

BAGHJAN – MADHUBAN PIPELINE PROJECT (ASSAM)

BID DOCUMENT FOR PROCUREMENT OF

ASSORTED VALVES

IFB NO. CPG0097P19

International COMPETITIVE BIDDING

VOLUME II OF II



PREPARED AND ISSUED BY MECON LIMITED

(A Govt. of India Undertaking)
Delhi, India

CONTENTS LIST – ASSORTED VALVES

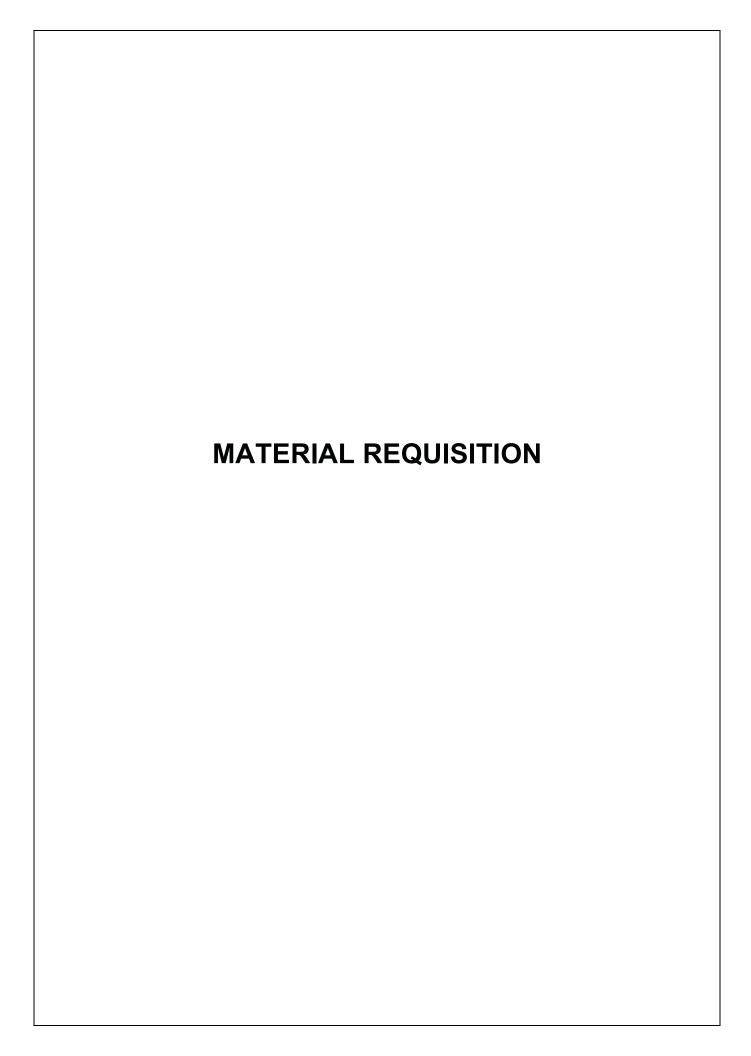


OIL & GAS SBU, DELHI

Page 1 of 1

SI.		Document /	Rev	vision	Total	Tender
No.	Document Title / Description	Drawing No.	No.	Date	Pages	Page Nos.
1.	MATERIAL REQUISITION - BALL VALVES	MEC/23U1/05/28/M/001 /S002	0	20.09.18	06	4-9
2.	NOTES TO MR	MEC/23U1/05/28/M/001 /S002	1	20.09.18	04	10-13
3.	STANDARD TECHNICAL SPECIFICATION FOR BALL VALVES	MEC/TS/05/21/002	Ed1; Rev1		20	15-34
4.	TECHNICAL SPECIFICATION FOR PLUG VALVES	MEC/TS/05/62/003	Rev-2		14	35-48
5.	TECHNICAL NOTES FOR GATE & GLOBE VALVES				07	49-55
6.	TECHNICAL SPECIFICATION FOR GAS OVER OIL ACTUATORS and HOV DATASHEET	MEC/ TS / 05 / E5 / 002	Rev1		18	56-73
7.	TECHNICAL SPECIFICATION FOR PACKING TRANSPORTATION AND HANDLING OF VALVES	MEC/TS/05/21/061	Ed1; Rev0	20.09.18	07	74-80
8.	DATA SHEETS FOR BALL VALVES	MEC/23U1/05/28/M/001 /DS/BV/01 to 11	0	20.09.18	11	82-92
9.	DATA SHEETS FOR PLUG VALVES	MEC/23U1/05/28/M/001 /DS/PV/01 to 5	0	20.09.18	5	93-97
10.	DATA SHEETS FOR GLOBE VALVES	MEC/23U1/05/28/M/001 /DS/GV/01	0	20.09.18	1	98
11.	SPARES LIST (START-UP & COMMISSIONING) - ASSORTED VALVES	MEC/23U1/05/28/M/001 /S002/CS	0	20.09.18	01	99
12.	SPARES LIST (2 YEARS NORMAL OPERATION) - ASSORTED VALVES	MEC/23U1/05/28/M/001 /S002/OS	0	20.09.18	01	100
13.	QAP FOR BALL VALVES	MEC/23U1/05/28/M/001 /S002/QAP-002	1		10	102-111
14.	QAP FOR GAS OVER OIL ACTUATOR Actuator	MEC/05/E5/STD./QAP/ GOV	0		01	112
15.	QAP FOR Hydraulic Actuator	MEC/05/E5/STD./QAP/ HOV	0		01	113

Client :	Project :	Document No. :	Rev.	Date :
OIL INDIA	BAGHJAN –		No.	
LTD.	MADHUBAN PIPELINE	MEC/23U1/05/28/M/001/S002/CONTENTS	0	20.11.18
	PROJECT			





OIL & GAS SBU, DELHI

Page 1 of 6

1.0 **SCOPE OF SUPPLY**

The scope of supply includes Ball Valves / Plug Valves / 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

GROUP-A: CARBON STEEL BALL VALVES - Design Standard: API-6D, MECON's specification no. MEC/TS/05/21/002 and data sheets given below :-MR Size NB. ANSI Valve Body Stem Valve Qty. Opening Ends Data Sheet No. Remarks Pressure Construction ltem mm Extension Operation (nos.) No. (inches) Rating 750 Fully welded Remote 300 # BW YES GOV MEC/23U1/05/28/M/001/DS/BV/01 01 A.1 FB (30")Body Operated Fully welded 750 A.2 300 # FB BW YES HOV 04 MEC/23U1/05/28/M/001/DS/BV/02 (30")Body 750 Fully welded A.3 300 # FB BW NO HOV MEC/23U1/05/28/M/001/DS/BV/03 02 (30")Body One Valve 600 Fully welded with Auto-300 # FΒ BW NO GOV MEC/23U1/05/28/M/001/DS/BV/04 02 Α4 (24")Body Closure facility Either Welded Valve with 600 Flanged Body or 2/3 Auto-A.5 300 # FR NO GOV MEC/23U1/05/28/M/001/DS/BV/05 01 (24")(RF) Piece Bolted Closure facility Either Welded 600 Flanged A.6 300 # RB NO Body or 2/3 HOV MEC/23U1/05/28/M/001/DS/BV/06 03 (RF) (24")Piece Bolted Either Welded 400 Flanged 300 # RB NO HOV MEC/23U1/05/28/M/001/DS/BV/06 02 A.7 Body or 2/3 (16")(RF) Piece Bolted Manual 300 Fully welded 300 # FΒ BW NO 02 8.A with Gear MEC/23U1/05/28/M/001/DS/BV/07 Body (12")Box Either Welded Manual 300 Flanged 300 # RB A.9 NO Body or 2/3 MEC/23U1/05/28/M/001/DS/BV/08 01 with Gear (RF) (12")Piece Bolted Box Either Welded 300 Flanged A.10 300 # FB NO Body or 2/3 GOV MEC/23U1/05/28/M/001/DS/BV/05 01 (RF) (12")Piece Bolted Manual Fully welded 250 YES 300 # RR RW MEC/23U1/05/28/M/001/DS/BV/09 10 A.11 with Gear (10")Body Box Manual 250 Fully welded MEC/23U1/05/28/M/001/DS/BV/10 A.12 300 # RB BW NO with Gear 04 (10")Body Box Either Welded Manual 250 Flanged A.13 300 # RR NO Body or 2/3 with Gear MEC/23U1/05/28/M/001/DS/BV/08 04 (10")(RF) Piece Bolted Box 250 Fully welded A.14 300 # RΒ BW NO GOV MEC/23U1/05/28/M/001/DS/BV/11 02 Body (10")Manual Fully welded 100 A.15 300 # RΒ BW NO Lever MEC/23U1/05/28/M/001/DS/BV/10 07 (4")Body Operated Either Welded Manual 100 Flanged A.16 300 # RB NO Body or 2/3 MEC/23U1/05/28/M/001/DS/BV/08 06 Lever (4")(RF) Piece Bolted Operated

Client :	Project :	Document No. :	Rev. No.	Date :
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002	0	20.11.18
LTD.	MADHUBAN PIPELINE PROJECT			



OIL & GAS SBU, DELHI

Page 2 of 6

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

1/61-	Z and da	ia sileets (Jiveli bei	OW						
MR Item No.	Size NB, mm (inches)	ANSI Pressure Rating	Pattern	Ends	Stem Extension	Installation	Valve Operation	Data Sheet No.	Qty. (nos.)	Remarks
B.1	250 (10")	300 #	Regular	BW	YES	UG	Manual with Gear Box	MEC/23U1/05/28/M/001/DS/PV/01	10	
B.2	250 (10")	300 #	Regular	BW	NO	AG	Manual with Gear Box	MEC/23U1/05/28/M/001/DS/PV/02	05	
B.3	250 (10")	300 #	Regular	Flanged (RF)	NO	AG	Manual with Gear Box	MEC/23U1/05/28/M/001/DS/PV/03	05	
B.4	100 (4 ")	300 #	Short	BW	NO	AG	Manual Lever Operated	MEC/23U1/05/28/M/001/DS/PV/04	05	
B.5	100 (4 ")	300 #	Short	Flanged (RF)	NO	AG	Manual Lever Operated	MEC/23U1/05/28/M/001/DS/PV/05	02	

GRO	GROUP - C: 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	
C.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

FB = Full Bore RB = Reduced Bore BW = Butt Welded

RF = Raised Face (Flanged)

GOV = Gas Over Oil Powered Actuated Valve

HOV = Hydraulic Operated Valve

UG = Under GroundAG = Above Ground

2.0 <u>DOCUMENTS & DATA REQUIREMENTS</u>

- 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.

Client :	Project :	Document No. :	Rev. No.	Date :
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002	0	20.11.18
LTD.	MADHUBAN PIPELINE PROJECT			



OIL & GAS SBU, DELHI

Page 3 of 6

- 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.

Client :	Project :	Document No. :	Rev. No.	Date :	
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002	0	20.11.18	ĺ
LTD.	MADHUBAN PIPELINE PROJECT				



OIL & GAS SBU, DELHI

Page 4 of 6

		Α		В		С
Item	Documents & Data	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)

Client :	Project :	Document No. :	Rev. No.	Date :
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002	0	20.11.18
LTD.	MADHUBAN PIPELINE PROJECT			



OIL & GAS SBU, DELHI

Page 5 of 6

	Welding procedure					2 Weeks
16.	specification and records WPS / PQR	-	3	2 Weeks	3	(with final technical file)
	/ FQIX					2 Weeks
17.	QA / QC program	3	3	2 Weeks	3	(with final
'''	QAY QO program	3		2 VVCCR3	3	technical file)
	Inspection and Test					2 Weeks
18.	Procedures along with Quality	3	3	2 Weeks	3	(with final
	Assurance Plan	-				technical file)
						2 Weeks
19.	Test Reports	-	-	-	3	(with final
						technical file)
						2 Weeks
20.	NDE / NDT Reports	-	-	-	3	(with final
						technical file)
						2 Weeks
21.	Heat Treatment Reports	-	-	-	3	(with final
						technical file)
00						2 Weeks
22.	Hydrotest and air test report	-	-	-	3	(with final
						technical file) 2 Weeks
23.	Maintenance and operating				3	(with final
23.	manuals	-	_	_	3	technical file)
						2 Weeks
24.	Installation instructions &	_	_	_	3	(with final
	Site inspection procedure				Ü	technical file)
	Material coefficients and EN					2 Weeks
25.	Material certificate as per EN	-	-	-	3	(with final
	10204 - 3.2					technical file)
	Painting system description 8					2 Weeks
26.	Painting system description & procedure	3	3	2 weeks	3	(with final
	'					technical file)
27.	List of sub-vendors with their	3	3	2 weeks		
	scope		_			0.14
0.0	Training CDs/DVDs covering				•	2 Weeks
28.	design, operation &	-	-	-	3	(with final
	maintenance					technical file)
00	Final technical file, preliminary			2 weeks before		
29.	copy for approval (in soft &	-	3	dispatch/	-	-
	hardcopy)			shipping		Before
30.	Final technical file (hardcopy)	-	-	-	3	shipping
	Final technical file (softcopy –					Shipping
31.	.pdf - Acrobat files in CD ROM	_	_	_	6	
	/ DVD)				•	
L	· = · = /		1	1		I

Client :	Project :	Document No. :	Rev. No.	Date :
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002	0	20.11.18
LTD.	MADHUBAN PIPELINE PROJECT			



OIL & GAS SBU, DELHI

Page 6 of 6

NOTES

- 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).

Client :	Project :	Document No. :	Rev. No.	Date :	
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002	0	20.11.18	ĺ
LTD.	MADHUBAN PIPELINE PROJECT				



OIL & GAS SBU, DELHI

Page 1 of 4

1.0 <u>Introduction</u>

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 <u>Compliance with Specification:</u> 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.
- **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. Lloyds
- 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.

Client :	Project :	Document No. :	Rev.	Date :
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002/	No.	20.11.18
LTD.	MADHUBAN PIPELINE PROJECT	NOTES	1	



OIL & GAS SBU, DELHI

Page 2 of 4

- **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

Client :	Project :	Document No. :	Rev.	Date :
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002/	No.	20.11.18
LTD.	MADHUBAN PIPELINE PROJECT	NOTES	1	



OIL & GAS SBU, DELHI

Page 3 of 4

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.
- 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	³ ⁄ ₄ " 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.

Client :	Project :	Document No. :	Rev.	Date :
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002/	No.	20.11.18
LTD.	MADHUBAN PIPELINE PROJECT	NOTES	1	



OIL & GAS SBU, DELHI

Page 4 of 4

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

SI. 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.

21.0 Strip Test: Vendor need to demonstrate strip test of bolted body Ball valves. For this test one valve of each ordered size and rating shall be selected at random after successful hydro and pneumatic tests by TPI & MECON inspector. The valve shall be dismantled completely. Alloy steel parts shall be checked for compliance to relevant material code using Positive material identification technique. Selected valve(s) shall then be reassembled after replacing sacrificial parts like gasket & O-rings and complete final inspection as per approved QAP shall be carried out once again to ensure the repeatability of body seals and seats.

Client :	Project :	Document No. :	Rev.	Date :
OIL INDIA	BAGHJAN –	MEC/23U1/05/28/M/001/S002/	No.	20.11.18
LTD.	MADHUBAN PIPELINE PROJECT	NOTES	1	



MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Hatier
		DOCUMENT NO.	Page 1 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

STANDARD TECHNICAL SPECIFICATION FOR BALL VALVES

SPECIFICATION NO.: MEC/TS/05/21/002



(OIL & GAS SBU) MECON LIMITED DELHI 110 092

	ISSUE DATE :

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Herri Commit
		DOCUMENT NO.	Page 2 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

AMENDMENT STATUS

SI.	Clause / Paragraph / Annexure / Exhibit /	Page	Rev.	Date	Ву		Verifie	d
No.	Drawing Amended	No.	icev.	Rev. Date -	Name	Sig.	Name	Sig.
1.	Cl. No. 4.6	4	1	April 09	Gurdeep Singh		K.K. De	
2.	Overall Revision	All	1	July 20	K.P. Singh		A.K. Tyagi	

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			THE SECOND COMPANY
		DOCUMENT NO.	Page 3 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

Abbreviations:

ASME : American Society of Mechanical Engineers
ASTM : American Society for Testing and Materials

API : American Petroleum Institute

BHN : Brinell hardness number

DN : Nominal Size

HAZ : Heat Affected Zone

LC : Lock Close (valve locked in full close position)

LO : Lock Open (valve locked in full open position)

MSS-SP : Manufacturers Standardization Society – Standard Practice

NDT : Non Destructive Testing

NPS : Nominal Pipe Size
RTJ : Ring Type Joint

SSPC : Steel Structures Painting Council

MECON LIMITED REGD, OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			THATEFUL COMPANY
		DOCUMENT NO.	Page 4 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

CONTENTS

SI.No.	Description
1.0	SCOPE
2.0	REFERENCE DOCUMENTS
3.0	MATERIALS
4.0	DESIGN AND CONSTRUCTION
5.0	INSPECTION AND TESTS
6.0	EXTENT OF INSPECTION & TESTING
7.0	TEST CERTIFICATES
8.0	PAINTING, MARKING AND SHIPMENT
9.0	SPARES AND ACCESSORIES
10.0	DOCUMENTATION
11.0	GUARANTEE
FIGURE-1	VENT, DRAIN & SEALANT INJECTION DETAILS

MECON LIMITED STANDARD TECHNICAL SPERED. OFF:		SPECIFICATION	
RANCHI 834002	OIL & GAS SBU, DELHI		Hersel Commen
		DOCUMENT NO.	Page 5 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

1.0 **SCOPE**

This specification covers the minimum requirements for design, manufacture, testing and supply of carbon steel ball valves of size DN 50 mm (2") and above and ANSI pressure rating class 150 to 900 to be used in on-shore pipeline systems handling non-sour hydrocarbons in liquid or gaseous phase, including Liquefied Petroleum Gas (LPG).

This specification does not cover ball valves for sour hydrocarbon (liquid / gas) service as defined in NACE standard MR-01-75.

2.0 **REFERENCE DOCUMENTS**

- 2.1 All valves shall be manufactured and supplied in accordance with the latest edition of American Petroleum Institute (API) Specification 6D / ISO 14313, 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

ASMEB 16.10 : Face-to-face and end-to-end dimensions of valves

ASME B 16.25 : Butt welding ends

ASME B 16.34 : Valves – flanged, threaded and welding ends

ASME B16.47 : Large diameter steel flanges

ASME B 31.3 : Process piping

ASME B 31.4 : Pipeline transportation systems for liquid

hydrocarbons and other liquids

ASME B 31.8 : Gas transmission and distribution piping systems

ASME Sec VIII : Boiler and pressure vessel code - Rules for

construction of pressure vessels

ASME Sec IX : Boiler and pressure vessel code - Welding and brazing

qualifications

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

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			THATHER COMMENT
		DOCUMENT NO.	Page 6 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

API 607 : Fire test for soft-seated quarter-turn valves

API 1104 : Welding of pipelines and related facilities

BS EN ISO 10497 : Testing of valves – 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:
 - Valve Data Sheets
 - Material Requisition
 - This Specification
 - API 6D Specification
 - Other Referred Codes & Standards
 - Manufacturer's Standard

3.0 **MATERIALS**

- 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 (suitable for the service conditions indicated in Data Sheet) and shall be subject to approval by Purchaser. In addition, the material shall also meet the requirements specified hereinafter.
- 3.2 Carbon steel used for the manufacture of valves shall be fully killed.
- 3.3 The Carbon Equivalent (CE) of valve end connections which are subject to further field welding by Purchaser, shall not exceed 0.43% (as calculated by the following formula) on check analysis for each heat of steel used:

For Valves specified to be used for Gas service or LPG service, Charpy V-notch test, on each heat of base material shall be conducted as per API 6D Clause 8.5, for all pressure containing parts such as body, end flanges and welding ends as well as bolting material for pressure containing parts. Unless stated otherwise, the Charpy V-notch test shall be conducted at 0 °C. Test procedure shall conform to ASTM A370. The average absorbed energy value of three full sized specimens shall be 27 J. The

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			THE SECOND COMMENT
		DOCUMENT NO.	Page 7 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

minimum impact energy value for any one specimen of the three specimens analysed as above, shall not be less than 22 J.

When Low Temperature Carbon Steel (LTCS) materials are specified in Valve Data Sheet or offered by Manufacturer, the Charpy V-notch test requirements of applicable material standard shall be complied with.

- 3.5 For all such valves where carbon steel is used as ball material, the ball shall have 75 micrometer (0.003 inch) thick Electroless Nickel Plating (ENP) as per ASTM B733 with following classification: SC2, Type II, Class 2. The hardness of plating shall be minimum 50 RC.
- 3.6 For valves specified to be used for Gas service or LPG service, hardness test shall be carried out as per ASTM A370 for each method of manufacture and each heat of steel used in the manufacture of valves. A full thickness cross-section shall be taken for this purpose and the maximum hardness of the materials of valve components shall not exceed 248 HV_{10} .
- 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 shall be as given elsewhere in the Material Requisition. In addition, Manufacturer shall confirm that all wetted parts are suitable for treated water / seawater environment, which may be used during field testing.
- 3.8 Non-metallic parts of the valves (including O-rings, soft seal etc.) intended for hydrocarbon gas service at pressures of PN 100 (600 #) and above shall be resistant to explosive decompression.

4.0 **DESIGN AND CONSTRUCTION**

- Valve design shall meet the requirements of API 6D and other referred codes and shall be suitable for the service conditions indicated in Valve Data Sheet. The ASME Boiler & Pressure Vessel Code, Section VIII, Division 1, may be used to design the valve body. Allowable stress requirements shall comply with the provisions of ASME B31.3. In addition, corrosion allowance indicated in Valve Data Sheet shall be considered in valve design. However, the minimum wall thickness shall not be less than the minimum requirement of ASME B16.34. The Manufacturer shall have a valid license to use API 6D monogram for manufacture of ball valves.
- 4.2 For above ground valves, valve body design shall be either fully welded or bolted type, as indicated in Valve Data Sheet. Valve body joints with threads are not permitted.

For buried valves, valve body design shall be fully welded type only. Valve body joints with bolts or threads are not permitted.

4.3 Ball shall be of single piece, solid type construction.

MECON LIMITED REGD, OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Hetser Commen
		DOCUMENT NO.	Page 8 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

Valves shall be Full Opening (FO) or Reduced Opening (RO) as indicated in Valve Data Sheet. FO valves shall be suitable for the passage of all types of pipeline scraper and inspection pigs on regular basis without causing damage to either the valve component or the pig. The FO valve shall provide an unobstructed profile for pigging operations in either direction. FO valves shall be designed to minimize accumulation of debris in the seat ring region to ensure that valve movement is not impeded.

The opening size of RO valves shall be corresponding to that of a FO valve of smaller nominal diameter as indicated in table below. For sizes of a particular rating not covered in API 6D, the opening sizes of the RO valve shall be as per Manufacturer's standard.

Nominal Valve Size	Nominal Valve Size for Reduced Opening	Nominal Valve Size	Nominal Valve Size for Reduced Opening
DN _{mm} (NPS _{inches})	DN _{mm} (NPS _{inches})	DN _{mm} (NPS _{inches})	DN _{mm} (NPS _{inches})
50 (2)	50 (2)	600 (24)	500 (20)
80 (3)	50 (2)	650 (26)	550 (22)
100 (4)	80 (3)	700 (28)	600 (24)
150 (6)	100 (4)	750 (30)	600 (24)
200 (8)	150 (6)	800 (32)	650 (26)
250 (10)	200 (8)	850 (34)	700 (28)
300 (12)	250 (10)	900 (36)	750 (30)
350 (14)	250 (10)	950 (38)	800 (32)
400 (16)	300 (12)	1000 (40)	850 (34)
450 (18)	350 (14)	1050 (42)	900 (36)
500 (20)	400 (16)	1200 (48)	1050 (42)
550 (22)	450 (18)		

4.5 Ball mounting shall be trunnion / pivot type or as indicated in Valve Data Sheet. Ball mounting, either trunnion or floating, unless otherwise specified, shall be as follows.

SI.	ANSI Pressure Rating	Nominal Valve	Size (NPS inches)
No.	ANSI Fressure Rating	Floating Ball	Trunnion Mounted
1.	150#	<u>≤</u> 8"	> 8"
2.	300#	<u>≤</u> 4"	> 4"
3.	600#	Nil	<u>></u> 2"

Valve design shall minimize the possibility of debris ingress into the trunnion as far as practicable.

