SUDE®
An ISO 9001:2015 Certified Company

20000 Series

High Performance
Fabricated Double Eccentric
Butterfly Valve

BSCIC NABCB QM 030
ISO 9001 REGISTERED

SUDE® An ISO 9001:2015 Certified Company

sdtork® An ISO 9001:2015 Certified Company

YES. WE CARE...
Courteously | Attentively | Respectably | Effectively |

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Introduction

Since its inception about 30 years back 'SUDE' has been the pioneers in contributing to the growth of automation processes for the modern industry. SUDE has designed & developed a vast range of products from very simple automation to very complex design valves which can meet challenges of controlling various parameters based on modern process conditions.

SUDE has established itself as brand known for its original ideas, innovation and product with cutting edge technologies. Under the able guidance of Mr. D.R. Shetty with team of trained and experienced engineers with ultra modern designing, manufacturing & testing facility the products offered are proved to be on par with all known international brands. It has been a constant endeavour to manufacture quality products with concept of "make in India"and help our industry to meet all modern process parameters to increase productivity and efficiency.

This has not only contributed to growth of local but help in saving foreign exchange. It also assisted in developing products which could meet requirements of Modern processes of steel, fertilizers, petrochemicals & cement etc.

The constant zeal for innovation has also helped the organisation to contribute to development of products for power, nuclear, Defence and Marine sectors. During growth of this activity it is also realized that there are certain products like Electrical actuators which are in demand but require revisiting the designs, which was conceptualized and established. In view of constant demand the company now has established new state of art facility under the brand name of SDTORK controls private Limited for design, manufacturing & testing to ensure that customer gets electrical actuators having quality on par with leading international brand.

It has been moto that create products which not only satisfy customer but establish image as most respected Brand since 1989.

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Purpose

- **Flow Control :** varying or maintaining volumetric flow within a system in response to a signal.
- **Isolation :** separating a system or a portion of a system from selected flow paths.
- **Pressure Control :** varying or maintaining a pressure within a system or space in response to a signal, or varying or maintaining a differential pressure between parts of a system or between spaces in response to a signal.
- **Pressure Relief :** limiting differential pressures across a duct, casing, or building wall to a predetermined value.
- **Balancing :** fixing the position of one or more VALVES to establish a flow or pressure relationship in a system.

Advantages of 20000 Series Valve

Why Double Eccentric Valve over Conventional Butterfly Valve & Tripple Eccentric ?

Application Industries

- Water & Water Waste Management
- Power plant Industries
- Nuclear industries
- Steel industries
- Sugar industries
- Cement industries
- Oil & Gas industries
- Textile industries
- Food & beverages industries
- Pharmaceuticals industries
- HVAC industries
- Coal Industries
- Paper industries

Oil & GAS

Pharma Industries

Steel Plant

Paper Industries

HVAC

Shipbuilding

Power Plant

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Industries

Sugar Industries

Cement Plant

Application Industries

Nuclear Plant

Food & Beverages

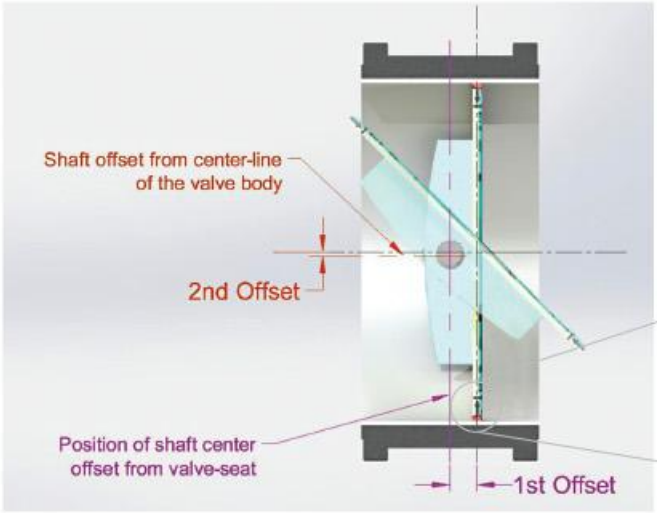
Water and Wastewater Treatment

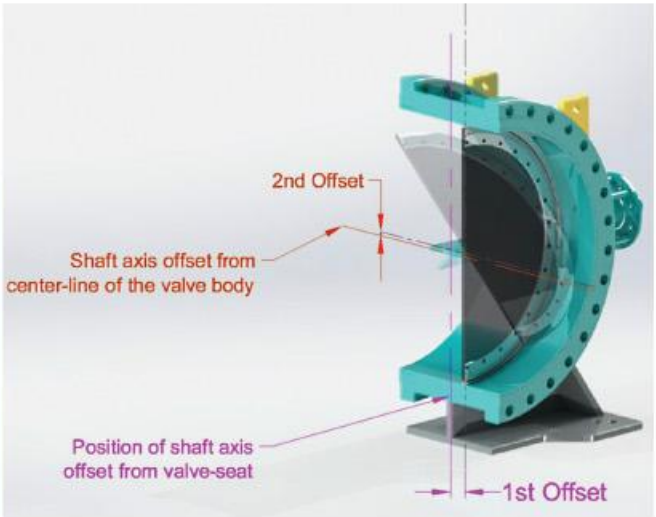
High Performance Fabricated Double Eccentric Butterfly Valve

20000 SERIES VALVES ARE DEDICATED TO VARIOUS INSDUSTRIES AND SUDE DO NOT SALE JUST VALVES, WE PROVIDE A COMPLETE SOLUTION FOR THE EFFICIENT PROCESS.

Industries like Nuclear plants , power plants, utility and fire water lines, HVAC systems any many others require wider temperature and pressure ranges that conventional butterfly valves can not achieve also the users were in search of a ideal alternate for casted Butterfly and sluice valves in water Sector distribution systems. This has driven the development of a HIGH PERFORMANCE FABRICATED DOUBLE ECCENTRIC BUTTERFLY VALVE .

- 20000 Series is a shut-off bidirectional valve designed for installation in pipelines that could be also used as a control valve within certain limits. Due to the double offset of the disc, the profile seal ring is completely unstressed when the valve is in open position. During opening / closing phase, the disc sealing ring does not exert any friction force on the body seat which results the reduction in operating forces and increase in the life of the seal. In closed position, the disc is perpendicular to the direction of flow. To close or open the valve, the disc must be turned by 90°. The tightness is guaranteed by a special profile seal ring which in the standard version is fixed by stainless steel retaining ring. In closed position, the elastic profile sealing ring is pressed to the conical seat surface inside the body and safely seals in both flow directions. 20000 series valves offer a light weight, compact, and cost effective design with the advantage of a low operating torque. The double Eccentric shaft and disc arrangement provides camming action to the disc which disengages from the seat with minimal rotation due to which this valve requires comparatively low torque to operate & this design minimizes the wear points at the top and bottom of the seat typically seen on conventional butterfly valves.
- Available in sizes up to 160" (4000 mm) in PN1, PN 2.5, PN 6, PN 10, PN 16 and PN 25 pressure ratings. Since the valves are of welded construction, the valves can be offered in intermediate sizes to suit customer requirements. SUDE welding procedures meet ASME Section IX requirements, and welding is carried out by experienced and qualified welders. All longitudinal welds in the valve are butt-welded and subjected to 100% radiography. The acceptance criteria for radiographs are as per ASME Section VIII, Division I.
- These 20000 Series VALVES can handle water, air, gases and vacuum services.
- EPDM/ Ebonite-lined valves for sea water applications.
- Butt-weld ends





Double Offset

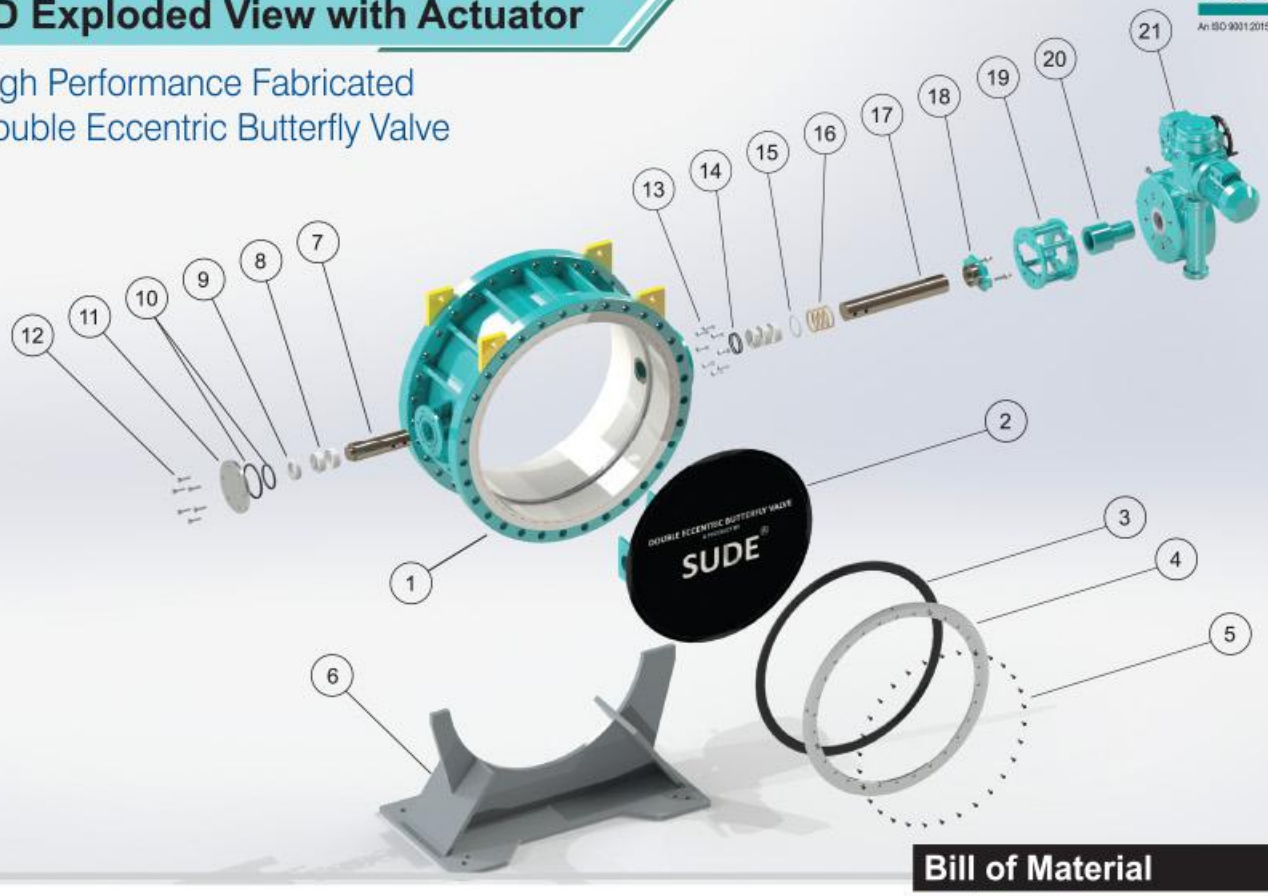
1st offset : Shaft is positioned downstream from the centerline of the seat.

