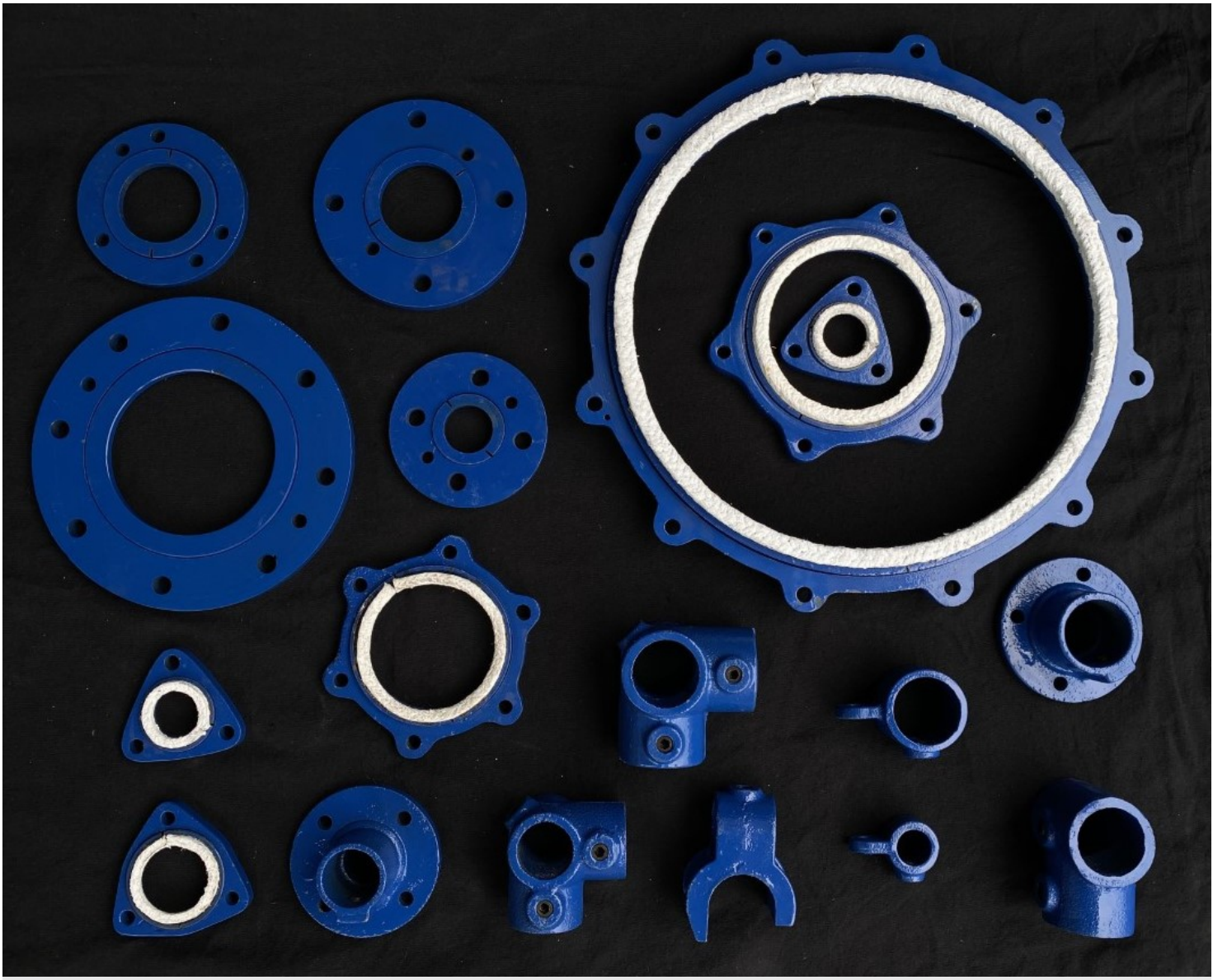
COUPLINGS, GASKETS STRUCTURE AND SUPPORTS



The couplings used with glass equipment are important from two main points of view:
1. They must ensure the effective seal of the joint.
2. They should not induce any undue stress in the glass.
3. They must be reliable in all service conditions.

In this section we have covered coupling to join glass components together as well as to join glass components with a other metal equipment.

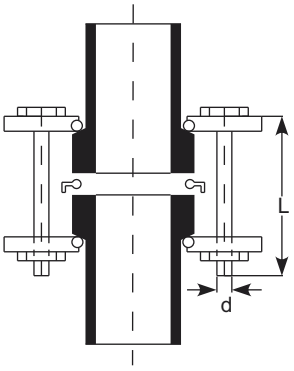
PTFE bellows are available for normal & vacuum applications, together with flanges to connect them to glass or non-glass equipment.

Glass plants are normally supported in a tubular structure formed of galvanised steel tubes. This type of structure is proved robust and flexible over many years.

COMPLETE COUPLINGS

A complete coupling is a set of two backing flanges with insert and nut-bolts. complete set of flanges require to make a joint & standard one are available in Cast Iron. Also available in other MOC like Stainless Steel 304 & 316, Siliumin.