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION		
RANCHI 834002			ilation Commen
		DOCUMENT NO.	Page 9 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1
4.6	tight sealing, shall be encased in a be removed from seat ring and operation of valve at maximum of	Valve seats shall have metal to metal contact. O-rings or other seals, if used for dritight sealing, shall be encased in a suitable groove in such a manner that it can not be removed from seat ring and there is no extrusion during opening or closin operation of valve at maximum differential pressure corresponding to valve class rating. The seat rings shall be so designed as to ensure sealing at low as well as high differential pressures.	
4.7	Valves shall have double block and draining and venting of the valve be		e complete flushing,
4.8	prevented by self relieving seat rir is not permitted. Self relieving se	For valves to be used in liquid service, the body cavity over-pressure shall be prevented by self relieving seat rings / assemblies. A pressure relief hole in the basis not permitted. Self relieving seat rings shall relieve at a body cavity differential pressure not exceeding 50% of the valve class rating pressure.	
4.9	Valves shall be designed to withstand a sustained internal vacuum of at least 1 (one milli-bar in both open and closed positions.		
4.10	FO valves of nominal size DN 200 DN 250 mm (10") & above shall ha full line pressure for seat and ster provided with a needle valve, a shall have a provision to replace to Location and arrangement of seals	ave provision for seconda in seals. All sealant injec grease fitting and non-re he sealant injection fitting	ry sealant injection und tion connections shall turn valve. Valve des g under full line pressu
4.11	Valves shall be provided with vent of vents and drains shall be as pe with valves (ball or plug type). Num	r Figure-1. Body vent an	d drain shall be provid
4.12	Valve design shall ensure repair of	stem seals / packing und	der full line pressure.
4.13 a)	Valve ends shall be either flanged butt welded as indicated in Valve forged body valves shall be integr face/ end-to-end dimensions shall dimensions for valve sizes not spe B 16.10. Face-to-face and end-to-e 16.10 shall be as per Manufactur Purchaser.	e Data Sheet. Flanges ally cast / forged with the conform to API 6D. Fac cified in API 6D shall be it and dimensions not show	of the flanged end ca e body of valve. Face- e-to-face and end-to-e n accordance with ASI n in API 6D or in ASME
b)	Flanged ends shall have flanges amm (24 inches) excluding DN 550 16.47 series A for valve sizes DN sand above. Flange face shall be	mm (22 inches) and as p 550 mm (22 inches) & for	er MSS-SP-44 / ASME r DN 650 mm (26 inch

and above. Flange face shall be either raised face or ring joint type (RTJ) 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 microinches AARH. In case of RTJ flanges, the groove hardness shall be minimum

140 BHN.

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION		
RANCHI 834002	OIL & GAS S	BU, DELHI	गेवर्गन का देखा देखा
		DOCUMENT NO.	Page 10 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

- 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, unless otherwise specified in Valve Data sheet. 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.
- 4.14 Design of weld end valves shall be such that during field welding operations, the soft seals or plastic components of the valve (where ever used) are not liable to be damaged. The Manufacturer shall furnish necessary field welding instructions and post-weld test procedure to demonstrate integrity and leak-tightness of valves after field welding operations.
- 4.15 Valves shall be provided with ball position indicator and stops of rugged construction at the fully open and fully closed positions.
- 4.16 FO valves of nominal size ≥ DN 200 mm (8") and RO valves of nominal size ≥ DN 250 mm (10") shall be equipped with support foot and lifting lugs. Tapped holes and eye bolts shall not be used for lifting lugs. Height of support foot shall be kept a minimum. The location and size of support foot / lifting lugs shall ensure unrestrictive operation of vent / drain valves.
- 4.17 Valve design shall be such as to avoid bimetallic corrosion between carbon steel and high alloy steel components. Suitable insulation shall be provided as required.
- 4.18 Valves shall be of fire resistant design as per API 607/BS EN ISO 10497/API 6FA, as indicated in Valve Data Sheet.
- 4.19 Valves shall be provided with anti-static devices to ensure electrical continuity between stem / ball and valve body.
- 4.20 Valves shall be suitable for either buried or above ground installation as indicated in Valve Data Sheet.
- When stem extension requirement is indicated in Valve Data Sheet, the valves shall have the following provisions :
 - a) Valves provided with stem extension shall have water proof outer casing. Length of stem extension shall be as indicated in Valve Data Sheet. The length indicated corresponds to the distance between centerline of the valve opening and the top of mounting flange for valve operating device (gear operator / power actuator as applicable).
 - b) Vent and drain connections and sealant injection lines 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 A 106 Gr. B, with Sch. 80. Fittings shall be ASTM A 105 / ASTM 234 Gr. WPB, Socket Welded, ANSI class 6000.

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Herri Compan
		DOCUMENT NO.	Page 11 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

- c) 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 movement between valve body, stem extension or its operator.
- d) 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.

4.22 Operating Devices

- a) Valves shall have a power actuator or manual operator as indicated in Valve Data Sheet. In case of manual operator, valve sizes ≤ DN 100 mm (4 inches) shall be wrench operated and valve sizes ≥ DN 150 mm (6 inches) 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 that damaged parts can be replaced without the valve cover being removed.
- b) The power actuator shall be in accordance with the Purchaser specification issued for the purpose and as indicated in 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 output shall be 1.25 times the break torque required to operate the ball valve under the maximum differential pressure corresponding to the valve class rating.
- c) For manual operator of all valves, the diameter of the hand wheel or the length of operating wrench shall conform to API 6D requirements and be such that under 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 operators) required for operating the valve from full open to full close position.
- d) 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.
- e) Gear operators, when provided, shall have a self locking provision and shall be fully encased, in water proof/ splash proof/ dust proof/ weather proof enclosure and shall be filled with suitable grease.
- f) Operating devices shall be designed for easy operation of the valve under maximum differential pressure corresponding to the valve rating.
- 4.23 All welds shall be made by welders and welding procedures qualified in accordance with the provisions of ASME Section IX. The procedure qualification shall include impact test and hardness test and shall meet the requirements of clauses 3.4 and 3.6 of this specification, respectively.
- 4.24 All welds shall be stress relieved in accordance with ASME Section VIII.

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION		
RANCHI 834002	OIL & GAS SBU,	OIL & GAS SBU, DELHI	
		DOCUMENT NO.	Page 12 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1
4.25	Repair by welding is not permitted repair by welding as per ASME repairs shall be carried out at cast before any heat treatment of casti shall also include impact test and clauses 3.4 & 3.6 of this specificat	B16.34 is permitted for ing supplier's care only. Fing is done. Repair weldir hardness test and shall	cast body valves. Su Repair shall be carried on g procedure qualification
4.26	The tolerance on internal diameter valves shall be as per applicable Data Sheet.		
4.27	When indicated in Material Requisition, valves shall have locking device to lock the valve either in full open (LO) or full close (LC) positions. Locking devices shall be permanently attached to the valve operator and shall not interfere with operation of the valve.		
4.28	Valve stem shall be capable of wit to operate the valve against the applicable class rating. The co allowable stresses specified in A actuated valves, the valve stem st selected power actuator (including	maximum differential pr mbined stress shall no SME Section VIII, Divisi nall be designed for maxi	ressure corresponding t exceed the maximution I. In case of pow mum output torque of t
5.0	INSPECTION AND 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 shall be free from any strikes, gough shall be thoroughly cleaned and from	ges and other detrimental	defects. The surfaces
5.1.2	Dimensional check on all valves s	shall be carried out as per	the Purchaser approv

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

material standards and this specification, for each heat of steel used.

drawings.

5.1.3

a) Body castings of all valves shall be radiographically examined on 100% of the surface of critical areas as per ASME B16.34. Procedure and acceptance criteria shall be as per ASME B16.34. The extent of radiography shall be as follows:

Chemical composition and mechanical properties shall be checked as per relevant

MECON LIMITED REGD, OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Hersel Commen
		DOCUMENT NO.	Page 13 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION: 1
			EDITION: 1

ANSI Pressure Rating	Valve Size	Extent of Radiography
150 #	All sizes	Nil
300 #	≤ DN 400mm (16") ≥ DN 450mm (18")	Nil 100%
<u>></u> 600 #	All sizes	100%

All castings shall be wet magnetic particle inspected 100% of the internal surfaces. Method and acceptance shall comply with ASME B.16.34.

b) All valves, with body fabricated from plates or made by forgings, shall be ultrasonically examined in accordance with the procedure and acceptance standard of Annexure E of ASME B16.34.

All forgings shall be wet magnetic particle inspected 100% of the internal surfaces. Method and acceptance shall comply with ASME B 16.34

- c) Bodies and bonnets made by welded assembly of segments of castings, forgings, plates or combinations thereof shall be examined, as applicable, by methods of clause 5.1.4 a) for cast components or clause 5.1.4 b) for forged components and plates.
- 5.1.5 Full inspection by radiography shall be carried out on all welds of pressure containing parts. Acceptance criteria shall be as per ASME B 31.4 or ASME B31.8, as applicable, and API 1104.
- 5.1.6 Welds, which in Purchaser'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 Section VIII, Division 1, Appendix 12 and Appendix 6, respectively.
- 5.1.7 a) All finished wrought weld ends subject to welding in field shall be 100% ultrasonically tested for lamination type defects for a distance of 50mm from the end. Laminations shall not be acceptable.
 - b) Weld ends of all cast valves subject to welding in field shall be 100% radiographically examined and acceptance criteria shall be as per ASME B16.34.
 - c) After final machining, all bevel surfaces shall be inspected by dye penetrant or wet magnetic particle methods. All defects longer than 6.35 mm are rejected, as are defects between 6.35 mm and 1.59mm that are separated by a distance less than 50 times their greatest length. Rejectable defects must be removed. Weld repair of bevel surface is not permitted.
- 5.1.8 All valves shall be tested in compliance with the requirements of API 6D. During pressure testing, valves shall not have sealant lines and other cavities filled with sealant, grease or other foreign material. The drain, vent and sealant lines shall be

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Hersel Commen
		DOCUMENT NO.	Page 14 of 20
TITLE	BALL VALVE	BALL VALVE MEC/TS/05/21/002	
			EDITION : 1

either included in the hydrostatic shell test or tested independently. Test pressure shall be held for at least 30 minutes. No leakage is permissible during hydrostatic testing. The body cavity self-relieving feature meeting the requirements of clause 4.8 of this specification shall also be checked.

- 5.1.9 A supplementary air seat test as per API 6D (Annex B, Clause B.3.3, Type II) shall be carried out for all valves. A bubble tight seal is required without the use of any sealant. No leakage is allowed. Test pressure shall be held for at least 15 minutes.
- 5.1.10 Manufacturer who intends bidding, must submit at bid stage, certificate and report for successful fire type-tests for valves in accordance with API-607/ BS EN ISO 10497 / API 6FA, as applicable in Valve Data Sheet.

Failure to comply with this requirement shall be a cause of rejection of the Bidder's offer.

5.1.11 Valves shall be subjected to Operational Torque Test as per API 6D (Annex B, Clause B.6) under hydraulic pressure equal to maximum differential pressure corresponding to the valve pressure class rating.

For manual operator of all valves, it shall be established that the force required to operate the valve does not exceed the requirements stated in clause 4.22(c) of this specification.

Power actuated valves shall be tested after assembly of the valve and actuator at the valve Manufacturer's works. At least five Open-Close-Open cycles without internal pressure and five Open-Close-Open cycles with maximum differential pressure shall be performed on the valve actuator assembly. The time for Full Open to Full close shall be recorded during testing. If required, the actuator shall be adjusted to ensure that the opening and closing times are within the limits stated in Actuator Data Sheet issued for the purpose.

Hand operator provided on the actuator shall also be checked after above testing, for satisfactory manual over-ride performance.

These tests shall be conducted on minimum one valve out of a lot of five (5) valves of the same size, rating and the actuator model / type. In case the tests do not meet the requirements, retesting / rejection of the lot shall be decided by Purchaser's Inspector.

- 5.1.13 Subsequent to successful testing as specified in clause 5.1.11 and 5.1.12 above, one (1) valve out of the total ordered quantity shall be randomly selected by the Purchaser's Representative for cyclic testing as mentioned below:
 - a) The valve shall be subjected to at least 100 Open-Close-Open cycles with maximum differential pressure corresponding to the valve rating.
 - b) Subsequent to the above, the valve shall be subjected to hydrostatic test and supplementary air seat test in accordance with clause 5.1.8 and 5.1.9.

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Hersel Commen
		DOCUMENT NO.	Page 15 of 20
TITLE	BALL VALVE	BALL VALVE MEC/TS/05/21/002	
			EDITION : 1

In case this valve fails to pass these tests, the valve shall be rejected and two more valves shall be selected randomly and subjected to testing as indicated above. If both valves pass these tests, all valves manufactured for the order (except the valve that failed) shall be deemed acceptable. If either of the two valves fails to pass these tests, all valves shall be rejected or each valve shall be tested at the option of Manufacturer.

Previously carried out test of similar nature shall be considered acceptable if the same has been carried out by Manufacturer in last two years. Valves of two sizes below and two sizes above the size of valve previously tested, and rating similar or one rating lower of valve tested previously, shall be qualified.

- 5.1.14 Checks shall be carried out to demonstrate that the dissimilar metal used in the valves are successfully insulated as per the requirement of clause 4.17 of this specification.
- 5.1.15 When indicated in Valve Data Sheet, valves shall be subjected to anti-static testing as per supplementary test requirement of API 6D (Annex B, Clause B.5).
- 5.2 Purchaser reserves the right to perform stage-wise inspection and witness tests as indicated in clause 5.1 above at Manufacturer's works prior to shipment. Manufacturer shall give reasonable access and facilities required for inspection to the Purchaser's Inspector.

Purchaser reserves the right to require additional testing at any time to confirm or further investigate a suspected fault. The cost incurred shall be to Manufacturer's account.

In no case shall any action of Purchaser or his Inspector 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 tests on all valves or as indicated in the Quality Assurance Plan (QAP) attached with this specification.
- The hydrostatic testing and cyclic opening and closing of the valves with the operator shall be witnessed by Purchaser's Inspector.

MECON LIMITED STANDARD TECHNICAL SPECIFICATION REGD. OFF:			
RANCHI 834002	OIL & GAS SBU, DELHI		Herri Commen
		DOCUMENT NO.	Page 16 of 20
TITLE	BALL VALVE	BALL VALVE MEC/TS/05/21/002	
			EDITION: 1

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 of hydrostatic and pneumatic tests complete with records of timing and pressure of each test.
 - c) Test reports on radiograph and ultrasonic inspection.
 - d) Test report on operation of valves conforming to clause 5.1.11, 5.1.12 and 5.1.13 of this specification.
 - e) 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 despatched from Manufacturer's works.

8.0 **PAINTING, MARKING & SHIPMENT**

- 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 valves to be installed underground, when indicated in Valve Data Sheet, the 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 diestamping 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.
- 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 or high impact plastic bevel protectors.
- 8.5 All sealant lines and other cavities of the valve shall be filled with sealant before shipment.

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Hater to someth
		DOCUMENT NO.	Page 17 of 20
TITLE	BALL VALVE	BALL VALVE MEC/TS/05/21/002	
			EDITION : 1

- 8.6 Packaging and shipping instructions shall be as per API 6D.
- 8.7 On packages, following shall be marked legibly with suitable marking ink:
 - 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 furnish list of recommended spares and accessories for valves required during start-up and commissioning and supply of such spares shall be included in the price quoted by Manufacturer.
- 9.2 Manufacturer shall furnish list of recommended spares and accessories required for two years of normal operation and maintenance of valves and price for such spares shall be quoted separately.
- 9.3 Manufacturer shall quote for spares & accessories as per Material Requisition.

10.0 **DOCUMENTATION**

- 10.1 At the time of bidding, Manufacturer shall submit the following documents:
 - a) General arrangement / assembly drawings showing all features and relative positions and sizes of vents, drains, gear operator / actuator, painting, coating and other external parts together with overall dimensions as well as weights of valve & actuator.
 - b) Sectional drawing showing major parts with reference numbers and material specification. In particular, a blow-up drawing of ball-seat assembly shall be furnished complying the requirement of clause 4.6 of this specification.
 - c) Reference list of similar ball 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 along with the 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.

MECON LIMITED REGD. OFF:			
RANCHI 834002	OIL & GAS SBU	Heri-	
		DOCUMENT NO.	Page 18 of 20
TITLE	BALL VALVE	BALL VALVE MEC/TS/05/21/002	
			EDITION: 1

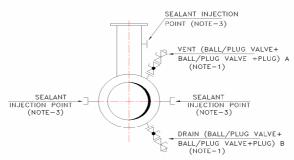
- g) Details of support foot, including dimensions and distance from valve centre line to bottom of support foot.
- h) Quality Assurance Plan enclosed with this tender duly signed, stamped and accepted.
- i) List of recommended spares required during start-up and commissioning.
- j) List of recommended spares required for 2 years of normal operation and maintenance.
- k) Other documents / drawings / data as per Material Requisition.
- 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 Purchaser's final approval:
 - a) Detailed sectional arrangement drawings showing all parts with reference numbers and material specifications as referred to in clause 10.1 above.
 - b) Assembly drawings with overall dimensions and features. Drawing shall also indicate the number of turns of hand wheel (in case of gear operators) required for operating the valve from full open to full close position and the painting scheme. Complete dimensional details of support foot (where applicable) shall be indicated in these drawings as referred to in clause 10.1 above.
 - c) Welding, heat treatment and testing procedures.
 - d) Procedure for cyclic testing.
 - e) Details of corrosion resistant paint to be applied on the valves.
 - f) Design calculation for pressure containing parts.
 - g) Other documents / drawings / data as per Material Requisition.

Manufacture of valves shall commence only after approval of the documents indicated in clause 10.2a) to 10.2c) above. Once approval has been given by Purchaser, any changes in design, material and method of manufacture shall be notified to Purchaser whose approval in writing of all changes shall be obtained before the valve is manufactured.

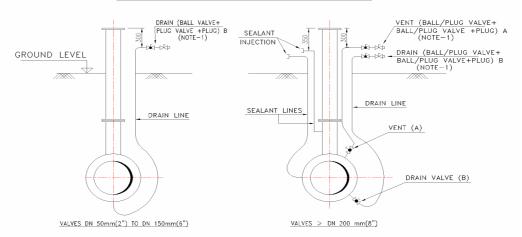
10.3 Within 2 weeks from the approval date, Manufacturer shall submit to Purchaser six copies of the approved drawings, documents and specifications as listed in clause 10.2 above.

MECON LIMITED REGD. OFF:	STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI		
RANCHI 834002			Hater to soon comme
		DOCUMENT NO.	Page 19 of 20
TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION : 1
			EDITION: 1
10.4	Prior to shipment, Manufacturer sl CD-ROMs) of the following:	hall submit six hard copie	s and six soft copies (on
	a) Test certificates as per clau	use 7.0 of this specification	n.
	b) Manual for installation, e including a list of recomme	The state of the s	•
	c) Other documents / drawings / data as per Material Requisition.		
10.5	All documents shall be in English language.		
10.6	The above documents & data requirements shall also be supplemented by all requirements of clause 2.0 of the Material Requisition.		
11.0	<u>GUARANTEE</u>		
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 Manufactu	urer's account.	

MECON LIMITED REGD. OFF:	EGD. OFF:		
RANCHI 834002			THATEFUL COMPANY
		DOCUMENT NO.	Page 20 of 20
TITLE	BALL VALVE	BALL VALVE MEC/TS/05/21/002	
			EDITION: 1



ABOVE GROUND INSTALLATION



UNDERGROUND INSTALLATION

SIZES OF VENT & DRAIN CONNECTIONS			
NOM. VALVE SIZE	A, DN(mm)	B, DN(mm)	
50 TO 150	-	15	
200 TO 600	15	25	
750 & ABOVE	15	50 (REFER NOTE-2)	

├── PLUG

- ALL VALVES (BALL OR PLUG) AND PLUGS FOR A AND
 B SHALL BE APPROVED BY THE PURCHASER.
- 2. VALVES OF SIZE 50mm SHALL BE MANUFACTURED AS PER API-6D.
- SEALANT INJECTION POINTS SHALL BE PROVIDED
 FOR FULL OPENING VALVES OF NOMINAL VALVE SIZE 200mm (8")
 & ABOVE AND REDUCED OPENING VALVES OF NOMINAL VALVE SIZE,
 DN 250mm (10") AND ABOVE ONLY.
- 3. IN BURIED SECTION, ALL VENT & DRAIN CONNECTION SHALL BE OF WELDED CONSTRUCTION.

FIGURE-1

VENT, DRAIN & SEALANT INJECTION DETAILS

PROCESS & PIPING DESIGN SECTION MECON LIMITED



TECHNICAL SPECIFICATION FOR PLUG VALVES (NB \geq 2")

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

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	74 min
TECHNICAL SPECIFICATION NO.: MEC/TS/05/62/003		REV-2	Page 1 of 13	

	<u>C O N T E N T S</u>		
SI.No.	<u>Description</u>	Page No.	
1.0	SCOPE	2	
2.0	REFERENCE DOCUMENTS	2	
3.0	MATERIALS & TEST PROCEDURES	3	
4.0	DESIGN & CONSTRUCTION	4	
5.0	INSPECTION & TESTS	7	
6.0	EXTENT OF INSPECTION & TESTING	9	
7.0	TEST CERTIFICATES	9	
8.0	PAINTING, MARKING & SHIPMENT	10	
9.0	SPARES & ACCESSORIES	10	
10.0	DOCUMENTATION	11	
11.0	GUARANTEE	12	

PREPARED BY :	CHECKED BY:	APPROVED BY :
Gurdeep Singh	A.K. Sarkar	A.K. Johri
Date	Date	Date

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	मेकॉन 8001 Care
TECHNICAL SPECIFICATION NO. :	MEC/TS/05/62/003		REV-2	Page 2 of 13

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**

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

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	2 2001 COLD 10
TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003		REV-2	Page 3 of 13	

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:

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

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

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

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	7 ani T
TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003		REV-2	Page 4 of 13	

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.

- 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.
- 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
	50-100 (2-4)	Short
150	150-300 (6-12)	Regular
	350 (14) & above	Venturi
	50-100 (2-4)	Short
300	150-250 (6-10)	Regular
	300 (12) & above	Venturi
	50-250 (2-10)	Regular
600	300 (12) & above	Venturi
	50-250 (2-10) R	Regular
900	300 (12) & above	Venturi

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	24 mily 100
TECHNICAL SPECIFICATION NO.: MEC/TS/05/62/003		REV-2	Page 5 of 13	

ī		
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.

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	NICAL SPECIFICATION FOR PLUG VALVES	2 2001 COLO (C)
TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003		REV-2	Page 6 of 13	

- 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 < DN 100mm (4") shall be wrench operated and valves of sizes > 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.

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	24 anim
TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003		REV-2	Page 7 of 13	

- 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.
- 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.

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	7 ani T
TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003		REV-2	Page 8 of 13	

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- \leq DN 400mm (16") - Nil

≥ DN 450mm (18") - 100%

ANSI Class 600 - All Sizes - 100%

and above

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.
- 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.

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	मेकान कार्य स्थाप
TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003		REV-2	Page 9 of 13	

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.
- 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**

- Purchaser's Inspector shall perform inspection and witness test on all valves as indicated in the Quality Assurance Plan (QAP) attached with this specification.
- The hydrostatic testing and cyclic opening and closing of the valves with the operator shall be witnessed by Purchaser's Inspector.

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	2001 Caro ph
TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003		REV-2	Page 10 of 13	

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**

- 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.
- 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.

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	2001 Care of
TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003		REV-2	Page 11 of 13	

- 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.

MECON LIMITED Delhi	PROCESS & PIPING DESIGN SECTION	TECH	INICAL SPECIFICATION FOR PLUG VALVES	Papir O O O CONT
TECHNICAL SPECIFICATION NO.: MEC/TS/05/62/003		REV-2	Page 12 of 13	

- 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.

MECON LIMITED PROCESS & PIPING DESIGN SECTION TECHNICAL SPECIFICATION FOR PLUG VALVES TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003 REV-2 Page 13 of 13

·
<u>GUARANTEE</u>
Manufacturer shall guarantee that the materials and machining of valves and fittings comply with the requirements in this specification and in the Purchase Order.
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.
If valve defect or malfunctioning cannot be eliminated, Manufacturer shall replace the valve without delay.
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.
All expenses shall be to Manufacturer's account.

TECHNICAL NOTES FOR GATE & GLOBE VALVES

TECHNICAL NOTES FOR GATE & GLOBE VALVES

1.0 General

- 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 250 500 **AARH** (250)**AARH** to 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	Upto 22 mm	Figure 2 Type A
Temp. Carbon Steel)	> 22 mm	Figure 3 Type A
Alloy Steel	Upto 10 mm	Figure 4
Stainless Steel &	> 10 mm & upto 25 mm	Figure 5 Type A
Low Temp Carbon Steel	> 25mm	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

- 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 By Pass

- 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".
- 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:

X7.1 . (D)	Class	Size Requiring Gear
Valve Types		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.
- 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.
- 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

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

	RATING	SIZE RANGE	RADIOGRAPHY
MATERIAL			
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.
- 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.

- 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**

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

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.
- 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.

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	all delt Constitution
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 1 of 15

TECHNICAL SPECIFICATION

FOR GAS OVER OIL ACTUATORS

SPECIFICATION NO.: MEC/TS/05/E5/002



ELECTRICAL & INSTRUMENTATION (OIL & GAS SBU) MECON LIMITED DELHI 110 092

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	SOUT CONFER
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 2 of 15

1.0 SCOPE

This specification covers the minimum requirements for design, manufacture, inspection and testing of quarter turn hydraulic actuators suitable for operation of ball valves in pipeline/piping systems handling hydrocarbons in gaseous phase.

