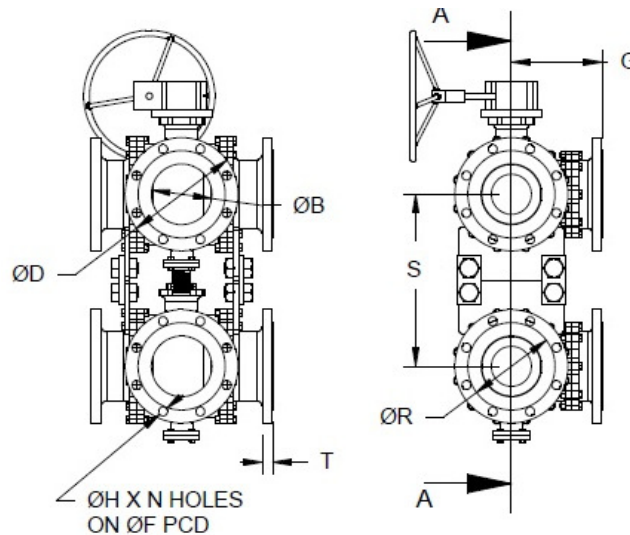


PRE-QUALIFICATION REQUIREMENTS
Double Three Way Valve

Doc. No.:
TL-PQR-DTWV-01
Rev00
Date: 05.08.2019

This requirement is for Double Three way valve (DTWV), which is used in oil applications as change-over valve for Oil coolers in steam turbines. Double three way valve is used for directing oil to the cooler in operation, while at the same time shutting off the flow in reserve oil cooler. The arrangement of these valves should be such that one hand wheel shall operate both three way valves together to establish in flow and out flow for one oil cooler. During changeover operation, outlet oil flow must not stop in any condition/position of the valve. The scope of supply shall include complete valve along with, flanges, gaskets, fasteners. General construction idea of the valve is given in fig. below. Two casing are arranged one over another and valves in these two casings are operated with a common hand wheel. A flow indicator on the valves body to indicate the direction of flow shall be provided. No intermediate position is required for operation. All three flanges of each casing should be in one plane as shown in figure.



BHEL requires DTWV with following characteristics:

TABLE - 1

Sl.No	Material code	Size (Nb)	Working Fluid	Working Parameter	Body Material
1.	W90311941044	150	Oil	12kg/cm ² 70°C	Stainless Steel
2.	W90311941036	200	Oil	12kg/cm ² 70°C	Stainless Steel
3.	W90313137188	150	Oil	12kg/cm ² 65°C	Carbon Steel or GGG40

ACCEPTANCE CRITERION FOR VENDOR

A. For DTWV (Stainless Steel) material code W90311941044 and W90311941036

1. Vendor should have experience in engineering, manufacturing, testing and supply of DTWV (stainless steel) (100NB or above and other requirements as mentioned in table-1) to power plants/ BHEL/process plant, used in oil applications and should have successfully executed at least two such contracts in last 5 years.

PRE-QUALIFICATION REQUIREMENTS
Double Three Way Valve

Doc. No.:
 TL-PQR-DTWV-01
 Rev00
 Date: 05.08.2019

2. Vendor to submit the PO copies (of 2 no. projects within last five year as on date of enquiry) of commissioned DTWV (100Nb or above and other requirements as mentioned in Table -1), used in oil applications. Vendor to furnish the GA drawing of DTWV of any of placed PO.
3. Vendor to furnish contact details of customer/end user i.e. Name, Address, email Telephone numbers etc.

Vendor to fill the information required in below mentioned format:

TABLE -2

	End customer Name	Size of Valve supplied	Pressure & Temp.	Fluid	Material of construction	Year of Execution	No. of PO copies	Seat Leakage	Contact details, Telephone no's & Email id of End user
Minimum acceptance criteria	-	Min 100 NB	12 kg/cm ² & 70 °c	oil	Stainless Steel	Within Last 5 years	2 (Within Last 5 years)	NIL leakage as per class rate 'A' of standard EN12266	-

In case vendor provides false information or fails to furnish information/documents as mentioned above and as per above requirement mentioned from sl no. 1 to 4, his offer shall not be considered for DTWV (Stainless Steel) material code W90311941044 and W90311941036.