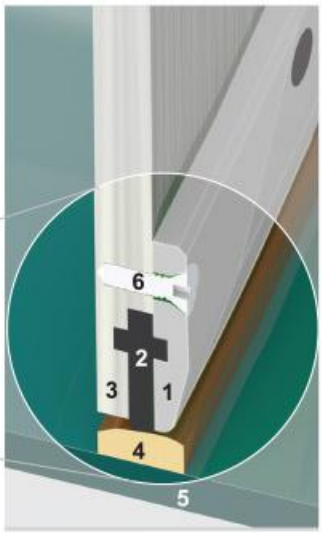
2nd offset : Shaft is off center from the vertical axis of the seat.

This is low friction Design.

3D Exploded View with Actuator

High Performance Fabricated Double Eccentric Butterfly Valve





The most important feature of our 20000 series valve is “DRS seal (2), a self-retaining disc seal that performs consistently over a wide range of pressures without any adjustment and it is molded in one piece (no glued joint) is mechanically attached to the disc (3) using retaining ring (1) and stainless steel lock screws (6). In closed position, line pressure forces “DRS seal” against the body seat (4) to obtain bi-directional bubble-tight sealing. “DRS seal” is designed to seal the fluid at rated pressure and offers no friction to the body (5).

Bill of Material

No.	Material
1	Body
2	Disc
3	Seal
4	Retarding Ring
5	Retarding Ring Locking Screw
6	Supporting Structure (Optional)
7	Driven Shaft
8	Self Lubricating Split Bearing
9	Thrust Bearing
10	Sealing Gasket
11	Bottom Plate
12	Bottom Plate Locking Bolt
13	Mounting Bracket Locking Bolt
14	'O' Ring
15	Packing Spacer
16	Gland Packing
17	Drive Shaft
18	Gland Press Plate
19	Mounting Bracket
20	Coupler
21	Gear Box with Actuator (Optional)

Light & Compact Design

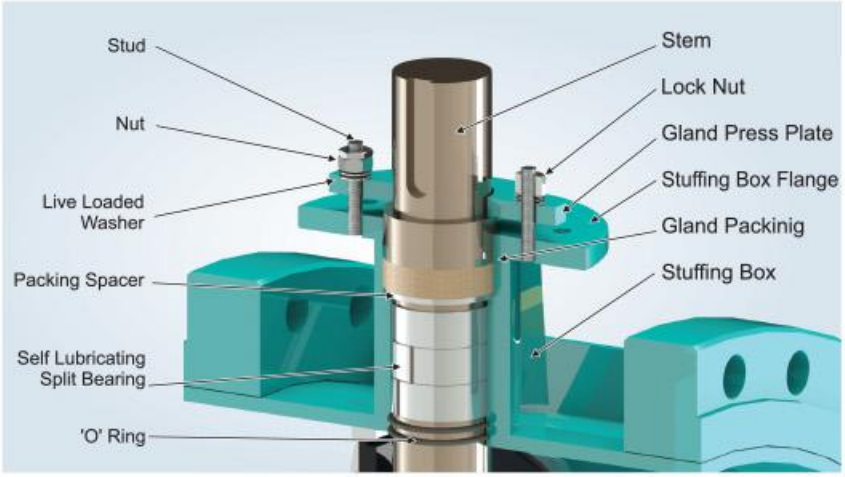
20000 series vales body, fabricated from steel plates, has better mechanical and structural properties compared to a cast iron body of the same size and pressure rating. The body also handles piping stresses and misalignments better. Being lighter, the valve is easier to handle, and requires less piping supports, and thus reduces valve installation cost considerably.

- High integrity sealing.
- Lower break torque - Saving in valve automation costs
- Easy to replace at site

Stuffing Box Details

Zero Leakage to Atmosphere

- The shaft is fully guided by a shaft bearing and gland packing to avoid any side load due to line pressure thrust.
- The packing set is a pre-compressed combination of braided graphite rings and die formed flexible graphite rings.
- The controlled Ra0.4-Ra0.8 finish of the shaft and Ra1.6 finish of the stuffing box result in optimum packing and shaft sealing performance.
- Optional: Live Loaded gland flange is available to provide constant packing compression



- Double O-Rings on the shaft provide reliable sealing to atmosphere. Unlike gland packing, this arrangement does not require any maintenance.

Low Operating Torque and Long Seal Life :

Due to the double offset of the disc, the profile seal ring is completely unstressed when the valve is in open position. During opening / closing phase, the disc sealing ring does not exert any friction force on the body seat and loses contact with the seat at crack open and thereby reduces friction and operating torque.

Maintenance free Bearings :

Self-Lubricated bearings are provided on the shafts.

Ordering Information

20000 Series Valves

For Example **2052/F/PN2.5/1200/2062/2062/EN8/D30**

2052 / F / PN2.5 / 1200 / 2062 / 2062 / EN8 / D30

SERIES	ACTUATION	END CONNECTIONS	RATING	SIZE	BODY MATERIAL
20	62 : Pneumatic Actuator 00 : Manual Gear Box 52 : Electric Actuator 72 : Hydraulic Actuator 75 : Electro Hydraulic Actuator	W : Wafer Type B : Butt Welding Type F : Flanged Type	PN1 PN2.5 PN6 PN10 PN16 PN25	XXXX	2062 - IS 2062 E250 BR 516 - ASTM A516 GRADE 70 387 - ASTM A387 GRADE 11 304 - ASTM A240 GRADE 304 316 - ASTM A240 GRADE 316 310 - ASTM A240 GRADE 310 309 - ASTM A240 GRADE 309 321 - ASTM A240 GRADE 321 625 - ASTM: B 443 Gr 1 [INCONEL 625]

Manufacturing Range

Pressure Rating →	PN1			PN2.5			PN6			PN10			PN16			PN25		
End Connection →	WAFER	WELDABLE	FLANGED	WAFER	WELDABLE	FLANGED	WAFER	WELDABLE	FLANGED	WAFER	WELDABLE	FLANGED	WAFER	WELDABLE	FLANGED	WAFER	WELDABLE	FLANGED
150	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
250	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
350	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
450	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
500	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
600	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
700	✓	✓	✓	✓	✓	✓			✓			✓			✓			✓
800	✓	✓	✓	✓	✓	✓			✓			✓			✓			✓
900		✓	✓			✓			✓			✓			✓			✓
1000		✓	✓			✓			✓			✓			✓			✓
1200			✓			✓			✓			✓			✓			✓
1400			✓			✓			✓			✓			✓			✓
1600			✓			✓			✓			✓			✓			✓
1800			✓			✓			✓			✓			✓			✓
2000			✓			✓			✓			✓			✓			✓
2200			✓			✓			✓			✓			✓			
2400			✓			✓			✓			✓			✓			
2600			✓			✓			✓			✓			✓			
2800			✓			✓			✓			✓			✓			
3000			✓			✓			✓			✓			✓			
3200			✓			✓			✓			✓			✓			
3400			✓			✓			✓			✓			✓			
3600			✓			✓			✓			✓			✓			
3800			✓			✓			✓			✓			✓			
4000			✓			✓			✓			✓			✓			

DISC MATERIAL	SHAFT MATERIAL	SEAL
2062 - IS 2062 E250 BR	304 - ASTM A276 AISI 304L	D10 - NATURAL RUBBER
516 - ASTM A516 GRADE 70	316 - ASTM A276 AISI 316L	D15 - WHITE NATURAL RUBBER
387 - ASTM A387 GRADE 11	310 - ASTM A276 AISI 310L	D30 - EPDM
304 - ASTM A240 GRADE 304	321 - ASTM A276 AISIE 321	D40 - BUTYL RUBBER
316 - ASTM A240 GRADE 316	410 - ASTM A276 AISI 410	D50 - BUTADIENE ACRYLONITRILE
310 - ASTM A240 GRADE 310	EN8 - BS 970	D60 - SILICON RUBBER
309 - ASTM A240 GRADE 309	625 - ASTM: B 446 Gr 1 [INCONEL 625]	D55 - GRAPHITE RUBBER
321 - ASTM A240 GRADE 321		D70 - VITON
625 - ASTM: B 443 Gr 1 [INCONEL 625]		D9330 - PTFE+EPDM
		D9370 - PTFE+VITON