		Flanges		inserts		Nuts-Bolts		
Cat.Ref.	DN	Cat.Ref.	Qty	Cat.Ref.	Qty	d	L	Qty
CT0.5	12	CF0.5	2nos	CN0.5	2nos	1/4"	50	3nos
CT0.7	15	CF0.7	2nos	CN0.7	2nos	1/4"	50	3nos
CT1*	25	CF1	2nos	CN1	2nos	5/16"	65	3nos
CT1.5*	40	CF1.5	2nos	CN1.5	2nos	5/16"	65	3nos
CT2*	50	CF2	2nos	CN2	2nos	5/16"	75	3nos
CT3*	80	CF3	2nos	CN3	2nos	5/16"	75	6nos
CT4*	100	CF4	2nos	CN4	2nos	5/16"	100	6nos
CT6*	150	CF6	2nos	CN6	2nos	5/16"	100	6nos
CT9*	225	CF9	2nos	CN9	2nos	3/8"	125	8nos
CT12*	300	CF12	2nos	CN12	2nos	3/8"	150	12nos
CT16	400	CF16	2nos	CN16	2nos	3/8"	150	12nos
CT18*	450	CF18	2nos	CN18	2nos	1/2"	150	12nos
CT24	600	CF24	2nos	CN24	2nos	1/2"	150	12nos
CT32	800	CF32	2nos	CN32	2nos	1/2"	150	24nos

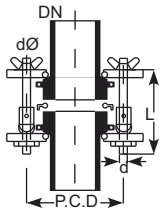


QUICK RELEASE COUPLINGS

For easy & fast opening or closing of couplings as quick as possible without using tools, the Quick Release Coupling is an ideal solution. In case of solid charging material to reaction or addition vessels, we recommend to use our Quick Release Coupling.

Quick Release coupling are offered in cast iron & stainless steel material as per the requirement. Quick Release Coupling is available from DN 80 to DN 300 sizes.

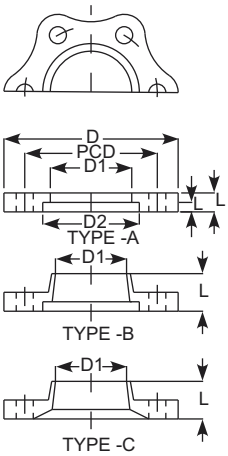
Cat.Ref.	DN	PCD	nxdØ
QCT3	80	133	6x9Ø
QCT4	100	178	6x9Ø
QCT6	150	254	6x9Ø
QCT9	225	310	8x11Ø
QCT12	300	395	12x11Ø



BACKING FLANGES

Backing flanges are used to couple a glass ends to a glass end or to a bellow. Backing flanges are made of cast iron and are used with Inserts.

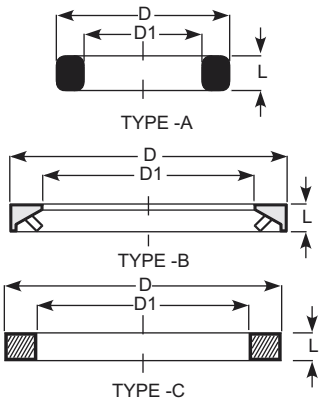
Cat.Ref.	DN	D	D1	D2	PCD	n x dØ	L	L1	Type
CF0.5	12	50	25	28	38	3 x 7Ø	6	3	A
CF0.7	15	65	29	37	48	3 x 7Ø	6	3.5	A
CF1	25	92	43	51	70	3 x 9Ø	10	6	A
CF1.5	40	110	58	66	86	3 x 9Ø	10	6	A
CF2	50	120	70	81	98	3 x 9Ø	12	8	A
CF3	80	155	101	112	133	6 x 9Ø	12	8	A
CF4	100	200	134	148	178	6 x 9Ø	12	8	A
CF6	150	275	186	196	254	6 x 9Ø	15	8	A
CF9	225	350	260	282	310	8 x 11Ø	28	8	B
CF12	300	425	342	363	395	12 x 11Ø	34	8	B
CF16	400	525	467	476	495	12 x 12Ø	22	8	A
CF18	450	630	537	557	585	12 x 14Ø	37	8	B
CF24	600	755	643	690	710	12 x 14Ø	50	5	C
CF32	800	990	861	922	950	24 x 14Ø	67	5	C



INSERTS

Split ring type inserts are used with backing flanges. These are made of Cast iron with asbestos lining. In addition, insert made of suitable composite rubber material for 25 DN to 150 DN size. New Non-Asbestos (make Champion, Klinger) insert are being introduced for 25DN to 300DN.

Cat.Ref.	DN	D	D1	L	Type
CN0.5	12	28	20	8	A
CN0.7	15	37	22	8	A
CN1	25	50	34	10	A
CN1.5	40	65	48	10	A
CN2	50	80	61	8	B
CN3	80	111	90	9	B
CN4	100	147	119	10	B
CN6	150	195	168	10	B
CN9	225	280	240	10	B
CN12	300	361	324	10	B
CN16	400	474	431	12	B
CN18	450	555	500	18	B
CN24	600	684	634	10	C



ADAPTOR BACKING FLANGES

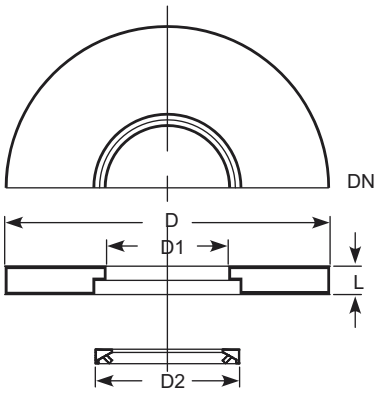
Adaptor backing flanges are used to couple a glass end to the flange having different bolt configuration. These flanges are made of cast iron and are supplied with inserts.
These are particularly used to fit a glass equipment on a non-glass equipment like Glass-lined Reactor etc.
Adaptor backing flanges are generally supplied undrilled. However, if specified, these can be supplied drilled as per "Table E", "Table F" and "ASA150" standards.

