

## 6. COUPLINGS AND GASKETS



COUPLINGS AND GASKETS

# COUPLINGS & GASKETS

## INTRODUCTION

In this section we have covered couplings to join glass process plant and pipeline components with other metal equipments.

The complete coupling includes two flanges, two inserts, the necessary numbers of nuts, and bolts to join them together.

The couplings designed for use with glass process plant and components are of major importance from two main point of view.

- ☞ They must ensure that the bolt load applied to the joint is sufficient to make an effective seal whilst not inducing undue stress in the glass.
- ☞ They must be totally reliable in all service conditions.

## COMPLETE COUPLING

A Complete coupling consists of two backing flanges, two inserts and the appropriate number of nuts, bolts with PTFE 'O' ring. It is a complete set of flanges required to make a joint.

BACKING FLANGES			INSERT		NUT & BOLTS			CAT. REF.
DN	CAT. REF.	QTY.	CAT. REF.	QTY.	D	L	QTY.	
15	ACF07	2	ACN07	2	5/16"	2.5"	3	ACT07
25	ACF1	2	ACN1	2	5/16"	2.5"	3	ACT 1
40	ACF 1.5	2	ACN 1.5	2	5/16"	2.5"	3	ACT 1.5
50	ACF 2	2	ACN 2	2	5/16"	2.5"	3	ACT 2
80	ACF 3	2	ACN 3	2	5/16"	3.5"	6	ACT 3
100	ACF 4	2	ACN 4	2	5/16"	3.5"	6	ACT 4
150	ACF 6	2	ACN 6	2	3/8"	3.5"	6	ACT 6
225	ACF 9	2	ACN 9	2	3/8"	5"	8	ACT 9
300	ACF 12	2	ACN 12	2	3/8"	5"	12	ACT 12
400	ACF 16	2	ACN 16	2	1/2"	8"	12	ACT 16
450	ACF 18	2	ACN 18	2	1/2"	8"	12	ACT 18
600	ACF 24	2	ACN 24	2	1/2"	8"	12	ACT 24

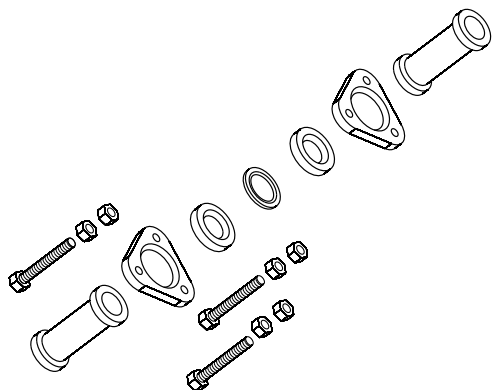
\* DN is the nominal size of coupling .

## QUICK RELEASE COUPLING

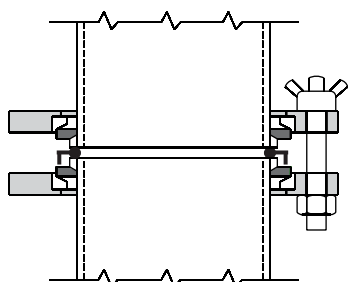
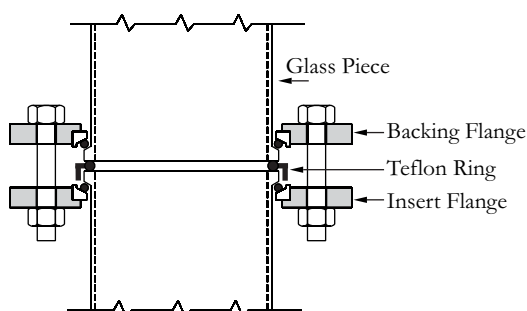
There are always applications where there is a need to open or close a coupling easily without using tools. Charging reaction vessels are an example of this. Quick release couplings provide this facility whilst securing the lower backing flange against falling down.

The flanges one of which has slotted bolt holes remains fixed on the glass and are separated by means of hinged quick release bolts and wingnuts.

Depending upon the frequency of opening, the sealing gasket may need regular renewal.



ASSEMBLY OF STANDARD  
FLAT JOINT ENDS



## BACKING FLANGE

Backing flange forms an intergral part of the complete couplings detailed earlier in this chapter. Up to and including DN 450 it is one-piece unit and for DN-600 the flange is available in two pieces.