B. For DTWV (Carbon Steel or GGG40) material code W90313137188

4. Vendor should have experience in engineering, manufacturing, testing and supply of DTWV (Carbon Steel or GGG40) (100NB or above and other requirements as mentioned in table-1) to power plants/ BHEL/process plant, used in oil applications and should have successfully executed at least two such contracts in last 5 years.
5. Vendor to submit the PO copies (of 2 no. projects within last five year as on date of enquiry) of commissioned DTWV (100Nb or above and other requirements as mentioned in Table -1), used in oil applications. Vendor to furnish the GA drawing of DTWV of any of placed PO.
6. Vendor to furnish contact details of customer/end user i.e. Name, Address, email Telephone numbers etc.

PRE-QUALIFICATION REQUIREMENTS
Double Three Way Valve

Doc. No.:
TL-PQR-DTWV-01
Rev00
Date: 05.08.2019

Vendor to fill the information required in below mentioned format:

TABLE -3

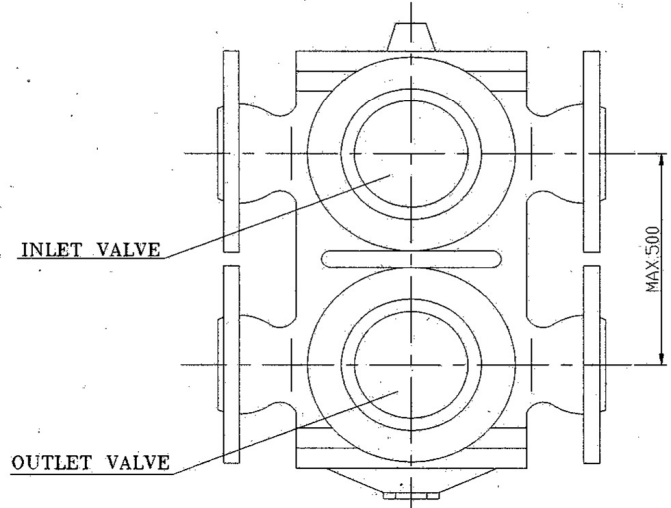
	End customer Name	Size of Valve supplied	Pressure & Temp.	Fluid	Material of construction	Year of Execution	No. of PO copies	Seat Leakage	Contact details, Telephone no's & Email id of End user
Minimum acceptance criteria	-	Min 100 NB	12 kg/cm ² & 65 °c	Oil	Carbon Steel or GGG40)	Within Last 5 years	2 (Within Last 5 years)	NIL leakage as per class rate 'A' of standard EN12266	-

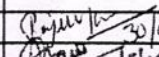
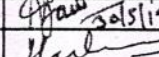
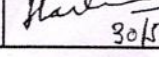
In case vendor provides false information or fails to furnish information/documents as mentioned above and as per above requirement mentioned from sl no. 5 to 8, his offer shall not be considered for DTWV (Carbon Steel or GGG40) material code W90313137188.

BHEL may visit the site where the item is installed/operational for which vendor shall facilitate. Cost of visit shall be borne by BHEL