Drilled to Table E

Cat.Ref.	PCD	n x dØ
CFA0.5/E	62	4 x 7Ø
CFA0.7/E	62	4 x 7Ø
CFA1/E	82	4 x 12Ø
CFA1.5/E	98	4 x 12Ø
CFA2/E	114	4 x 16Ø
CFA3/E	146	4 x 16Ø
CFA4/E	178	8 x 16Ø
CFA6/E	235	8 x 19Ø
CFA9/E	324	12 x 19Ø
CFA12/E	406	12 x 23Ø

Undrilling flanges

Cat.Ref.	DN	D	D1	D2	L
CFA0.5	12	80	25	28	6
CFA0.7	15	85	29	37	6
CFA1	25	115	43	51	10
CFA1.5	40	150	58	66	10
CFA2	50	165	70	81	12
CFA3	80	200	101	112	12
CFA4	100	220	134	148	12
CFA6	150	285	186	196	15
CFA9	225	395	260	282	15
CFA12	300	445	342	363	18



Drilled to ASA 150

Cat.Ref.	PCD	n x dØ
CFA0.5/A	62	4 x 7Ø
CFA0.7/A	62	4 x 7Ø
CFA1/A	79	4 x 12Ø
CFA1.5/A	98	4 x 12Ø
CFA2/A	121	4 x 16Ø
CFA3/A	152	4 x 16Ø
CFA4/A	190	8 x 16Ø
CFA6/A	241	8 x 19Ø
CFA9/A	298	8 x 19Ø
CFA12/A	432	12 x 23Ø

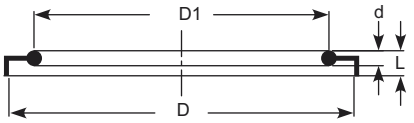
Drilled to Table F

Cat.Ref.	PCD	n x dØ
CFA0.5/F	67	4 x 7Ø
CFA0.7/F	67	4 x 7Ø
CFA1/F	87	4 x 16Ø
CFA1.5/F	105	4 x 16Ø
CFA2/F	127	4 x 16Ø
CFA3/F	165	8 x 16Ø
CFA4/F	190	8 x 16Ø
CFA6/F	260	12 x 19Ø
CFA9/F	356	12 x 23Ø
CFA12/F	438	16 x 23Ø

PTFE "O" RING WITH LOCKING COLLAR

These PTFE O rings are specially made to use as gaskets in glass fittings. These are provided with a collar which helps to locate it on the glass end correctly.

Cat.Ref.	DN	D	D1	d	L
TR0.5	12	26	18	3	5
TR0.7	15	28	17	3	5
TR1*	25	42	33	3	5
TR1.5*	40	57	48	3	5
TR2*	50	70	59	3	5
TR3*	80	100	88	3	5
TR4*	100	134	119	4	6
TR6*	150	186	168	4	6
TR9*	225	260	236	4	7
TR12*	300	342	318	4	7
TR16	400	467	435	6	7
TR18*	450	527	490	6	7
TR24	600	686	640	8	10
TR32	800	910	885	10	12

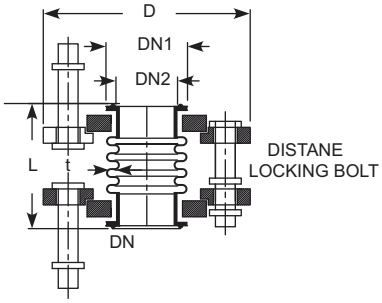


PTFE BELLOWS - GLASS TO GLASS

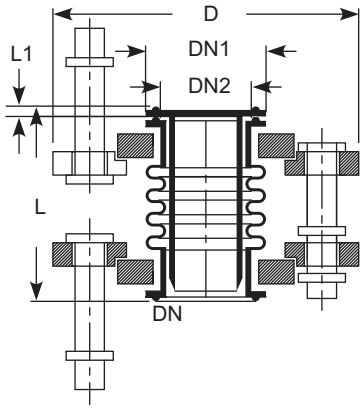
These bellows are used in installation of glass equipment for following purposes :
- to provide safe branching of pipelines from the main glass equipment.
- to accommodate odd degrees and variation in length.

Bellows are supplied along with required bellow flanges and nut-bolts.
Distance - locking bolts are provided to avoid excessive compression or contraction of the bellow. Gaskets are not required where bellows are used. For drilling details, refer "Bellow flanges"

Line bellows
These can withstand a temperature of 200°C under normal atmospheric conditions.



Cat.Ref.	DN	D	D1	D2	L
FBN0.5	12	50	24	16	50
FBN0.7	15	64	28	17	55
FBN1*	25	95	41	31	65
FBN1.5*	40	105	56	43	65
FBN2*	50	120	69	55	65
FBN3*	80	155	98	82	65
FBN4*	100	200	132	111	65
FBN6*	150	275	184	162	65
FBN9*	225	350	258	230	65
FBN12	300	420	340	308	65



Vacuum bellows

For pipelines of 80DN and above operating under vacuum, the bellows are provided with an internal sleeve which supports the convolutions without affecting the flexibility of the bellow. These bellows can withstand a temperature of 200° C under full vacuum.
For size upto 50DN, line bellows can be used for these applications

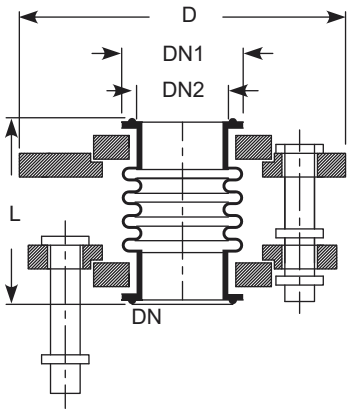
Cat.Ref.	DN	D	D1	D2	L	L1	t
VB3	80	155	98	82	70	5	3.0
VB4	100	200	132	111	70	5	3.5
VB6	150	275	184	162	70	5	4.0
VB9	225	350	253	230	70	5	5.0
VB12	300	420	338	308	70	5	5.0

