

List of Enquiry Items for Enquiry BAP/PUR/FGD/FLANGES/2014/4231382E dt 29.01.2014

Sl.No	Material Code	Description	Unit	Qty	Destination
1.	RFW301260001	600 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	20	BHEL Stores Ranipet
2.	RFW301260002	500 NB FLANGE SETS AS PER TECHNICAL SECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	4	do
3.	RFW301260003	350 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	3	do
4.	RFW301260004	250 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	5	do
5.	RFW301260005	200 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	8	do
6.	RFW301260006	150 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	32	do
7.	RFW301260007	100 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	75	do
8.	RFW301260008	80 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	32	do
9.	RFW301260009	50 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	10	do
10.	RFW301260010	25 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	2	do
11.	RFW301270001	1000 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	3	do
12.	RFW301270002	900 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	12	do
13.	RFW301270003	450 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	12	do
14.	RFW301270004	350 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	6	do
15.	RFW301270005	300 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	12	do
16.	RFW301270006	250 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-	ST	36	do

		SPEC-02:REV-00			
17.	RFW301270007	215 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	3	do
18.	RFW301270008	200 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	21	do
19.	RFW301270009	150 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	15	do
20.	RFW301270010	100 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	12	do
21.	RFW301270011	50 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	15	do
22.	RFW301270012	40 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	3	do
23.	RFW301280001	1000 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	1	do
24.	RFW301280002	900 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	2	do
25.	RFW301280003	450 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	2	do
26.	RFW301280004	350 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	1	do
27.	RFW301280005	300 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	2	do
28.	RFW301280006	250 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	5	do
29.	RFW301280007	215 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	1	do
30.	RFW301280008	200 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	3	do
31.	RFW301280009	150 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	2	do
32.	RFW301280010	100 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	2	do
33.	RFW301280011	50 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	2	do

34.	RFW301280012	40 NB FLANGE SETS AS PER TECHNICAL SPECIFICATION NTPC:BONG:FGD:FLANGES-SPEC-02:REV-00	ST	1	do
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**BONGAIGAON– 3X250 MW
FLUE GAS DESULFURIZATION SYSTEM**

**TECHNICAL SPECIFICATION FOR
TANKS & ABSORBER FLANGES**

CUSTOMER : NATIONAL THERMAL POWER CORPORATION LIMITED



NTPC: BONG: FGD: FLANGES-SPEC-02: REV-00

Flue Gas Desulphurization Group
Air Quality Control Systems
BAP:: BHEL :: Ranipet



**TECHNICAL SPECIFICATION
FOR
FLANGES**

TECHNICAL SPECIFICATION FOR TANKS & ABSORBER FLANGES

Prepared	Checked	Approved
N Sridhar Asst. Engineer-I	B Kabilash Engineer-FGD	SASHI KUMAR Senior Engineer-FGD
R00 dated 11 01 14		



**TECHNICAL SPECIFICATION
FOR
FLANGES**

CONTENTS

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**TECHNICAL SPECIFICATION
FOR
FLANGES**

1.0	PROJECT INFORMATION	
	▪ Owner	NTPC
	▪ Buyer	BHEL, Ranipet
	▪ Process / application	Wet Lime Stone FGD system
1.1	SITE CONDITIONS	
	▪ Ambient temperature (Guarantee)	27 Deg C
	▪ Ambient temperature (Design)	50 Deg C
	▪ Height above sea level	47 m
	▪ Relative Humidity	60 %
1.2	LOCATION AND APPROACH	
	▪ Project location	
	▪ State	Assam
	▪ District	Kokrajhar
	▪ Place	Kumkuri near Salakati, Bongaigaon
	▪ Height above sea level	47 m



TECHNICAL SPECIFICATION FOR FLANGES

2.0 STANDARDS AND CODES

Flanges in general shall conform to the requirements of the following standards:

- a. ANSI-B-16.5 / AWWA specification for flange.

3.0 MATERIAL OF CONSTRUCTION

Material of construction for flange shall be as per **Annexure-I (Tanks) & Annexure-II (Absorber)** or its equivalent

4.0 SCOPE OF SUPPLY

- Vendor shall supply the flanges as per class rating indicated in the table Annexure-I and Annexure-II
- Vendor to provide the type of flanges as indicated in Annexure-I & Annexure-II
- Vendor to provide the Painting as Annexure-III
- Vendor has to provide the counter flanges (Blind / hollow flange) for each flanges as per Annexure-I & Annexure-II
- Vendor to provide gasket, high tensile fasteners, bolts and nuts as per enclosed Annexure-I & Annexure-II