अधिकृत एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक PRODUCT STANDARD (STEAM TURBINE ENGINEERING)	ST- 47028 पृष्ठ 03 का 01 Page 01 of 03																																				
SUPERSEDES INVENTORY NO.	TECHNICAL SPECIFICATION FOR DOUBLE THREE WAY VALVE																																						
सापेक्ष सूची संख्या को अतिरिक्तित करता है	1.0 SCOPE :- 1.1 The specification covers design, manufacturing, assembly, testing and supply of double three way valves, details as per table-1. 1.2 One set of all rubber (VITON) seals as commissioning spares.																																						
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	TABLE-1: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <th rowspan="2">SL. NO.</th> <th colspan="4">SIZE NB (mm)</th> <th rowspan="2">MEDIUM</th> <th rowspan="2">WORKING PARAMETER</th> <th rowspan="2">BODY MATERIAL</th> </tr> <tr> <th>VAR. 01</th> <th>VAR. 02</th> <th>VAR. 03</th> <th>VAR. 04</th> </tr> <tr> <td>01</td> <td>125</td> <td>200</td> <td>150</td> <td>100</td> <td>TURBINE OIL VG46</td> <td>12 Kg/cm² 65°C</td> <td>CARBON STEEL OR GGG40</td> </tr> <tr> <td>02</td> <td>200</td> <td>150</td> <td></td> <td></td> <td>FIRE RESISTANT FLUID (PHOSPHATE ESTER)</td> <td>1 Kg/cm² 55°C</td> <td>CARBON STEEL</td> </tr> <tr> <td>03</td> <td>100</td> <td></td> <td></td> <td></td> <td>-DO-</td> <td>12 Kg/cm² 55°C</td> <td>STAINLESS STEEL</td> </tr> </table>			SL. NO.	SIZE NB (mm)				MEDIUM	WORKING PARAMETER	BODY MATERIAL	VAR. 01	VAR. 02	VAR. 03	VAR. 04	01	125	200	150	100	TURBINE OIL VG46	12 Kg/cm ² 65°C	CARBON STEEL OR GGG40	02	200	150			FIRE RESISTANT FLUID (PHOSPHATE ESTER)	1 Kg/cm ² 55°C	CARBON STEEL	03	100				-DO-	12 Kg/cm ² 55°C	STAINLESS STEEL
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स्वत्वधिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं आरक्षण केवल उसी ही उद्देश्य के लिए ही की जा सकती है अन्यथा इसे न किया जाए।	2.0 FUNCTION:- The oil/Fire Resistant Fluid is cooled in oil cooler before it flows into the system. Double three way valve is used for directing oil/Fire Resistant Fluid to the cooler in operation, while at the same time shutting off the flow in reserve oil cooler. The arrangement of these valves should be such that one hand wheel shall operate both three way valves to establish in flow and out flow for one oil/ Fire Resistant Fluid cooler.																																						
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स्वत्वधिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं आरक्षण केवल उसी ही उद्देश्य के लिए ही की जा सकती है अन्यथा इसे न किया जाए।	5.0 END CONNECTION:- Flange as per rating PN 16 DIN 2633.																																						
स्वत्वधिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं आरक्षण केवल उसी ही उद्देश्य के लिए ही की जा सकती है अन्यथा इसे न किया जाए।	6.0 INSTALLATION:- In horizontal pipe lines, valve in vertical position.																																						
अधिकृत एवं दिनांक SIGN & DATE 21/3/13	सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE																																				
INVENTORY NO. D-5519	TSX MEMBER PSC	अनुवादक TRANSLATED BY VIVEK RAWAT	निर्माणकर्ता WORKED BY A.KUMAR																																				
(SUPERSEDES)	जांचकर्ता CHECKED BY ANUJ JAIN	पर्यवेक्षणकर्ता SUPERVISED BY	GR. No. 3-50																																				
REV.NO. 07 Dt. 15.03.13	स्वीकृति APPROVED : (A.B.GUPTA) AGM	निर्माण PREPARED : PED	जारी ISSUED : PED																																				
		दिनांक : DATE: 26.03. 84																																					