PTFE BELLOWS - GLASS TO METAL

These bellows are used in installation of glass equipment for following purposes :

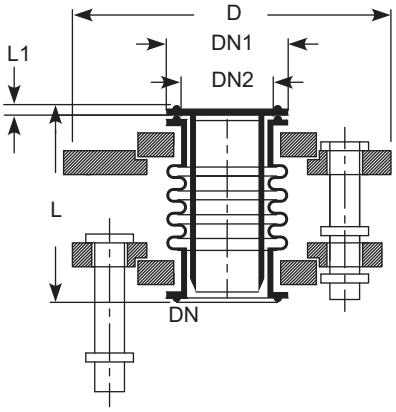
- to minimize the transfer of vibrations from the rotating equipments which are connected to the glass assembly.
- to accommodate the thermal expansion of any metallic (non-glass) equipment which are connected to the glass pipeline.

These are similar to the bellows for glass-to-glass in construction, but having adaptor bellow flange at one end.Generally this adaptor flange is supplied undrilled so that it can be drilled as per the configuration of mating flange. However, this adaptor bellow flange can be supplied drilled AS per "Table E", "Table F" or "ASA 150" standards, if Specified.



Line bellows

Cat.Ref. Undrilled	Cat.Ref. Table E	Cat.Ref. Table F	Cat.Ref. ASA 150	DN	D	L
FBF0.5	FBF0.5/E	FBF0.5/F	FBF0.5/A	12	80	50
FBF0.7	FBF0.7/E	FBF0.7/F	FBF0.7/A	15	85	55
FBF1*	FBF1/E	FBF1/F	FBF1/A	25	115	60
FBF1.5*	FBF1.5/E	FBF1.5/F	FBF1.5/A	40	150	65
FBF2*	FBF2/E	FBF2/F	FBF2/A	50	165	65
FBF3*	FBF3/E	FBF3/F	FBF3/A	80	200	65
FBF4*	FBF4/E	FBF4/F	FBF4/A	100	220	65
FBF6*	FBF6/E	FBF6/F	FBF6/A	150	285	65
FBF9*	FBF9/E	FBF9/F	FBF9/A	225	395	65
FBF12	FBF12/E	FBF12/F	FBF12/A	300	445	65



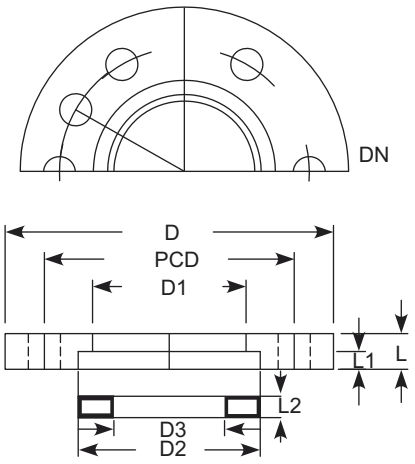
Vacuum bellows

Cat.Ref. Undrilled	Cat.Ref. Table E	Cat.Ref. Table F	Cat.Ref. ASA 150	DN	D	L
VBF3	VBF3/E	VBF3/F	VBF3/A	80	200	70
VBF4	VBF4/E	VBF4/F	VBF4/A	100	220	70
VBF6	VBF6/E	VBF6/F	VBF6/A	150	285	70
VBF9	VBF9/E	VBF9/F	VBF9/A	225	395	70
VBF12	VBF12/E	VBF12/F	VBF12/A	300	445	70

BELLOW FLANGES

Bellow flanges are used to fit a bellow to a glass component. Standard Bellow are made Cast Iron. Cast Iron with Epoxy Coated, Cast Iron with PTFE coated, Aluminum, Silumin, Stainless Steel, 304 & 316 and are used in FBV, VB, FB type bellows. These are provided with two holes at 180° for Distance - locking bolts and are supplied with a split ring.

Cat.Ref.	DN	D	D1	D2	D3	L	L1	L2
BF0.5	12	50	25	28	20	6	3	6
BF0.7	15	65	29	37	22	6	3	6
BF1*	25	95	43	51	33	7	3	6
BF1.5*	40	110	58	66	45	7	3	6
BF2*	50	120	70	81	57	7	3	6
BF3*	80	155	101	112	84	7	3	6
BF4*	100	200	134	148	113	8	3	6
BF6*	150	275	186	196	164	8	3	6
BF9*	225	350	260	282	234	8	3	6
BF12	300	425	342	363	310	10	5	8



Drilling details

Cat.Ref.	PCD	n x dØ	n x d1Ø
BF0.5	38	3 x 9Ø	2 x 9Ø
BF0.7	48	3 x 9Ø	2 x 9Ø
BF1	70	3 x 9Ø	2 x 9Ø
BF1.5	86	3 x 9Ø	2 x 9Ø
BF2	98	3 x 9Ø	2 x 9Ø
BF3	133	6 x 9Ø	2 x 9Ø
BF4	178	6 x 9Ø	2 x 9Ø
BF6	254	6 x 9Ø	2 x 9Ø
BF9	310	8 x 11Ø	2 x 11Ø
BF12	395	12 x 11Ø	2 x 11Ø

ADAPTOR BELLOW FLANGES

Adaptor bellow flange are used to fit a bellow to a flange having different bolt configuration. These flanges are made of cast iron and are supplied with a split ring.

These are particularly used to fit a bellow with a non-glass equipment like Glass-lined Reactor etc. These are used in FBF, VBF type PTFE bellows.

