Final Certificates	1. MECON's T.S. 2. API 6D Std. / BS EN ISO 17292 (as applicable)	H	H	-	
1.11	Complete and compiled documentation check and despatch clearance				-	-	-				1. Final Report 2. Final Certificates	1. MECON's T.S. 2. API 6D Std. / BS EN ISO 17292 (as applicable)	H	-	H	
1.12	Actuator Tests					**Not Applicable**										

For MECON (Stamp & Signature) For CONTRACTOR/ SUB-CONTRACTOR

QAP NO.: MEC/23U1/05/28/M/001/S003/QAP REV **0**