Applicable Standards

ANSI - American National Standards Institute		
ANSI	B16.5	Pipe flanges & flange fittings
ANSI	B16.10	Face-to-face and end-to-end dimensions of valves
ANSI	B16.47	Large diameter flanges, NPS 26 through NPS 60
ANSI - American National Standards Institute		
API	598	Valve Inspection and Test
API	609	Butterfly valves : Double flanged, Lug- and wafer-type
API	607	Fire test for soft-seated quarter-turn valves
API	6FA	Standard for fire test for valve
API	SPEC. Q1	Specification for quality management system requirements for manufacturing Organizations for the petroleum and natural gas industry
API	6D	Specification for pipeline valves
BS/EN - British Standard/European Norms		
BS	970	Spec. for EN8 medium carbon steel
BS	4504	For flange dimensions
BS	5147	Part 2 : Specification for pressure testing requirements for general purpose valves
BS	5155	Specification for Butterfly Valves
BS	6754	Part 1 : Specification for production pressure testing requirements
EN	19	Industrial valves - Marking of metallic valves
EN	558	Industrial valves - Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems
EN	593	Industrial valves - Metallic butterlfy valves
EN	736	"Part 1 : Definition of types of valves Part 2 : Definition of components of valves Part 3 : Definition of terms"
EN	1092	Flanges and their joint. Circular flanges for pipes, valves, fittings and accessories
EN	1503	Materials for bodies, bonnets and covers
EN	1561	Founding. Grey cast irons
EN	1775	Gas supply - Gas pipework for buildings
EN	1759	Flanges and their joint. Circular flanges for pipes, valves, fittings and accessories
EN	6363	Specification for welded cold formed steel structural hollow sections
EN	6708	Pipework components - definition and selection of DN (nominal size)
EN	10204	Metallic products - Types of inspection documents
EN	12516	Part 2 : Valves, shell design strength. Calculation method for steel valve shells Part 3 : Shell design strength. Experimental method
EN	12569	Industrial valves - Method for sizing the operating element
EN	12266	Industrial valves -Testing of metallic valves
DIN - Deutsches Institut für Normung		
DIN	1690	Technical delivery conditions for castings made from metallic materials
DIN	1691	Cast iron
DIN	1693	Nodular iron
DIN	2501	Flanges - connecting dimensions
DIN	3202	Part 1 : Face-to-face and centre-to-face dimensions - Flanged valves
DIN	3337	Part-turn valve actuator attachment - flange dimensions
DIN	3840	Valve bodies, strength calculation in respect of internal pressure
ISO - International Organisation for Standardisation		
ISO	9001-2015	Quality management systems — Requirements
ISO	2082	Metallic coatings, electroplated coatings of zinc on iron or steel
ISO	5208	Industrial valves - pressure testing for valves
ISO	5211	Part-turn valve actuator attachment - flange dimensions
ISO	5752	Metal valves for use in flanged pipe systems. Face-to face and centre-to-face dimensions
ISO	14723	Standards for petroleum and natural gas industries — Pipeline transportation systems — Subsea pipeline valves
ISO	7005	Metallic flanges
ISO	898	Spec. For Nuts,Bolts,Screw & Stud With Specified Property Classes
ISO	7268	Pipe components, definition of nominal pressure

ASME - American Society of Mechanical Engineer		
ASME	B16.34	Valves—Flanged, threaded, and welding end
ASME	B16.47	Large diameter steel flanges
ASME	B16.25	Butt welding ends
ASME	B16.5	Pipe flanges and flanged fittings
ASME	SECTION II	Materials
ASME	SECTION III	Nuclear facility component
ASME	SECTION V	Non destructive examination (NDE)
ASME	SECTION VIII	Design & construction
ASME	SECTION IX	Welding
MSS - Manufacturers Standard Society		
MSS	SP-6	Standard finishes for contact faces of pipe flanges
MSS	SP-25	Standard Marking System for Valves, Fittings, Flanges, and Unions
MSS	SP 44	Steel pipeline flanges
MSS	SP 61	Pressure Testing of Valves
MSS	SP-67	Butterfly Valves
MSS	SP-68	High Pressure Butterfly Valves with Offset Design
MSS - Manufacturers Standard Society		
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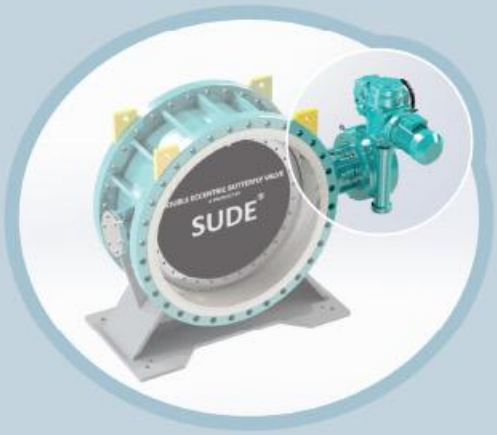
MSS	SP 61	Pressure Testing of Valves
MSS	SP-67	Butterfly Valves
MSS	SP-68	High Pressure Butterfly Valves with Offset Design
NACE - National Association Of Corrosion Engineers		
NACE	MR 01-03	Standard Material Requirements
NACE	MR 01-75	Petroleum and natural gas industries—Materials for use in H2S-containing environments in oil and gas production
NACE	TM 01-77	Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H2S Environments
NACE	TM 02-84	"Test Method : Evaluation of Pipeline and Pressure Vessel Steels" for Resistance to Hydrogen-Induced Cracking
MESC - Material and Equipments Standards and Code		
MESC	SP 77/134	Shell spec. for butterfly valves
MESC	SP 77/205	Shell spec. for valves in oxygen service
MESC	SP 77/208	Shell spec. for valves in heat transfer fluid service
MESC	SP 77/300	Procedure and technical specification for type acceptance testing (TAT) of industrial valves
MESC	SP 77/302	Shell spec. for materials, non-destructive examination & certification requirements for valves in general service
MESC	SP 77/312	Shell spec. for fugitive emission leak detection of valves
AWWA - Americam Water Work Assocoation		
AWWA	M49	Butterfly valves: Torque, head loss, and cavitation analysis
AWWA	C207	Steel pipe flanges for waterworks service
AWWA	C504	Standrad for Rubber seated butterfly valves
ASTM - Americam Society For Testing and Materials		
ASTM	A204	Spec. for stainless steel plate
ASTM	A276	Spec. for stainless steel bars
ASTM	A106	Spec. For seamless carbon steel pipe for high temp. service
ASTM	A516	Spec. for pressure vessel plate, carbon steel for moderate & lower temp. service
IS - Indian Standards		
IS	2062	Spec. for hot rolled medium & high tensile structural steel
IS	6392	Spec. for steel pipe flanges

Option with Actuation Devices

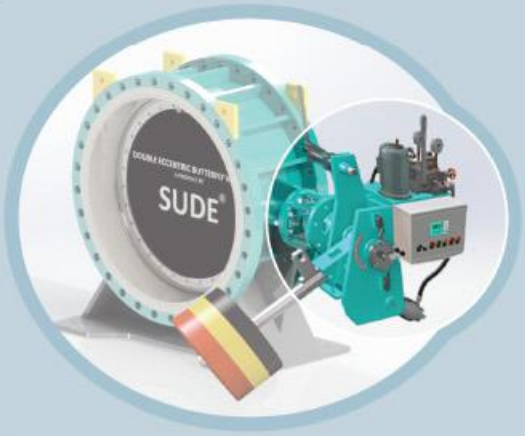


ELECTRIC ACTUATOR

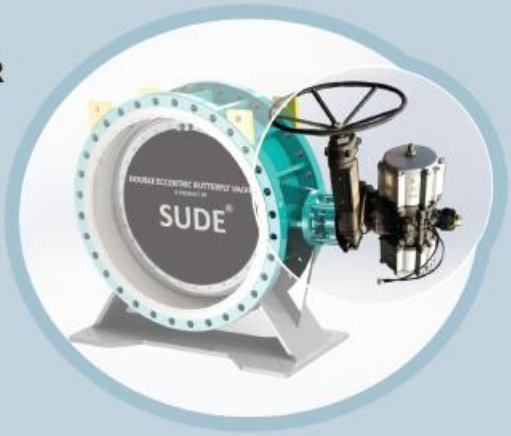
MANUAL GEARBOX

High Performance Fabricated Double Eccentric Butterfly Valve

HYDRAULIC ACTUATOR



ELECTRO HYDRAULIC ACTUATOR WITH COUNTERWEIGHT



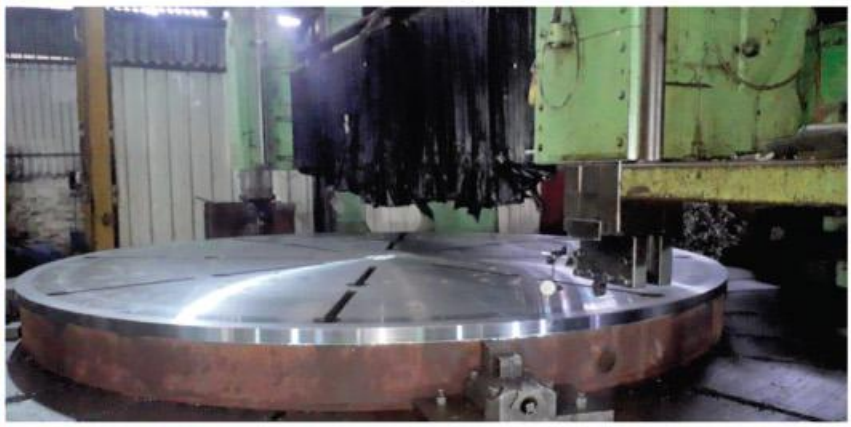
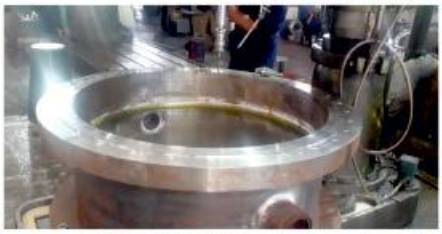
PNEUMATIC ACTUATOR WITH MANUAL DRIVE

Hydro Test Specifications

Test Type	ISO Standard	AWWA Standard
Hydrostatic Shell Test	1.5 x Maximum service pressure	2.0 x Maximum service pressure
Hydrostatic Seat Test	1.1 x Maximum service pressure	Maximum service pressure