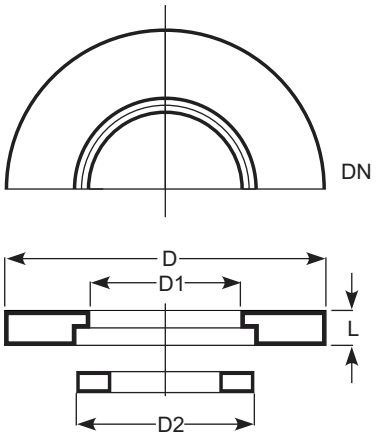
Adaptor bellow flanges are generally supplied undrilled. However, if specified , these can be supplied drilled as per "Table E", "Table F" and “ASA150" standards.

Undrilling flanges

Cat.Ref.	DN	D	D1	D2	L
BFA0.5	12	80	25	28	6
BFA0.7	15	85	29	37	6
BFA1*	25	115	43	51	7
BFA1.5*	40	150	58	66	7
BFA2*	50	165	70	81	7
BFA3*	80	200	101	112	7
BFA4*	100	220	134	148	8
BFA6*	150	285	186	196	8
BFA9*	225	395	260	282	8
BFA12	300	445	342	363	10

Drilled to Table E

Cat.Ref.	PCD	n x dØ
BFA0.5/E	62	4 x 7Ø
BFA0.7/E	62	4 x 7Ø
BFA1/E	82	4 x 12Ø
BFA1.5/E	98	4 x 12Ø
BFA2/E	114	4 x 16Ø
BFA3/E	146	4 x 16Ø
BFA4/E	178	8 x 16Ø
BFA6/E	235	8 x 19Ø
BFA9/E	324	12x19Ø
BFA12/E	406	12x23Ø



Drilled to Table F

Cat.Ref.	PCD	n x dØ
BFA0.5/F	67	4 x 7Ø
BFA0.7/F	67	4 x 7Ø
BFA1/F	87	4 x 16Ø
BFA1.5/F	105	4 x 16Ø
BFA2/F	127	4 x 16Ø
BFA3/F	165	8 x 16Ø
BFA4/F	190	8 x 16Ø
BFA6/F	260	12 x 19Ø
BFA9/F	356	12 x 23Ø
BFA12/F	438	12 x 23Ø

Drilled to ASA 150

Cat.Ref.	PCD	n x dØ
BFA0.5/A	62	4 x 7Ø
BFA0.7/A	62	4 x 7Ø
BFA1/A	79	4 x 16Ø
BFA1.5/A	98	4 x 16Ø
BFA2/A	121	4 x 19Ø
BFA3/A	152	4 x 19Ø
BFA4/A	190	8 x 19Ø
BFA6/A	241	8 x 19Ø
BFA9/A	298	8 x 19Ø
BFA12/A	432	12x23Ø

SUPPORT OF COLUMN

Glass plants and pipeline should be supported correctly. To prevent inducing undesirable stresses in the glass, support should be rigid. When supported, glass should be in compression.

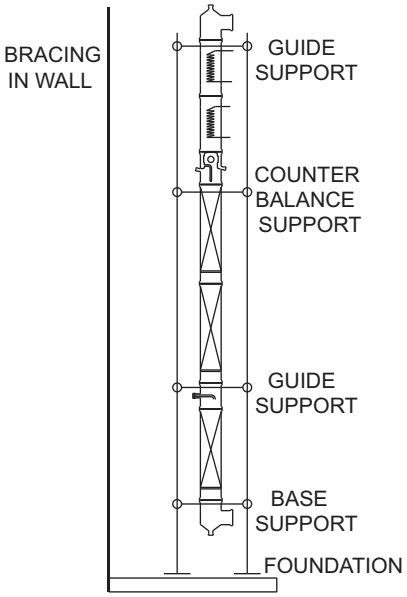
Generally, glass plant and equipment are supported in a rectangular tubular structure. This structure is formed of galvenised mild steel tubing with the cast iron fittings which are described in this catalogue. This type of structure provides enough flexibility for future modifications and is strong enough to support a glass unit.

Following rules should be followed while supporting a glass unit in a tubular structure.

1. The structure must be rigid. To give lateral support it must be braced back to the nearest wall or any rigid feature.

2. All glass columns are build up from a fixed point on which whole weight of the column should be taken. If total loads exceeds the permissible limits, counter balance supports should be used to releive excessive weight.

3. With change in temperature, glass column and tubular structure expands at different rate. Therefore glass unit must be free for vertical movement above the fixed point. Hence, above the fixed point, guides supports should be used to give lateral support.



STRUCTURE TUBES,

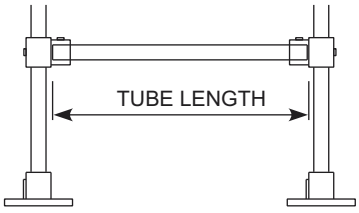
For forming the structure,"B" class galvanised tubes, Mild Steel with Epoxy Coated, Stainless Steel 304 & 316 are used in size of 1/2", 1", 1.1/4", 1.1/2" and 2". Cut tubes are available in required length to form a standard size structure. Cut tubes areprovided with rubber plug at both the ends.