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक PRODUCT STANDARD (STEAM TURBINE ENGINEERING)		ST- 47028 पृष्ठ 03 का 02 Page 2 of 3																									
SUPERSEDES INVENTORY NO. सापेक्ष सूची संख्या को अतिरिक्त करता है	7.0 The bidder shall furnish Quality Plan in specified format. However the min. test requirement envisaged by BHEL are as follows : 7.1 Testing of Materials :- The material of components of valve such as body, bonnet, stem & fasteners shall be tested as per relevant specification for its chemical composition & mechanical properties. For remaining components compliance certificate shall be furnished. 7.2 DPT on body, stem & seat and all welded joints. 7.3 Color matching of valve seat & plug in case of metal contact. 7.4 Function test. (Functional test to be furnished by vendor with offer for BHEL's approval) 7.5 All welding to be carried out as per qualified procedures and welders in according with ASME Sec. IX. 7.6 Hydraulic test at 1.5 times the design pressure. 7.7 Seat leakage test: - It shall be carried out at 1.1 times of the design pressure for 5 minutes. Acceptance norms shall be NIL leakage as per class rate 'A' of standard EN12266. 8.0 Painting Scheme :- <table border="1" data-bbox="289 1060 1334 1507"> <thead> <tr> <th>Paint (Cost)</th> <th>Paint Type</th> <th>No. of coat</th> <th>DFT*</th> </tr> </thead> <tbody> <tr> <td>Primer Paint</td> <td>Epoxy base Zinc rich primer paint</td> <td>2 Coats</td> <td>70</td> </tr> <tr> <td>Intermediate Paint</td> <td>Epoxy TiO2 Pigmented Polyamide Cured Paint</td> <td>1 Coat</td> <td>70</td> </tr> <tr> <td>Finish (Final) Paint</td> <td>Aliphatic Acrylic 2 Pack Polyurethane finish paint</td> <td>2 Coats</td> <td>60</td> </tr> <tr> <td>Shade as per IS:5 or Equivalent</td> <td>Smoke Grey ISC 692</td> <td></td> <td></td> </tr> <tr> <td colspan="2"></td> <td>Total</td> <td>DFT 180</td> </tr> </tbody> </table>					Paint (Cost)	Paint Type	No. of coat	DFT*	Primer Paint	Epoxy base Zinc rich primer paint	2 Coats	70	Intermediate Paint	Epoxy TiO2 Pigmented Polyamide Cured Paint	1 Coat	70	Finish (Final) Paint	Aliphatic Acrylic 2 Pack Polyurethane finish paint	2 Coats	60	Shade as per IS:5 or Equivalent	Smoke Grey ISC 692					Total	DFT 180
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COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company																													
स्वत्वाधिकार एवं गोपनीय हम प्रत्येक में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं अपरयोग के बिना किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।	*DFT-Dry Film Thickness (Final) in microns. <i>Color shade may be changed during execution of contract.</i> 9.0 GUARANTEE:- The supplier shall guarantee trouble free and satisfactory operation of the equipment for a period of 18 months after delivery or 12 months after commissioning which ever is earlier.																												
दिनांक एवं हस्ताक्षर SIGN & DATE 16/3/13	REV. NO. 07	(SUPERSEDES)	निर्माणकर्ता WORKED BY A.KUMAR	जांचकर्ता CHECKED BY ANUJ JAIN	16/3/13 16/3/13																								
सापेक्ष सूची संख्या INVENTORY NO. P-5519																													

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक PRODUCT STANDARD (STEAM TURBINE ENGINEERING)		ST- 47028 पृष्ठ 03 का 03 Page 03 of 03	
सुपरसेडस INVENTORY सामग्री सूची संख्या को अधिकृतित करता है	10.0 DOCUMENT 10.1 DOCUMENTS REQUIRED ALONGWITH OFFER- Acts of following documents in English language - (i) Cross sectional and dimensional drawing along with Bill Of Material and end connection details. (ii) Quality Plan. (iii) List of spares for 3 years of operation				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	10.2 DOCUMENTS AFTER PLACEMENT OF ORDER (i) Four copies of finalized contract drawings-within four weeks of placement of order. (ii) Ten copies of operation and maintenance instructions-within 12 weeks of placement of order. (iii) Six copies of test certificates.				
स्वत्व अधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।	 GENERAL VIEW				
हस्ताक्षर एवं दिनांक SIGN & DATE 16/3/13	Cross referred standard:- ASME sec. IX DIN 2633 IS: 5 ISC 692 EN 12266				
सामग्री सूची संख्या INVENTORY NO. P-5519	REV. NO. 07	(SUPERSEDES)	निर्माणकर्ता WORKED BY	A.KUMAR	Ashok 16/3/13
			जांचकर्ता CHECKED BY	ANUJ JAIN	Anuj 16/3/13