Manufacturing Process

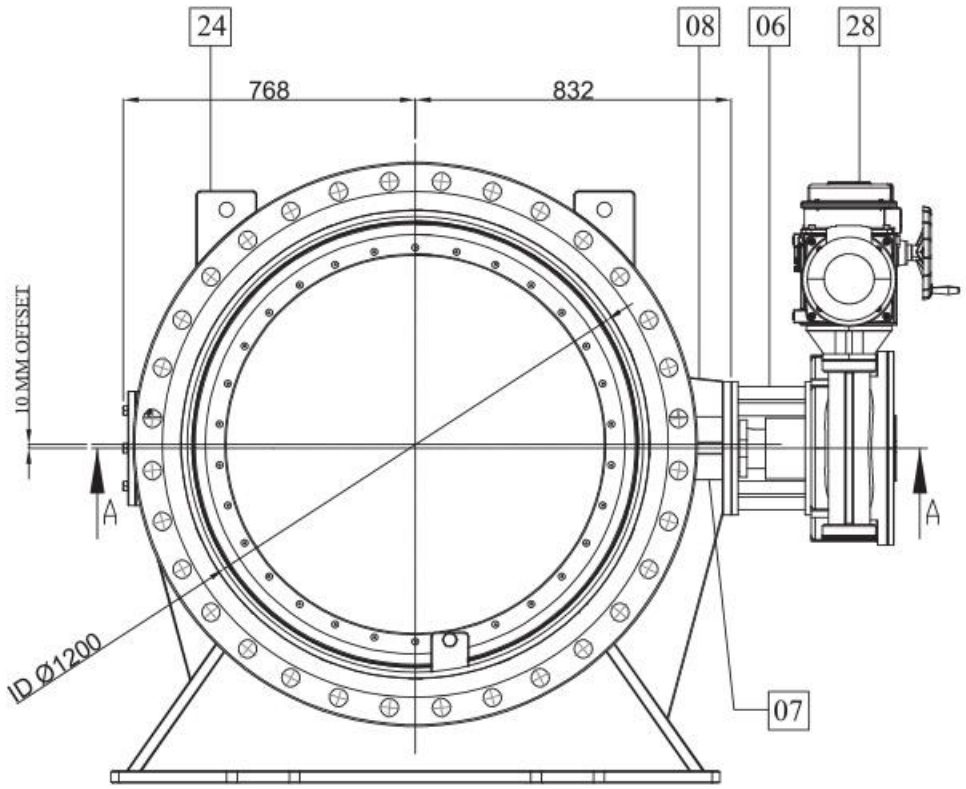


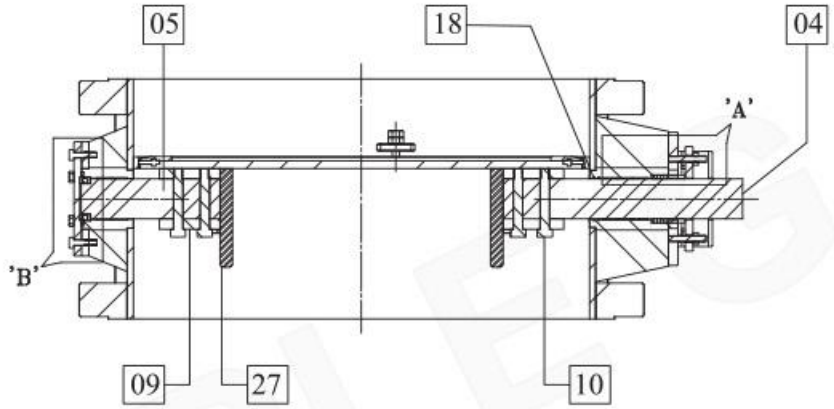


DESIGN DATA :
1. FLOWING MEDIA : AIR / GAS
2. DESIGN PRESSURE : 24 BAR
3. DESIGN TEMP.: -20° C TO +120° C
4. PRESSURE RATING : PN16

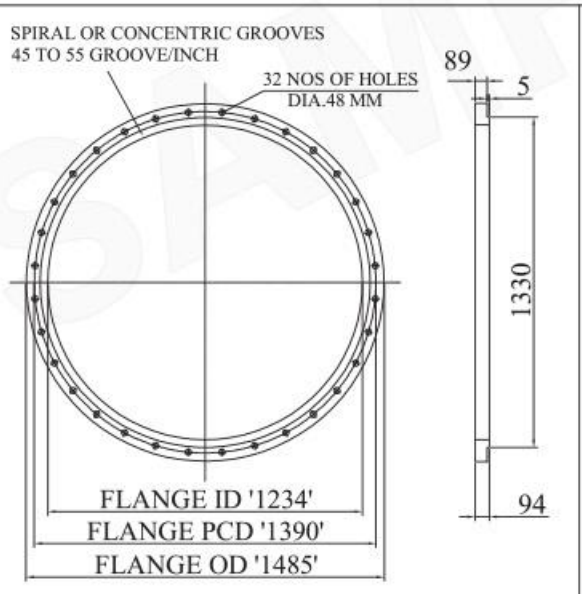
SAMPLE G.A. DRAWING



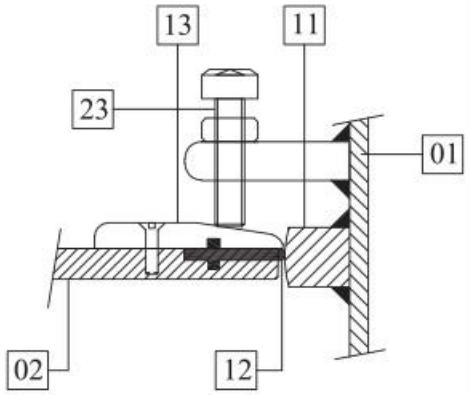
FRONT VIEW



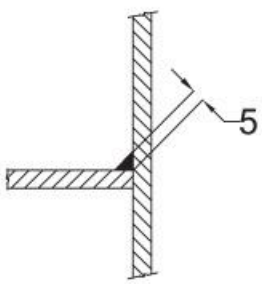
SEC. VIEW A-A WITHOUT ACTUATOR



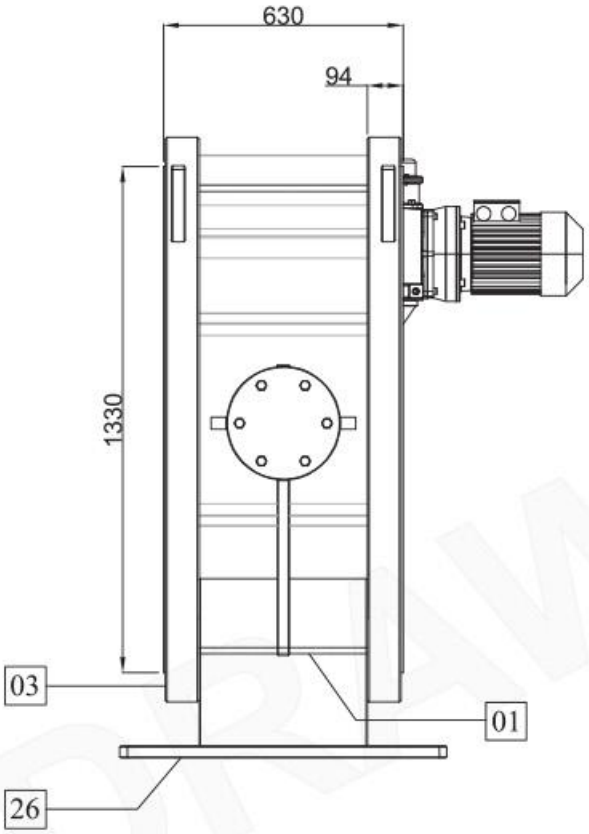
FLANGE DETAILS



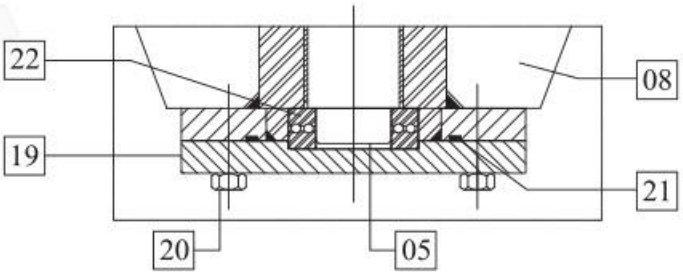
SEAL IN CLOSED POSITION



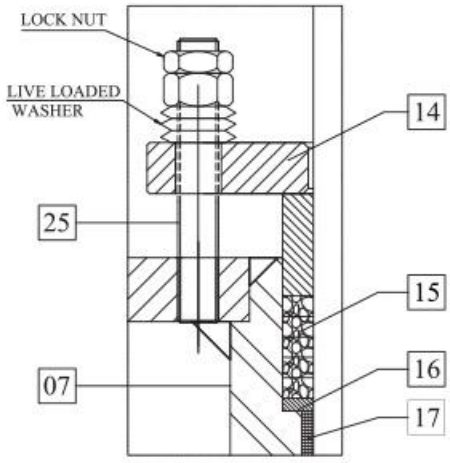
FILLET WELD DETAIL



SIDE VIEW



DETAIL 'B'



DETAIL 'A'