2.0 REFERENCE DOCUMENTS

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

a)	ASME B 31.8	-	Gas transmission and distribution piping System
b)	ASME B 16.5	-	Steel Pipe Flanges and Flanged Fittings
c)	ASME Sec VIII	-	Boiler and Pressure Vessels Code & Sec IX
d)	MSS-SP-101	-	Quarter-Turn Valve Actuator Attachment – Flange and Driving Component Dimensions and Performance Characteristics
e)	SSPC-VIS-1	-	Steel Structures Painting Council Visual Standard

In case of conflict between the requirements of this specification and the Codes, Standards and Specification referred above, the requirements of this specification shall govern.

3.0 MATERIALS

Actuators shall be supplied with SS 316 stainless steel trim. Materials of all parts and seals shall be compatible with the operating hydraulic fluid. All materials shall be suitable for the ambient conditions indicated in the Actuator Data Sheets.

4.0 GAS OVER OIL ACTUATOR

- 4.1 The basic requirements for Actuators are as follows:
 - a) Actuator shall be quarter turn Gas over Oil type.
 - b) Actuator torque shall be minimum 1.25 times the maximum valve's break torque required at full rated differential pressure of valve.

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	वेशकी करण है.
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 3 of 15

- c) Vendor shall indicate actuator model no., valve torque and actuator torque in a tabular form along with the quotation. Vendor shall submit the same for Buyer's review.
- d) Pneumatic connections shall be of 3/8" NPT (F) size as minimum. Pneumatic tubing shall be SS 316L, 3/8" OD x 0.049" WT minimum exact size shall be decided based on actual requirements.
- e) Valve with actuator shall be suitable for installation in horizontal pipeline.
- f) All Pneumatic tube fittings shall be of SS 316L and of SWAGELOK / PARKER make.
- g) All accessories as applicable shall be mounted on the SS back plate, which in turn shall be mounted on the actuator.
- h) Actuators shall be equipped with adjustable stoppers for opening and closing of the valves. At normal operating conditions these stoppers at the actuators shall be limiting the opening and closing of the valves.
- 4.2 The actuator local control panel shall be weatherproof to IP-65. The logic components / tubing inside the panel shall be of SS 316 L materials as minimum. All the electrical components mounted inside the panel shall be intrinsic safe and shall be certified by a statutory body like UL/BASEEFA/FM/CENENEC and PTB etc.,
- 4.3 Proximity type switches shall be provided for indication of valve position. These shall be mounted in intrinsic safe enclosure and necessary certificate has to be provided.
- 4.4 The Control logic shall enable the following (Refer enclosed typical sketch):
 - a) Local and Remote operation of the Valve.
 - b) Local Function shall include open/close facilities.
 - c) Remote function shall facilitate remote closure and opening of the valve (without any manual intervention if all the process interlocks are met). In case electrical signal to solenoid valve fails, the valve shall remain in the stay put position
 - d) Manual local hydraulic operation of the valve, with hand pump, in case of non-availability of the pneumatic (gas).
 - e) High differential pressure switch shall inhibit the remote operation of the valve, when the differential pressure becomes high. In this case, it shall be possible to operate the valve locally. Also, provision shall be kept to bypass the diff. pressure switch in case not required and valve shall operate normally at any differential pressure.
 - f) Close command (or open command) shall be inhibited during valve opening (or valve closing) and be made effective only after 100% opening (or closing) is achieved.
- 4.5 Hydraulic cylinders shall be sized so that the Actuator/operator shall be capable of minimum,

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	Tester Super Conv.
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 4 of 15

two open & close operations in the event of loss of line pressure.

- 4.6 Vendor shall supply gas filter regulators to derive power gas pressure to required level for the operation of the logic. Actuator sizing shall be based on minimum gas pressure as indicated in data sheet.
- 4.7 Solenoid valves shall be mounted inside the actuator control panel for the remote open/close operation of the valve actuators. Solenoid Valves shall be intrinsically fire safe and necessary certificate has to be certified.
- 4.8 All equipment and accessories shall be tropicalised and provided with anticorrosion protection, suitable for use in corrosive atmosphere.
- 4.9 All material shall be new, clean and free from rust, pits and obvious defects.
- 4.10 Steel castings, if any, of actuators shall be radiographically examined as per the procedure and acceptance criteria specified in ANSI B16.34, Annexure B.
- 4.11 The range (minimum/max.) of opening/closing timings for gas over oil-actuated valves shall be as per datasheet.
- 4.12 Material for Studs shall be ASTM A193, Grade B7 and Nuts material shall be ASTM A194 Grade 2H.
- 4.13 All equipment's and valves shall be coated with anticorrosive paints for a corrosive, near shore Environment. Vendor in compliance with the written procedures recommended by the Manufacturer shall prepare his own coating procedures including surface preparation and Application of coating and curing. Vendor's painting/coating system shall be submitted along With the bid for Buyer's review and approval.
- 4.14 Vendor shall provide the following potential free contacts for PURCHASERs use.
 - a. Local/Remote selector switch in LOCAL position
 - b. Local/Remote selector switch in REMOTE position
 - c. High Differential Pressure
 - d. Valve OPEN indication
 - e. Valve CLOSE indication

All the potential free contacts and the REMOTE OPEN & CLOSED Commands shall be provided at a terminal block in the actuator control panel. Suitable provision for double compression cable entry/exit shall also be provided.

All the Solenoid valves/ switches shall be suitable for operation of 24V DC only(to be provided by client)

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	Pagit and the state of the stat
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 5 of 15

5.0 HYDRAULIC ACTUATOR (MANUALLY ACTUATED)

DESIGN AND CONSTRUCTION

- 5.1 Hydraulic actuator shall be of rotary vane mechanism type or double acting scotch yoke mechanism type with pistons and shall maintain the selected valve position fully open or closed with pressure equalized.
- 5.2 Actuator body shall be designed and all body joints shall be in accordance with ASME Section VIII, Division.
- 5.3 Actuator shall be suitable for direct mounting on the ball valves without changing the standard top works of the valve and shall have the capability to be mounted or removed from the valve when the valve is in service.
- 5.4 All pressure and load carrying components in the actuator shall be designed to withstand the maximum output thrust without affecting valve performance.
- 5.5 Actuator shall be sized considering the break-away thrust corresponding to maximum differential pressure of valve ANSI Rating required at the valve stem to open and close the valve A factor of safety of 1.25 shall be considered in the actuator design. Due correction factor shall be applied for the temperature and pressure.
- 5.6 Actuator maximum thrust shall be limited such that the allowable stress values of valve stem is not exceeded during valve operation.
- 5.7 Actuator valve interface shall meet the applicable requirements of MSS-SP-101. To assure geometrically accurate valve/actuator alignment, a centering ring as required may be provided.
- 5.8 Actuator shall be capable of opening or closing the valves within the operating time indicated in the Actuator Data Sheet and. Provision shall be made for slower actuation during maintenance and field testing activities.
- 5.9 Actuator shall be provided with valve position switch/indicator which shall clearly show whether the valve in open, close or in partially open position.
- 5.10 Mechanical stops shall be provided to limit the actuator travel independently from any valve stops.
- 5.11 Threading connection shall be NPT as per ASME B 1.20.1 and flange connection shall be as per ASME B 16.5. The tubing, fitting and valves shall be SS 316 stainless steel. All the fittings should be of dielectric type. All tubing shall be properly supported and shielded from damage by a suitable protective cover.

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	SOUT COND.
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 6 of 15

- 5.12 Each actuator shall be provided with a manual hydraulic module incorporating a positive displacement piston pump, directional control valve, hydraulic reservoir, level indicator and pressure relief. In addition, by-pass for high speed operation shall also be provided. This manual hydraulic pump module shall be mounted as an integral component of actuator.
- 5.13 Hydraulic reservoir required to be provided as a part of the manual hydraulic pump module shall be manufactured from 316 stainless steel and be fitted with internal weir /baffles to prevent return oil channeling directly to pump suction, level gauge with isolating valves, inspection/cleaning cover and vent/breather.
- 5.14 Positive displacement hand pump to be provided as a part of the manual hydraulic pump module shall eliminate cavitations or sucking air. It shall be possible to stroke the hand-pump at any speed without drawing a vacuum into the pumping chamber. The hand pump shall be provided with an individual suction filter, block valves, pressure gauge, relief valve and check valve.
- 5.15 Hydraulic fluid used shall be oil based and shall have a cleanliness level of NAS 1638, Class 6. The actuator shall be supplied filled with hydraulic fluid approved by Purchaser.
- 5.16 Actuator and its accessories shall be suitable for outdoor installation and shall be provided with weather proof enclosures as per NEMA 4X or equivalent.
- 5.17 All compartments and housing containing electrical devices such as switches, etc. shall be intrinsic fire safe suitable for Zone- 2, group IIA/IIB, Temp. Class T3 as per IEC/IS.
- 5.18 Actuators shall be provided with limit switches for open and close positions. Limit switch shall be of proximity type with NAMUR design. Limit switch shall be provided with integral junction box having 2 no. of ½" NPT F cable entries. One cable entry shall be plugged. Flying leads shall not be acceptable. Contact type shall be DPDT type of rating 2A @ 24 VDC. Two no.of potential free NO contacts shall be provided at AV cabinet for open and close status of the valve.
- 5.19 All mounting accessories needed for installing the actuator and its accessories are in manufacturer's scope of supply.
- 5.20 The interconnecting cabling, interconnecting pipe work between the actuator and the manual hydraulic module, adapters, tubing, cable glands, junction box as required are in manufacturer's scope of supply.

6.0 INSPECTIONS AND TESTING

6.1 The actuator Manufacturer shall perform all inspection and tests as per the requirements of this specification and the relevant codes at his Works, prior to shipment to valve Manufacturer's works.

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	alega Con Con Agra
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 7 of 15

Such inspection and tests shall be but not limited to the following:

- a) All actuators shall be visually inspected.
- b) Dimensional check shall be carried out as per the Purchaser approved drawings.
- c) Chemical and mechanical properties as per relevant materials standards and this specification shall be checked.
- d) Complete actuator housing with internals including the open/close hydraulic circuits of all actuators shall be subjected to a hydrostatic pressure test by applying 1.5 times the actuator design pressure for a minimum period of 2 hours. Chart recorder shall monitor pressure. No leakage shall be permitted during the hydrostatic test.
- e) Actuator functional test shall be carried out by mounting the actuator on a test rig, and applying the hydraulic fluid pressure. The actuator shall be successfully stroked five times for open and close by suitably applying the hydraulic fluid pressure through hand provided. Actuator position indication shall be checked for correct operations during the test.
- f) Non-destructive examination of individual actuator material and components consisting of but not limited to castings, forgings, plate and assembly welds shall be carried out by the Manufacturer. As a minimum, the following shall be carried out as applicable
- g) All casting of pressure containing parts shall be radio graphically examined as per ASTM E-94 and E-186/E-280 or E-446 as applicable, at quality level 2-2T. Category A, B or C defects shall not exceed the severity level for Class 2. Category D, E, F or G defects shall not be accepted.
 - ii) All forgings shall be ultrasonically examined to ASTM E-609. Quality 1 will be the minimum level of acceptance.
 - iii) All machined surfaces shall be liquid penetrate examined as per ASTM E-165. Surface discontinuities shall not be acceptable.
 - iv) Sealing areas within the actuator body shall be completely inspected by magnetic particle methods in accordance with ASTM E-709. Surface discontinuities shall not be acceptable.
- h) Valve/Actuator Assembly Test

After testing of individual actuators has been completed, the actuators shall be mounted on valves. Integrated valve and actuator tests shall be carried out at the Valve Manufacturer's

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	alega Constant
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 8 of 15

Works, in compliance with the requirements stated in Purchaser Specification for Ball Valves enclosed with the material requisition/purchase order.

- 6.2 Purchaser reserves the right to perform stage wise inspection and witness tests as indicated in Cl. 6.1 above at Manufacturer's works prior to shipment. Manufacturer shall give reasonable access and facilities required for inspection to the Purchaser's Inspector. Purchaser reserves the right to require additional testing at any time to confirm or further investigate a suspected fault. The cost incurred shall be to Manufacturer's account. In no case shall any action of Purchaser's Inspector relieve the Manufacturer of his responsibility for material, design, quality or operation of the actuators. 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.
- 6.3 Gas Over Oil Actuator shall be mounted on the valve and tested as follows: (For Buried valves stem extension shall be installed before testing)
 - a) Cycle (open and shut) each valve with its actuator, at least five (5) times to ensure smoothness of operation. Valve/Operator shall be adjusted and tested for 100% opening and closing at actuator stoppers. It shall be tested for both Local/Remote operations.
 - b) Apply the actual differential pressure as given in the data sheet, across the valve and check the valve operation. Valve operation should not be jerky or binding. This shall be repeated at least 3 times and shutdown time noted at minimum supply pressure.
 - c) The actuator shall be adjusted to ensure that the opening and closing times is within limits as per data sheets.
 - d) The electrical signal to the solenoid valves on the actuator control panel shall be disconnected and valve shall be tested for stay put conditions.
 - e) Test shall be witnessed by Purchaser or their representatives.
 - f) Final testing and approval made by Purchaser's representative inspector shall not relieve the manufacturer from his own responsibilities, guarantees and contract obligations.
 - g) The torque required to open and close the valve shall be measured and a curve produced considering various valve positions from 0° to 90° at 15° intervals. This should be done for three opening and three closing cycles without internal pressure and three opening cycles and three closing cycles with maximum differential pressure.

6.4 EXTENT OF INSPECTION AND TESTING

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	Test T
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 9 of 15

All actuators shall be tested in accordance with the requirements of Section 6.0 of this specification.

6.5 TEST CERTIFICATES/REPORTS

Manufacturer shall submit the following certificates:

- a) Mill test certificates relevant to the chemical analysis and mechanical properties of the materials used for the actuator pressure containing parts as per the relevant standards and specifications.
- b) NDT reports for radiography, ultrasonic, magnetic particle and liquid penetrant inspection.
- c) Test report on operation of actuators including operating time.
- d) Test report on hydrostatic test of actuators.
- e) Test report on actuator/valve assembly tests.
- f) All other actuator test reports and certificates as required by this specification.

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

7.0 PAINTING AND MARKING

Actuator surface shall be thoroughly cleaned, freed from rust and grease and applied with sufficient coats of corrosion resistant paint suitable for marine/industrial environment as indicated in the Actuator Data Sheet. Surface preparation shall be carried out by shot blasting to SP-6 in accordance with "Steel Structures Painting Council-Visual Standard SSPC-VIS-1". Manufacturer shall indicate the type of corrosion resistant pain used in the drawings submitted for approval.

- 7.1 All actuators shall be marked as per Manufacturer's standard and shall have a permanently attached stainless steel plate with the following, as a minimum, details:
 - Tag Nos.
 - Manufacturer's Name
 - Actuator Type, Model No., Serial No.
 - Suitable for mounting on Valve __" Size, ___ ANSI Rating Ball Valve
 - Area Classification
- 7.2 All threaded and flanged opening shall be suitably protected to prevent entry of foreign material. The actuator shall be supplied pre-assembled.

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS / 05 / E5 / 002	digit to the state of the state	
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 10 of 15	

DATA SHEET for GAS OVER - OIL ACTUATORS FOR BALL VALVES

1. Actuator Manufacturer : BY VENDOR

2. Specification for Gas Over Oil Actuator : MEC/TS / 05 / E5 / 002

3. Actuator Type : On-Off

4. Tag No. : ------

5. Line No. : ------

6. Service : Wet Natural Gas

7. Vendor to furnish after sizing the actuator, the filled in torque Table no-2

8. Actuator Shut-off Pressure : As per the Table-1

9. **Process Conditions**

Power Gas : Wet Natural Gas

Gas Temperature : As per Table-1

Line Gas Pressure : As per Table-1

Molecular Weight : As per Attached Sheet

Cp/Cv : As per Attached Sheet

Compressibility Factor : As per Attached Sheet

10.. Power Gas Feed Connection from : 3/4" SW

main line

11. Actuator remote operation : Required

(For open and close)

12. Actuator Feed Gas : a) Line gas

b) N₂ Bottles

C) Oil

MECON LIMITED NEW DELHI		INSTRUMENTATION SECTION	T.S. NO.:	MEC/TS/05/E5/002	Andre Cartifa
TITL	Æ	GAS OVER OIL ACTUATORS		REV 1	Page 11 of 15
13.	Valv	re Position Limit Switch	:	Required (SPD and SPDT Cont position separat	
14.		al/ Remote selector switch its status contact	:	Required (shall junction box as diagram)	-
15.	pilot Actu	umatic limit valves and solenoid valves to shut-off gas supply to lator when valve reaches one of end positions	•	Required	
16.	mon	retaining system for retaining nentary open or close signals e control circuit	:	Required	
17.		etrical conduit connection (cable les to junction box for purchaser e)	: 's	1" NPT	
18.	a) S	rating voltage for Solenoid Valves Relays	:	24V D.C. ± 10%	
19.	a) l	tact rating for Limit Switches L/R Switch (Status)	:	2A at 24V D.C.	
20.	Pad	lock with L/R Switch	:	Required	
21. a)	Encl Actu	osure for lator	:	Certified weathe	erproof as per IP-
b)	valv	etrical items like solenoid es, junction boxes, relays, e glands	:	Certified weathe	certified for Class
22.	Area	a Classification	:	NEC (Class 1 D T3)/equiv	iv. 2 Gr. C & D

Material of construction for all tubing, : SS 316

23.

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	all death Conf.
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 12 of 15

Valves, piping and fittings etc.

By Vendor Make & Model No. of Actuator 24.

25. Accessories Required Required as per Specification

Manual/ Hydraulic Override Required as per Specification 26.

2-3 sec. per inch. Nominal 27.

Time required for full opening/ Closing of the ball valve valve port Dia.

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	के विकास करण करणे. विकास करण करणे.
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 13 of 15

TABLE-1

ITEM : GAS OVER - OIL BALL VALVE ACTUATORS

Sl.	Tag No.	Size/ Class	Type of Valve	Line No.	Gas To	emp	Line (Pressi (kg/cr	ure	Delta P Shut Off (kg/cm ² g)	Location
					Min	Max	Min	Max		
		*	*	-	-29	65	-	-	49	

^{*}As per MR.

MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	STOOL CONTRACTOR
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 14 of 15

TABLE-2

ITEM : GAS OVER OIL BALL VALVE ACTUATORS

Sl. No.	Tag No.	Data from Ball Valve Vendor for (@ Max. Diff. Press.)		Ball Valve Torque Figure with a safety Factor of 1.25		Actuator Generated Torque at 10 Kg/cm2g regulated pressure (Note-1)		Model Selected	
		Break Torque (Nm)	Running Torque (Nm)	Max Allowable Valve Stem Torque (Nm)	Break Torque (Nm)	Running Torque (Nm)	Break Torque (Nm)	Running Torque (Nm)	Science
1.0	As per MR.								
2.0									

NOTE:

- 1. THESE FIGURES SHALL BE USED AS BASIS FOR TESTING THE ACTUATOR PERFORMANCE DURING FACTORY TESTING THE ACTUATOR ACCEPTANCE WOULD BE CARRIED OUT AFTER VERIFYING SUCCESSFUL TESTING COMPLETE BALL VALVE WITH ACTUATOR ASSEMBLY.
- 2. ALL TORQUE FIGURES MUST BE IN Nm.
- 3. Opening / Closing time shall be achieved at max. Design Differential pressure across the valve & actuator set at pressure 15 kg/cm2(g) (approx.). However, the actuator shall open/close the valve at actuator set pressure of 10 kg/cm2(g) at max. Design Differential pressure and without timing restriction.

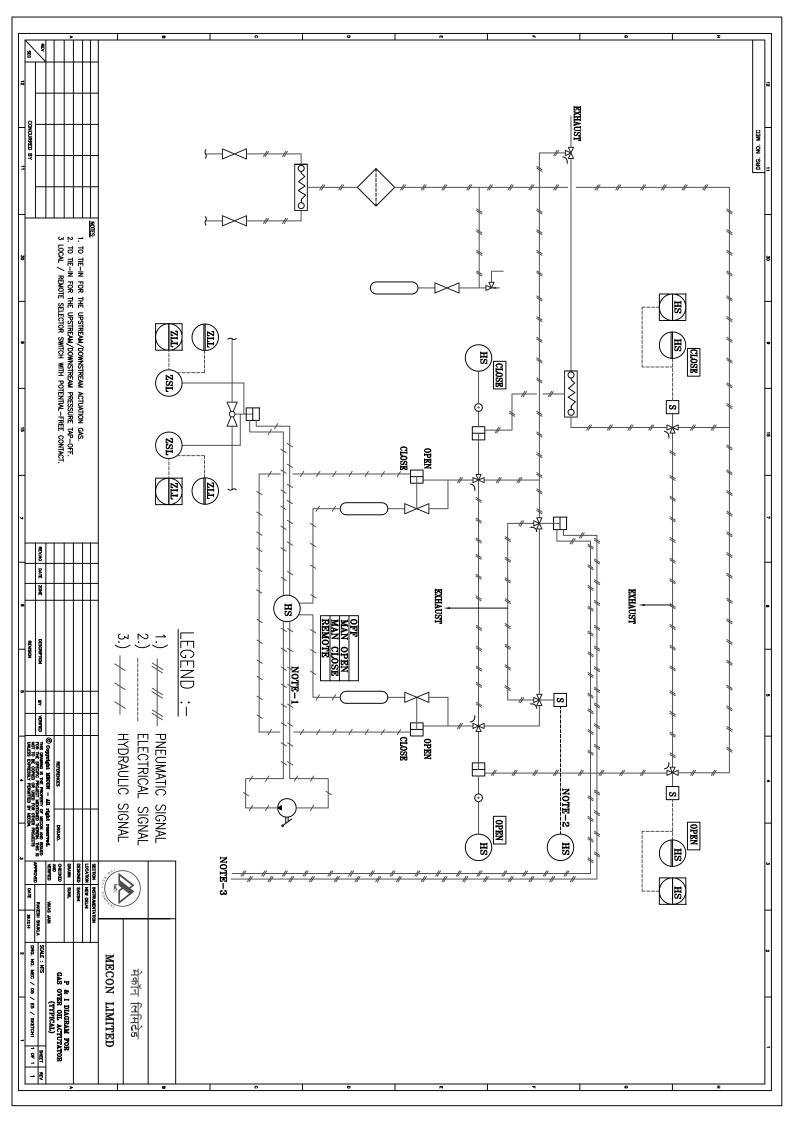
MECON LIMITED NEW DELHI	INSTRUMENTATION SECTION	T.S. NO.: MEC/TS/05/E5/002	The state of the s
TITLE	GAS OVER OIL ACTUATORS	REV 1	Page 15 of 15

Gas Composition

Natural Gas composition- in % (Vol/Vol.)

- a) Methane- 92.83
- b) Ethane- 3.10
- c) Propane- 1.23
- d) i-Butane- 0.23
- e) n-Butane- 0.30
- f) i-Pentane- 0.10
- g) n-Pentane-0.08
- h) Hexane-0.14
- i) Nitrogen- 0.77
- j) Carbon dioxide- 1.22

Considerably wet gas & also contain water vapour.



PHILOSOPHY FOR AUTO-CLOSURE OF VALVES

The valve shall be designed with Auto closure facility in case of pressure drops below specified value in order to prevent gas leakage due to damage in pipeline.

Three nos. Pressure switches shall be provided and the valve shall close in event of pressure drop indication by 2 out of 3 Pressure Switch.

On auto-closure, valve needs to be opened manually at site.

The set point of pressure for auto-closure shall be communicated during detailed engineering. However, it shall be field adjustable.

Facility for bypassing the auto closure (through manual valve) at site shall be provided. In that case, valve shall operate as a normal on-off remote operated valve.

The range of pressure switch shall be communicated during detailed engineering. However, it may cover entire pipeline operating pressure range.

Note: The above philosophy is applicable to valve actuators having auto closure facility and as indicated against respective MR item nos.