Baking flange is made from cast iron and is used with insert.

DN	D	H	P.C.D.	d x N	TYPE	CAT. REF.
15	70	10	50	6 X 3	A	ACF07
25	90	10	70	9 x 3	A	ACF1
40	105	10	86	9 x 3	A	ACF 1.5
50	120	11	98	9 x 3	A	ACF 2
80	155	12	133	9 x 6	A	ACF 3
100	200	14	178	9 x 6	A	ACF 4
150	280	15	254	11 x 6	A	ACF 6
225	335	29	310	11 x 8	B	ACF 9
300	420	35	394	11 x 12	B	ACF 12
400	525	22	495	12 x 12	A	ACF 16
450	630	38	585	14 x 12	B	ACF 18
600	745	48	710	14 x 12	B	ACF 24

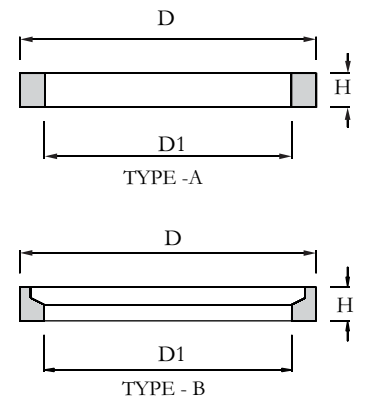
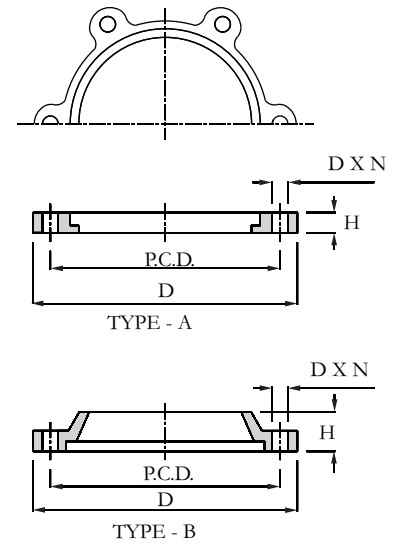
\* Stainless steel (S.S.) flanges can be made on request basis.

## INSERT

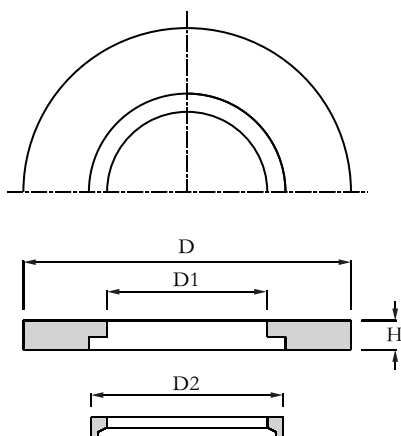
Insert is fitted between the flange and the glass buttress end and should always be renewed if a joint is dismantled.

Spilt ring type insert is used with backing flanges. It is made of cast iron asbestos rope. Non asbestos PTFE impregnated rope cab be supplied on request. Insert from ruber material can also be supplied on request.

DN MM	D MM	D1 MM	H MM	TYPE	CAT. REF.
15	34	22	8	A	ACN07
25	50	36	8	A	ACN1
40	65	50	8	A	ACN 1.5
50	79	62	8	A	ACN 2
80	110	92	8	A	ACN 3
100	146	122	8	A	ACN 4
150	197	174	10	A	ACN 6
225	275	240	10	A	ACN 9
300	359	322	10	A	ACN 12
400	474	431	12	A	ACN 16
450	555	500	18	A	ACN 18
600	684	634	18	B	ACN 24



# COUPLINGS & GASKETS



## ADAPTOR BACKING FLANGE

This flange is used to connect a glass component to a flange on other equipment where different bolt configurations and/or drilled PCD's are required. This flange is made of cast iron and supplied with a split ring.

Aluminium flange can also be supplied on request. Please mention Cat.Ref. ACFA for cast iron and AAFC for aluminium flange.