BILL OF MATERIAL

PART NO.	PART NAME	MATERIAL DESCRIPTION	QTY.
1	CASING	ASTM A516 GR.70 ; 16 MM THK	1
2	FLAP	ASTM A516 GR.70 ; 20 MM THK	1
3	FLANGE	ASTM A516 GR.70 ; 94 MM THK	2
4	DRIVE SHAFT	ASTM A276 TYPE 410 ; DIA.110 MM	1
5	DRIVEN SHAFT	ASTM A276 TYPE 410 ; DIA.110 MM	1
6	MOUNTING BRACKET	IS 2062 E250 BR ; 25 MM THK	1
7	STUFFING BOX	EN8 ; DIA.170 MM	2
8	STIFFENER FOR STUFFING BOX	IS 2062 E250 BR; 25 MM THK	6
9	BUSH FOR FLAP	EN8 ; DIA.170 MM	2
10	FLAP LOCKING FASTENERS	M24X160 MM LG ;CROME PLATED	4
11	SEAT RING	ASTM A240 TYPE 304	1
12	SEAL	EPDM RUBBER	1
13	RETARDING RING	ASTM A240 TYPE 304 ; 12 MM THK	1
14	GLAND PRESS PLATE	IS 2062 E250 BR ; 20 MM THK	1
15	GLAND PACKING	METALLIC CERAMIC FIBER ROPE ; SQ.12 MM THK	1
16	PACKING SPACER	IS 2062 E250 BR ; 10 MM THK	1
17	SELF LUBRICATING SPLIT BEARING	PTFE + SS316	5
18	'O' RING	EPDM RUBBER	2
19	BOTTOM PLATE	IS 2062 E250 BR ; 25 MM THK	1
20	BOTTOM PLATE LOCKING BOLT	M14X60 MM LG ; CROME PLATED	6
21	SEALING GASKET FOR BOTTOM PLATE	EPDM RUBBER ; SQ.10 MM	1
22	THRUST BEARING	SKF MAKE	1
23	MECHANICAL STOPPER	M18X100 MM LG ; CROME PLATED	2
24	LIFTING LUGS	IS 2062 E250 BR ; 36 MM THK	4
25	STUD FOR GLAND PRESS PLATE	M16X60 MM LG ; CROME PLATED	2
26	SUPPORTING STRUCTURE	IS 2062 E250 BR ; 20 MM THK	1
27	STIFFENER FOR FLAP	ASTM A516 GR.70	2
28	ACTUATOR WITH GEAR BOX	SD-3002-50-WG100-E ;SD TORK MAKE	1

APPLICABLE CODES , STANDARDS & SPECIFICATIONS

A	ASME SECTION II:- MATERIALS 1) PART A:- FERROUS MATERIAL SPECIFICATIONS 2) PART B:- NON-FERROUS MATERIAL SPECIFICATIONS 3) PART C:- SPEC. FOR WELDING RODS , ELECTRODES & FILLER METAL 4) PART D:- MATERIAL PROPERTIES
B	ASME SECTION V:- FOR NON DESTRUCTIVE EXAMINATION (NDE)
C	ASME SECTION VIII (DIV-1):- FOR DESIGN & CONSTRUCTION OF DAMPER
D	ASME SECTION IX:- FOR WELDING
E	IS:6392:-FOR FLANGE DRILLING
F	BS EN558:- FOR FACE TO FACE DIMENSIONS.
G	IS2062:- FOR HOT ROLLED MEDIUM & HIGH TENSILE STRUCTURAL STEEL
H	ASTM A516 GR.70:- SPEC. FOR PRESSURE VESSEL PLATE , CARBON STEEL FOR MODERATE & LOWER TEMPERATURE SERVICE
I	ASTM A240 TYPE 304:- SPEC. FOR STAINLESS STEEL PLATE
J	ASTM A276 TYPE 410:-SPEC. FOR STAINLESS STEEL BARS
K	API598:-FOR VALVE INSPECTION AND TEST
L	BS970 :-SPEC. FOR EN8 MEDIUM CARBON STEEL
M	ISO 898-1:- SPEC. FOR BOLTS , SCREWS & STUDS WITH SPECIFIED PROPERTY CLASSES
N	ISO 898-2:-SPEC. FOR NUTS WITH SPECIFIED PROPERTY CLASSES

SR. NO	HYDRO TEST	HYDROSTATIC PRESSURE FOR BODY (BAR)	HYDROSTATIC PRESSURE FOR SEAT (BAR)	TEST DURATION (MINUTE)
1	1200 MM	24	17.6	15

00	16.02.2019	DOUBLE ECCENTRIC BUTTERFLY VALVE	B.B.S	R.S.S	V.D.G
REV.	DATE	STATUS REV. MEMO	DRAWN BY	CHK'D BY	APPV'D BY

CONFIDENTIAL - NOT TO DISCLOSE WITHOUT PRIOR APPROVAL

SUDE
An ISO 9001:2015 Certified Company

SUDE ENGINEERING CORPORATION

Gat.No.94/2 , Plot No.1, Alandi Markal Road,Village Dhanore-412105

	NAME	SIGNATURE	DATE
DRAWN	B.B.S		12.02.2019
CHK'D	R.S.S		12.02.2019
APPV'D	V.D.G		16.02.2019

TITLE:- GA DRAWING OF DOUBLE ECCENTRIC BUTTERFLY VALVE DIA.1200MM

DWG NO.:- GAD-SU-2052-DECC-DIA.1200 MM

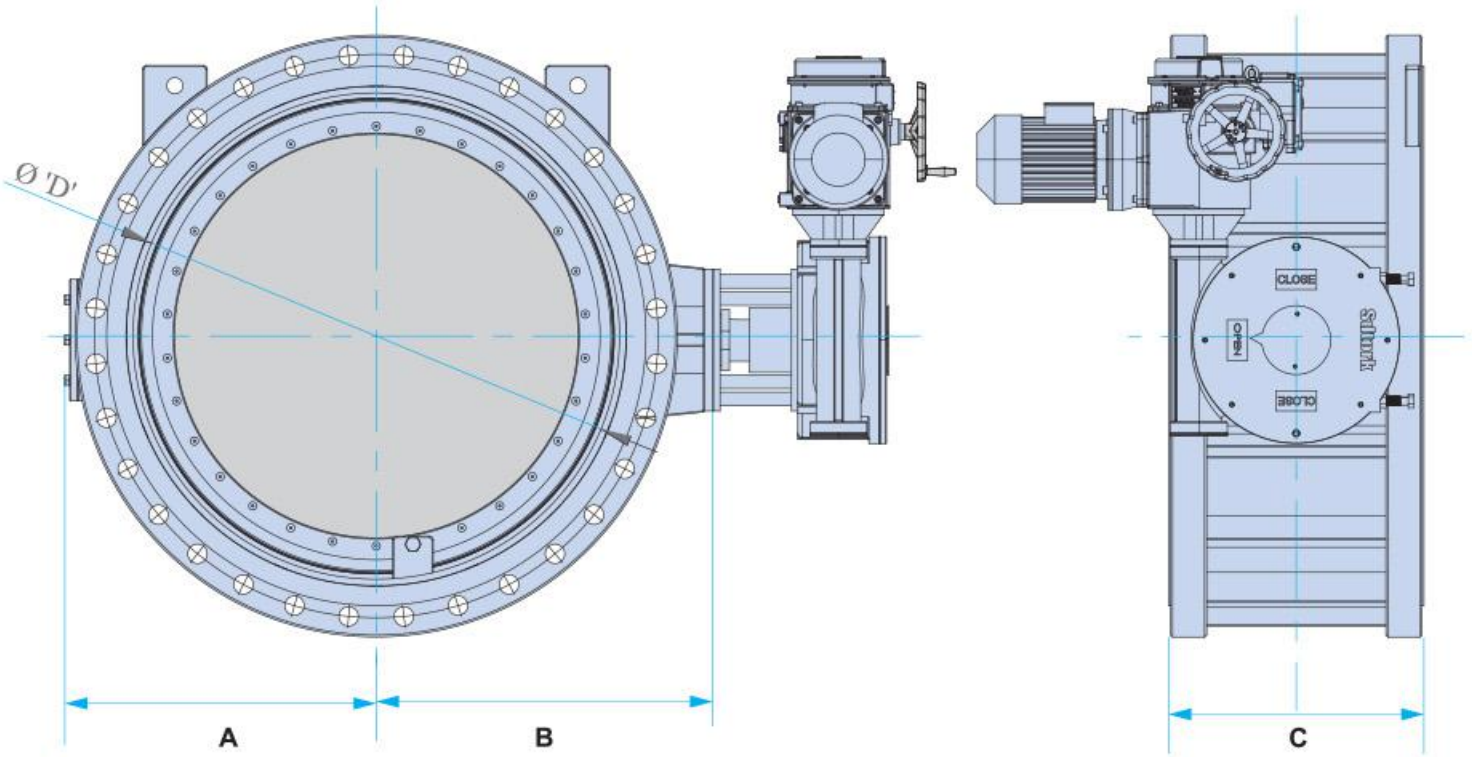
MATERIAL:- ASTM A516 GR.70

REV.	SCALE
00	1:1

SHEET 1 OF 1

Dimensional Details

From Size 150 mm To 4000 mm and Rating From PN1 To PN25



Dimensions in mm

DN	PN1					PN2.5					Approx. Weight (KG)
	ØD	A	B	C (Option-1)	C (Option-2)	ØD	A	B	C (Option-1)	C (Option-2)	
150	150	155	195	140	210	150	155	195	140	210	41
200	200	180	230	152	230	200	180	230	152	230	62
250	250	210	250	165	250	250	210	250	165	250	78
300	300	240	273	178	270	300	240	273	178	270	95
350	350	260	295	190	290	350	260	295	190	290	152
400	400	302	320	216	310	400	302	320	216	310	168
450	450	330	350	222	330	450	330	350	222	330	220
500	500	372	430	229	350	500	372	430	229	350	240
600	600	430	480	267	390	600	430	480	267	390	355
700	700	490	530	292	430	700	490	530	292	430	560
800	800	520	580	318	470	800	520	580	318	470	695
900	900	600	625	330	510	900	600	625	330	510	1050
1000	1000	625	730	410	550	1000	625	730	410	550	1530
1200	1200	760	840	470	630	1200	760	840	470	630	2190
1400	1400	880	945	530	710	1400	880	945	530	710	3260
1600	1600	960	1055	600	790	1600	960	1055	600	790	3765
1800	1800	1060	1132	670	870	1800	1060	1132	670	870	4830
2000	2000	1220	1240	760	950	2000	1220	1240	760	950	7560
2200	2200	1282	1338	810	980	2200	1282	1338	810	980	9930
2400	2400	1390	1450	830	1010	2400	1390	1450	830	1010	13350
2600	2600	1495	1580	850	1040	2600	1495	1580	850	1040	15950
2800	2800	1580	1680	880	1070	2800	1580	1680	880	1070	20050
3000	3000	1685	1770	910	1090	3000	1685	1770	910	1090	24940
3200	3200	1820	1850	950	1110	3200	1840	1860	950	1110	27800
3400	3400	1915	1960	990	1140	3400	1930	1980	990	1140	31080
3600	3600	2030	2040	1030	1190	3600	2050	2060	1030	1190	33000
3800	3800	2125	2190	1070	1230	3800	2150	2220	1070	1230	37300
4000	4000	2230	2295	1090	1260	4000	2245	2310	1090	1260	40400