Tube size

NB Inches	NB mm	External Diameter
1/2"	15	19.5
1"	25	32.5
1.1/4"	30	41.5
1.1/2"	40	48.3
2"	50	60.3

Available cut lengths

Structure	NB (mm)				
Dimension	15*	25*	30*	40*	50*
For Vertical installation					
2500	-	2500	-	-	-
3000	-	3000	3000	-	-
3500	-	3500	3500	-	-
4000	-	-	4000	-	-
000	-	6000	6000	6000	6000
For Frames					
400	-	365	355	345	335
500	-	465	455	445	435
600	-	565	555	545	535
800	-	765	755	745	735
1000	-	965	955	945	935
1200	-	1165	1155	1145	1135
1500	-	1465	1455	1445	1435
For Frames					
400	435	445	445	455	465
500	535	545	545	555	565
600	635	645	645	655	665
800	835	845	845	855	865
1000	1035	1045	1045	1055	1065
1200	1235	1245	1245	1255	1265
1500	1535	1545	1545	1555	1565



STRUCTURE DIMENSION

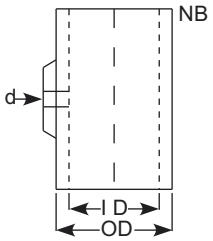
Cat. Ref. TBG (NBmm/Cut length)
for e.g. TBG 25/365

SUPPORT FITTINGS

Following structure fittings are available to use with galvanised tubes in order to form a tubular structure for aglass plant. These fittings are made of cast iron. Also available in Stainless Steel 304 & 316 and aresuitable to the galvanised tubes described earlier.

These slidable fittings are provided with grub screws to fix it at required position on a galvanised tube.

These fittings are specially made to construct a tubular structure which provides enough flexibility for future modifications without involving any hammering and welding.



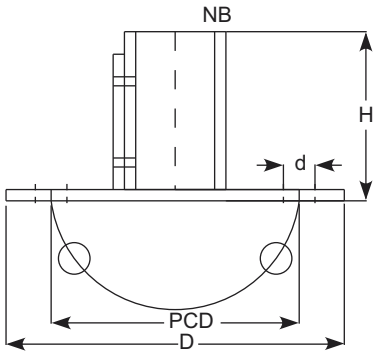
STRUCTURE FITTINGS -
GENERAL DATA

NB	TUBE DIA	ID	OD	d
25	32.5	35	45	1/2"
30	42.5	45	55	1/2"
40	48.3	51	61	1/2"
50	60.3	63	73	1/2”

STRUCTURE FITTINGS -
BASE

These are to be used with vertical tubes. Holes are provided for foundation.

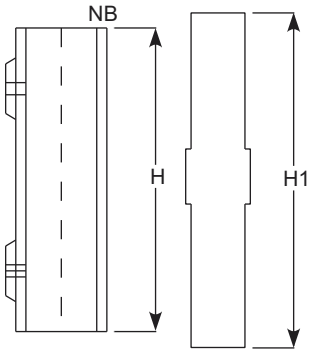
Cat.Ref.	NB	D	H	PCD	dØ
BS25*	25	150	75	110	4 x 14Ø
BS30*	30	150	75	110	4 x 14Ø
BS40	40	150	75	110	4 x 14Ø
BS50	50	175	75	125	4 x 14Ø



STRUCTURE FITTINGS -
COUPLER

These are generally used to couple the vertical tubes where more length is require.

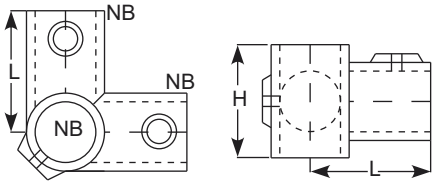
Cat.Ref.	NB	H	H1
CL25	25	150	200
CL30	30	150	200
CL40	40	150	200
CL50	50	150	200



STRUCTURE FITTINGS -
BEND

These are used to build frames on vertical tubes.

Cat.Ref.	NB	H	L
BN 25*	25	50	55
BN30*	30	65	70
BN40	40	70	80
BN50	50	85	95

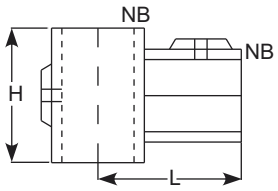


STRUCTURE AND SUPPORTS

STRUCTURE FITTINGS -

TEE

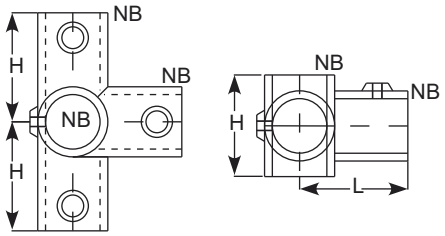
Cat.Ref.	NB	H	L
T25*	25	50	55
T30*	30	65	70
T40	40	70	80
T50	50	85	95



STRUCTURE FITTINGS -

DOUBLE BEND

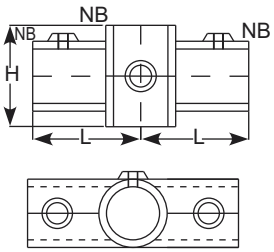
Cat.Ref.	NB	H	L
BN 25	25	50	55
BN30	30	65	70
BN40	40	70	80
BN50	50	85	95



STRUCTURE FITTINGS -

DOUBLE TEE

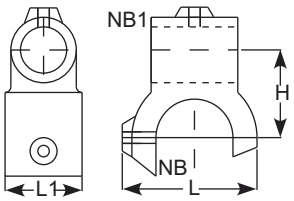
Cat.Ref.	NB	H	L
DT25	25	50	55
DT30	30	65	70
DT40	40	70	80
DT50	50	85	95



STRUCTURE FITTINGS -

EQUAL BRACKET

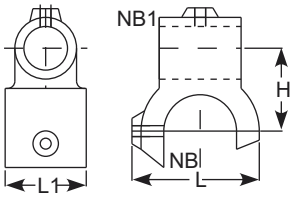
Cat.Ref.	NB	H	L	L1
EBT25*	25	40	65	50
EBT30*	30	52	75	60
EBT40	40	62	85	60
EBT50	50	72	95	60