SIGN & DATE			DOUBLE THREWAY VALVE ADDENDUM TO SPECIFICATION ST47028				4-13137-S5100	
			Page 1 of 1					
SUPERSEDES INVENTORY		A.VARIANT TABLE:						
		TABLE-2.						
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	SL. NO.	SIZE NB (mm)				MEDIUM	WORKING PARAMETER	BODY MATERIAL
	VAR. 01	VAR. 02	VAR. 03	VAR. 04				
	01	125	200	150	100	TURBINE OIL VG46	12 Kg/cm ² 65°C	CARBON STEEL OR GGG40
	02	200	150			FIRE RESISTANT FLUID (PHOSPHATE ESTER)	1 Kg/cm ² 55°C	CARBON STEEL
	03	100				-DO-	12 Kg/cm ² 55°C	STAINLESS STEEL
	04	125	200	150	100	TURBINE OIL VG46	12 Kg/cm ² 70°C	STAINLESS STEEL
Above listed table-2 (containing item variants) supersedes the table-1 of clause-1 of ST47028. For rest of requirements, spec ST47028 is applicable.								
SIGN & DATE						NAME	SIGNATURE & DATE	
INVENTORY					WORKED BY	RAJEEV	 30/05/19	
					CHECKED BY	A.JAIN	 30/05/19	
	AGREED DEPTT.	NAME	DATE & SIGNATURE	APPROVED BY	S. K. Gupta	 30/05/19		

QUALITY PLAN										Page 1 of 2			
BHEL	QP NO.	QA_BI_QP_101		REV.	00	DESCRIPTION			LEGENDS				
	SPEC. NO.	AS PER PO		REV.	AS PER PO	DOUBLE THREE WAY VALVE			P- PERFORMED BY		1- BHEL REP		
	DRG. NO.	APPROVED DRAWING AS PER PO		REV.	AS PER PO				W- WITNESSED BY		2- VENDOR		
										V- VERIFIED BY		3- SUBVENDOR	
SL. NO	COMPONENT OPERATION	CHARACTERISTICS	CLASSIFI- CATION	TYPE OF CHECK	QUANTUM	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS	
								P	W	V			

1	GENERAL		QUALIFICATION WELDING PROCEDURE, WELDER, TESTING FACILITY	MAJOR	VISUAL	100%				2		1	SUB-VENDORS CERTIFICATE & SUPPORTING DOCUMENTS
RAW PARTS / SEMI FINISHED PRODUCTS													
2	CHANGE-OVER HOUSING	i	CHEMICAL ANALYSIS	MAJOR	CHEMICAL	100%	APPROVED DRAWING / DATA SHEET / SPECIFICATION	TC	3		2, 1		
		ii	MECHANICAL PROPERTIES	MAJOR	MECHANICAL	100%		TC	3		2, 1		
		iii	D.P TEST or ULTRASONIC TEST	MAJOR	NDT	100%		TC	3		2, 1		
		iv	DIMENSION	MAJOR	MEASUREMENT	100%		TC	2		1		
3	BALL	i	CHEMICAL ANALYSIS	MAJOR	CHEMICAL	100%	APPROVED DRAWING / DATA SHEET / SPECIFICATION	TC	3		2, 1		
		ii	MECHANICAL PROPERTIES	MAJOR	MECHANICAL	100%		TC	3		2, 1		
		iii	DIMENSION	MAJOR	MEASUREMENT	100%		TC	2		1		
4	SPINDLE	i	CHEMICAL ANALYSIS	MAJOR	CHEMICAL	100%	APPROVED DRAWING / DATA SHEET / SPECIFICATION	TC	3		2, 1		
		ii	MECHANICAL PROPERTIES	MAJOR	MECHANICAL	100%		TC	3		2, 1		
		iii	DIMENSION	MAJOR	MEASUREMENT	100%		TC	2		1		
5	FLANGE	i	CHEMICAL ANALYSIS	MAJOR	CHEMICAL	100%	APPROVED DRAWING / DATA SHEET / SPECIFICATION	TC	3		2, 1		
		ii	MECHANICAL PROPERTIES	MAJOR	MECHANICAL	100%		TC	3		2, 1		
		iii	DIMENSION	MAJOR	MEASUREMENT	100%		TC	2		1		
6	PIPE	i	CHEMICAL ANALYSIS	MAJOR	CHEMICAL	100%	APPROVED DRAWING / DATA SHEET / SPECIFICATION	TC	3		2, 1		
		ii	MECHANICAL PROPERTIES	MAJOR	MECHANICAL	100%		TC	3		2, 1		