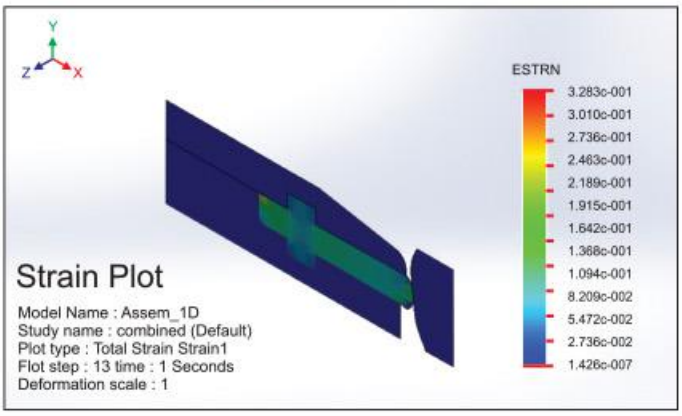
Dimensions in mm

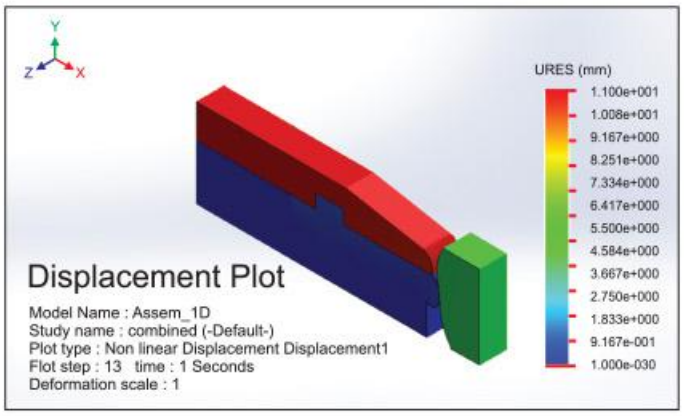
DN	PN6					PN10					Approx. Weight (KG)
	ØD	A	B	C (Option-1)	C (Option-2)	ØD	A	B	C (Option-1)	C (Option-2)	
150	150	155	195	140	210	150	160	195	76	210	43
200	200	180	230	152	230	200	185	230	89	230	64
250	250	210	250	165	250	250	215	250	114	250	81
300	300	240	273	178	270	300	242	273	114	270	98
350	350	260	295	190	290	350	265	295	127	290	156
400	400	302	320	216	310	400	308	320	140	310	172
450	450	330	350	222	330	450	335	350	152	330	225
500	500	372	430	229	350	500	375	430	152	350	245
600	600	430	480	267	390	600	430	480	178	390	365
700	700	490	530	292	430	700	490	530	229	430	570
800	800	520	580	318	470	800	520	580	241	470	705
900	900	600	625	330	510	900	600	625	241	510	1080
1000	1000	625	730	410	550	1000	630	730	300	550	1580
1200	1200	760	840	470	630	1200	765	840	350	630	2210
1400	1400	880	945	530	710	1400	885	945	390	710	3290
1600	1600	960	1055	600	790	1600	962	1055	440	790	3795
1800	1800	1060	1132	670	870	1800	1063	1135	490	870	4880
2000	2000	1220	1240	760	950	2000	1228	1245	540	950	7590
2200	2200	1282	1338	810	980	2200	1282	1340	590	980	9980
2400	2400	1390	1450	830	1010	2400	1390	1452	590	1010	13380
2600	2600	1495	1580	850	1040	2600	1495	1580	630	1040	15970
2800	2800	1580	1680	880	1070	2800	1583	1680	630	1070	20090
3000	3000	1685	1770	910	1090	3000	1687	1775	680	1090	24970
3200	3200	1840	1860	950	1110	3200	1847	1865	690	1110	27930
3400	3400	1930	1980	990	1140	3400	1932	1983	730	1140	31120
3600	3600	2050	2060	1030	1190	3600	2050	2065	800	1190	33100
3800	3800	2150	2220	1070	1230	3800	2150	2225	870	1230	37400
4000	4000	2245	2310	1090	1260	4000	2245	2320	920	1260	41300

DN	PN16					PN25					Approx. Weight (KG)
	ØD	A	B	C (Option-1)	C (Option-2)	ØD	A	B	C (Option-1)	C (Option-2)	
150	150	160	205	76	210	150	160	205	76	210	48
200	200	185	238	89	230	200	185	238	89	230	65
250	250	215	255	114	250	250	215	255	114	250	82
300	300	242	273	114	270	300	242	273	114	270	110
350	350	265	295	127	290	350	265	295	127	290	165
400	400	308	320	140	310	400	308	320	140	310	175
450	450	335	350	152	330	450	335	350	152	330	230
500	500	375	430	152	350	500	375	430	152	350	255
600	600	430	480	178	390	600	430	480	178	390	365
700	700	490	530	229	430	700	490	530	229	430	575
800	800	520	580	241	470	800	520	580	241	470	710
900	900	600	630	241	510	900	600	630	241	510	1070
1000	1000	630	735	300	550	1000	630	735	300	550	1540
1200	1200	765	840	350	630	1200	765	840	350	630	2210
1400	1400	885	950	390	710	1400	885	950	390	710	3275
1600	1600	962	1055	440	790	1600	962	1055	440	790	3785
1800	1800	1063	1135	490	870	1800	1063	1135	490	870	4840
2000	2000	1228	1247	540	950	2000	1228	1247	540	950	7590
2200	2200	1282	1340	590	980						
2400	2400	1390	1452	590	1010						
2600	2600	1495	1580	630	1040						
2800	2800	1583	1680	630	1070						
3000	3000	1687	1780	680	1090						
3200	3200	1847	1870	690	1110						
3400	3400	1932	1990	730	1140						
3600	3600	2050	2080	800	1190						
3800	3800	2150	2230	870	1230						
4000	4000	2245	2330	920	1260						

Note : Dimensions are subjected to change as per design & development

Analysis





Engieneering

- Working out cutomer - specific requirements.
- Product development support.
- Providing Solidworks / Autocad 2D & 3D assembly drawings.
- Supply 3D Solidworks Models.

Workshops

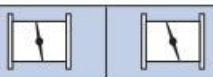
- Modern workshops of more than 22000 Sq. Ft.
- Facilitating of large & Complex projects.
- Automating & modifying according to customer-specific requirements.

Testing

- Large test facilities.
- Pressure testing of valves up to DN4000 / 160"
- Maximum test pressure 60 bar.

Valve Sizing Coefficient (Kv).

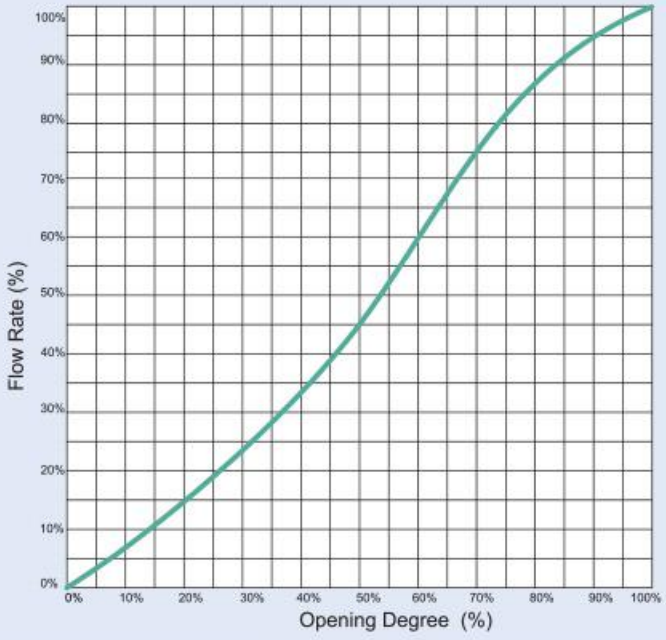
DISC POSITION (DEGREES)

Disc Position									
Valve Size (mm)	10°	20°	30°	40°	50°	60°	70°	80°	90°
550	89.095	792.340	1790.550	3036.150	4878.600	37887.000	12596.130	19054.220	23500.320
600	224.035	889.220	2064.755	3671.060	6022.130	43855.500	15773.275	23515.890	28678.210
650	249.985	986.965	2380.480	4229.850	6767.760	52765.000	17231.665	25690.500	31330.300
700	255.175	1145.260	2710.045	4670.135	7470.140	60723.000	19529.970	30000.795	36000.435
750	363.300	1428.980	3447.890	6124.200	9798.720	37887.000	24950.060	37197.595	45363.195
800	475.750	1752.490	4010.140	6905.295	11022.695	43855.500	28191.215	42002.670	52469.170
850	461.045	1992.960	4506.650	7641.410	12277.810	52765.000	31700.520	47953.870	59143.510
900	640.100	2400.375	5134.640	8468.350	13469.780	60723.000	34674.390	51611.955	66681.950
1000	654.805	2569.230	5990.125	10260.630	16700.555	37887.000	43601.190	61001.350	78001.375
1050	677.295	3029.230	6815.335	11242.405	18173.650	43855.500	47215.160	72159.165	89085.485
1100	781.960	3517.090	7523.770	12409.290	19737.570	52765.000	50810.100	75626.950	97710.400
1200	884.895	4023.115	8965.725	14713.650	23564.330	60723.000	60922.815	94257.320	114948.120
1300	Consult Factory								
1400	1123.635	5106.960	11381.670	18678.810	29914.295	48155.415	77340.515	119658.910	145925.500
1500	1280.200	5536.000	12542.500	21192.500	34081.000	54668.000	88230.000	133210.000	164350.000
1650	1427.250	6150.150	13926.500	23614.500	37887.000	60723.000	97745.000	147915.000	182515.000
1800	1643.500	7110.300	16089.000	27247.500	43855.500	70238.000	113315.000	171270.000	211060.000
2000	1980.850	8572.150	19376.000	32870.000	52765.000	84597.000	136670.000	205870.000	254310.000
2200	1980.850	9852.350	22317.000	37800.500	60.723.000	97226.000	156565.000	237010.000	292370.000
2250	Consult Factory								
Up to 4000	Consult Factory								