		TYPICAL DATA SHEET FOR HYDRAULIC ACTUA	TOR
GENERAL	1	SERVICE	WET NATURAL GAS
ACTUATOR	1	TYPE	HYDRAULIC ACTUATOR, MANUALLY OPERATED
	2	MIN. GAS PRESSURE FOR ACTUATOR SIZING	**
	3	SUPPLY PRESSURE: MIN/NOR/MAX.	*
	4	POWER GAS SUPPLY CONNECTION	*
	5	TUBING MATERIAL	SS 316
	6	TUBING SIZE: PNEUMATIC/HYDRAULIC	*/* 1/2" O.D. MINIMUM.
	7	FILTER REGULATOR	REQUIRED
	8	VALVE POSITION INDICATOR	OPEN/CLOSE
	9	MANUAL OVERRIDE	REQUIRED
	10	FAILURE POSITION	FAIL IN LAST POSITION
	11	PAINTING	AS PER PAINTING SPECIFICATION
	12	LOCAL CONTROL PANEL	REQUIRED
	13	CONTROL PANEL MATERIAL	SS 316
	14	LOGIC/TUBING COMPONENTS	SS 316 (MINIMUM)
	15	TUBE FITTINGS	SS 316
	16	PANEL ENCLOSURE CLASS	IP-66
	17	GAS STORAGE & HYD. CYLINDER CAPACITY	
	18	ACCESSORIES	
	19	POSITION SWITCHES	REQUIRED FOR BOTH OPEN AND CLOSED POSITIONS
	20	SOLENOID VALVE	*
	21	ADJUSTABLE STOPPER FOR ACTUATOR	REQUIRED FOR BOTH OPENING & CLOSING
	22	STEM EXTENSION	*
VALVE POSITION SWITCH	1 2	SWITCH TYPE	PROXIMITY TYPE
	3	CONTACT RATING	*
	4	CABLE ENTRY (JUNCTION BOX)	1/2" NPT (F) (2 NOS.)
	5	SWITCH QUANTITY	TWO
	6	ENCLOSURE MATERIAL	SS 316
	7	ENCLOSURE CLASS	NEMA 4X (NOTE-1)
	8	CERTIFICATION	REQUIRED
	9	CERTIFICATION AGENCY	UL/FM/BASEEFA OR EQUAL
PROCESS DATA	1	FLUID	WET NATURAL GAS
	2	FLOW RATE MIN/ NOR. / MAX MMSCMD	*
	3	PRESSURE DROP @ NORMAL FLOW (KPBA)R(G)	*
	4	OPERATING TEMPERATURE °C	5 TO 50
	5	OPERATING PRESSURE MIN./NOR./MAX BAR(G)	*
	6	DESIGN TEMPERATURE °C	-29 TO +65 °C
	7	DESIGN PRESSURE Kg/cm2g	49
	8	DIFFERENTIAL PRESSURE Kg/cm2g	49
	9	DENSITY @ NOR. FLOW / MOLECULAR WEIGHT	*
	10	VISCOSITY CP	*
	11	SPECIFIC HEAT RATIO (CP/CV) SPECIFIC HEAT RATIO (CP/CV)	*

^{*} Vendor to specify
** Actuator shall be sized considering max. Design Differential pressure across the valve.

MECON LIMITED	STANDARD TECHNIC		
REGD. OFF: RANCHI 834002	OIL & GAS	क्षेत्र मेकान कार्यः २००० Contin	
		DOCUMENT NO.	Page 1 of 7
TITLE	PACKING, TRANSPORTATION	MEC/TS/05/21/061	REVISION: 0
	& HANDLING OF VALVES		EDITION: 1

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)	(HARSH KUMAR)	(A. K. GUPTA)	11.09.2018
SDE	MGR	DGM	

MECON LIMITED	STANDARD TECHNIC		
REGD. OFF: RANCHI 834002	OIL & GAS S	के मेकान कार्य:2000 Contin	
		DOCUMENT NO.	Page 2 of 7
TITLE	PACKING, TRANSPORTATION	MEC/TS/05/21/061	REVISION: 0
	& HANDLING OF VALVES		EDITION: 1

AMENDMENT STATUS

SI.	Clause / Paragraph / Annexure / Exhibit /	Page	Pay Data		Rev. Date	вү	ву		d
No.	Drawing Amended	No.	itev.	Date	Name	Sig.	Name	Sig.	

MECON LIMITED	STANDARD TECHNIC		
REGD. OFF: RANCHI 834002	OIL & GAS	क्षेत्र मेकान कार्य:2000 Constituti	
		DOCUMENT NO.	Page 3 of 7
TITLE	PACKING, TRANSPORTATION	MEC/TS/05/21/061	REVISION: 0
	& HANDLING OF VALVES		EDITION : 1

TABLE OF CONTENTS

1.0	SCOPE	4
		_
2.0	PACKING	4
3.0	HANDLING	4
4.0	TRANSPORTATION	_
4.0	TRANSPORTATION	5

MECON LIMITED	STANDARD TECHNIC		
REGD. OFF: RANCHI 834002	OIL & GAS	के भेकान 8001:2000 Confe	
		DOCUMENT NO.	Page 4 of 7
TITLE	PACKING, TRANSPORTATION	MEC/TS/05/21/061	REVISION: 0
	& HANDLING OF VALVES		EDITION: 1

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
	TT Will a 1 to 1 to 1 to 1 to 7500

Withstand temperatures up to 75°C
I Non deforming, loosening or detaching
I Proof against sand blasting
I No glue residue
I Chloride free

MECON LIMITED	STANDARD TECHNIC		
REGD. OFF: RANCHI 834002	OIL & GAS	की मेकान कार्ग के किया के किया के किया के किया किया किया किया किया किया किया किया	
		DOCUMENT NO.	Page 5 of 7
TITLE	PACKING, TRANSPORTATION	MEC/TS/05/21/061	REVISION: 0
	& HANDLING OF VALVES		EDITION: 1

- 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.
- 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.

MECON LIMITED	STANDARD TECHNIC		
REGD. OFF: RANCHI 834002	OIL & GAS	80 मेकान विकास के	
		DOCUMENT NO.	Page 6 of 7
TITLE	PACKING, TRANSPORTATION	MEC/TS/05/21/061	REVISION: 0
	& HANDLING OF VALVES		EDITION: 1

- 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/

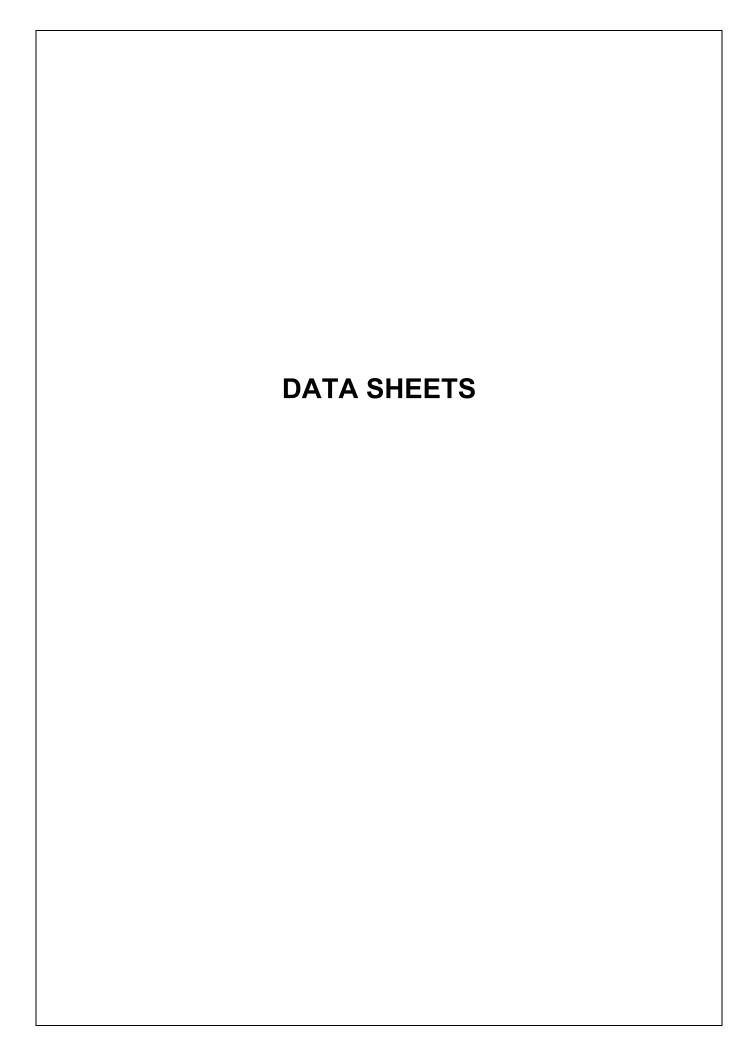
MECON LIMITED	STANDARD TECHNIC		
REGD. OFF: RANCHI 834002	OIL & GAS	के मेकान कार्य:2000 Conve	
		DOCUMENT NO.	Page 7 of 7
TITLE	PACKING, TRANSPORTATION	MEC/TS/05/21/061	REVISION: 0
	& HANDLING OF VALVES		EDITION: 1

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 SHEET I	OR BALL VALV	<u>'ES</u>		
1.0	MR Item no				:				Actuator Manufacturer :	
2.0	Valve Size	DN (inch)	: DN 750 (3	0")			ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's	Technical S	Specification	No.	: MEC/TS	/05/21/002, Rev-1	, Ed-1			
4.0	Connecting	g Pipeline D	esign Pressi	ure, kg/cm2 (g):	49				Design Temperature, °C : -29	°C to +65°C
5.0 5.1	Connectin Material	g Pipe Spe	ecification :			DN 750 (30") API 5L Gr. X-70 PSL 2				
5.2 5.3	Outer Diam Thickness,					762 15.9]			
6.0 6.1.	Valve Con: Configurati	struction D	Design		: Reduced	1 Bore	Full Bore √			
6.2. 6.3.	End Conne		plicable)			as per ASME B16.		RT	per ASME B16.25 NA V	
6.4 6.5	Ball Mounti Valve body	-				Mounted	Two/Three Piece B		Either	_
6.6	500 mm pu	up piece(inte		ed to the valve or kness of pup pie	each side):	Yes √ connecting pipe men		No	
7.0	Valve Mate	erial Specif	fication					T		_
		art			Specified	Material		(Eq	Material Offered uivalent or superior)	
7.1 7.2	Body Ball			CC / A 234 Gr. WF CC/A 234 Gr.WPC		coating/ AISI410				
7.3	Body Seat R (No Casting)		AISI 4140 +	75 micron ENP	coating/A	ISI 410				
7.4 7.5	Seat Seal Stem (No ca	astina)	VITON/DEV	LON 5 micron ENP co	ating/AISI 4	110				
7.6 7.7	Stem Seals		VITON/PTF		_					
8.0	Stud Bolts/ N	Allowance		3 GI. BII A134 V	31. 211			Service : NATUR	RAL GAS / RLNG	
9.0	Location				: Above	e Ground	Buried √			
10.0	Stem Exter	nsion Requi	irement		: Yes	$\sqrt{}$	No		extension shall be 2750+ or -250 nalized during drawing approva	
11.0	Gear Opera	ator Requir	ement		: Yes	(For 6"&	above)	No √	nunzed during drawing approva	stage.
12.0		equirement			: Yes	$\sqrt{}$	No		Gas Over Oil Actuator MEC/TS/05/E5/002	
13.0		_	Requiremen	t	: Type	test as per API 6F	A/API607			
14.0	valve i est	ting Requir	rement			ressure (min.),	Minimum Dura	ation, minutes	1	
14.1	Hydrostatio	Test		Body		kg/cm²(g) 79	As per		1	
14.2	Air Test			Seat		57 5.6-7	As per As per		-	
15.0	Anti-Static	Testing Re	quirement	: As per Sta	ndard API	6D (Latest Ed.)			_	
16.0 16.1	Valve Pain	nting Speci	fication		SA 2 1/2	Swedish Standard	SIS-055 909			
16.2	For under g	ground insta	allation-Thre	e coats of corros	ion resista	nt paint shall be ap	plied with minimum finalized during dra			
17.0	Lock Open.	/ Lock Clos	e/Normally C	Close Requireme	nt : N.A.					
	1.								//21/002,Rev 1 ,Ed. 1	
	2. 3.	Stops shal	ll be provided	I for positive alig	nment of b	all with ports and e	t, MECON's T.S., A nsure proper installa	ation of handle.		
	4. 5.				,		Only long pattern va		oplied. nuts shall be conducted	
		as per Cl.	3.4 & 3.6 of	ΓS respectively of	r as per re	levant material cod	le.	,_, o.o.n a oluuo /	So conducted	
	6. 7.						/ gasket materials. num and minimum I	ID at pipe end) sh	all not be more than 0.5% of pip	e OD.
	8	Valves sha	all be inspect	ed and approved	by Purcha	ser before despate	ch.			
	9 10	Bidder sha	all clearly writ	e valves materia	l (equivale		red by them against	•		
	11	shall clearl	ly indicate "A	GREED".			mentioned above in specified in ASME		neet, bidder osion allowance specified in this	datasheet .
REV. NO.	DATE	ZONE		DESCRIPTIONS		BY	APPRD			
			•	REVISIONS	CLIENT			REFERENCES	DRG. NO.	
SECTION	PROCESS	DATE	G CHKD	DATE		Oil India Limited : BAGHJAN – MAI	DHUBAN			
DSGN DRWN	A.Mathur	20-11-18	Harsh Kumar	20-11-18	PIPELINE	PROJECT		मेकॉन 8001 टकाप	MECON LIMIT	ED
APPROVE	ED.	<u> </u>	1	AK Gupta,DGM	DATA	SHEET FOR BA (NB ≥ 2")	ALL VALVES	DATA SHEET NO.: MEC/23U1/05/28/M/0	001/DS/BV/01	REV 0

						DATA SHEET I	FOR BALL VALVE	<u>:s</u>		
1.0	MR Item n				:				Actuator Manufacturer :	
2.0	Valve Size	e DN (inch)	: DN 750 (3	30")			ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's	Technical S	Specification	No.	: MEC/T	S/05/21/002, Rev	-1, Ed-1			
4.0	Connectin	g Pipeline [Design Press	sure, kg/cm2 (g)	49				Design Temperature, °C : -29°C	to +65°C
5.0	Connectin	ng Pipe Spe	ecification :			DN 750 (30")]			
5.1	Material					API 5L Gr. X-70 PSL 2				
5.2 5.3	Outer Diar Thickness					762 15.9	_			
						15.9	_			
6.0 6.1.	Valve Cor Configurat	nstruction [tion	Design		: Reduce	ed Bore	Full Bore √			
6.2. 6.3.	End Conne Flanges (v	ections vherever ap	plicable)		: Flange : a) RF b) Sei		16.5 Smooth (125 to 200)	Butt Welded as per A	ASME B16.25 V	
6.4	Ball Mount	-			: Trunnio	on Mounted				J
6.5 6.6	Valve bod		tegrally weld	led to the valve	: Fully W on each s		Two/Three Piece Be Yes √	olted	Either No	
0.0							ne connecting pipe m	entioned above)		
7.0	Valve Mat	erial Speci	fication					1		1
	P	art			Specifie	ed Material			aterial Offered valent or superior)	
7.1 7.2	Body Ball			CC / A 234 Gr. W		IP coating/ AISI410				
7.2	Body Seat F			+ 75 micron EN		-				
7.4	(No Casting Seat Seal	1)	VITON/DE\							
7.5	Stem (No c		AISI 4140 + 1	75 micron ENP c	oating/AIS	1410				
7.6 7.7	Stem Seals Stud Bolts/		VITON/PTF ASTM A 19	FE 93 Gr. B7/ A194	Gr. 2H					
8.0	Corrosion	Allowance	: 5 mm					Service : NATURAL	GAS / RLNG	
9.0	Location	7 mowarioc	. •		: Abov	ve Ground	Buried √	CCIVICE : IVITOTOLE	O/IO/ NENO	
10.0	Stem Exte	nsion Requ	irement		: Yes	\Box	No	Length of stem exter	nsion shall be 2750+ or -250mm	
11.0		rator Requir			: Yes	(For 6"	& above)	_	ed during drawing approval stage	
12.0	Actuator R	Requirement	t		: Yes	$\sqrt{}$	No	As per attached Gas		
13.0	Fire Resis	tant Design	Requiremen	nt	: Тур	e test as per API 6	6FA/API607	specification No. ME	C/TS/05/E5/002 and HOV datasl	neet
14.0	Valve Tes	ting Requi	rement				1		1	
						Pressure (min.), kg/cm²(g)	Minimum Du	ration, minutes		
14.1	Hydrostati	c Test		Body Seat		79 57		r API 6D r API 6D]	
14.2	Air Test			Seat		5.6-7		r API 6D		
15.0	Anti-Static	Testing Re	equirement	: As per Sta	andard Al	PI 6D (Latest Ed.)				
16.0		nting Speci	·							
16.1				sting as per grad	de SA 2 1/	/2, Swedish Stand	ard SIS-055 909.			
16.2		-						m thickness of 600 m drawing approval stag		
17.0	•	n/ Lock Clos	se/Normally	Close Requirem	nent: N.A	١.				
	Notes: 1.							ion No. MEC/TS/05/2		
	2. 3.		-				heet, MECON's T.S., d ensure proper insta	API 6D and other rele	evant standards.	
	4.				-	•		alves are to be suppl	lied.	
	5.					adaptor, end flang		ngs, stem & studs / n	uts shall be conducted	
	6.	Compress	ed asbestos	fibre (CAF) sha	all not be u	used for body seal	ing / gasket materials			_
	7. 8		-		-	erence between m chaser before des		n ID at pipe end) shal	I not be more than 0.5% of pipe 0	DD.
	9	Support fo	ot & lifting lu	ugs shall be pro	vided as p	er Cl. 4.16 of the	TS for Ball Valves		of control in the	
	10		-					st each part/material of in MECON's data she		
	11	shall clearl	ly indicate "/	AGREED".	Ü				on allowance specified in this dat	tasheet .
			1			T		I		
REV. NO.	DATE	ZONE	<u> </u>	DESCRIPTIONS REVISIONS		BY	APPRD	REFERENCES	DRG. NO.	
SECTION	PROCES NAME	S & PIPIN			4	: Oil India Limited				
DSGN	A.Mathur	DATE 20-11-18	CHKD Harsh Kumar	DATE 20-11-18	1	T: BAGHJAN – M E PROJECT	ADI IODAN	मेकॉन	MECON LIMITED)
DRWN					DATA	SHEET FOR E	BALL VALVES	DATA SHEET NO.:	<u> </u>	REV
APPROVE	ED			AK Gupta,DGM		(NB ≥ 2")	TALTEO	MEC/23U1/05/28/M/001/	DS/BV/02	0

						DATA SHEET F	OR BALL VALV	<u>'ES</u>		
1.0	MR Item n Valve Man				:				Actuator Manufacturer :	
2.0	Valve Size	DN (inch)	: DN 750 (3	30")			ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's	Technical S	Specification	No.	: MEC/TS	/05/21/002, Rev-1	, Ed-1			
4.0	Connecting	g Pipeline D	Design Pres	sure, kg/cm2 (g)	:49				Design Temperature, °C : -29°C	C to +65°C
5.0	Connectin	g Pipe Spe	ecification :			DN 750 (30")]			
5.1	Material					API 5L Gr. X-70 PSL 2				
5.2 5.3	Outer Dian Thickness,					762 15.9	1			
6.0		struction [Desian				_			
6.1.	Configurati	ion	200.g		: Reduced		Full Bore √			,
6.2. 6.3.	End Conne Flanges (w	ections /herever ap	plicable)		: Flanged : a) RF b) Serra	as per ASME B16 ated	Smooth (125 to 200	RT RT AARH)	ASME B16.25	-
6.4 6.5	Ball Mount Valve body	-			: Trunnior		Two/Three Piece I	Bolted	Either	-
6.6	500 mm pt	up piece(int		led to the valve o	on each sid	e):	Yes √ connecting pipe me		No	
7.0	Valve Mate	erial Speci	fication					T		7
	Pa	art			Specified	Material			aterial Offered valent or superior)	
7.1 7.2	Body Ball			CC / A 234 Gr. WI		coating/ AISI410				
7.3	Body Seat R			+ 75 micron EN						1
7.4	(No Casting) Seat Seal)	VITON/DE	VLON						
7.5	Stem (No ca	asting)		75 micron ENP co	oating/AISI 4	10				
7.6 7.7	Stud Bolts/ N	Nuts	VITON/PTF ASTM A 19	-E 93 Gr. B7/ A194	Gr. 2H					
8.0	Corrosion	Allowance	: 5 mm					Service : NATURAL	GAS / RLNG	
9.0	Location				: Above	Ground √	Buried			
10.0	Stem Exter	nsion Requ	irement		: Yes		No √			
11.0	Gear Oper	ator Requir	rement		: Yes	(For 6"&	above)	No √		
12.0	Actuator R	equirement	t		: Yes	√	No	As per attached Gas	s Over Oil Actuator	
13.0	Fire Resist	ant Design	Requireme	nt	: Туре	test as per API 6F	A/API607	specification No. ME	C/TS/05/E5/002 and HOV datast	heet
14.0	Valve Test	ting Requir	rement						-	
						ressure (min.), g/cm ² (g)	Minimum Du	uration, minutes		
14.1	Hydrostatio	c Test		Body		79		er API 6D		
14.2	Air Test			Seat		57 5.6-7		er API 6D er API 6D	-	
15.0	Anti-Static	Testing Re	quirement	: As per Sta	andard API	6D (Latest Ed.)			_	
		_	-	·		, ,				
16.0 16.1	Valve Pair Surface pr			sting as per grad	le SA 2 1/2,	Swedish Standar	d SIS-055 909.			
16.2		•				•		m thickness of 300 m	nicron er any change in colour	
	shall be fin	alized durir	ng drawing a	approval stage.		miorony. Goldar G	r paint shade shair i	be rule 7000, nowev	or any change in colour	
17.0	Lock Open Notes:	/ Lock Clos	se/Normally	Close Requirem	ent :N.A.					
	1.							ion No. MEC/TS/05/2		
			_				ensure proper insta	API 6D and other release allation of handle.	evant standards.	
				•		•		valves are to be suppl	lied. uts shall be conducted	
						elevant material co	•	ngs, stem & studs / n	uts shall be conducted	
				. ,		, ,	g / gasket materials imum and minimun		I not be more than 0.5% of pipe 0	OD.
	8	Valves sha	all be inspec	ted and approve	d by Purch	aser before despa	itch.	F-Po ona/ ona	s and a solve of pipe of	
			-	-	-	Cl. 4.16 of the TS nt or superior) offe		st each part/material	of valve in the	
		space prov	vided for. W	herever bidder a				in MECON's data she		
			ly indicate "A hickness of		apter shall n	ot be less than tha	at specified in ASM	E B16.34 plus corrosi	ion allowance specified in this da	tasheet .
REV. NO.	DATE	ZONE		DESCRIPTIONS		BY	APPRD			
		S & PIPIN	G	REVISIONS	CLIENT.			REFERENCES	DRG. NO.	
SECTION	NAME	DATE	CHKD	DATE	4	Oil India Limited : BAGHJAN – MA	DHUBAN			
DSGN DRWN	A.Mathur	20-11-18	Harsh Kumar	20-11-18	PIPELINE	PROJECT		मेकॉन 5001 Eart (हार)	MECON LIMITEI	D
	-D		1	AKO 1 555	1	SHEET FOR BA	ALL VALVES	DATA SHEET NO.:	1	REV
APPROVE	בט			AK Gupta,DGM	1	(NB ≥ 2")		MEC/23U1/05/28/M/001/I	D9/RA\03	0