Annexure-I

5.0 List of Tanks Flanges

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
1	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ROOF MAN HOLE	1	Blind Flange(Refer Fig:01)
2	600	FF	150	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	BOTTOM MANHOLE	1	Blind Flange(Refer Fig:01)
3	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ROOF MAN HOLE	1	Blind Flange(Refer Fig:01)
4	600	FF	150	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	BOTTOM MANHOLE	1	Blind Flange(Refer Fig:01)
5	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ROOF MAN HOLE	1	Blind Flange(Refer Fig:01)
6	600	FF	150	ANSI B16.5	A105/IS2062	SA 193 B7	SA 194 2H	NITRILE RUBBER	AGITATOR	1	Blind Flange(Refer Fig:01)
7	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SIDE MANHOLE	1	Blind Flange(Refer Fig:01)



**TECHNICAL SPECIFICATION
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
8	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ROOF MAN HOLE	1	Blind Flange(Refer Fig:01)
9	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SIDE MANHOLE	1	Blind Flange(Refer Fig:01)
10	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ROOF MAN HOLE	1	Blind Flange(Refer Fig:01)
11	600	FF	150	ANSI B16.5	A105/IS2062	SA 193 B7	SA 194 2H	NITRILE RUBBER	WORKING AGITATOR	1	Blind Flange (Refer Fig:01)
12	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SIDE MANHOLE	1	Blind Flange(Refer Fig:01)
13	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ROOF MAN HOLE	1	Blind Flange (Refer Fig:01)
14	600	FF	150	ANSI B16.5	A105/IS2062	SA 193 B7	SA 194 2H	NITRILE RUBBER	AGITATOR	1	Blind Flange (Refer Fig:01)
15	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SIDE MANHOLE	1	Blind Flange(Refer Fig:01)
16	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ROOF MAN HOLE	1	Blind Flange (Refer Fig:01)



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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
17	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ROOF MAN HOLE	1	Blind Flange (Refer Fig:01)
18	600	SOFF	150	AWWA	A105/IS2062	SA 193 B7	SA 194 2H	NITRILE RUBBER	MAN HOLE	1	Blind Flange (Refer Fig:01)
Spares of 600 NB											
1	600	FF	86	AWWA	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SIDE MANHOLE	2	Blind Flange (Refer Fig:01)
Flanges of 500 NB											
1	500	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	WORKING AGITATOR	1	Applicable (Refer Fig:02)
2	500	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	WORKING AGITATOR	1	Applicable (Refer Fig:02)
3	500	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	AGITATOR	1	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
	Spares of 500 NB										
1	500	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	AGITATOR	1	Applicable (Refer Fig:02)
	Flanges of 350 NB										
1	350	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	FILTRATE TANK FEED PUMP SUCTION	2	Applicable (Refer Fig:02)
	Spares of 350 NB										
1	350	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	FILTRATE TANK FEED PUMP SUCTION	1	Applicable (Refer Fig:02)
	Flanges of 250 NB										
1	250	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TANK FEED(Pri. H'clone)	1	Applicable (Refer Fig:02)



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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
2	250	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION (Make up)	2	Applicable (Refer Fig:02)
3	250	SOFF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LIME POWDER FEED	1	Applicable (Refer Fig:02)
Spares of 250 NB											
1	250	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TANK FEED(Pri. H'clone)	1	Applicable (Refer Fig:02)
Flanges of 200 NB											
1	200	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)
2	200	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)
3	200	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
4	200	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	1	Applicable (Refer Fig:02)
5	200	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)
6	200	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVERFLOW	1	Applicable (Refer Fig:02)
7	200	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	1	Applicable (Refer Fig:02)
Spares of 200 NB											
1	200	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	1	Applicable (Refer Fig:02)
Flanges of 150 NB											



**TECHNICAL SPECIFICATION
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
1	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LIME SLURRY FROM BALL MILL	1	Applicable (Refer Fig:02)
2	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	2	Applicable (Refer Fig:02)
3	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	2	Applicable (Refer Fig:02)
4	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	1	Applicable (Refer Fig:02)
5	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LIME SLURRY FROM BALL MILL	1	Applicable (Refer Fig:02)
6	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	2	Applicable (Refer Fig:02)
7	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	2	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
8	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	1	Applicable (Refer Fig:02)
9	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TANK FEED	3	Applicable (Refer Fig:02)
10	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	2	Applicable (Refer Fig:02)
11	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SECONDARY HYDROCYCLONE FEED PUMP SUCTION	2	Applicable (Refer Fig:02)
12	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TANK FEED(WW. H'clone)	1	Applicable (Refer Fig:02)
13	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TANK FEED(Belt Filter)	1	Applicable (Refer Fig:02)
14	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION (WW H'clone)	2	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
15	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TANK FEED	1	Applicable (Refer Fig:02)
16	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TANK FEED	3	Applicable (Refer Fig:02)
17	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	2	Applicable (Refer Fig:02)
Spares of 150 NB											
1	150	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	3	Applicable (Refer Fig:02)
Flanges of 100 NB											
1	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
2	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SLURRY RETURN FROM ABSORBER	1	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
3	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	3	Applicable (Refer Fig:02)
4	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DENSITY MEASUREMENT	2	Applicable (Refer Fig:02)
5	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
6	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SLURRY RETURN FROM ABSORBER	1	Applicable (Refer Fig:02)
7	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	3	Applicable (Refer Fig:02)
8	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DENSITY MEASUREMENT	2	Applicable (Refer Fig:02)
9	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)