Valve Torque Table With FOS

Sr. No.	Size		Pressure In Bar			
			6 Bar	10 Bar	16 Bar	25 Bar
	Inch	mm	Nm	Nm	Nm	Nm
1	6"	150	58.3	108.7	147.8	200.0
2	8"	200	110.1	205.0	277.7	424.2
3	10"	250	233.4	433.5	591.1	712.2
4	12"	300	360.7	668.1	909.6	1136.4
5	14"	350	494.6	912.7	1239.6	1623.1
6	16"	400	690.8	1272.1	1727.5	2384.9
7	18"	450	999.8	1836.4	2494.5	3483.1
8	20"	500	1335.3	2451.5	3330.2	4582.6
9	22"	550	1665.5	3049.2	4138.0	5768.7
10	24"	600	2087.1	3811.2	5172.4	7116.6
11	26"	650	2686.5	4896.8	6643.9	9039.0
12	28"	700	3198.3	5815.6	7887.3	11074.9
13	30"	750	3769.8	6833.3	9263.3	13396.1
14	32"	800	4402.3	7957.1	10779.3	15681.7
15	36"	900	5866.2	10537.0	14259.9	21399.4
16	40"	1000	7617.9	13596.1	18380.0	28815.3
17	44"	1100	10866.6	19387.0	26201.1	37918.1
18	48"	1200	13702.9	24294.9	32801.7	52849.3
19	52"	1300	17428.9	30771.3	41515.8	64398.2
20	56"	1400	21050.3	36932.7	49772.6	81541.1
21	60"	1500	24866.5	43317.6	64748.5	108546.1
22	64"	1600	29451.8	50974.6	76372.5	125700.5
23	66'	1650	36291.3	62649.1	84561.8	130657.6
24	72"	1800	42649.5	73218.2	100243.4	166128.3
25	80"	2000	55608.5	94097.1	133716.5	219627.4
26	84"	2100	67042.6	113349.5	151770.3	263749.9
27	88"	2200	76138.9	127936.1	172020.6	283564.4
28	96"	2400	96925.3	160872.3	215406.6	356239.7
29	100"	2500	111165.2	183906.3	241001.3	396829.3
30	112"	2800	151384.1	245537.8	331581.4	669680.6
31	120"	3000	189083.6	304176.8	407979.4	827902.5
32	136"	3400	248434.1	347913.1	803697.8	1291098.4
33	160"	4000	449893.2	756748.7	1203036.9	1941563.3

Flow Characteristic Curve



Flow Rate 6" and above

Installation Instructions

General

- Valves can be installed in the pipeline in any position.
- Before installing valves, the pipeline must be cleaned from dirt and welding residues otherwise seat may be damaged.
- Also the pipeline must be free from tention and elecric current.
- When handling valves, be careful to avoid contact with or impact by other equipment.
- Check carefully whether valve seat / disc surface, as well as mating face, are all clean.
- Tighten again, if any, all bolts loosened during transport and / or handling.
- Open and close valves to check proper operation.
- Do not put a weight on the lever or gear handle during valve operation.
- If possible, install valves in the direction of arrow mark on it for easier access and maintenance.
- Do not use valve as a substitute for jack when putting pipes in alignment.
- The span of pipeline having connection between valve and pipe should be free from such excessive loading as may
- cause serious bending.
- Do not weld the piping arround the valve area under the condition that the valve is installed.
- Installation on new pipeline
- Shut partially valve disc until disc profile is at least 10mm within the body.
- Align the two flanges with the valve body.
- Flange gaskets shoud be positioned, aligned with bore.
- Span the body with some flange-bolts and tighten the bolts partially.
- Finish tightening by uniform cross bolting.
- Use the flange-valve-flange unit for pipe centering.
- Tack-weld the flanges to the pipe.
- Remove the bolts and the valve from the flanges. Just perform tack-welding only when the valve is inserted, as
- high heat temperature can damage valve seat.
- Weld flanges to the pipe and wait until completely cooled down.
- Install the valve in accordance with the instruction.
- Replacement of Packing
- Before replacing gland packing or a seat ring, close upstream valve and detach the valve from the piping.

Installation on new pipeline

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Replacement of Packing

- Before replacing gland packing or a seat ring, close upstream valve and detach the valve from the piping.

Material with their application

BODY / DISC / RETARDING RING / SEAT RING

S.NO.	MATERIAL	FLOWING MEDIA
1	IS 2062 E250 BR	Water, Air, Gases & Vaccume Services .
2	ASTM A516 GRADE 70	Air, Water, Flue Gas Processing Application.
3	ASTM A387 GRADE 11	Oil, Gas & Petrochemical Industry.
4	ASTM A240 GRADE 304	Air, Water, Steam, Food & Beverage, Pharmacy, Cosmetic & Chemical Industry.
5	ASTM A240 GRADE 316	Air, water, Steam, Chemical Industry, Food Processing .
6	ASTM A240 GRADE 310	Air, Water, Steam, Chemical Industry, pharmaceutical Industry.
7	ASTM A240 GRADE 309	Food Processing, Biofuels Plants.
8	ASTM A240 GRADE 321	Air, Water, Steam, Chemical Industry.
9	ASTM: B 443 Gr 1 [INCONEL 625]	Air, Water, Steam, Food & Beverage.

SHAFT

S.NO.	MATERIAL	FLOWING MEDIA
1	304-ASTM A276 AISI 304L	Air, Water, Steam, Food & Beverage, Pharmacy, Cosmetic & Chemical Industry.
2	316-ASTM A276 AISI 316L	Air, Water, Steam, Chemical Industry, Food Processing .
3	310-ASTM A276 AISI 310L	Air, Water, Steam, Chemical Industry, Pharmaceutical Industry.
4	321-ASTM A276 AISIE 321	Air, Water, Steam, Chemical Industry .
5	410-ASTM A276 AISI 410	Water, Air, Gases & Vaccume Services .
6	EN8-BS 970-1955	Water, Air, Gases & Vaccume Services .
7	625-ASTM: B 446 Gr 1 [INCONEL 625]	Air, Water, Steam, Food & Beverage .

BODY / DISC / RETARDING RING / SEAT RING

S.NO.	MATERIAL	FLOWING MEDIA
1	D10-NATURAL RUBBER	Inorganic Salt Solutions, Dilute Mineral Acidic Application .
2	D15-WHITE NATURAL RUBBER	Food & Pharmaceuticals , Toothpaste, Brewing, Dairy .
3	D30-EPDM	Water-steam, Sea Water, Brine, Esters, Ketone, Alkalis, Caustic Soda .
4	D40-BUTYL RUBBER	Hydrocarbons Natural Gas Oils & Fat Air Gasoline .
	D50-BUTADIENE ACRYLONITRILE	Hydrocarbons Natural Gas Oils & Fat Air Gasoline .
5	GRAPHITE RUBBER	Oils, Fuels, Hydrocarbons & Water .
6	SILICON RUBBER	Food & Beverage.
7	D70-VITON	Strong Sulphuric Acids, Chlorine Gas, Oils Application .
8	D9330-PTFE+EPDM	Strong Acids, Alkaline & Salts in Water at High Temperature Application.
9	D9370-PTFE+VITON	Strong Acids, Chlorine Bromine at High Temperature Application .

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DYE Penetrent Examination Report

INDUSTRIAL INSPECTION & HEAT TREATMENT SERVICES

- THIRD PARTY INSPECTION - NDT SERVICES & TRAINING - NDT CONSULTANCY - WPS FOR WELDING CONSULTANCY &TRAINING
- STRESS RELIEVING - PREHEATING & POST WELD HEAT TREATMENT - NORMALISING - OIL FIRING & GAS FIRING & BLE METHOD

Plot No. PAP 3/10, Behind BSNL Office, MIDC, Baramati - 413133 Mob : 9421806761, 9860923726 Email : industrialinspection.hi@gmail.com

DYE-PENETRENT EXAMINATION REPORT

Client: Sude Engineering Corporation Gat No:94/2 Polt No:1 Alandi Markal Road Dhanore Khed Pune- 412105	**Report No:** DPT/IIHS/2018-19/70 **Page No:** 1 of 1
Item NO : 5Z480B-20000693-0A	**Date:**14-07-2018
Equipment Name: Single Flap Butterfly Valves (1200)	**Drawing No:** SU-17000-00176-Diameter1200
Job No: . SU-17000-00176-V2 **(Valve=2)**	**Test Surface condition**: After welding
Material Spec. : SS316 & SS304	**DP Material company Name** :Ferro Chem
Material Thickness: 10mm	**Penetration Time** :10 min
Joint No: As below	**Developing Time** : 5min
Reference Standard : ASME Sec.V Article.6	**Extent of Test :** 100%
Acceptance Standard :ASME SEC. VIII Div.I App.8	**Welder Name/Code :** ----

Material Details

1.Cleaner ----	Batch No: 7668	Exp.Date :Jan2020
2.Dye Penetrant---	Batch No: 7672	Exp.Date : Feb2020
3.Developer ---	Batch No: 7678	Exp.Date :March2020

SR NO	Weld ID	Observation	Remark	Inspecting Remark
1	SU-17000-00176-V2-RHS-W4 (BD)	No unacceptable Indication Observed	Acceptable	
2	SU-17000-00176-V2-LHS-W5 (BD)	No unacceptable Indication Observed	Acceptable	