				DATA SHEET F	OR BALL VALVE	<u>:s</u>		
	MR Item nos.: A.							
1.0	Valve Manufactur	er		:			Actuator Manufacturer :	
2.0	Valve Size DN (in	ch) : DN 600 (2	24")		ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's Technic	cal Specification	No.	: MEC/TS/05/21/002, Rev-1,	Ed-1			
4.0	Connecting Pipeli	ne Design Press	sure, kg/cm2 (g):	49			Design Temperature, °C : -29°C	to +65°C
5.0	Connecting Pipe Material	Specification :		DN 600 (24") API 5L Gr. X-52				
5.1 5.2	Outer Diameter, r	nm		PSL 2 610				
5.3	Thickness, mm			14.3				
6.0 6.1.	Valve Construction	on Design		. Doduced Pere	Full Bore √			
6.2.	Configuration End Connections			: Reduced Bore : Flanged as per ASME B16.9		Butt Welded as per A	-,]
6.3.	Flanges (whereve	r applicable)		: a) RF b) Serrated S	mooth (125 to 200 mi	RT LIDIC (ICTOINCHES AARH)	NA √ NA √	
6.4 6.5	Ball Mounting Valve body type			: Trunnion Mounted : Fully Welded \[\]	Two/Three Piece Bo	olted	Either	•
6.6	500 mm pup piec				Yes		No V	
7.0	Valve Material S	ecification				Т м.	aterial Offered	İ
	Part			Specified Material			ralent or superior)	
7.1 7.2	Body Ball		/CB / A 234 Gr. WP /CB/A 234 Gr.WPB	B) +75 μENP coating/ AlSI410				
7.3	Body Seat Rings (No Casting)	AISI 4140	+ 75 micron ENP	coating/AISI 410				
7.4	Seat Seal	VITON/DE						
7.5 7.6	Stem (No casting) Stem Seals	AISI 4140 + VITON/PTI	75 micron ENP co	ating/AISI 410				
7.7	Stud Bolts/ Nuts	ASTM A 19	93 Gr. B7/ A194 G	Gr. 2H				
8.0	Corrosion Allowar	ce : 5 mm				Service : NATURAL	GAS / RLNG	
9.0	Location			: Above Ground √	Buried			
10.0	Stem Extension F	equirement		: Yes	No √			
11.0	Gear Operator Re	quirement		: Yes [(For 6"& a	above)	No √		
12.0	Actuator Requirer	nent		: Yes √	No	As per attached Gas specification No. ME		
13.0	Fire Resistant De	sign Requiremer	nt	: Type test as per API 6FA	VAPI607	with Auto-Closure fac	cility	
14.0	Valve Testing Re	quirement		Test Pressure (min.),]	
14.1	Hydrostatic Test		Body	kg/cm²(g)		ration, minutes		
14.1	nyurostatic rest		Seat	57		r API 6D		
14.2	Air Test			5.6-7	As per	r API 6D		
15.0	Anti-Static Testing	Requirement	: As per Star	ndard API 6D (Latest Ed.)				
16.0	Valve Painting S			010400 0 10104 1 10	0.055.000			
16.1 16.2	For above ground (Permissible thick	installation-Thre ness in each co	ee coats of corrosi oat shall be within	SA 2 1/2, Swedish Standard Si ion resistant paint shall be appl 80 to 120 micron). Colour of pa	ied with minimum thi			
17.0	shall be finalized Lock Open/ Lock			nt: N.A.				
	Notes: 1. This V	alve Data Sheet	t shall be read in o	onjunction with MECON's Tech	inical Specification N	lo. MEC/TS/05/21/002	,Rev 1 ,Ed. 1	
	Inspec	tion and Testing	g shall be as per a	ttached QAP, this Data Sheet, ment of ball with ports and ens	MECON's T.S., API	6D and other relevant		
	4. Short	oattern valves (a	as per API 6D or o	therwise) are not permitted. Or	ly long pattern valve	s are to be supplied.		
				y, body adaptor, end flanges, b r as per relevant material code.		stem & studs / nuts sh	all be conducted	
	6. Comp	essed asbestos	fibre (CAF) shall	not be used for body sealing / g	gasket materials.	t pipe and) -t-!!- '	e more than 0.50/ -f -i 0.5	
	8 Valves	shall be inspec	ted and approved	e. difference between maximu by Purchaser before despatch		n pipe enu) snan not b	e more trair 0.5% or pipe OD.	
				led as per Cl. 4.16 of the TS fo (equivalent or superior) offered		ch part/material of val	ve in the	
	space	provided for. W	herever bidder agı	rees with valves material as me		•		
		learly indicate "A um thickness of		ter shall not be less than that s	pecified in ASME B1	6.34 plus corrosion all	lowance specified in this datashee	t.
REV. NO.	DATE ZON	E	DESCRIPTIONS	BY	APPRD			
SECTION	PROCESS & PI	PING	REVISIONS	CLIENT: Oil India Limited		REFERENCES	DRG. NO.	
	NAME DAT	E CHKD	DATE	PROJECT: BAGHJAN – MAD	HUBAN		MEGGY	
DSGN DRWN	A.Mathur 20-11	-18 Harsh Kumai	20-11-18	PIPELINE PROJECT		SOOT COMPANY	MECON LIMITED	
APPROVE	:D		AK Gupta,DGM	DATA SHEET FOR BALL (NB ≥ 2")	VALVES	DATA SHEET NO.: MEC/23U1/05/28/M/001/D	S/BV/04	REV 0

				DATA SHEET F	OR BALL VALVE	<u>:s</u>		
1.0	MR Item nos.: A Valve Manufactu	-,		:			Actuator Manufacturer :	
2.0	Valve Size DN (in	ch) : DN 600 (2	24"), DN 300 (12")		ANSI Rating: 300#	ŧ	Design Standard : API 6D	
3.0	MECON's Techn	cal Specification	No.	: MEC/TS/05/21/002, Rev-1,	Ed-1			
4.0	Connecting Pipel	ne Design Press	sure, kg/cm2 (g):	49			Design Temperature, °C : -29°C	to +65°C
5.0 5.1	Connecting Pipe Material	Specification :		N.A.				
5.2 5.3	Outer Diameter, Thickness, mm	nm						
6.0	Valve Construct	on Docian						
6.1.	Configuration	on Design		: Reduced Bore	Full Bore √	5	10ME D40 05	1
6.2. 6.3.	End Connections Flanges (wherever	er applicable)		: Flanged as per ASME B16. : a) RF	5 [V] Smooth (125 to 200 m	Butt Welded as per RTicroinches AARH)	NA NA	
6.4 6.5	Ball Mounting Valve body type			: Trunnion Mounted : Fully Welded	Two/Three Piece Bo	olted	Either √	,
6.6	500 mm pup pied		ed to the valve on e ckness of pup piece		Yes		No √	
7.0	Valve Material S	pecification		Specified Material			laterial Offered	
7.1	Body	A 216 Gr. W	VCB / A 234 Gr. WPB	ореспіви мацепа!		(Equi	valent or superior)	
7.2	Ball Body Seat Rings			+75 μENP coating/ AlSI410				
7.3	(No Casting)		+ 75 micron ENP c	oating/AISI 410				
7.4 7.5	Seat Seal Stem (No casting)		75 micron ENP coat	ing/AISI 410				
7.6 7.7	Stem Seals Stud Bolts/ Nuts	VITON/PT ASTM A 1	FE 93 Gr. B7/ A194 Gr	. 2H				
8.0	Corrosion Allowa	nce : 5 mm					Service : NATURAL GAS / RLNG	;
9.0	Location			: Above Ground √	Buried			
10.0	Stem Extension I	Requirement		: Yes	No √			
11.0	Gear Operator R	equirement		: Yes [(For 6"&	above)	No √		
12.0	Actuator Require	ment		: Yes √	No	As per attached Ga specification No. MI		
13.0	Fire Resistant De	sign Requiremer	nt	: Type test as per API 6F.	A/API607	•	y for 24" Valve only)	
14.0	Valve Testing R	equirement		Test Pressure (min.),	Minimum Du	ration minutes	1	
14.1	Hydrostatic Test		Body	kg/cm ² (g) 79		ration, minutes	-	
14.2	Air Test		Seat	57 5.6-7	As per	r API 6D r API 6D	1	
15.0	Anti-Static Testin	n Requirement	: As per Stand	lard API 6D (Latest Ed.)	As per	74105	J	
			. To per claire	/ / (
16.0 16.1		on by Short Blas		A 2 1/2, Swedish Standard SI				
16.2	•			n resistant paint shall be appli 0 to 120 micron). Colour of pa				
17.0	shall be finalized		approval stage. Close Requirement	: N.A.				
	Notes:	•		njunction with MECON's Tech	nical Specification No	n MEC/TS/05/24/002	Rev 1 Ed 1	
	Inspe	ction and Testing	g shall be as per atta	ached QAP, this Data Sheet, I	MECON's T.S., API 6	D and other relevant		
				nent of ball with ports and ens erwise) are not permitted. On				
		•	•	body adaptor, end flanges, bas per relevant material code.	. ,	tem & studs / nuts sh	all be conducted	
	6. Comp	ressed asbestos	s fibre (CAF) shall no	ot be used for body sealing / g	asket materials.	nine and) -b-!! - '	e more than 0.50/ -f = : OD	
	8 Valve	s shall be inspec	ted and approved b	y Purchaser before despatch.		pipe enu) snaii not b	e more than 0.5% of pipe OD.	
		_	-	d as per Cl. 4.16 of the TS for equivalent or superior) offered		h part/material of val	ve in the	
	shall	learly indicate ".	AGREED".	es with valves material as me			dder lowance specified in this datashee	t.
DEL				·		piac concolori all		
REV. NO.	DATE ZO	•	DESCRIPTIONS REVISIONS	BY	APPRD	REFERENCES	DRG. NO.	
SECTION	PROCESS & P		DATE	CLIENT: Oil India Limited PROJECT: BAGHJAN – MAI	OHUBAN	1		
DSGN	A.Mathur 20-1			PIPELINE PROJECT		मेकॉन	MECON LIMITED)
DRWN				DATA SHEET FOR BALI	VALVES	DATA SHEET NO.:	•	REV
APPROVE	ט		AK Gupta,DGM	(NB ≥ 2")		MEC/23U1/05/28/M/001/	DS/BV/05	0

				DATA SHEET F	OR BALL VALVE	<u>:s</u>		
1.0	MR Item nos.: Valve Manufact			:			Actuator Manufacturer :	
2.0	Valve Size DN	(inch) : DN 60	00 (24"), DN 400 (16")		ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's Tech	nical Specifica	ition No.	: MEC/TS/05/21/002, Rev-1,	Ed-1			
4.0	Connecting Pip	eline Design P	ressure, kg/cm2 (g):	49			Design Temperature, °C : -29°C	to +65°C
5.0	Connecting Pi	pe Specification	on :	N.A.				
5.1	Material							
5.2 5.3	Outer Diameter Thickness, mm	*						
6.0 6.1.	Valve Construction	ction Design		: Reduced Bore √	Full Bore			
6.2.	End Connection			: Flanged as per ASME B16.5		Butt Welded as per A		
6.3.	Flanges (where	ever applicable)		mooth (125 to 200 mi	RT L	NA	
6.4 6.5	Ball Mounting Valve body type	e		: Trunnion Mounted : Fully Welded	Two/Three Piece Bo	olted	Either √	
6.6			velded to the valve on Thickness of pup piece	each side): e to be same as that of the cor	Yes nnecting pipe mention	ned above)	No √	
7.0	Valve Material	Specification		Specified Material		M	aterial Offered	
7.1	Part Body	A 216 G	Gr. WCB / A 234 Gr. WPI			(Equiv	valent or superior)	
7.2	Ball	(A 216 (+75 µENP coating/ AISI410				
7.3	Body Seat Rings (No Casting)	Al3i 41	140 + 75 micron ENP	coating/AISI 410				
7.4 7.5	Seat Seal Stem (No casting		/DEVLON 40 + 75 micron ENP coa	iting/AISI 410				
7.6 7.7	Stem Seals Stud Bolts/ Nuts	VITON ASTM	/PTFE A 193 Gr. B7/ A194 G	r. 2H				
8.0	Corrosion Allow						Service : NATURAL GAS / RLNG	i
9.0	Location			: Above Ground √	Buried			
10.0	Stem Extension	n Requirement		: Yes	No √			
11.0	Gear Operator	Requirement		: Yes [(For 6"& a	ibove)	No √		
12.0	Actuator Requir	rement		: Yes √	No	As per attached Gas	Over Oil Actuator C/TS/05/E5/002 and HOV Datashe	eet
13.0	Fire Resistant [Design Require	ement	: Type test as per API 6FA	VAPI607			
14.0	Valve Testing	Requirement		Test Pressure (min.),	Minimum Du]	
14.1	Hydrostatic Tes	st	Body	kg/cm²(g) 79		ration, minutes		
			Seat	57	As per	r API 6D		
14.2	Anti-Static Test	ing Peguireme	nt · As nor Stan	5.6-7 dard API 6D (Latest Ed.)	As per	r API 6D	I	
				ualu Ari ob (Latest Lu.)				
16.0 16.1	Valve Painting Surface prepara	•		SA 2 1/2, Swedish Standard SI	S-055 909.			
16.2				on resistant paint shall be appl 30 to 120 micron). Colour of pa				
17.0		-	ng approval stage. ally Close Requiremen	t : N.A.				
	Notes:			onjunction with MECON's Tech	inical Specification N	In MEC/TS/05/21/002	Rev 1 Ed 1	
	Insp	ection and Tes	sting shall be as per at	tached QAP, this Data Sheet,	MECON's T.S., API	6D and other relevant		
	4. Sho	rt pattern valve	es (as per API 6D or of	ment of ball with ports and ens herwise) are not permitted. Or	ly long pattern valve	s are to be supplied.		
				 body adaptor, end flanges, b as per relevant material code. 		stem & studs / nuts sh	all be conducted	
				not be used for body sealing / o		it pipe end) shall not h	e more than 0.5% of pipe OD.	
	8 Valv	es shall be ins	spected and approved	by Purchaser before despatch.		. , , , , , , , , , , , , , , , , , , ,		
	10 Bidd	der shall clearly	write valves material	ed as per Cl. 4.16 of the TS for (equivalent or superior) offered	by them against ea	•		
	shal	Il clearly indica	te "AGREED".	ees with valves material as me				
				ı		6.34 plus corrosion all	lowance specified in this datashee	t .
REV. NO.	DATE Z	ONE	DESCRIPTIONS REVISIONS	BY	APPRD	REFERENCES	DRG. NO.	
SECTION	PROCESS &	PIPING DATE CHK	D DATE	CLIENT: Oil India Limited PROJECT: BAGHJAN – MAD	HUBAN			
DSGN		-11-18 Harsh K		PIPELINE PROJECT	J=1 = 1	मेकॉन	MECON LIMITED)
DRWN APPROVE	<u>.</u>		AK Cunto DOM	DATA SHEET FOR BALL	VALVES	DATA SHEET NO.:	D/DV/IDE	REV 0
ALLKOVE	.U		AK Gupta,DGM	(NB ≥ 2")		MEC/23U1/05/28/M/001/D	3/10/10/0	U

					DATA SHEET F	OR BALL VALVE	<u>s</u>		
	MR Item nos.:								
1.0	Valve Manufac	cturer			:			Actuator Manufacturer : N.A.	
2.0	Valve Size DN	l (inch)	: DN 300 (1	2")		ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's Tec	chnical S	pecification	No.	: MEC/TS/05/21/002, Rev-1,	Ed-1			
4.0	Connecting Pi	ipeline D	esign Press	sure, kg/cm2 (g)):49			Design Temperature, °C : -29°C	to +65°C
5.0	Connecting P	Pipe Spe	ecification:		DN 300 (12") API 5L Gr. B				
5.1	Material Outer Diamete				PSL 2				
5.2 5.3	Thickness, mn	. ,			323.9 12.7				
6.0	Valve Constru	uction D	Design						
6.1. 6.2.	Configuration End Connection	one			: Reduced Bore : Flanged as per ASME B16.	Full Bore √	Butt Welded as per A	ASME B16 25	l
6.3.	Flanges (wher		plicable)		: a) RF	5 6mooth (125 to 200 m	RT	NA √ NA √	
6.4 6.5	Ball Mounting Valve body typ	ne			: Trunnion Mounted : Fully Welded $\sqrt{}$	Two/Three Piece Bo	olted	Either	•
6.6	500 mm pup p	oiece(inte			on each side) : iece to be same as that of the	Yes		No √	
7.0	Valve Materia	I Specif	fication				l Ma	aterial Offered	l
7.4	Part		A 245 C= W	OD / A 004 O- W	Specified Material			alent or superior)	
7.1 7.2	Body Ball			CB / A 234 Gr. W CB/A 234 Gr.WP	B) +75 µENP coating/ AISI410				
7.3	Body Seat Rings (No Casting)	S	AISI 4140 +	75 micron EN	IP coating/AISI 410				
7.4	Seat Seal	,	VITON/DE\						
7.5 7.6	Stem (No castin Stem Seals		VITON/PTF	75 micron ENP c	oating/AISI 410				
7.7	Stud Bolts/ Nuts	5	ASTM A 19	3 Gr. B7/ A194	Gr. 2H				
8.0	Corrosion Allo	wance	: 5 mm					Service : NATURAL GAS / RLNC	3
9.0	Location				: Above Ground √	Buried			
10.0	Stem Extension	on Requi	irement		: Yes	No √			
11.0	Gear Operator	r Require	ement		: Yes √ (For 6"&	above)	No		
12.0	Actuator Requ	uirement			: Yes	No √			
13.0	Fire Resistant	Design	Requiremen	nt	: Type test as per API 6F.	A/API607			
14.0	Valve Testing	Requir	ement		Test Pressure (min.),	Minimum Dur	ration, minutes		
14.1	Hydrostatic Te	et .		Body	kg/cm ² (g)		r API 6D		
	Try drootatio To			Seat			API 6D		
14.2	Air Test				5.6-7	As per	r API 6D		
15.0	Anti-Static Tes	sting Red	quirement	: As per St	andard API 6D (Latest Ed.)				
16.0	Valve Painting			iting on	de SA 2 1/2, Swedish Standar	4 CIC OEE 000			
16.1 16.2			•		rosion resistant paint shall be a		n thickness of 300 mid	cron	
				at shall be with approval stage.	in 80 to 120 micron). Colour o	f paint shade shall be	e RAL-7038, however	r any change in colour	
17.0	Lock Open/ Lo			Close Requirem	nent : N.A.				
					n conjunction with MECON's T				
		•	_	•	r attached QAP, this Data She ignment of ball with ports and			vant standards.	
	4. She	ort patte	rn valves (a	s per API 6D o	r otherwise) are not permitted.	Only long pattern va	alves are to be supplie		
					ody, body adaptor, end flange or as per relevant material co	•	gs, stem & studs / nu	ts shall be conducted	
	6. Co	mpresse	ed asbestos	fibre (CAF) sha	all not be used for body sealing	g / gasket materials.			_
			-		s (i. e. difference between max ed by Purchaser before despa		וט at pipe end) snall ו	not be more than 0.5% of pipe Ol	J.
			-		vided as per Cl. 4.16 of the TS ial (equivalent or superior) offer		t each nart/material of	f valve in the	
	spa	ace prov	rided for. WI	herever bidder a	agrees with valves material as		•		
			y indicate "A nickness of		apter shall not be less than tha	at specified in ASME	B16.34 plus corrosio	n allowance specified in this data	sheet .
REV. NO.	DATE 2	ZONE		DESCRIPTIONS	BY	APPRD			
SECTION			2	REVISIONS	CLIENT : Oil India Limited		REFERENCES	DRG. NO.	
SECTION		DATE	CHKD	DATE	PROJECT: BAGHJAN – MAI	HUBAN			
DSGN DRWN	A.Mathur 20	0-11-18	Harsh Kumar	20-11-18	PIPELINE PROJECT		मेकॉन 9001 Company	MECON LIMITED)
APPROV	ED			AK Gupta,DGM	DATA SHEET FOR BA (NB ≥ 2")	LL VALVES	DATA SHEET NO.: MEC/23U1/05/28/M/001/E	DS/BV/07	REV 0

					<u>DAT.</u>	A SHEET FO	R BALL VALVES	<u>s</u>		
1.0	MR Item no Valve Manut		13,A.16		:				Actuator Manufacturer : N.A.	
2.0	Valve Size D	ON (inch)	: DN 300 (12"),	DN 250 (10"), DN	100 (4")		ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's To	echnical Sp	pecification No.		: MEC/TS/05/21/	/002, Rev-1, Ed	i-1			
4.0	Connecting	Pipeline De	esign Pressure, I	kg/cm2 (g):	49				Design Temperature, °C : -29°C 1	to +65°C
5.0	Connecting	Pipe Spec	cification :		N.A.					
5.1 5.2	Material Outer Diame	eter, mm								
5.3	Thickness, r									
6.0 6.1.	Valve Cons Configuratio		esign		: Reduced Bore		Full Bore			
6.2.	End Connec				: Flanged as per		√ V	Butt Welded as per A	SME B16.25	1
6.3.	Flanges (wh	nerever app	licable)		: a) RF b) Serrated		ooth (125 to 200 micro	RT	NA NA	1
6.4	Ball Mountin				: Trunnion Mour	nted for 12" ar	nd 10" Valves ; Floa	ating Ball for 4" Valve		J
6.5 6.6	Valve body t		arally welded to	the valve on each	: Fully Welded		Two/Three Piece Bol Yes	Ited	Either √ √	
0.0					,	the connecting	pipe mentioned abo	ove)	140	
7.0	Valve Mater	rial Specifi	cation					1		7
	Pa	rt			Specified Materia	al			aterial Offered ralent or superior)	
7.1 7.2	Body Ball		A 216 Gr. WCB		μENP coating/ AIS	SIA10				
7.3	Body Seat Ri	ngs		micron ENP coa		51410				
7.4	(No Casting) Seat Seal		VITON/DEVLO		ang/Alor 410					-
7.5	Stem (No cas	sting)		icron ENP coating	/AISI 410					
7.6 7.7	Stem Seals Stud Bolts/ No		VITON/PTFE	r. B7/ A194 Gr. 2I						
7.7	Stud Boits/ IN	uis	ASTIM A 193 G	1. B// A194 GI. 21	1			ı		ı
8.0	Corrosion Al	llowance	: 5 mm						Service : NATURAL GAS / RLNG	
9.0	Location				: Above Groun	nd √ I	Buried			
10.0	Stem Extens	sion Requir	rement		: Yes		No √			
11.0	Gear Operat	tor Require	ment		: Yes √	(For 12"&	10" Valves)	No √ (Leve	r Operated for 4" Valves)	
12.0	Actuator Re	quirement			: Yes		No √			
13.0	Fire Resista	nt Design F	Requirement		: Type test as	per API 6FA/A	PI607			
14.0	Valve Testi	ng Require	ement							
					Test Pressur kg/cm ²		Minimum Du	ration, minutes		
14.1	Hydrostatic ¹	Test		Body	79	(9)		r API 6D		
14.2	Air Test			Seat	57 5.6-7	7		r API 6D r API 6D		
		5		04	dd ADLOD (1 -4-	-454)				
15.0	Anti-Static T	esting Req	uirement	: As per Stan	dard API 6D (Late	est Ed.)				
16.0	Valve Paint				400 0 0					
16.1 16.2			-		1/2, Swedish Stan sistant paint shall		909. 1 minimum thickness	s of 300 micron		
	(Permissible	e thickness	in each coat sh	all be within 80 to				8, however any change	in colour	
17.0			g drawing approve/Normally Close	/al stage. Requirement : N	.A.					
	Notes:		•	•						
								C/TS/05/21/002,Rev 1 other relevant standar		
							oper installation of ha			
							pattern valves are to		onducted	
				-	er relevant materi	-	ıy əcat iirigs, steifi &	studs / nuts shall be o	Jinduoled	
					e used for body se			and) about 4.	than 0 E0/ of -in- OD	
		_			terence between r urchaser before de		ııııı ıu at pipe	end) shall not be more	шан 0.5% от pipe OD.	
	9 ;	Support foo	ot & lifting lugs sl	nall be provided a	s per Cl. 4.16 of th	ne TS for Ball V				
			-					t/material of valve in th 's data sheet, bidder	е	
	:	shall clearly	y indicate "AGRI	ED".					and the district of the second	
	11 1	Minimum th	nickness of valve	body / adapter sl	nail not be less tha	an that specifie	a in ASME B16.34 pl	ius corrosion allowance	specified in this datasheet .	
REV. NO.	DATE	ZONE		DESCRIPTIONS		BY	APPRD	DEEEDENOES	PD0 //2	
SECTION	PROCESS	& PIPING		REVISIONS	CLIENT : Oil Indi	ia Limited		REFERENCES	DRG. NO.	
	NAME	DATE	CHKD	DATE	PROJECT: BAGH	HJAN – MADH	UBAN		MEGGNING	
DSGN DRWN	A.Mathur	20-11-18	Harsh Kumar	20-11-18	PIPELINE PROJE	ECI		2001 COMP #1	MECON LIMITED	J
	<u>. </u>				DATA SHEET I		/ALVES	DATA SHEET NO.:		REV
APPROVE	D			AK Gupta,DGM	(NB	≥ 2")		MEC/23U1/05/28/M/001/DS	/BV/08	0