 संजीव कुमार भारद्वाज
 Sanjeev Kumar Bhardwaj
 वरिष्ठ अभियन्ता/Senior Engineer
 गुणवत्ता आश्वासन/Quality Assurance

QUALITY PLAN										Page 2 of 2		
BHEL	QP NO.	QA_BI_QP_101		REV.	00	DESCRIPTION			LEGENDS			
	SPEC. NO.	AS PER PO		REV.	AS PER PO	DOUBLE THREE WAY VALVE			P- PERFORMED BY		1- BHEL REP	
	DRG. NO.	APPROVED DRAWING AS PER PO		REV.	AS PER PO				W- WITNESSED BY		2- VENDOR	
										V- VERIFIED BY		3- SUBVENDOR
SL. NO	COMPONENT OPERATION	CHARACTERISTICS	CLASSIFI- CATION	TYPE OF CHECK	QUANTUM	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									P	W	V	

		iii	DIMENSION	MAJOR	MEASUREMENT	100%		TC	2		1	
7	HEX-BOLTS	i	CHEMICAL ANALYSIS	MAJOR	CHEMICAL	100%	APPROVED DRAWING / DATA SHEET	TC	3		2, 1	
		ii	MECHANICAL PROPERTIES	MAJOR	MECHANICAL	100%	/ SPECIFICATION	TC	3		2, 1	
		iii	DIMENSION	MAJOR	MEASUREMENT	100%		TC	2		1	
8	CHANGE-OVER VALVE'S FLANGE ASSEMBLY (WELDING)	i	DIMENSION	MAJOR	MEASUREMENT	100%	APPROVE DRAWING	INSPECTION REPORT	2/ 3			
		ii	D.P.TEST	MAJOR	DPT	100%	VENDOR SPECIFICATION	COC	2/ 3			
9	CHANGE OVER VALVE ASSEMBLY	i	DIMENSION	MAJOR	MEASUREMENT	100%	APPROVE DRAWING	TC	2	1		
		ii	SEAT LEAKAGE TEST (time 5 minutes)	MAJOR	LEAKAGE TEST	100%	VENDORS TENDOR APPROVED DRAWING / DATA SHEET / SPECIFICATION	TC	2	1		
		iii	FUNCTIONAL TEST TO CHECK SMOOTH OPENING / CLOSING	MAJOR	VISUAL	100%	VENDORS TENDOR APPROVED DRAWING / DATA SHEET / SPECIFICATION	TC	2	1		
		iv	HYDRO STATIC TEST (1.5 TIMES OF WORKING PRESSURE FOR 30 MINUTES)	MAJOR	HYDRAULIC TEST	100%	VENDORS TENDOR APPROVED DRAWING / DATA SHEET / SPECIFICATION	TC	2	1		
		v	PAINTING	MAJOR	VISUAL	100%	VENDORS TENDOR APPROVED DRAWING / DATA SHEET / SPECIFICATION		2			

NOTE: COLOR MACHTING IS NOT REQUIRED AS THERE IS NO METAL TO METAL CONTACT BETWEEN BALL AND SEAL CUP.

Sanjeev
04.07.19

संजीव कुमार भारद्वाज
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