STRUCTURE FITTINGS -

UNEQUAL BRACKET

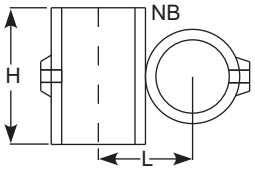
Cat.Ref.	NB	NB1	H	L	L1
UBT25/15*	25	15	35	65	50
UBT30/15*	30	15	40	75	60
UBT40/25	40	25	50	85	60
UBT50/25	50	25	55	95	60



STRUCTURE FITTINGS -

CROSS

Cat.Ref.	NB	H	L
X25	25	50	45
X30	30	65	55
X40	40	65	70
X50	50	65	85

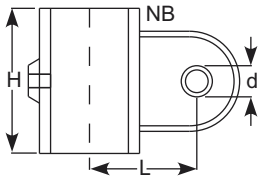


STRUCTURE AND SUPPORTS

STRUCTURE FITTINGS -

SUPPORT

Cat.Ref.	NB	h	L	d
SPT15*	15	40	35	13
SPT25*	25	55	50	13
SPT30*	30	55	57	13
SPT40	40	55	62	13
SPT50	50	55	67	13

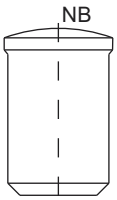


STRUCTURE FITTINGS -

PLUGS

These are used to plug the open ends of galvanised tubes.

Cat. Ref.	NB
PLUG15	15
PLUG25	25
PLUG30	30
PLUG40	40
PLUG59	50

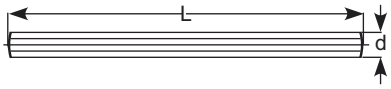


STRUCTURE FITTINGS -

STUDS

These are used as screwed rods with supports

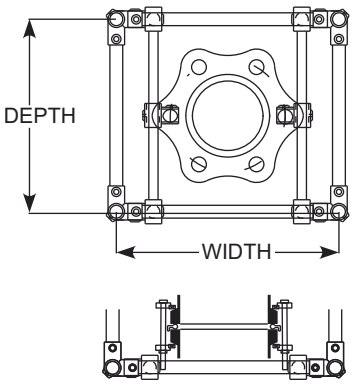
Cat.Ref.	d	L
STUD5/16-150	5/16”	150
STUD3/8-150	3/8”	150
STUD1/2-200	1/2”	200



STRUCTURE DIMENSIONS

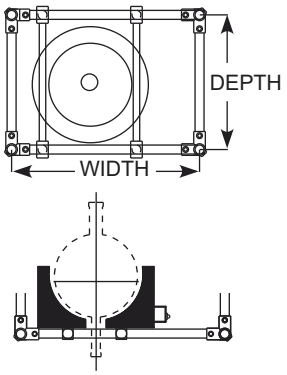
FOR COLUMNS

DN	Recommended tube size NB (mm)	Minimum Structure size Depth X Width
80	25	500 x 500
100	25	500 x 500
150	25,30	600 x 600
225	30	800 x 800
300	30	800 x 800
400	30	1000 x 1000
450	30,40	1000 x 1000
600	40,50	1200 x 1200



FOR VESSELS (IN HEATING MENTLES)

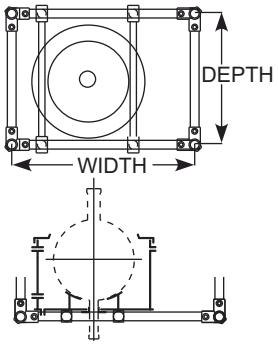
Size (Litres)	Recommended tube size NB (mm)	Minimum Structure size Depth X Width
20	25	400 x 600
50	25	600 x 800
100	25,30	800 x 800
200	30	800 x 1000



STRUCTURE AND SUPPORTS

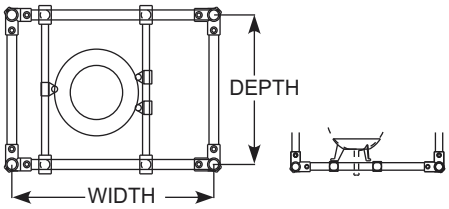
FOR VESSELS (IN HEATING BATHS)

Size (Litres)	Recommended tube size NB (mm)	Minimum Structure size Depth X Width
20	25	500 x 600
50	25	600 x 800
100	25,30	800 x 1000
200	30	800 x 1200



FOR VESSELS (IN VESSEL HOLDERS)

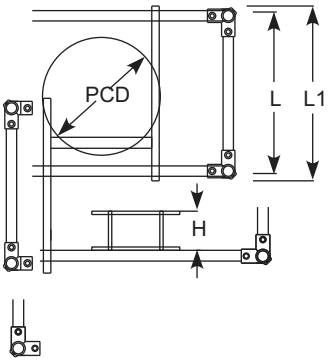
Size (Litres)	Recommended tube size NB (mm)	Minimum Structure size Depth X Width
20	25	500 x 600
50	25	600 x 800
100	25,30	1000 x 1000
200	30	1000 x 1000



COLUMN BASE SUPPORT FRAMES

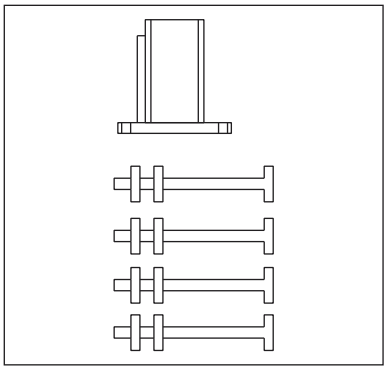
These channel frames are used as fixed support in erection of columns. These are supplied with full threaded jacking rods and U bolts.