						DATA SHEET F	OR BALL VALVE	<u>s</u>		
1.0	MR Item n Valve Man				:				Actuator Manufacturer : N.A.	
2.0	Valve Size	DN (inch)	: DN 250 (1	0")			ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's	Technical S	Specification	No.	: MEC/TS	6/05/21/002, Rev-1	, Ed-1			
4.0	Connecting	g Pipeline [Design Press	sure, kg/cm	149				Design Temperature, °C : -29°C	C to +65°C
5.0		ıg Pipe Sp	ecification :			DN 250 (10") API 5L Gr. B]			
5.1 5.2	Material Outer Dian	neter. mm				PSL 2 273	-			
5.3	Thickness,	mm				12.7]			
6.0 6.1. 6.2.	Valve Con Configurati End Conne	ion	Design		: Reduced	d Bore √ I as per ASME B16	Full Bore	Butt Welded as per	ASME B16 25 √	1
6.3.	Flanges (w		oplicable)		: a) RF b) Serr		Smooth (125 to 200 m	RT	NA √	1
6.4	Ball Mount	-			: Trunnio	n Mounted	Two/Three Piece Bo		- Fither	_
6.5 6.6		up piece(int	tegrally welde eter and Thic			ch side):	Yes f the connecting pipe		Either No √	
7.0	Valve Mate		ification					l Ms	aterial Offered	1
7.1	Pa Body	art	A 216 Gr. W	CB / A 224 C		fied Material			valent or superior)	_
7.1	Ball					μENP coating/ AISI4	10			
7.3	Body Seat R (No Casting)		AISI 4140 +	· 75 micror	ENP coat	ting/AISI 410				
7.4 7.5	Seat Seal Stem (No ca	asting)	VITON/DEV AISI 4140 + 7		NP coating/	AISI 410				1
7.6 7.7	Stem Seals Stud Bolts/ N		VITON/PTF ASTM A 19	E						1
				3 GI. B <i>II F</i>	(194 GI. 21			l .	Consign : NATUDAL CAS / DLN	_
8.0	Corrosion	Allowance	: 5 mm			- 0	During [7]		Service : NATURAL GAS / RLN	G
9.0	Location					e Ground	Buried √			
10.0	Stem Exter	·			: Yes		No	which shall be finalize	nsion shall be 2750+ or -250mm ed during drawing approval stage	
11.0	Gear Oper				: Yes	√ (For 6"8	k above)	No		
12.0	Actuator R	-	ı Requiremer	nt .	: Yes	test as per API 6F	No			
14.0	Valve Tes	-			. Турс	test do per 711 Tor	7070 1007			
						Pressure (min.), kg/cm²(g)	Minimum Dur	ration, minutes]	
14.1	Hydrostatio	c Test		Body		79		r API 6D		
14.2	Air Test			Seat		57 5.6-7	•	r API 6D r API 6D		
15.0	Anti-Static	Testing Re	equirement	: As pe	r Standard	d API 6D (Latest E	d.)			
16.0	Valve Pair	nting Spec	ification							
16.1 16.2	Surface pr	eparation b	y Short Blas		•		ndard SIS-055 909.	mum thickness of 600) micron	
10.2		-				•		ng drawing approval s		
17.0		/ Lock Clos	se/Normally	Close Requ	irement :	As indicated in I	MR/Schedule of Rate	es (SOR)		
									5/21/002,Rev 1 ,Ed. 1	
		-	-				Sheet, MECON's T.S and ensure proper in	S., API 6D and other stallation of handle.	relevant standards.	
	4.	Short patte	ern valves (a	s per API 6	D or other	wise) are not permi	tted. Only long patter	rn valves are to be su	pplied. / nuts shall be conducted	
		as per Cl.	3.4 & 3.6 of	TS respect	ively or as	per relevant mater	al code.	-	7 Huts shall be conducted	
						,	ealing / gasket materi maximum and minim		hall not be more than 0.5% of pip	oe OD.
					-	Purchaser before das per Cl. 4.16 of the	espatch. ne TS for Ball Valves			
	10	Bidder sha	all clearly writ	te valves m	aterial (equ	uivalent or superior) offered by them aga	ainst each part/materi		
		shall clear	ly indicate "A	AGREED".	ŭ					datachast
			INCKNESS Of V			ı	,	JIVI⊏ D 10.34 PIUS COFI	rosion allowance specified in this	uatasneet .
REV. NO.	DATE	ZONE	<u> </u>	DESCRIPT REVISION		BY	APPRD	REFERENCES	DRG. NO.	
SECTION	PROCESS	S & PIPIN DATE	IG CHKD	DATE	4	Oil India Limited Γ: BAGHJAN – MA	DHUBAN			
DSGN DRWN	A.Mathur	20-11-18	Harsh Kumar	20-11-18	1	PROJECT		मेकॉन (8) 5001 Con Part	MECON LIMITE	D
		<u> </u>	A1/ 6	Punto DOM		SHEET FOR BA	LL VALVES	DATA SHEET NO.:	I De IDVIGO	REV
APPROVE	_ט		AK (Supta,DGM	1	(NB ≥ 2")		MEC/23U1/05/28/M/001/I	P0/Va/6U	0

					<u> </u>	DATA SHEET F	OR BALL VALVES	<u>s</u>		
1.0	MR Item no Valve Manu	. ,	.15		:				Actuator Manufacturer : N.A.	
2.0	Valve Size D	ON (inch)	: DN 250 (10	0"), DN 100 (4")			ANSI Rating: 300#		Design Standard : API 6D	
3.0	MECON's To	echnical Sp	pecification N	lo.	: MEC/TS/05	5/21/002, Rev-1, E	Ed-1			
4.0	Connecting	Pipeline De	esign Pressu	re, kg/cm2 (g):	49				Design Temperature, °C : -29°C	to +65°C
5.0	Connecting	Pipe Spe	cification :		F	DN 250 (10") API 5L Gr.B	DN 100 (4") API 5L Gr.B]		
5.1 5.2	Material Outer Diame	eter mm			_	PSL 2 273	PSL 2 114.3	-		
5.3	Thickness, r				E	12.7	8.56	_		
6.0	Valve Cons	truction D	esign							
6.1.	Configuratio				: Reduced B		Full Bore	Butt Welded as per A	SME B16 25	1
6.2. 6.3.	End Connec Flanges (wh		olicable)		: rianged as	per ASME B16.5		RT RT	NA V	
0.0.	r langee (m.	.о.ото. арр	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		b) Serrate	ed Sn	nooth (125 to 200 micro		NA √	1
6.4	Ball Mountin						/alves ; Floating Ball			_
6.5 6.6	Valve body t		arallu usaldas	d to the velve on	: Fully Welde	ed √	Two/Three Piece Bol	lted	Either No √	
0.0				to the valve on ness of pup piece		as that of the conr	Yes ecting pipe mentioned	d above)	NO V	
7.0	Valve Mater		ication					1	laterial Offered	1
	Pa	rt			Specified I	Material			laterial Offered valent or superior)	
7.1 7.2	Body Ball			CB / A 234 Gr. WF CB/A 234 Gr.WPE		nating/ AISIA10				
	Body Seat Ri	ngs								1
7.3	(No Casting)			75 micron ENP	coating/AISI	410				
7.4	Seat Seal		VITON/DEV							_
7.5 7.6	Stem (No cas Stem Seals	sting)	VITON/PTF	'5 micron ENP co	ating/AISI 410					_
7.7	Stud Bolts/ No	uts		- 3 Gr. B7/ A194 G	ir. 2H					
8.0	Corrosion Al	llowance	: 5 mm						Service : NATURAL GAS / RLNG	_
9.0	Location				: Above G	Ground √	Buried			
10.0	Stem Extens	sion Requir	rement		: Yes		No √			
11.0	Gear Opera	tor Require	ement		: Yes	√ (For 10")		No √ Lever o	operated for 4" valve	
12.0	Actuator Re				: Yes		No √			
13.0			Requirement		'	st as per API 6FA				
14.0	Valve Testii	-	•		71					
						essure (min.),	Minimum Du	ration, minutes		
14.1	Hydrostatic	Test		Body	Kg.	/cm²(g) 79	As per	r API 6D	-	
	,			Seat		57		r API 6D		
14.2	Air Test					5.6-7	As per	r API 6D	_	
15.0	Anti-Static T	esting Req	uirement	: As per Sta	ndard API 6D	(Latest Ed.)				
16.0	Valve Paint	ing Specif	ication							
16.1						dish Standard SIS				
16.2							ed with minimum thick	ness of 300 micron -7038, however any ch	ango in colour	
				proval stage.	TO 120 IIIICIC	ori). Colour or pair	t Stiade Stiali De RAL-	7036, flowever any cri	ange in coloui	
17.0				ose Requiremen	t : N.A.					
	Notes:	-	D C:					NEO TOMESTOS	4.51.4	
								. MEC/TS/05/21/002,R and other relevant sta		
							ure proper installation		induids.	
	4.	Short patte	rn valves (as	per API 6D or of	herwise) are i	not permitted. Onl	y long pattern valves	are to be supplied.		
							III, body seat rings, ste	em & studs / nuts shall	be conducted	
		•				ant material code. or body sealing / g	asket materials			
								pipe end) shall not be	more than 0.5% of pipe OD.	
		_	-			before despatch.				
						4.16 of the TS for				
			-					n part/material of valve CON's data sheet, bidd		
			y indicate "A	-	CCO WILL VAIV	co material as IIIE	Indica above in MEC	JOI 4 3 UAIA SHEEL, DIUU	ioi	
			•		er shall not be	e less than that sp	ecified in ASME B16.	34 plus corrosion allov	vance specified in this datasheet .	
REV. NO.	DATE	ZONE		DESCRIPTIONS		BY	APPRD			
SECTION	PROCESS	& PIPING		REVISIONS	CLIENT : Oil	I India Limited		REFERENCES	DRG. NO.	
SECTION	NAME	DATE	CHKD	DATE		BAGHJAN – MADI	HUBAN			
DSGN	A.Mathur	20-11-18	Harsh Kumar	20-11-18	PIPELINE PR			मेकॉन	MECON LIMITED)
DRWN	l .		l .	l	DATA SI	HEET FOR BA	LL VALVES	DATA SHEET NO.:		REV
APPROVE	D			AK Gupta,DGM		NB ≥ 2")		MEC/23U1/05/28/M/001/D	S/BV/10	0

						DATA SHEET F	OR BALL VALVE	<u>s</u>		
1.0	MR Item no Valve Manu				:				Actuator Manufacturer :	
2.0	Valve Size	DN (inch)	: DN 250 (10)")			ANSI Rating: 300#	ŧ	Design Standard : API 6D	
3.0	MECON's T	Technical Sp	pecification N	o.	: MEC/TS	/05/21/002, Rev-1, E	d-1			
4.0	Connecting	Pipeline De	esign Pressur	re, kg/cm2 (g):	49				Design Temperature, °C : -29°C t	o +65°C
5.0 5.1	Connecting Material	g Pipe Spe	cification :			DN 250 (10") API 5L Gr. B				
5.2 5.3	Outer Diam Thickness,					PSL 2 273 12.7				
6.0	Valve Cons	struction D	esign				<u></u>			
6.1. 6.2.	Configuration End Connection				: Reduced : Flanged	Bore √ as per ASME B16.5	Full Bore	Butt Welded as per A	SME B16.25 √	1
6.3.	Flanges (wi		olicable)		: a) RF		anoth (405 to 000 orions	RT	NA √	1
6.4	Ball Mountii	ng			b) Serra		nooth (125 to 200 micro	oinches AARH)	NA _√	J
6.5 6.6	Valve body		arally wolder		: Fully Wel	ded √	Two/Three Piece Bol	Ited	Either No √	
0.0				to the valve on each ness of pup piece to l		that of the connection	ng pipe mentioned ab	pove)	NO V	
7.0	Valve Mate		cation					Т	laterial Offered]
7.1	Body	art	A 216 Gr WC	CB / A 234 Gr. WPB	Specified	Material			valent or superior)	
7.1	Ball			CB/A 234 Gr.WPB) +7	5 µENP coa	ting/ AISI410				
7.3	Body Seat R (No Casting)		AISI 4140 +	75 micron ENP coa	ting/AISI 4	10				
7.4	Seat Seal		VITON/DEV		11101 110					
7.5 7.6	Stem (No ca Stem Seals	sting)	VITON/PTFI	5 micron ENP coating	g/AISI 410					
7.7	Stud Bolts/ N	luts		3 Gr. B7/ A194 Gr. 2	Н					
8.0	Corrosion A	Allowance	: 5 mm						Service : NATURAL GAS / RLNG	
9.0	Location				: Above	Ground √	Buried			
10.0	Stem Exten	ision Requir	rement		: Yes		No √			
11.0	Gear Opera	ator Require	ement		: Yes	(For 6"&	above)	No √		
12.0	Actuator Re	equirement			: Yes	$\sqrt{}$	No		As per attached Gas Over Oil Actu specification No. MEC/TS/05/E5/0	
13.0	Fire Resista	ant Design F	Requirement		: Type	test as per API 6FA/	API607			
14.0	Valve Test	ing Require	ement		Test F	Pressure (min.),	Minimum Du		1	
14.1	Hydrostatic	Test		Body		kg/cm ² (g) 79		r API 6D	-	
	-	1031		Seat		57	As pe	r API 6D		
14.2	Air Test					5.6-7	As pe	r API 6D		
15.0	Anti-Static	Testing Req	uirement	: As per Standar	rd API 6D (Latest Ed.)				
16.0	Valve Pain				410. =					
16.1 16.2				ig as per grade SA 2 coats of corrosion re			5 909. ith minimum thicknes:	s of 300 micron		
					120 micror	n). Colour of paint sh	ade shall be RAL-703	38, however any chang	ge in colour	
17.0		-	g drawing app e/Normally Clo	oroval stage. ose Requirement : I	N.A.					
	Notes: 1.	This Value	Data Sheet o	hall he read in coniu	action with	MECON's Technical	Specification No. ME	EC/TS/05/21/002,Rev 1	Ed 1	
	2.	Inspection	and Testing s	shall be as per attach	ed QAP, thi	is Data Sheet, MECO	DN's T.S., API 6D and	d other relevant standa		
	3. 4.						proper installation of h			
	4. 5.							to be supplied. & studs / nuts shall be	conducted	
				S respectively or as p			at materials			
				ibre (CAF) shall not be of roundness (i. e. d				e end) shall not be mo	re than 0.5% of pipe OD.	
	8	Valves sha	Il be inspecte	d and approved by F	urchaser b	efore despatch.				
	9 10			s shall be provided a valves material (equ				rt/material of valve in t	he	
		space prov	ided for. Whe	erever bidder agrees			ned above in MECON			
	11		y indicate "AC hickness of va		hall not be	less than that specifi	ed in ASME B16.34 p	olus corrosion allowand	ce specified in this datasheet .	
REV. NO.	DATE	ZONE		DESCRIPTIONS		BY	APPRD			
SECTION	PROCESS	& PIPING		REVISIONS	CLIENT ·	Oil India Limited		REFERENCES	DRG. NO.	
SECTION	NAME	DATE	CHKD	DATE		: BAGHJAN – MADI	HUBAN			
DSGN	A.Mathur	20-11-18	Harsh Kumar	20-11-18	PIPELINE	PROJECT		मेकॉन	MECON LIMITED	
DRWN	<u> </u>		I	<u> </u>	DATA	SHEET FOR BAI	L VALVES	DATA SHEET NO.:	1	REV
APPROVE	D			AK Gupta,DGM		(NB ≥ 2")		MEC/23U1/05/28/M/001/D	S/BV/11	0

					DATA SHEET	FOR PLUG VALV	<u>E</u>		
	MR Item	nos. : B.1							
1.0	Valve Ma	nufacturer			:				
2.0	Valve Siz	e (NB) (inch)	: 10"		ANSI Rati	ng : 300#		Design Standard : API 6D	
3.0	MECON'S	s Technical S	pecification	ı No.	: MEC/TS/05/62/003, Rev-2			Design Temperature, °C : -29°C to	65°C
4.0	Connecti	ng Pipeline D	esign Pres	sure, Kg/cm	n2(g): 49				
5.0	Connect	ing Pipe Spe	cification		10"]			
5.1 5.2	Material	(OD), mm (ii	ach)		API 5L, Gr. B PSL2 273 mm				
	Thicknes		icii)		12.7 mm	<u> </u>			
6.0	Valve Co	nstruction E	Design						
	Pattern				: Short	Regular	\rightarrow	Venturi	
6.2.	End Con	nections			: Flanged both ends : Butt Weld both ends			ged as per ASME B 16.5 Veld as per ASME B16.25	
					: Flanged one end, butt weld	other end	Buit	veid as per Advill B10.25	
6.3.	Flanges (wherever ap	plicable)		: a) RF FF Smoot	_ th (125 to 200 microinch	RTJ nes AARH)	NA √ NA √	
7.0		aterial Speci	fication		Matadal		Matarial Off	and (Familial and an Ourseile a)	İ
7.1	Body	Part	A 216 Gr. W	VCB/A 234 G	Material Gr. WPB/A105		iviateriai Offe	ered (Equivalent or Superior)	
7.2	Plug		(A 216 Gr.V	VCB/A 234 C	Gr.WPB/A105)+75 µENP coating/AISI	410			
7.3	Cover	Coating)			A234 Gr. WPB				
7.4 7.5	Stem (No Stem Seal		PTFE/Grap		s ENP Coating)/ AISI 410				
7.6	Stud Bolts			3 Gr. B7/ A1	94 Gr. 2H				
8.0	Corrosion	n Allowance	: 5 mm					Service : NATURAL GAS / RLNG	
9.0	Location				: Above Ground	Buried √			
10.0	Stem Ext	ension Requ	irement		: Yes V		-	nsion shall be 2750+ or -250mm zed during drawing approval stage.	
11.0	Gear Ope	erator Require	ement		: Yes V No		Willer Stiall be illian	zeu duning drawing approvar stage.	
12.0	Gas Pow	ered Actuato	r Requirem	ent	: Yes No	$\sqrt{}$			
13.0	Fire Resi	stant Design	Requireme	nt	: Type-Test as per Standard A	PI 6FA/ BS EN: 1049	7		
14.0	Valve Te	sting Requir	ement		Test Pressure (min.), kg/cm2(g)	Minimum Dura	ation, minutes]	
14.1	Hydrosta	tic Test		Body	79	As per	API 6D		
14.2	Air Test			Seat	57 5.6 - 7	As per As per			
14.2	All Test				5.6 - 7	As per	API 0D	I	
		inting Speci							
	For unde	r ground insta	allation-Thre	ee coats of	grade SA 2 1/2, Swedish Standard corrosion resistant paint shall be ap wever any change in colour shall be	plied with minimum th		on	
16.0	Lock Ope	en/ Lock Clos	e Requirem	nent: N.	Α.	-	-		
	Notes:								
	1. 2.				d in conjunction with MECON's Tec per attached QAP, this Data Sheet,				
	3. 4.	Stops shall b	oe provided	for positive	alignment of plug with ports and er or body, plug, cover, stem & studs/n	nsure proper installation	on of handle.		
	→.	of TS respec		noss icai lu	, body, plug, cover, sterri & stuus/II	ato siran be conducte	a as per Glause NO	J W J.J	
	5.			•	entrolling parts of the valve shall be provi				
	6. 7.				mitted for approval after making ne ed minimum yield strength of 35000 psi.				
	••		,		ntegrally welded to the valve on each sig		•		
	8.				ess (i. e. difference between maxim				
	9.				terial (equivalent or superior) offere er agrees with valves material as me				
		shall clearly	indicate "A	GREED".	G				
	10	Minimum thi	ckness of v	alve body /	adapter shall not be less than that s	specified in ASME B1	6.34 plus corrosion a	Illowance specified in this datasheet	
REV. NO.	DATE	ZONE		DESCRIPTI REVISION		APPRD	REFERENCES	DRG. NO.	
SECTION	OIL&C	GAS		7.0.01	CLIENT: Oil India Limited			5.10.110.	
	NAME	DATE	CHKD	DATE					
DSGN DRWN	A.Mathur	20.11.2018	Harsh	20.11.2018	PROJECT: BAGHJAN – MADI PROJ		मेकॉन 3001 Comp (**)	MECON LIMITI	ED
APPROV	 'ED			AK Gupta			SCALE : DATA SHEET NO.: MEC	/23U1/05/28/M/001/DS/PV/01	REV 0
				DGM	(NB ≥ 2")				

					DATA SHEET	FOR PLUG VALV	<u>E</u>		
	MR Item	nos. : B.2							
1.0	Valve Ma	nufacturer			:				
2.0	Valve Siz	e (NB) (inch)	: 10"		ANSI Rati	ng : 300#		Design Standard : API 6D	
3.0	MECON'S	s Technical S	pecification	No.	: MEC/TS/05/62/003, Rev-2			Design Temperature, °C : -29°C to	65°C
4.0	Connecti	ng Pipeline D	esign Pres	sure, Kg/cm	n2(g): 49				
5.0 5.1	Connecti Material	ng Pipe Spe	cification		10" API 5L, Gr, B PSL2				
5.2 5.3		(OD), mm (ii s, mm	nch)		273 mm 12.7 mm				
6.0 6.1.	Valve Co	nstruction E	Design		: Short	Regular		Venturi	
6.2.	End Coni	nections			: Flanged both ends : Butt Weld both ends	rtegular	Flan	ged as per ASME B 16.5 Veld as per ASME B16.25	
6.3.	Flanges (wherever ap	plicable)		: Flanged one end, butt weld (: a) RF FF b) Serrated Smoot	other end] th (125 to 200 microinch	RTJ	NA √ NA √	
7.0		terial Speci	fication		Material		Material Offe	ered (Equivalent or Superior)	
7.1	Body	- GIL			ir. WPB/A105		material Office	Cost (Equivalent or Ouperior)	
7.2 7.3	Plug Cover				6r.WPB/A105)+75 µENP coating/AISI A234 Gr. WPB	410			
7.4	Stem (No		(AISI 4140 +	75 microns	ENP Coating)/ AISI 410				
7.5 7.6	Stem Seal Stud Bolts		PTFE/Graph ASTM A193	hite 3 Gr. B7/ A1	94 Gr. 2H				
8.0	Corrosior	Allowance	: 5 mm					Service : NATURAL GAS / RLNG	
9.0	Location				: Above Ground \[Buried			
10.0	Stem Ext	ension Requ	irement		: Yes NO	∨			
11.0	Gear Ope	erator Require	ement		: Yes V No				
12.0	Gas Pow	ered Actuato	r Requireme	ent	: Yes No	$\sqrt{}$			
13.0		stant Design	·	nt	: Type-Test as per Standard A	PI 6FA/ BS EN: 1049	7		
14.0	Valve Te	sting Requir	ement		Test Pressure (min.), kg/cm2(g)	Minimum Dura	ation, minutes		
14.1	Hydrosta	tic Test		Body	79	As per			
14.2	Air Test			Seat	57 5.6 - 7	As per As per			
15.1 15.2	Surface p For above (Permiss change in	e ground insta sible thicknes	y Short Blas allation-Thre s in each co be finalized	ee coats of oat shall be d during dra	grade SA 2 1/2, Swedish Standard corrosion resistant paint shall be ap within 80 to 120 micron). Colour of wing approval stage.	plied with minimum t			
	Notes: 1. 2.	This Valve D	ata Sheet s	shall be read	d in conjunction with MECON's Tec per attached QAP, this Data Sheet,				
	3. 4.	Stops shall b	pe provided otch & Hard	for positive	alignment of plug with ports and er r body, plug, cover, stem & studs/n	nsure proper installation	on of handle.		
	5.	Minimum all pr	ressure conta		ntrolling parts of the valve shall be provi			ian assast	
	6. 7.				mitted for approval after making ne ed minimum yield strength of 35000 psi.				
	0				ntegrally welded to the valve on each side				
	8. 9.				ess (i. e. difference between maxim terial (equivalent or superior) offere				
			led for. Whe	erever bidde	er agrees with valves material as mo				
	10	,		alve body /			6.34 plus corrosion a	llowance specified in this datasheel	·-
REV. NO.	DATE	ZONE		DESCRIPTI REVISION		APPRD	REFERENCES	DRG. NO.	
SECTION	OIL&C	SAS		IVENIOIOI	CLIENT: Oil India Limited		INCI LINLINGES	DRG. NO.	
	NAME	DATE	CHKD	DATE					
DSGN DRWN	A.Mathur	20.11.2018	Harsh	20.11.2018	PROJECT: BAGHJAN – MADI PRO		मेकॉन 9001 CONPORT	MECON LIMIT	
APPROV	ED			AK Gupta	DATA SHEET FOR PLU (NB ≥ 2")		SCALE : DATA SHEET NO.: MEC	/23U1/05/28/M/001/DS/PV/02	REV 0

					DATA SHEET	FOR PLUG VALV	<u>E</u>				
	MR Item	nos. : B.3									
1.0	Valve Ma	nufacturer			:						
2.0	Valve Siz	e (NB) (inch)	: 10"		ANSI Rati	ng : 300#		Design Standard : API 6D			
3.0	MECON's	s Technical S	pecification	No.	: MEC/TS/05/62/003, Rev-2			Design Temperature, °C : -29°C to	65°C		
4.0	Connecti	ng Pipeline D	esign Press	sure, Kg/cm	12(g): 49						
5.0 5.1	Connecti Material	ng Pipe Spe	cification		N.A.						
5.2 5.3	Diameter Thickness	(OD), mm (ii s, mm	nch)								
6.0 6.1.	Valve Co	nstruction E	Design		: Short	Regular	/	Venturi			
6.2.	End Conr	nections			: Flanged both ends	rtogulai	Flan	ged as per ASME B 16.5			
6.3.	Flanges (wherever ap	plicable)		 Butt Weld both ends Flanged one end, butt weld (a) RF	other end] h (125 to 200 microinch	RTJ	Veld as per ASME B16.25 NA NA NA			
7.0		terial Speci	fication						•		
7.1	Body	Part			Material ir. WPB/A105		Material Offe	ered (Equivalent or Superior)			
7.2 7.3	Plug Cover				6r.WPB/A105)+75 µENP coating/AISI A234 Gr. WPB	410					
7.4	Stem (No	Casting)			ENP Coating)/ AISI 410						
7.5 7.6	Stem Seal Stud Bolts		PTFE/Graph ASTM A193		94 Gr. 2H						
8.0	Corrosion	Allowance	: 5 mm					Service : NATURAL GAS / RLNG	•		
9.0	Location				: Above Ground √	Buried					
10.0	Stem Ext	ension Requ	irement		: Yes NO	<u>√</u>					
11.0	Gear Ope	erator Require	ement		: Yes V No						
12.0	Gas Pow	ered Actuato	r Requireme	ent	: Yes No	$\sqrt{}$					
13.0		stant Design	·	nt	: Type-Test as per Standard A	PI 6FA/ BS EN: 10497	7				
14.0	Valve Te	sting Requir	ement		Test Pressure (min.), kg/cm2(g)	Minimum Dura	ation, minutes				
14.1	Hydrostat	tic Test		Body	79	As per					
14.2	Air Test			Seat	57 5.6 - 7	As per As per					
15.1 15.2	Surface p For above (Permiss change in	e ground insta sible thicknes	y Short Blas allation-Thre s in each co be finalized	ee coats of pat shall be I during dra	grade SA 2 1/2, Swedish Standard corrosion resistant paint shall be ap within 80 to 120 micron). Colour of wing approval stage.	plied with minimum to					
					d in conjunction with MECON's Tec						
	3. 4.	Stops shall b	pe provided otch & Hard	for positive	per attached QAP, this Data Sheet, alignment of plug with ports and er or body, plug, cover, stem & studs/n	sure proper installation	on of handle.				
	5.	Minimum all pr	ressure conta		ntrolling parts of the valve shall be provi						
					mitted for approval after making ne ed minimum yield strength of 35000 psi.						
					ntegrally welded to the valve on each sidess (i. e. difference between maxim						
	9.	Bidder shall	clearly write	valves ma	terial (equivalent or superior) offere	d by them against eac	ch part/material of va	lve 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.										
REV. NO.	DATE	ZONE		DESCRIPTI	ONS BY	APPRD					
				REVISION	ls .	–	REFERENCES	DRG. NO.			
SECTION	NAME	DATE	CHKD	DATE	CLIENT: Oil India Limited		(25				
DSGN DRWN	A.Mathur	20.11.2018	Harsh		PROJECT: BAGHJAN – MADI PROJ		<u>मैकॉन</u> 3001 टक्स Р	MECON LIMIT	ED		
APPROV	ΈD			AK Gupta DGM	DATA SHEET FOR PLU (NB ≥ 2")		SCALE : DATA SHEET NO.: MEC	/23U1/05/28/M/001/DS/PV/03	REV 0		