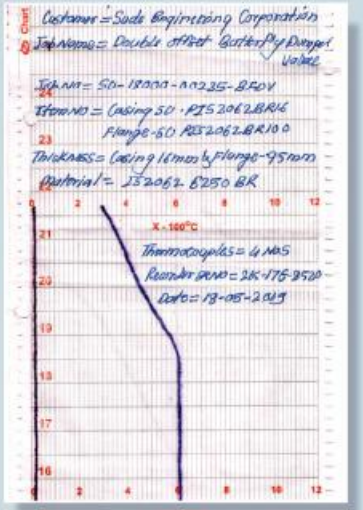
BD=Bush Disc

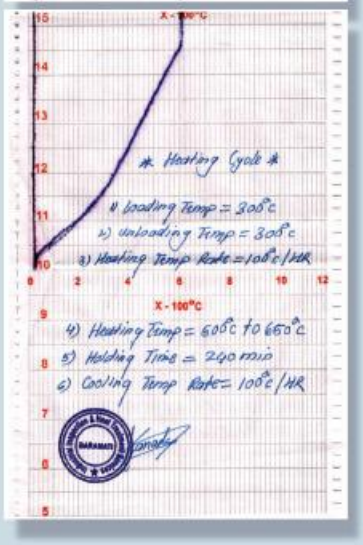
ASNT LEVEL - II D.B.Kanade RT,UT,MT,PT

For Industrial Inspection & Heat Treatment Services | Customer Representative | Inspection Authority

SUDE ENGINEERING CORPORATION PUNE 412 105 SINCE 1989 ALANDI

Heat Treatment Report





INDUSTRIAL INSPECTION & HEAT TREATMENT SERVICES

- THIRD PARTY INSPECTION - NDT SERVICES & TRAINING - NDT CONSULTANCY - WPS FOR WELDING CONSULTANCY &TRAINING
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Plot No. PAP 3/10, Behind BSNL Office, MIDC, Baramati - 413133 Mob : 9421806761, 9860923726 Email : industrialinspection.hi@gmail.com

HEAT TREATMENT REPORT

CLIENT	Sude Engineering Corporation	EQUIPMENT DESCRIPTION	Double offset Butterfly Damper
PROJECT LOCATION	Alandi Markal Road	RECORDER SERIAL NUMBER	2K-178-8520
DESCRIPTION OF WORK	Post weld Heat Treatment of [BFDV]	CALIBRATION CERTIFICATE No.	PL-S-1115-1
JOB NUMBER	SU-18000-00235-BFDV	RECORDING RANGE	0°C to 1200°C
REPORT NO.	53	CHART SPEED	25mm/HR
ITE OF WORK PERFORMED	18-05-2019	CHART NUMBER	

Heat Treatment specification - Heat Treatment was carried out in accordance with client's requirements as per Engineering Codes : _____

Specification :

Rate of rise unrestricted from ambient to 300 °C

Rate of rise at a maximum of 100 °C per hour.

Holding Temperature : Within 600 °C to 650 °C

Holding Duration : Minimum 4 hours 00 minutes

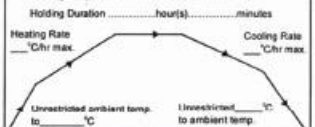
Rate of Cooling at a maximum of 100 °C per hour

Cooling rate restricted after achieving 300 °C down to ambient temperature.

Temperature Specification Chart

Holding Temperature.....°C to .....°C

Holding Duration .....hour(s).....minutes



Sketch depicting thermocouple location

Chart Receipt :

Kindly acknowledge receipt of Temperature Chart(s) in respect of the following Heat Treatment.

T/C	Drawing / Line No.	Weld/Joint
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Remarks :

COMPANY'S REPRESENTATIVE	RECEIVED BY	SPECIFICATION APPROVED BY
Name :	Name :	Name :
Signature & Company Stamp :	Signature & Company Stamp :	Signature & Company Stamp :

Ultrasonic Examination Report

Radiography Examination Report

INDUSTRIAL INSPECTION & HEAT TREATMENT SERVICES

THIRD PARTY INSPECTION • NDT SERVICES & TRAINING • NDT CONSULTANCY • WPS,PQR,WELDING CONSULTANCY &TRAINING
• STRESS RELIEVING • PREHEATING & POST WELD HEAT TREATMENT • NORMALISING • OIL FIRING & GAS FIRING & ELE.METHOD

Plot No. PAP 3/19, Behind BSNL Office, MIDC, Baramati - 413133 Mob : 9421608761 , 9850923725
Email : industrialinspection.hti@gmail.com

ULTRASONIC EXAMINATION REPORT

CUSTOMER: Sude Engineering Corporation
Gat No:94/2 Polt No:1 Alandi Markal Road
Dhanore Khed Pune -412105

Report N: IIHT / UT/2019-20/117
Date : 15/05/2019

Job Name: Double Offset Butterfly Damper Valve **Material Specification:** IS2062 E250 BR

Item No: FLANGE –SU PIS2062BR100 & CASING-SU PIS2062BR16

Job ID : 1. SU-18000-00235-BFDV-W1 (Casing) Thick: 16mm
2. SU-18000-00235-BFDV-W2 (Casing to Flange) Thick: 16mm
5. SU-18000-00235-BFDV-W3 (Casing to Flange) Thick: 16mm

Equipment Used: Ultrasonic Flaw Detector (Pulse Echo) **Make: EEC** **Model: DS-322**

Probe Used: 4MHz (0 60 &70) Dia10mm **Type of Crystal:** Single **Type of Probe:** Straight Beam

Scanning Sensitivity: BWE set to 80% + 6dB = 58.5 dB **Range:** 0 – 50mm
Plotting DAC from SDH & Echo set to 80% = 52.5 dB **Couplant:** Oil

Technique: Contact & Manual **Area of Examination:** 100% **Stage Of Inspection :** After Welding & Grinding

Reference Standard: ASME Sec.V Div-2 Article.5

Acceptance Standard: ASME Sec.VIII Div.1 App.12

Observations: No unacceptable indication observed.

Remark: ACCEPTABLE

ASNT LEVEL - II D.B.Kanade RT,UT,MT,PT

(Tested & Prepared by) **(Customer Representative)** **(Inspection Authority**

MAS INSPECTION SERVICES

Works Add. :- Plot No. 111, Shree Ind. Estate, Gala No. 1A, Gen. Block, MIDC Bhosari, Landewadi, Pune - 411 039.
Reg. Add. :- A-403 'Sai Residency' Sec-7, Near Priyadarshani School Indrayaninagar, Pune - 411 026.
Contact : 9284592565 / 9970339844 / 8421827835 ☎ : 020 - 65321444 Email : mas.inspection16@gmail.com

P. W. H. T./ OIL FIRING / RADIOGRAPHY / ULTRASONIC / MAGNETIC PARTICLE / PENETRANT TESTING

RADIOGRAPHY EXAMINATION REPORT

Client :m /s - BUDEENGINEERIN CORPORATION Plot NO.1,Gat No. 94/2,Alandi – Markal Road, Dhanore Khed , Pune –412 105.		Report	MAS/RT/18-19/247
		Date of RT	03/06/2018
Job : Damper Flange		Date of Evln.	04/06/2018
RT 100%	ID : SU – 17000-00176 V1-V4 Drg no :	Sheet	1 of 2
		Mat. Spec.	ASTM A516 GR.70
Source : Ir-192	Mat. Thik : 36 + 2.4 mm	IQI: ASME :	ASTM : 1B
Source strength : 17 Ci	Source Size : 2.7 X 2.9 mm	Sensitivity :	2%
Exposure time : 5 Min.	SFD : 300 mm	Film Density :	2 to 4
Exposure tech. : SWSI	SOD : 262 mm	Screen:	F&B : 0.1 mm
Weld tech : SMAW/FCAW	Film Type : Agfa-D7	Specification :	ASME SEC-V
Reinforcement : 2.4 mm	Welder : -----	Acc .std. :	ASME SEC-VIII,DIV-1 UW-51

S.no.	F.Size	Radiograph No.	Spot	Observation	Remarks	Insp. Auth.
1	3X15	SU-17000-00176-V-1 RHS J-1	A-B	NSI	Acceptable	
2	3X15	J-2	A-B	NSI	Acceptable	
3	3X15	J-3	A-B	NSI	Acceptable	
4	3X15	J-4	A-B	NSI	Acceptable	
5	3X15	SU-17000-00176-V-1 LHS J-1	A-B	NSI	Acceptable	
6	3X15	J-2	A-B	NSI	Acceptable	
7	3X15	J-3	A-B	NSI	Acceptable	
8	3X15	J-4	A-B	NSI	Acceptable	
9	3X15	SU-17000-00176-V-2 RHS J-1	A-B	NSI	Acceptable	
10	3X15	J-2	A-B	NSI	Acceptable	
11	3X15	J-3	A-B	NSI	Acceptable	
12	3X15	J-4	A-B	NSI	Acceptable	
13	3X15	SU-17000-00176-V-2 LHS J-1	A-B	NSI	Acceptable	
14	3X15	J-2	A-B	NSI	Acceptable	
15	3X15	J-3	A-B	NSI	Acceptable	
16	3X15	J-4	A-B	NSI	Acceptable	

The above Radiographs are viewed and found satisfactory except Sr .no . : NIL

For MAS Insp. Services **Client** **Inspecting Authority**

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- Heavy duty – Single phase & Three phase actuators for operating Gates & Chutes.
- Pneumatic & Motorised pinch valve.
- Pneumatic & Motorised Flush Bottom valve.
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- And Instrumentation Product likes Pressure Transmitter, PID Controller, Flow meter etc., for System Integration.

NOTE : TECHNICAL SPECIFICATIONS, DETAILS & DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.
DIMENSIONS IN THE TABLE ARE APPROXIMATE SUBJECT TO FINAL CONFIRMATION BY SUDE.

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