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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
10	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	2	Applicable (Refer Fig:02)
11	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
12	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	3	Applicable (Refer Fig:02)
13	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
14	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	RECIRCULATION FLANGE	1	Applicable (Refer Fig:02)
15	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	2	Applicable (Refer Fig:02)
16	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TEMP. TRANSMITTER	1	Applicable (Refer Fig:02)
17	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	1	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
18	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)
19	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	2	Applicable (Refer Fig:02)
20	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL GAUGE	1	Applicable (Refer Fig:02)
21	100	SOFF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
22	100	SOFF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	1	Applicable (Refer Fig:02)
23	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
24	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	3	Applicable (Refer Fig:02)
25	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194	Nitrile Rubber	TEMP. TRANSMITTER	3	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
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Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
							2H				
26	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
27	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER FEED	1	Applicable (Refer Fig:02)
28	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TEMP. TRANSMITTER	1	Applicable (Refer Fig:02)
29	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	3	Applicable (Refer Fig:02)
30	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	2	Applicable (Refer Fig:02)
31	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	1	Applicable (Refer Fig:02)
32	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	ME PUMP SUCTION	2	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
FLANGES**

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
33	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL GAUGE	1	Applicable (Refer Fig:02)
34	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
35	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER FEED	1	Applicable (Refer Fig:02)
36	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	TEMP. TRANSMITTER	1	Applicable (Refer Fig:02)
37	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	3	Applicable (Refer Fig:02)
38	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	2	Applicable (Refer Fig:02)
39	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	1	Applicable (Refer Fig:02)
40	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194	Nitrile Rubber	ME PUMP SUCTION	2	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
FLANGES**

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
							2H				
41	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL GAUGE	1	Applicable (Refer Fig:02)
42	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LEVEL TRANSMITTER	1	Applicable (Refer Fig:02)
	Spares of 100 NB										
1	100	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	RECIRCULATION FLANGE	10	Applicable (Refer Fig:02)
	Flanges of 80 NB										
1	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
2	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
FLANGES**

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
3	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER	1	Applicable (Refer Fig:02)
4	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
5	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	RECIRCULATION FLANGE	1	Applicable (Refer Fig:02)
6	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER	1	Applicable (Refer Fig:02)
7	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
8	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LIME DOSING	1	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
FLANGES**

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
9	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
10	80	SOFF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
11	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	1	Applicable (Refer Fig:02)
12	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)
13	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER	1	Applicable (Refer Fig:02)
14	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
15	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER RETURN	1	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
FLANGES**

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
16	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
17	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	1	Applicable (Refer Fig:02)
18	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)
19	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER RETURN	1	Applicable (Refer Fig:02)
20	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
21	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	1	Applicable (Refer Fig:02)
22	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
FLANGES**

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
23	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER FEED	1	Applicable (Refer Fig:02)
24	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	SPARE	1	Applicable (Refer Fig:02)
25	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	DRAIN	1	Applicable (Refer Fig:02)
26	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	OVER FLOW	1	Applicable (Refer Fig:02)
27	80	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	2	Applicable (Refer Fig:02)
	Spares of 80 NB										
1	80	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194	Nitrile Rubber	PROCESS WATER	4	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
FLANGES**

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
							2H				
	Flanges of 50 NB										
1	50	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LIQUID FROM BALL MILL	1	Applicable (Refer Fig:02)
2	50	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER	1	Applicable (Refer Fig:02)
3	50	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LIQUID FROM BALL MILL	1	Applicable (Refer Fig:02)
4	50	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER	1	Applicable (Refer Fig:02)
5	50	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	pH METER	2	Applicable (Refer Fig:02)
6	50	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PUMP SUCTION	2	Applicable (Refer Fig:02)