						DATA SHEET	FOR PLUG VALVI	<u>E</u>		
	MR Item	nos. : B.4								
1.0	Valve Ma	nufacturer			:					
2.0	Valve Siz	e (NB) (inch)	: 4"			ANSI Ratir	ng: 300#		Design Standard : API 6D	
3.0	MECON's	s Technical S	Specification	n No.	: MEC/TS/05/62/	003, Rev-2			Design Temperature, °C : -29°C to	65°C
4.0	Connecti	ng Pipeline D	esign Pres	sure, Kg/cm	2(g): 49					
5.0 5.1 5.2 5.3	Material	ing Pipe Spe (OD), mm (ii s, mm			AP	4" I 5L, Gr. B PSL2 114.3 6.02 mm				
6.0 6.1.	Valve Co	nstruction [Design		: Short Γ	7	Regular		Venturi	
6.2.	End Conr	nections			: Flanged bot		Regulai	Flan	ged as per ASME B 16.5	
6.3.	Flanges (wherever ap	plicable)			e end, butt weld o	other end] n (125 to 200 microinch	RTJ	Veld as per ASME B16.25 NA	
7.0		aterial Speci	fication							•
7.1	Body	Part	A 216 Gr. V	VCB/A 234 G	Mate ir. WPB/A105	erial		Material Offe	ered (Equivalent or Superior)	
7.2	Plug					ENP coating/AISI4	10			
7.3	Cover				234 Gr. WPB					
7.4	Stem (No Stem Seal				ENP Coating)/ A	SI 410				
7.5 7.6	Stud Bolts		ASTM A19	3 Gr. B7/ A19	94 Gr. 2H					
8.0	Corrosion	Allowance	: 5 mm						Service : NATURAL GAS / RLNG	
9.0	Location				: Above Ground	$\sqrt{}$	Buried			
10.0	Stem Ext	ension Requ	irement		: Yes	NO	√			
11.0	Gear Ope	erator Require	ement		: Yes	No	V LEVER OF	PERATED		
12.0	Gas Pow	ered Actuato	r Requirem	ent	: Yes	No	$\sqrt{}$			
13.0	Fire Resi	stant Design	Requireme	ent	: Type-Test a	s per Standard AF	PI 6FA/ BS EN: 10497	7		
14.0	Valve Te	sting Requir	rement		Test Pressure (m	in.), kg/cm2(g)	Minimum Dura	ation, minutes		
14.1	Hydrostat	tic Test		Body		9	As per			
14.2	Air Test			Seat		57 5 - 7	As per As			
15.0	Valve Pa	inting Speci	fication							
15.1						Swedish Standard				
15.2 16.0	(Permiss change in	sible thicknes	s in each c be finalized	oat shall be d during dra	within 80 to 120 wing approval sta	micron). Colour of	plied with minimum the paint shade shall be l			
	Notes:					MEOC		MEOGE		
	2. 3.	Inspection a Stops shall to	nd Testing : be provided	shall be as p for positive	per attached QAP alignment of plug	, this Data Sheet, with ports and en	nnical Specification No MECON's T.S., API 6 sure proper installation ats shall be conducted	D and other relevant on of handle.	standards.	
		of TS respec								
							ded with EN 10204-3.2 o cessary changes cons		ion aspect	
							In case the same canno			
							e) with strength equivale			
									be more than 0.5% of pipe OD.	
							I by them against eac intioned above in ME0			
		shall clearly	indicate "A	GREED".	· ·			,	uder	
REV. NO.	DATE	ZONE	555 61 V	DESCRIPTI			APPRD			
			1	REVISION	IS		PI FIND	REFERENCES	DRG. NO.	
SECTION					CLIENT: Oil Ind	a Limited				
	NAME	DATE	CHKD	DATE						
DSGN DRWN	A.Mathur	20.11.2018	Harsh	20.11.2018	PROJECT: E	BAGHJAN – MADH PROJ		9001 CONVOCA	MECON LIMIT	
APPROV	'ED			AK Gupta		HEET FOR PLU		SCALE : DATA SHEET NO.: MEC	/23U1/05/28/M/001/DS/PV/04	REV 0
				DGM	(NB	≥ 2")				

					DATA SHEET	FOR PLUG VALVI	<u>E</u>		
	MR Item	nos. : B.5							
1.0	Valve Ma	nufacturer			:				
2.0	Valve Siz	e (NB) (inch)	: 4"		ANSI Rati	ng : 300#		Design Standard : API 6D	
3.0	MECON'S	s Technical S	Specification	n No.	: MEC/TS/05/62/003, Rev-2			Design Temperature, °C: -29°C to	65°C
4.0	Connecti	ng Pipeline D	esign Pres	sure, Kg/cm	2(g): 49				
5.0 5.1 5.2 5.3	Material	ing Pipe Spe (OD), mm (ii s, mm			N.A.				
6.0 6.1.	Valve Co	nstruction [Design		: Short 🗸	Regular		Venturi	
6.2.	End Conr	nections			: Short : Flanged both ends : Butt Weld both ends	Regulai	Flan	ged as per ASME B 16.5	
6.3.	Flanges (wherever ap	plicable)		: Flanged one end, butt weld one end, but well on end, but well on end, but well one end, but well on end, but well one end, but wel	other end] h (125 to 200 microinch	RTJ	Veld as per ASME B16.25 NA NA NA	
7.0		aterial Speci	fication				T		•
7.1	Body	Part	A 216 Gr. V	VCB/A 234 G	Material er. WPB/A105		Material Offe	ered (Equivalent or Superior)	
7.2	Plug				ir.WPB/A105)+75 µENP coating/AIS	110			
7.3	Cover				234 Gr. WPB				
7.4 7.5	Stem (No Stem Seal		PTFE/Grap		ENP Coating)/ AISI 410				
7.6	Stud Bolts			3 Gr. B7/ A19	94 Gr. 2H				
8.0	Corrosion	Allowance	: 5 mm					Service : NATURAL GAS / RLNG	
9.0	Location				: Above Ground √	Buried			
10.0	Stem Ext	ension Requ	irement		: Yes NO	V			
11.0	Gear Ope	erator Require	ement		: Yes No	V LEVER C	PERATED		
12.0	Gas Pow	ered Actuato	r Requirem	ent	: Yes No	$\sqrt{}$			
13.0	Fire Resi	stant Design	Requireme	ent	: Type-Test as per Standard A	PI 6FA/ BS EN: 10497	7		
14.0	Valve Te	sting Requir	rement		Test Pressure (min.), kg/cm2(g)	Minimum Dura	ation, minutes		
14.1	Hydrostat	tic Test		Body	79	As per			
14.2	Air Test			Seat	57 5.6 - 7	As per As per			
15.0	Valve Pa	inting Speci	fication						
15.1					grade SA 2 1/2, Swedish Standard				
15.2 16.0	(Permiss change in	sible thicknes	s in each c be finalize	oat shall be d during dra	corrosion resistant paint shall be ap within 80 to 120 micron). Colour of wing approval stage. A.				
	Notes:								
					I in conjunction with MECON's Tech per attached QAP, this Data Sheet,				
	3.	Stops shall b	be provided	for positive	alignment of plug with ports and er r body, plug, cover, stem & studs/n	sure proper installation	on of handle.		
		of TS respec	ctively.				·		
					ntrolling parts of the valve shall be provi				
					mitted for approval after making ned a minimum yield strength of 35000 psi.				
			,	•	ntegrally welded to the valve on each sid		•		
					ss (i. e. difference between maxim				
					terial (equivalent or superior) offered r agrees with valves material as me				
		shall clearly	indicate "A	GREED".			,	uder	
DEV/ NO						APPRD	o.o-r pius contosion d		•
REV. NO.	DATE	ZONE	l	DESCRIPTION	IS	MERKU	REFERENCES	DRG. NO.	
SECTION			1	_	CLIENT: Oil India Limited				
OSGN	NAME A.Mathur	DATE 20.11.2018	CHKD Harsh	DATE 20.11.2018	PROJECT: BAGHJAN – MADI	HIRAN PIPELINE	मेकॉन	MECON LIMIT	ED
ORWN					PRO.		SCALE:		REV
APPROV	'ED			AK Gupta DGM	DATA SHEET FOR PLU (NB ≥ 2")	JG VALVES	DATA SHEET NO.: MEC	/23U1/05/28/M/001/DS/PV/05	0

				DATA SHEET FOR GLOBE VA	ALVES								
		MR Item nos. : C.1											
	1.	Valve Manufacturer		:									
	2.	Size : 4"		Rating : ANSI 300#	Des	sign Standard :BS EN ISO							
	3.	Purchaser's Specificatio	on	: Refer Technical notes for Gate & Globe Valves		17292:2004							
	4.	Design Pressure		: 49 kg/cm ² (g)	Design Temperature : -2	10°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 applical	ble)	: a) RF VFF RTJ									
				b) Serrated Smooth (125 to 200 AARH)	V								
	8.	Connecting Pipe Specif	fication	:									
ĺ	9.	Valve Material Specifica Part	ation :	Material	Material Offered (Equi	ivalent or Superior)							
	9.1	Body		ASTM A 216 Gr.WCB	Material Offered (Equi	ivalent of Superior)							
	9.2	Bonnet (Bolted)		ASTM A 216 Gr.WCB									
	9.3	Stem (Rising) Disc(Loose Plug/Ball Ty		13% Cr. Steel (No Casting) (ASTM A 216 Gr. WCB + 13% Cr Steel Facing) /									
	3.4	Disc(Loose Flug/Ball Ty	(pe)	13% Cr Steel (Stellited)									
	9.5	Body Seat Ring		ASTM A 216 Gr. WCB+13% Cr Steel Facing (Stellited)									
	9.6	Stem Packing (Renewal		Corrosion inhibited die formed flexible									
		with valve open on stre		graphite with braided anti extrusion rings	4								
	9.7	Hand Wheel (Rising)		Malleable Iron/ Cast Steel/ Fab. Steel									
	9.8	Bonnet Bolts Bonnet Nuts		A 193 Gr. B7 A194 Gr. 2H	+								
		Bonnet Gasket		Spiral Wound SS 316 + Grafoil									
	10. 11.	 Hydrostatic Test Pressure a) Body b) Seat 79 kg/cm²(g) 57 kg/cm²(g) PnuematicTest Pressure with 5.6 - 7 kg/cm² (g) 											
		Air		(3)									
	12.	Painting Specifications:		lasting as an area and CA CAIC Constitute Office and CIC OFF	200								
	i) ii)	For above ground instal	llation-T	lasting as per grade SA 2 1/2, Swedish Standard SIS-055 9 hree coats of corrosion resistant paint shall be applied with coat shall be within 80 to 120 micron).		on							
	Notes:												
	1. 2.	Valve specification shee Valve shall be designed		pe read in conjunction with technical notes for Gate and Glo	be valves.								
	3.	•		12266-1,approved QAP,this specification and other relevan	t standards.								
	4.			y deviation against each part/ material of valve in the space									
				IECON's data sheet, bidder shall clearly indicate "agreed".									
	5.			eat of base material shall be conducted for all pressure con		•							
				ting material as per ASTM A370. The test shall be conducte se specimen shall be 27 J with an individual minimum per s		=							
	6.			but on each heat of base material for all pressure containing		ss							
	٠.			this purpose and the maximum hardness shall not exceed	, ,								
		measurements represer	nting the	e entire thickness.									
	7.	, ,		le with valve open on stream .									
	8.	• .		s shall be as per Manufacturer's Standard.									
	9. 10.			lydro Test Reports shall be furnished prior to dispatch. dy / adapter shall not be less than that specified in ASME B	16.34 plus corrosion allowance s	specified in this datasheet							
				· · · · · · · · · · · · · · · · · · ·	p	,							
EV. NO.	DATE	ZONE D	ESCRIP [*]	TIONS BY APPRD	DEEEDENOEO	DDO NO							
SECTION	N PR∩	CESS & PIPING		CLIENT: Oil India Limited	REFERENCES	DRG. NO.							
,_01101	NAME		DATE	SELECT. OF HIGH ENTROOP	(
	I W-UVIC	DATE OHNO	DVIE										
SGN PRWN	A.Mathui	20.11.2018 Harsh Kumar 20.	.11.2018	PROJECT: BAGHJAN – MADHUBAN PIPELINE PROJECT	मेकॉन 3001 East Part	MECON LIMITED							
					SCALE :	R							
APPROV	/ED	AK	(Gupta	DATA SHEET FOR GLOBE VALVES ≥ 2"	DATA SHEET NO.: MEC/23U1/05/21/	/M/001/DS/GV/01							

SPARES LIST (START-UP & COMMISSIONING) - ASSORTED VALVES



OIL & GAS SBU, DELHI

Page 1 of 1

<u>LIST OF COMMISSIONING SPARES AND ACCESSORIES FOR START-UP & COMMISSIONING FOR BALL VALVES, PLUG VALVES, GLOBE VALVES and ACTUATORS</u>

SI. No.	Item No.	Description	Quantity
1.		Sealant Gun for BALL VALVES , PLUG VALVES	One No.
2.		Sealant for BALL VALVES , 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 Ball Valves, Plug Valves, Globe Valves and Actuators.
- 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

Client :	Project :	Document No. :	Rev. No.	Date :
OIL INDIA LTD.	BAGHJAN – MADHUBAN PIPELINE PROJECT			
		MEC/23U1/05/28/M/001/S002/CS	0	20.11.18

SPARES LIST (2 YEARS NORMAL OPERATION) - ASSORTED VALVES



OIL & GAS SBU, DELHI

Page 1 of 1

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

SI. 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

Client :	Project :	Document No. :	Rev. No.	Date :
OIL INDIA LTD.	BAGHJAN – MADHUBAN PIPELINE PROJECT	MEC/23U1/05/28/M/001/S002C/OS	0	22.11.18

QAPs

INSTRUCTIONS FO	R FILLING UP:	CODES F	OR EXTENT OF INSPECTION, TESTS, TEST CERTIFICAT	TES & DOCUMENTS :
9001 Cany	ORDER NO. & DATE		EQUIPMENT	
मेकॉन	SUB-CONTRACTOR		STRUCTURAL AND MECHANICAL	BALL VALVES, PLUG VALVES,GLOBE VALVES
	ORDER NO. & DATE		FOR	
	CONTRACTOR		QUALITY ASSURANCE PLAN	PROJECT: BAGHJAN -MADHUBAN PIPELINE PROJECT

- 1. OAP 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

ABBREVIATIONS USED: **KEY TO SYMBOLS:**

SV : SUB VENDOR * : TO BE FILLED BY VENDOR MFR : MANUFACTURER

TPI Н : HOLD : REVIEW R W : WITNESS

: DESIGNATED THIRD PARTY INSPECTION AGENCY

** : TEST TO BE PERFORMED, IF APPLICABLE

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
- Balancing
- 17. Vibration Test

Code Description

- 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

Code Description

- 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 dras released for mfa.
- 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 amendments, if any
- D9. Calibration Certificate of all measuring instruments and gauges
- D10. X-Ray Reports

		EQUIPMENT	DETAILS				INSPECTION AND TESTS					Test Certificates &	Acceptance Criteria	REMARKS/	
SI. No.	Description (with equipment heading, place of use and brief	Identification No.	Quantity No./M	Unit Weight	Manufacturer's Name and Address	Expected Schedule of		Raw Material and In-Process Stage Inspection			Final Inspection/ Test by		Documents to be submitted to MECON	Standards/ IS/ BS/ ASME/ Norms and	SAMPLING PLAN
	specifications)	(MR Item No.)		(Kg)		Final Inspn.	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.0	1.0 BALL VALVES 24",12",16", 12",10" 4" #300 PLUG Valves 10", 4" #300 B.1 to I GLOBE Valves 4" #300 C.1		As Per MR	*	*	*	As per att	tached she	et 2 to 10						
	For MECON (Stamp & Signature)				RACTOR/ SUB-CONTRACTOR (Stamp & Signature)							QAP NO.	MEC/23U1/05/28/M/001/9	5002/QAP	REV 0

										QAP No.	: MEC/23U1/05/28/	M/001/S002/QAP				FORM NO. 11.20(4.4)F-09 REV-0
	EQUIPMENT [INSPECTION				Test Certificates &	Acceptance Criteria		pection Co		REMARKS
SI.	Description (with equipment	Identification	Quantity	Unit		terial and I		Final I	nspection/	Test by	Documents to be	Standards/ IS/ BS/	& 9	Sampling P	lan	
No.	heading, place of use and brief	No.	No./M	Weight	MFR/SV	age inspect		MFR/SV	TPI	MECON	submitted to MECON		MFR/SV	TPI	MECON	4
	specifications)			(Kg)	MFK/SV	TPI	MECON	MFK/SV	IPI	MECON		Documents	MFR/SV	IPI	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			1,2	-	-	-	-	-	1. D1 2. Report	D1 Relevant Material Standard Manufacturer's Specification	Н	R	R	
		by MECON			4	4	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's D.S.	Н	Н	R	
					5	5	-	1	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					6 **	6 **	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends
					7 **	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	Н	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.	Н	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.	Н	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	Relevant Material Standard	Н	R	R	
					35	35	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	Н	Н	R	
					41	41	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	

QAP No. : MEC/23U1/05/28/M/001/S002/QAP

Test Certificates & Acceptance Criteria

_					1					QAF NO.	: MEC/ 2301/05/ 28/					10101110. 11:20(1:1)1 051624 0
	EQUIPMENT						INSPECTION				Test Certificates &	Acceptance Criteria		pection Co		REMARKS
SI.	Description (with equipment	Identification		Unit		terial and I		Final I	nspection/	Test by	Documents to be	Standards/ IS/ BS/	& 9	Sampling P	lan	
No.	heading, place of use and brief	No.	No./M	Weight		age inspect		1.1ED (0) (submitted to MECON					
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	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			1,2	-	-	-	,	-		D1 Relevant Material Standard Manufacturer's Specification	Н	R	R	
		by MECON)			4	4	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's D.S. 	Н	Н	R	
					5	5	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	Н	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.	Н	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.	Н	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	Relevant Material Standard	Н	R	R	
					35	35	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					41	41	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	

QAP No.: MEC/23U1/05/28/M/001/S002/QAP Test Certificates & Acceptance Criteria

	FOLITPIAENT D	ETATI C			ı — —		NCDECTION	LAND TECT	-	QAP NO.	: MEC/23U1/05/28/					PENA DICC
SI. No.	EQUIPMENT D Description (with equipment heading, place of use and brief	Identification No.	Quantity No./M	Unit Weight		I terial and Ir age inspect			nspection/	Test by	Test Certificates & Documents to be submitted to MECON	Acceptance Criteria Standards/ IS/ BS/ ASME/ Norms and		spection Co Sampling P		REMARKS
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	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			1,2	-	-	-	-	-		D1 Relevant Material Standard Manufacturer's Specification	Н	R	R	
		by MECON)			4	4	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's D.S.	Н	Н	R	
					5	5	-	-	-	-		Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	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.	Н	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)
					8 **	8 **	-	-	-	-		1. ASME B16.34 Annex-B 2. MECON's T.S.	Н	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	Standard	R	R	R	
					35	35	-	-	-	-	Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Η	Н	R	
					41	41	-	-	-	-		Relevant Material Standard MECON's T.S. MECON's D.S.	R	Н	R	

QAP No. : MEC/	23U1/05/	28/M/001	/S002/	'QAF
----------------	----------	----------	--------	-------------

	EQUIPMENT D						NSPECTION				Test Certificates &	Acceptance Criteria		pection Co		REMARKS
SI. No		Identification No.	Quantity No./M	Unit Weight		terial and Ir age inspect		Final I	nspection/	Test by	Documents to be submitted to MECON	Standards/ IS/ BS/ ASME/ Norms and	& 5	Sampling P		
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON]	Documents	MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
1.0	Trunnion (for Trunnion Mounted Valves)	Material Manufacturer to indicate (to be approved			1,2	1,2	-	-	-	-	1. D1 2. Report	D1 Relevant Material Standard Manufacturer's Specification	Н	R	R	
		by MECON)			4	4	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's D.S.	Н	Н	R	
					5	5	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					13	13	-	-	-	-	Report/ Material Test Certificates	Relevant Material Standard	Н	R	R	
					43 **	43 **	-	-	-	-	Test Report Material Test Certificates for composition, hardness, thickness & integrity	MECON's T.S. MECON's D.S. ASTM B733 Std. Manufacturer's Specification	Н	Н	R	
1.0	5 Obturator	Material As per MR/ Alternate Material accepted			1,2	1,2	-	-	-	-	1. D1 2. Report	D1 Relevant Material Standard Manufacturer's Specification	Н	R	R	
		by MECON			4	4	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's D.S. 	Н	Н	R	
					5	5	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	Н	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.	Н	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves

QAP No.: MEC/23U1/05/28/M/001/S002/QAP

	EQUIPMENT D	ETAILS				I	NSPECTION	AND TEST	S	•	Test Certificates &	Acceptance Criteria	Ins	pection Co	des	REMARKS
SI.	Description (with equipment	Identification	Quantity	Unit		erial and Ir		Final I	nspection/	Test by	Documents to be	Standards/ IS/ BS/	& :	Sampling P	lan	
No.	heading, place of use and brief	No.	No./M	Weight		ige inspect					submitted to MECON	ASME/ Norms and			T	
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	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.	Н	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	Relevant Material Standard	Н	R	R	
					35	35	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					41	41	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					43	43	-	-	-	-		MECON's T.S. MECON's D.S. ASTM B733 Std. Manufacturer's Specification	Н	Н	R	
1.06	Stem	Material As per MR/ Alternate Material accepted			1,2	1,2	-	-	-	-	1. D1 2. Report	D1 Relevant Material Standard Manufacturer's Specification	Н	R	R	
		by MECON			4	4	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's D.S.	Н	Н	R	
					5	5	-	-	-	-	Material Test Certificates	1. Relevant Material Standard 2. MECON's T.S. 3. MECON's D.S.	Н	Н	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-		1. ASME B16.34, Appendix-II 2. MECON's T.S.	Н	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel
					8**	8**	-	1	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	Н	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves

QAP No.: MEC/23U1/05/28/M/001/S002/QAP

	EQUIPMENT D		Quantity				INSPECTION				Test Certificates &	Acceptance Criteria		pection Co		REMARKS
SI No		Description (with equipment heading, place of use and brief specifications) Identification No.		Unit Weight		erial and Ir age inspect		Final I	nspection/	Test by	Documents to be submitted to MECON	Standards/ IS/ BS/ ASME/ Norms and	& 5	Sampling P	lan	
				(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	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.	Н	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	Relevant Material Standard	Н	R	R	
					35	35	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					41	41	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					43	43	-	-	-	-	Test Report Material Test Certificates for composition, hardness, thickness & integrity	MECON'S T.S. MECON'S D.S. ASTM B733 Std. Manufacturer's Specification	Н	Н	R	
1.0	7 Seats	Material As per MR/ Alternate Material accepted			1,2	1,2	-	-	1	-		D1 Relevant Material Standard Manufacturer's Specification	Н	R	R	
		by MECON			4	4	-	-	1	-	Material Test Certificates	Relevant Material Standard MECON's D.S.	Н	Н	R	
					5	5	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	Н	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)