Cat.Ref.	PCD	L1	L	H
FCSH225	310	1000	800	75
FCSH300	395	1000	800	75
FCSH400	495	1200	1000	75
FCSH450	585	1200	1000	100
FCSH600	710	1400	1200	100

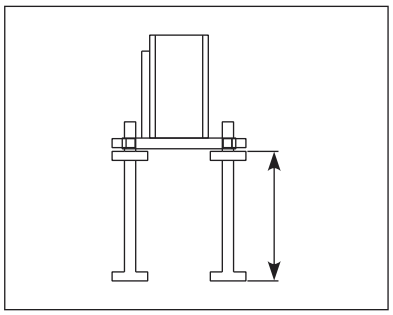


STRUCTURE AND SUPPORTS

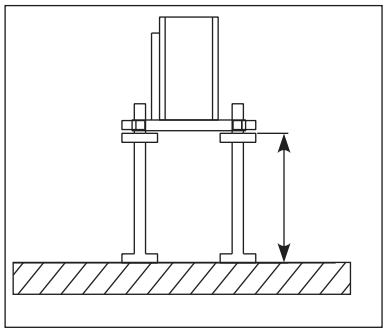
GROUTING OF BASE



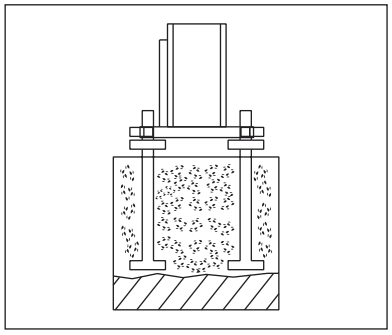
1.
Take one Cast Iron BASE and four foundation Bolts, each with 2 nuts.



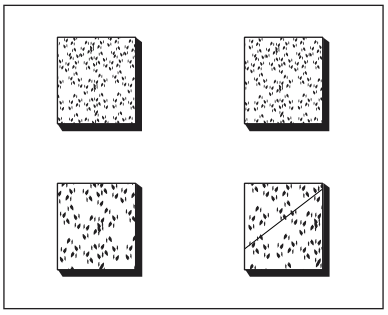
2.
Fit the bolts in BASE so that base is raised upto 150mm from head of bolts.



3.
Put this assembly on the floor and prepare a rough surface for proper bonding of grouting.



4.
Make a concrete block over the bolts of about 200 x 200 mm upto the base of BASE i.e. 150mm high.



5.
Prepare separate block for each BASE instead of making one big common block. For all BASES.

* marked items are available fast.

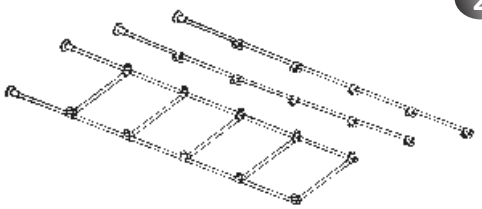
STRUCTURE AND SUPPORTS

ASSEMBLING OF STRUCTURE

1. Mark the position of required fittings on all the Vertical tubes,slide them in correct sequence and lightly Tighten.
2. Assemble one side frame of the structure by adding the crosstubes between two vertical tubes.
3. Assemble other side frame of the structure by adding the crosstubes between other two vertical tubes.
4. Build up the cross tubes in one side frame and Tighten lightly.
5. Add the other side frame on it and tighten all the fittings firmly.
6. Hoist the structure and brace it to some existing rigid feature.
7. Grout the foundation bolts and fix the structure bases with that.
8. Adjust bracing to obtain a correct plumb in Structure.
9. Adjust the horizonatal frames in correct level.
10. Assemble the support tubes at their positions.

1

2



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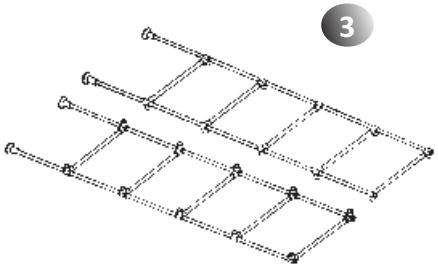

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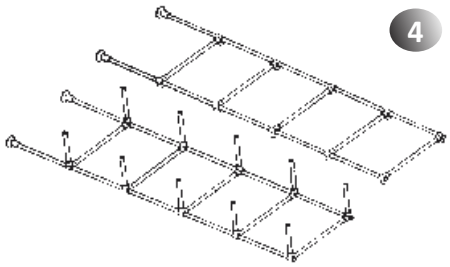

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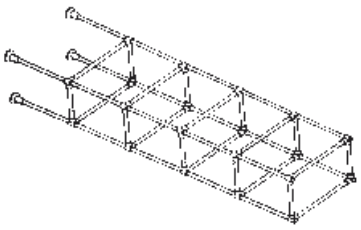

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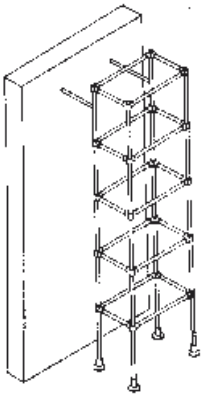

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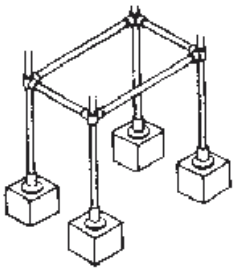

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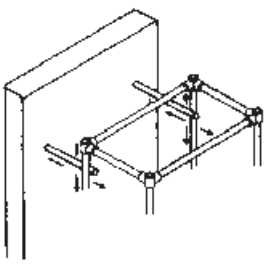

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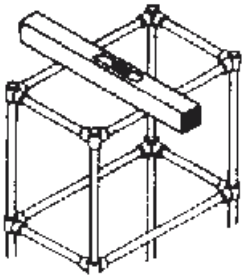

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