**TECHNICAL SPECIFICATION
FOR
FLANGES**

Sl.no.	Flange	Flange				Accessories			Service	Quantity	Counter flanges
	Flange Size in NB	TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
7	50	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	VENT	1	Applicable (Refer Fig:02)
	Spares of 50 NB										
1	50	FF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	LIQUID FROM BALL MILL	1	Applicable (Refer Fig:02)
	Flanges of 25 NB										
1	25	SOFF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER FEED	1	Applicable (Refer Fig:02)
	Spares of 25 NB										
1	25	SOFF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	PROCESS WATER FEED	1	Applicable (Refer Fig:02)

Annexure-II

6.0 List of Absorber Flanges

SL.NO	Identification	Description	Size in NB	Flange				Accessories			Qty	Type of Flange	Counter flanges
				TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
Flanges for 1000 NB													
1	M1	Man way	1000	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
Spares for 1000 NB Flanges													
1	M1	Man way	1000	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	1	Applicable (Refer Fig:02)	
Flanges for 900 NB													
1	P1-P4	Pump inlet	900	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	12	Applicable (Refer Fig:02)	
Spares for 900 NB Flanges													
1	P1-P4	Pump inlet	900	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	2	Applicable (Refer Fig:02)	
Flanges for 450 NB													
1	L2-L5	Slurry Inlet	450	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	12	Applicable (Refer Fig:02)	
Spares for 450 NB Flanges													
1	L2-L5	Slurry Inlet	450	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	2	Applicable (Refer Fig:02)	
Flanges for 350 NB													
1	OB1-OB2	Oxidation blower	350	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	6	Applicable (Refer Fig:02)	
Spares for 350 NB Flanges													



**TECHNICAL SPECIFICATION
FOR
FLANGES**

SL.NO	Identification	Description	Size in NB	Flange				Accessories			Qty	Type of Flange	Counter flanges
				TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
1	OB1-OB2	Oxidation blower	350	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	1	Applicable (Refer Fig:02)	
Flanges for 300 NB													
1	A1-A4	Agitator	300	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	12	Applicable (Refer Fig:02)	
Spares for 300 NB Flanges													
1	A1-A4	Agitator	300	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	2	Applicable (Refer Fig:02)	
Flanges for 250 NB													
1	MW	Make up water	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
2	SD	Slurry inlet	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
3	OC	Over flow	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
4	D1-D3	Density meter	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	9	Applicable (Refer Fig:02)	
5	SH	From auxiliary absorbent tank	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
6	BPR	Bleed pump return	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	



**TECHNICAL SPECIFICATION
FOR
FLANGES**

SL.NO	Identification	Description	Size in NB	Flange				Accessories			Qty	Type of Flange	Counter flanges
				TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
7	N	Vent	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
8	PW	Process water	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
9	SP1	Spare Flange	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
10	DP	Intake from drain pit	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
Spares for 250 NB Flanges													
1	DP	Intake from drain pit	250	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	5	Applicable (Refer Fig:02)	
Flanges for 215 NB													
1	DP4	Diff. pressure	215	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
Spares for 215 NB Flanges													
1	DP4	Diff. pressure	215	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	1	Applicable (Refer Fig:02)	
Flanges for 200 NB													
1	DR	Drain	200	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	



**TECHNICAL SPECIFICATION
FOR
FLANGES**

SL.NO	Identification	Description	Size in NB	Flange				Accessories			Qty	Type of Flange	Counter flanges
				TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
2	BP1-BP2	Bleed pump	200	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	6	Applicable (Refer Fig:02)	
3	L6-L9	Mist Eliminator wash	200	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	12	Applicable (Refer Fig:02)	
Spares for 200 NB Flanges													
1	L6-L9	Mist Eliminator wash	200	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
Flanges for 150 NB													
1	LT1-LT3	Level transmitter	150	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	9	Applicable (Refer Fig:02)	
2	SP2-SP3	Spare Flange	150	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	6	Applicable (Refer Fig:02)	
Spares for 150 NB Flanges													
1	SP2-SP3	Spare Flange	150	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	2	Applicable (Refer Fig:02)	
Flanges for 100 NB													
1	DP1-DP3	Diff. pressure	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	9	Applicable (Refer Fig:02)	
2	TE	Temp. Element	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	