QAP No.: MEC/23U1/05/28/M/001/S002/QAP

г	EOUIPMENT DETA	ATLC		1		INSPECTION	I AND TECT		QAI IIO.	Test Certificates &		Too	spection Cod	4	REMARKS
-		dentification	Quantity Un	. Dave	Material and 1			inspection/	Took bu		Acceptance Criteria Standards/ IS/ BS/		Spection Coo Sampling Pl		REMARKS
	No. heading, place of use and brief	No.	C ,	-			Filldi 1	inspection/	rest by	Documents to be submitted to MECON		α	Sampling Pi	dii	
		NO.			stage inspec		NAED (C) (MECON	Submitted to MECON	'	MED (C) (TDI	месом	
	specifications)		(Kg) MFR/S	V TPI	MECON	MFR/SV	TPI	MECON		Documents	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.	Н	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.	Н	W	R	Bevel Surfaces (by MPI/ DP)
				13	13	-	-	-	-	Report/ Material Test Certificates	Relevant Material Standard	Н	R	R	
				35	35	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
				41	41	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
				43	43	-	-	-	-	Test Report 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	Н	Н	R	
1	As Alt Ma	aterial s per MR/ Iternate aterial ccepted		1,2	1,2	-	-	-	-	1. D1 2. Report	D1 Relevant Material Standard Manufacturer's Specification	Н	R	R	Alongwith thickness measurement for ENP Coating.
	by	y MECON		4	4	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's D.S.	Н	Н	R	
				5	5	-	-	-	-	Material Test Certificates	Relevant Material Standard MECON's T.S. MECON's D.S.	Н	Н	R	
				6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends
L															

March Marc			FOLITAMENT D	ETATIC			1	-	INCDECTION	I AND TECT		QAP NO.	Took Contification 0		T.o.	anadian Ca	daa	REMARKS
No. No.	 	a. 1 - 5											Test Certificates &	Acceptance Criteria				REMARKS
Specifications Clay MPRISON TPI MECCON MPRISON										Final I	nspection/	lest by			8.	Sampling P	lan	
1		No. heading		No.	No./M								submitted to MECON					
			specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON	
Appendix T. Appendix T		1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
B** B** C Test Report 1. ASSM B16.34,							7**	7**	-	-	_	-	Test Report	1. ASME B16.34.	Н	W	R	Wet MPI for 100%
8** 8**													·					of internal surfaces
B** B**																		
Series S														2. 14.00113 1.5.				
8** 6** - - Test Report 1. ASME 1915-34, Appendix 51.4 b) Fest Report 2. MECON'S T.S. H W R All castings as per dispersion of all cast valves 51.4 b) Fest Report 2. MECON'S T.S. H W R Bevel Surfaces 1. ASME 1915-34, Appendix-11 2. MECON'S T.S. H W R Bevel Surfaces (ky MP/J DP) R R R R R R R R R																		curfaces (MDI/DD)
Appendix Cause 5.1.4 b) of Except Cause 5.																		
9** 9**							8**	8**	-	-	-	-	Test Report		н	W	R	
9** 9** - - Test Report 1. ASME B16.34, H W R Bevel Surfaces (by MPI/ DP)																		
9** 9** Test Report 1, ASME B16.34, Appendix-III 2, MECON'S T.S. 41														MECON's T.S.				
13 13 - - - Report Material Test Relevant Material H R R																		ends of all cast valves
Appendix II 2, MECONS T.S. Ctylinates Certificates Cer																		
13 13 - - - Report Material Test Relevant Material H R R							9**	9**	_	_	_	-	Test Report	1. ASMF B16.34.	Н	W	R	Bevel Surfaces
13 13 13 13 13 14 15 15 15 15 16 18 18 18 18 18 18 18								,					rest report					
13 13 - - - Reporty Material Test 1. Relevant Material H R R																		(by I'll 1/ bi)
Assembled Valves														Z. MECONS 1.5.				
Certificates Standard																		
Assembled Valves																		
41 41 Material Test Certificates Standard Certificates Standard MicroNis Ti.S.							13	13	-	-	-	-			Н	R	R	
1.09 Assembled Valves													Certificates	Standard				
1.09 Assembled Valves																		
Certificates Standard Standard Standard Standard Member Standard Standar																		
Certificates Standard Standard Standard Standard Member Standard Standar							41	//1	 	_	_	_	Material Teet	1 Polovant Material	ы	ш	D	
1.09 Assembled Valves							41	71	_	_	_	_			"	''	N.	
1.09 Assembled Valves													Certificates					
1.09 Assembled Valves 1,2 1,2 1,2 Report 1, D1 2, MECON'S T.S. H H W W W W W W W W																		
3 3 3 Report 14 14 14 1. Report 2. Test Certificates 15 15 15 1. Report 2. Test Certificates 15 15 15 1. Report 2. Test Certificates 15 15 15 1. Report 2. Test Certificates 15 15 15 1. Report 2. Test Certificates 15 15 15 1. Report 2. Test Certificates 15 15 15 1. Report 2. Test Certificates 15 15 15 1. Report 2. Test Certificates 17 15 15 15 1. Report 2. Test Certificates														3. MECON'S D.S.				
3 3 3 3 Report	1	.09 Assembled \	/alves				-	-	-	1,2	1,2	1,2	Report	1. D1	Н	Н	W	
14 14 14 1. Report 1. D1 MECON's T.S. 3. MECON's T.S. 4. MECON's T.S. 5. M											_			2. MECON's T.S.				
2. Test Certificates 2. Test Certificates 3. MECON'S D.S. 4. API 60 Stad, API 60 Stad, BES NI 2266 (as applicable) 1. Report 2. Test Certificates 3. MECON'S D.S. 4. API 60 Stad, BES NI 2266 (as applicable) 40 40 40 1. Report 2. Test Certificates 40 40 40 1. Report 3. Test Certificates 42 42 42 1. Report 42 42 42 1. Report 43. MECON'S D.S. 4. API 60 Stad, BES NI SD 10497 (as applicable) (as applicable) 44 42 42 1. Report 45. Test Certificates 46 MECON'S D.S. 47 BOON'S D.S. 48 BES NI SD 10497 (as applicable) 49 MECON'S D.S. 40 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 41 API 60 Stad, BES NI SD 10497 (as applicable) 42 API 60 Stad, 43 MECON'S D.S. 44 API 60 Stad, 45 SEN ISD 10497 (as applicable) 46 MECON'S D.S. 47 BOON'S D.S. 48 BES NI SD 10497 (as applicable) 49 MECON'S D.S. 40 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 40 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 41 MECON'S D.S. 42 MECON'S D.S. 43 MECON'S D.S. 44 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 44 MECON'S D.S. 44 MECON'S D.S. 47 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 41 MECON'S D.S. 42 MECON'S D.S. 43 MECON'S D.S. 44 MECON'S D.S. 44 MECON'S D.S. 44 MECON'S D.S. 44 MECON'S D.S. 44 MECON'S D.S. 45 MECON'S D.S. 46 MECON'S D.S. 47 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S D.S. 48 BES NI SD 10497 (as applicable) 40 MECON'S								-						4 54				
A							-	-	-	14	14	14			н	Н	W	
1. API 6D Std./ B SEN 12266 (sa applicable)													2. Test Certificates					
SEEN 12266 Sapplicable SEEN 12266 Sapplicable SEEN 12266 Sapplicable SEEN 12266																		
15 15 15 15 15 15 15 15																		
2. Test Certificates 2. Test Certificates 2. MECON's T.S. 3. MECON's D.S. 4. API 6D Std./ 85 EN 12266 (as applicable) 1. API 607/API 6FA / 85 EN ISO 10497 (as applicable) 2. MECON's T.S. 3. API 6D Std. (as applicable) 37 37 37 Certificates 44 44 44 1. Report 1. MECON's T.S. 3. API 6D Std. (as applicable) R R 44 44 44 1. Report 1. MECON's T.S. 3. MECON'S T.S. 4. MECON'S T.S. 5. MEC																		
2. Test Certificates 2. MECON'S T.S. 3. MECON'S D.S. 4. API 6D Std./ BS EN 150 10497 8 EN 150 1049							-	-	-	15	15	15	1. Report		Н	Н	W	
API 60 Std./ BS EN 12266 (as applicable) API 60 Std./ BS EN 12266 (as applicable)																		
Hold Hold																		
40 40 40 1. Report 1. API 607/ API 6FA / B5 EN ISO 10497 (as applicable) 2. MECON'S D.S. 3. MECON'S D.S. 42 42 42 1. Report 1. MECON'S T.S. H H W W W W W W W 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. 3. MECON'S D.S. 42 42 42 1. Report 1. MECON'S T.S. 4. MECON'S T.S. 2. MECON'S D.S. 3. API 60 Std. (as applicable) 4. MECON'S T.S. 4. MECON'S D.S. 3. API 60 Std. (as applicable) 4. MECON'S T.S. 4. MECON'																		
2. Test Certificates 2. Test Certificates 2. Test Certificates 2. Test Certificates 2. MECON's T.S. 3. MECON'S T.S. 42									 	40	40	40	1 Donort		D	D	В	
										40	40				К	К	K	
1				1					1				z. rest certificates					
1. Report 1. MECON'S D.S. H H W														MECON's T.S.				
2. Test Certificates 2. MECON's D.S. 3. API 6D Std. (as applicable) 37 37 37 Certificates - R R 44 44 44 1. Report 1. MECON's T.S. H W R / W 2. Test Certificates 2. MECON's D.S. 3. Manufacturer's 3. Meanufacturer's 3. Manufacturer's 3. Manufacturer's 3. Manufacturer's 3. Manufacturer's 3. Manufacturer's 3. Manufacturer's 3. Meanufacturer's																		
2. Test Certificates 2. MECON's D.S. 3. API 6D Std. (as applicable) 37 37 37 Certificates - R R 44 44 44 1. Report 1. MECON's T.S. H W R / W 2. Test Certificates 2. MECON's D.S. 3. Manufacturer's 3. Meanufacturer's 3. Manufacturer's 3. Manufacturer's 3. Manufacturer's 3. Manufacturer's 3. Manufacturer's 3. Manufacturer's 3. Meanufacturer's						1			1	42	42	42	1. Report	MECON's T.S.	Н	Н	W	
37 37 37 Certificates									1]	1	
37 37 37 Certificates - R R 44 44 44 1. Report 1. MECON's T.S. H W R / W 2. Test Certificates 2. MECON's D.S. 3. Manufacturer's					1	1							_ rescentificates				1	
44 44 44 1. Report 1. MECON's T.S. H W R / W 2. Test Certificates 2. MECON's D.S. 3. Manufacturer's														(as applicable)				
44 44 1. Report 1. MECON's T.S. H W R / W 2. Test Certificates 2. MECON's D.S. 3. Manufacturer's						1	-	-	-	37	37	37	Certificates		-	R	R	
2. Test Certificates 2. MECON's D.S. 3. Manufacturer's				1	1	1	-	-	-					 MECON's T.S. 	Н			
3. Manufacturer's														MECON's D.S.			1,	
Specification				1					1									
	L													Specification				

FORM NO. 11.20(4.4)F-09 REV-0 QAP No.: MEC/23U1/05/28/M/001/S002/QAP **EQUIPMENT DETAILS** INSPECTION AND TESTS Test Certificates & Acceptance Criteria Inspection Codes REMARKS SI. Description (with equipment Identification Quantity Unit Raw Material and In-Process Final Inspection/ Test by Documents to be Standards/ IS/ BS/ & Sampling Plan No. heading, place of use and brief No./M Weight stage inspection submitted to MECON ASME/ Norms and No. specifications) (Kg) MFR/SV TPI MECON MFR/SV TPI MECON Documents MFR/SV TPI MECON 1 2 3 4 5 8 9 10 11 12 14 15 16A 16B 16C 13 MECON's T.S. 45 45 45 1. Report Н R MECON's D.S. 2. Test Certificates API 6D Std. / BS EN ISO 17292 as applicable) 46 46 46 1. Report 1. MECON's T.S. Н Н W . API 6D Std. 2. Test Certificates (as applicable) 47 47 . MECON's T.S. Report Н Н W API 6D Std. / Test Certificates BS EN ISO 17292 (as applicable) MECON's T.S. 48 48 48 Report Н Н W API 6D Std. 2. Test Certificates (as applicable) . MECON's T.S. 49 49 1. Report W Н Н . MECON's D.S. 2. Test Certificates 1. MECON's T.S. 1.10 Complete documentation check and 1. Final Report Н Н API 6D Std. / 2. Final Certificates compilation BS EN ISO 17292 (as applicable) 1.11 Complete and compiled documentation 1. Final Report 1. MECON's T.S. \equiv Н Н . API 6D Std. / check and despatch clearance 2. Final Certificates BS EN ISO 17292 (as applicable) 1.12 Actuator Tests **Not Applicable** QAP NO.: MEC/23U1/05/28/M/001/S002/QAP REV For MECON (Stamp & Signature) For CONTRACTOR/ SUB-CONTRACTOR 0

																				FORM NO. 1	1.20(4.4) F-09 REV-0
		CONTRACTOR					QI	U A LITY A	SSUR	ANCEPL	_A N				PROJECT:						
6	∞	ORDERNO. & DATE							FOR	!					PACKAGE NO.:						
7	· /	SUB-CONTRACTOR						INSTR	UMEN	TATION					PACKAGE NAME :						
	1	ORDERNO. & DATE						EQ	UIPM	ENT					I TEM NAME : GAS	OVE	ROIL ACTUAT	OR			
INST	RUCTI ONS FO	RFILLING UP:	•			CODES FOR EXTENT	OF INSPECT	TI ON, TES TS , TE	STCERT	IFICATES & DO	CUMENTS :	:									
1.	QAP shall be s	ubmitted for each of th	e equipment se	eparately wi	th break up	Code Description		Coale		Desci	ription				Code			Descrip	ntion	Code DOCUMENTS:	
		ub-assembly & part/c				1. Visual		18.		Amplitude Test	,				34.				Inspection Report	D1. Approved GA draw	rings
	having same s	pecification.				Dimensional		19.		Sponge Test								by Cont	ractor	D2. Information and or	ther
2.	Use numerical	codes as indicated fo	r extent of insp	ection & te	sts and	3. Fitment & Ali	ignment	20.		Dust/ Water In	gress Test				35.			Hardne	ss Test	reference drg/ star	mped
	submission of	test certificates & doc	uments. Additio	onal codes	& description	Physical Tes	t (Sample)	21.		Friction Factor T	est				36.			Spark T	est for Lining	drgs released for r	nfg.
	for extent of ins	spection & tests may b	oe added as ap	plicable for	the plant	Chemical Test	st (Sample)	22.		Adhesion Test					37.			Calibrat	on	D3. Relevant catalogu	es es
	and equipment	t				Ultrasonic To	est	23.		Performance Tes	st/Characteris	tic			38.			Safety I	Device Test	D4. Bill of matl./ I tem	no./
3.	Separate identit	ification number with q	uantity for equi	pment shall	be	7. Magnetic Par	ticle Test (MPI	1)		Curve					39.			Ease of	Maintenance	Identification	
		rever equipment havinç		ations belo	nging	8. Radiography		24.		No Load/ Free F	-				40.				t (Type Test)	D5. Matchmarks detail	
		lities are grouped toge				Dye Penetrat		25.		Load/ Overload					41.				V-Notch Test	D6. Line/ Layout diag	
4.		grams must be indicate				Metallograph		26.		Measurement of					42.				onal Torque Test	D7. Approved erection	
		ghts may be indicated	wherever actua	al weights a	ire not	11. Welder's Qu		27.		Accoustical Tes					43.				ectroless Nickel Plating)	procedures	
	available.					Weld Proced		28. 29.		Geometrical Acc					44.			Executi		D8. Unpriced sub P.O	
-						 Approval of T Procedure 	est and Repair	29.		Repeatability an Accuracy	ia Positioning				44. 45.			Painting Anti-Sta		specification and a ments, if any	amend-
	ABBREVIAT	TONE HEED.	KEY TO SY	MPOLS.		13. Heat Treatm	ont	30.		Proving Test					45.				atic Double Block &	D9. Calibration Certific	ata of
	CONTR	: CONTRACTOR			AS APPLICAB	14. Pressure Tes		31.		Surface Preparat	tion				40.			Bleed T		all measuring inst	
	CONTIN	. CON INACION	. MFR/CO	WIRACION -	A3 AFFEICAB	15. Leakage Tes		31.		Juliace Freparat	ion				47.				nal Test :	all measuring insu	unens
						a) Piston Se													trical and pneumatic functional test.		
						b) Pneumation													lation Test of Electrical components.		
						Connection	, , , , , ,												k of operating time control.		
																			k of limiting device operation.		
																			oad test (DP=0) & load (DP max) Operations		
																		with the	minimum required		
																		feeding	pressure.		
	MFR	: MAN U FACTURER	** : TEST TO	BE PERFOR	MED. IF APPL			32.		Manufacturer's	Test Certificate	es							al Override functional test.	and gauges	
	Н	: HOLD				16. Balancing				for bought-out ite	ems				48.			Pneuma	tic Double Block &	D10. X-Ray Reports	
	R	: REVI EW				17. Vibration Tes	t	33.		I BR/ Other State		S						Bleed T	est		
	W	: WITNESS : PERFORM								compliance cert	tificate										
-	Р	: PERFORM	EOILIBM	ENT DETAI	ıs	<u>l</u>		ı			INSD	ECTLO	ON AND TEST	re					Test Certificates &	Acceptance Criteria	REMARKS/
SI.	Description	n (with equipment	Identification	Quantity	Unit	Manufacturer's	Expected		aw Materi	al and In-Process		ECITO	ON AND TEST		Final Inspection/ 1	Fost h	v		Documents to be	Standards / TS/ BS/	SAMPLING PLAN
No.		ace of use and brief	No.	No./M	Weight	Name and Address	Schedule of	· ·		Inspection					indi inspectori	CSCD	,		submitted to MECON	ASME/ Norms and	GAME ETTO TEAT
110.		cifications)	(As per MR)	110.7 111	(Kg)	rune una ruacos	Final Inspn.			1		Ŧ				I			Substituce to the South	Documents	
		,	(= p=y		(1.9)			MFR		TPI	MECO	N	MFR		TPI		MECON	ı			
1		2	3	4	5	6	7	8		9	10	+	11		12		13		14	15	16
								5,6/7/8/9*,14,		6/7/8/9*,14,		1,	,2,3,15(b),3		1,2,3,15(b),44		1,2,3,15(b),4				
	CAS OVER	ROIL ACTUATOR	As per PO				15(a),42,23	Р	15(a),42,23	w# -		1,44,47	Р	,47	w	4,47	R	1,2,3,5,6,7,8,9,14,15(a),15(b),23	D2,D3,D4,D6, MECON TS	100%	
	GASOVEI	KOTEACIDAIOK	из регто	1							T									10070	
Ш										5	R		32,33	R	31,32,33	R	31,32,33	R	31,32,33,42,44,47		
		licable shall be carried	-			-															
		e witnessed for storag		er Oil tanks	& actuator h	nousing.															
	NOTE :- 3.2 In:	spection Report shall b	oe provided.																		
		Γ																			
																		CART	D. MEC/05/E5/STD./QAP/GOV		REV
	For MECON 10	Stamp & Signature)			Eor CONTO	ACTOR/ SUB-CONTRACT	np											QAP NO	J. WEG US/ ES/ STD./ QAP/ GUV		REV 0
1	TO INECOM (S	лапра экупаше)			I OF CONTR	(Stamp & Signature)	OK .											SHEET	1.0F.1		U
1						(Swith a signature)												STEET			

FORM NO	11	20/4	4)	= 00	DEM

REV

0

QAP NO. MEC/05/E5/STD./QAP/HOV

SHEET 1 OF 1

		CONTRACTOR					OHALI	TY AS	SILE	RANCE	PI A	A N			PROJECT :					FORM NO.	11.20(4.4)F-09 REV
6		ORDER NO. & DATE					20111		FOR		,	• • •			PACKAGE I						
(मेकॉन	SUB-CONTRACTOR						INSTRU		-					PACKAGE						
3	SOOI COMP SE	ORDER NO. & DATE						EOU									RAULIC AC	TUATO	2		
		ORDER NO. & DATE						EQU) I F IVI	ENI					ITEM NAMI	E : HYL	DRAULIC AC	TUATO	₹		
INSTR	RUCTIONS FOR	FILLING UP :				CODES FOR EXTENT	OF INSPECTI	ON, TESTS,	, TEST	CERTIFIC	ATES &	DOCUME	NTS:								
2. 3. 4.	of assembly/si having same s Use numerical submission of for extent of in and equipmen Separate ident indicated when to different far Weight in kilog	codes as indicated for test certificates & docu spection & tests may b	extent of inspectments. Addition to added as application of same specifications and the column and the column are column.	group of eq ction & test: nal codes & blicable for t ipment shal ations belon	s and description the plant Il be iging	Code Description 1. Visual 2. Dimensional 3. Fitment & Ali 4. Physical Test 5. Chemical Tes 6. Ultrasonic Ter 7. Magnetic Par 8. Radiography 9. Dye Penetrat 10. Metallograph 11. Welder's Qua Weld Procedu 12. Approval of T	(Sample) t (Sample) st ticle Test (MPI) Test ion Test c Exam. lification & ure Test	24. 25. 26. 27. 28.		Amplitude Sponge Te Dust/ Wat Friction Fa Adhesion - Performan Curve No Load/ I Load/ Ove Measurem Accoustica Geometric Repeatabil	est er Ingre ctor Tes Test ce Test/ Free Rur rload Te ent of S I Test al Accur	ess Test st /Character nning Test est speeds racy			Code 34. 35. 36. 37. 38. 39. 40. 41. 42. 43.			by Cor Hardne Spark Calibra Safety Ease of Fire Te Charpy Opera	al Inspection Report Itractor sss Test Test for Lining tition Device Test f Maintenance sst (Type Test) V-Notch Test ional Torque Test icletroless Nickel Plating) ion	Code DOCUMENTS: D1. Approved GA draw D2. Information and of reference drg/ star drgs released for n D3. Relevant catalogue D4. Bill of matt./Item n Identification D5. Matchmarks details D6. Line/ Layout diagra D7. Approved erection procedures D8. Unpriced sub P.O. specification and a	ther mped nfg. ss so./ s am
	ABBREVIATI CONTR	ONS USED: : CONTRACTOR : MANUFACTURER	KEY TO SYM * : MFR/ CONTR	RACTOR - AS AP		Procedure 13. Heat Treatm 14. Pressure Tes 15. Leakage Test a) Piston Sea b) Hydraulic	ent	30. 31.		Accuracy Proving Te Surface Pr	est eparatio	on			45. 46. 47.			Anti-Si Hydros Bleed Function a) Election b) Che	atic Test static Double Block & Test onal Test : trical functional test. ck of limiting device operation. oad test (DP=0) & load (DP max)	ments, if any D9. Calibration Certific all measuring instr	ate of
	H R W	: HOLD : REVIEW : WITNESS : PERFORM	. TEST TO BE	PERFORMED, IF	FAPPLICABLE	16. Balancing 17. Vibration Tes	t	33.		for bought IBR/ Other compliance	out iter	ms ory agencie			48.			Pneum	natic Double Block & Test	D10. X-Ray Reports	
	r	: PERFURIVI	FOUIPME	ENT DETAIL	I.S.	<u> </u>						INSPECTI	ON AND TI	FSTS					Test Certificates &	Acceptance Criteria	REMARKS/
SI. No.	heading, p	on (with equipment lace of use and brief ecifications)	Identification No. (As per MR)	Quantity No./M	Unit Weight (Kg)	Manufacturer's Name and Address	Expected Schedule of Final Inspn.		St	iterial and In tage Inspecti	ion	s		Fin	al Inspecti		<u> </u>		Documents to be submitted to MECON	Standards/ IS/ BS/ ASME/ Norms and Documents	SAMPLING PLAN
	3h	ecincations)	(AS per IVIK)		(kg)		riliai IIISpii.	MFR	?	TP	l	MECON	MFF	₹	TPI		MEC	ON		Documents	
1		2	3	4	5	6	7	8		9		10	11		12		13	3	14	15	16
	HYDRA	ULIC ACTUATOR		As per PO	-			5,6/7/8/9*, 14,15(a),4 2,23	P	6/7/8/9*, 14,15(a), 42,23	W [#]	-	1,2,3,15 (b),31,4 4,47	P R	1,2,3,15(b),44,47 31,32,33	W R	1,2,3,15(b),44,47 31,32,33	R R	1,2,3,5,6,7,8,9,14,15(a),15(b),23 31,32,33,42,44,47	D2,D3,D4,D6, MECON TS	100%
·	*Tests as app	icable shall be carried of	out on actuator	cylinder.	•	•		•	*	-										•	
		e witnessed for actuato	.,																		<u>'</u>

For CONTRACTOR/ SUB-CONTRACTOR (Stamp & Signature)

For MECON (Stamp & Signature)