**TECHNICAL SPECIFICATION
FOR
FLANGES**

SL.NO	Identification	Description	Size in NB	Flange				Accessories			Qty	Type of Flange	Counter flanges
				TYPE	RTG	STD	Material	Bolts	Nuts	Gaskets			
Spares for 100 NB Flanges													
1	TE	Temp. Element	100	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	2	Applicable (Refer Fig:02)	
Flanges for 50 NB													
1	A1S-A4S	Agitator Sparger	50	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	12	Applicable (Refer Fig:02)	
2	L1	Emergency Quench	50	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
Spares for 50 NB Flanges													
1	L1	Emergency Quench	50	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	2	Applicable (Refer Fig:02)	
Flanges for 40 NB													
1	L10	Normal quench	40	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	3	Applicable (Refer Fig:02)	
Spares for 40 NB Flanges													
1	L10	Normal quench	40	SORF	150	ANSI B16.5	A105	SA 193 B7	SA 194 2H	Nitrile Rubber	1	Applicable (Refer Fig:02)	

Annexure-III

7.0 Painting Procedure

Primer Coat		Intermediate Coat		Finish coat			Total DFT µm (min)
Paint	No of Coats /DFT	Paint	No of Coats	Paint	No of Coats	Shade	
HB Chlorinated Rubber based Zinc Phosphate Primer DFT= 50 µm per coat (Solid by Volume min 60%)	2	--	--	Chlorinated Rubber Based Finish paint DFT= 30 µm per coat (Solid by Volume min 60%)	2	Gray shade to R9002	160

8.0 Sketch of Flange

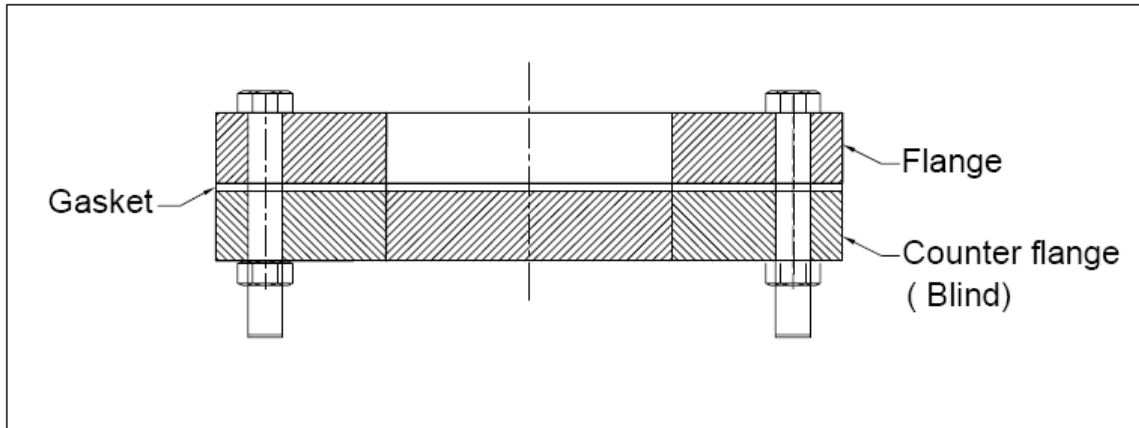


Fig: 1

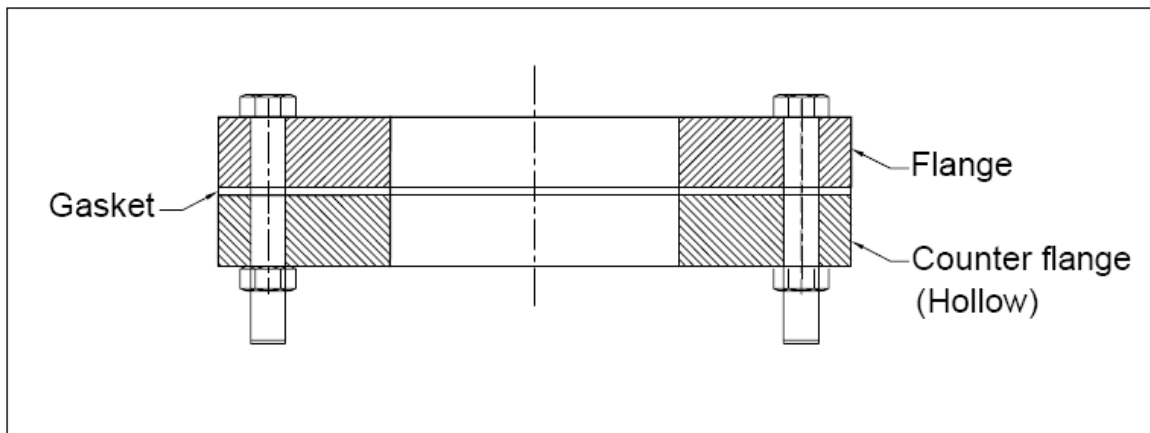


Fig: 2