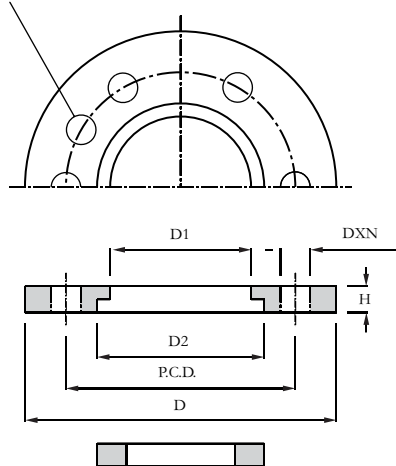
Adaptor backing flange is generally supplied un-drilled. However, if specified, this can be supplied drilled as per "Table E/F/ASA150" standards.

## UNDRILLED FLANGE

DN MM	D MM	D1 MM	D2 MM	H MM	CAT. REF.
15	70	29	30	10	ACFA07
25	115	43	51	10	ACFA 1
40	150	58	66	10	ACFA 1.5
50	165	70	81	12	ACFA 2
80	200	101	112	12	ACFA 3
100	220	134	148	12	ACFA 4
150	285	186	196	15	ACFA 6
225	395	260	282	15	ACFA 9
300	445	342	363	18	ACFA 12

DRILLED TABLE - E			DRILLED TABLE - F			DRILLED TABLE - ASA150		
CAT.REF.	PCD	n x D $\phi$	CAT.REF.	PCD	n x D $\phi$	CAT.REF.	PCD	n x D $\phi$
ACFA07/E	67	4 x 12 $\phi$	ACFA07/F	67	4 x 16 $\phi$	ACFA07/A	60	4 x 12 $\phi$
ACFA 1/E	82	4 x 12 $\phi$	ACFA 1/F	87	4 x 16 $\phi$	ACFA 1/A	79	4 x 12 $\phi$
ACFA 1.5/E	98	4 x 12 $\phi$	ACFA 1.5/F	105	4 x 16 $\phi$	ACFA 1.5/A	98	4 x 12 $\phi$
ACFA 2/E	114	4 x 16 $\phi$	ACFA 2/F	127	4 x 16 $\phi$	ACFA 2/A	121	4 x 16 $\phi$
ACFA 3/E	146	4 x 16 $\phi$	ACFA 3/F	165	8 x 16 $\phi$	ACFA 3/A	152	4 x 16 $\phi$
ACFA 4/E	178	8 x 16 $\phi$	ACFA 4/F	190	8 x 16 $\phi$	ACFA 4/A	190	8 x 16 $\phi$
ACFA 6/E	235	8 x 19 $\phi$	ACFA 6/F	260	12 x 19 $\phi$	ACFA 6/A	241	8 x 19 $\phi$
ACFA 9/E	324	12 x 19 $\phi$	ACFA 9/F	356	12 x 23 $\phi$	ACFA 9/A	298	8 x 19 $\phi$
ACFA 12/E	406	12 x 23 $\phi$	ACFA 12/F	438	16 x 23 $\phi$	ACFA 12/A	432	12 x 23 $\phi$

Locking Bolt



## BELLOW FLANGE

Bellow flange is used to fit a bellow to a glass component. This is made of cast iron and is used in AFBN, AVB, AFB type of bellows.

This is provided with a split ring.

DN	D	D1	D2	PCD	d X N	H	CAT. REF.
15	60	30	34	50	9 x 3	8	ABF07
25	90	44	54	70	9 x 3	8	ABF 1
40	105	59	66	86	9 x 3	9	ABF 1.5
50	121	71	80	98	9 x 3	10	ABF 2
80	155	102	115	133	9 x 6	10	ABF 3
100	200	135	146	178	9 x 6	10	ABF 4
150	274	186	202	254	10 x 6	10	ABF 6
225	340	260	275	310	10 x 8	11	ABF 9
300	425	340	363	394	11 x 12	15	ABF 12

Aluminum and S.S. flanges can be supplied on request.

## ADAPTOR BELLOW FLANGE

This flange is made of cast iron and supplied with a split ring.

Aluminium flange can also be supplied on request. Please mention Cat.Ref. ACFA for cast iron and AAFC for aluminium flange.

Adaptor backing flange is generally supplied un-drilled. However, if specified, it can be supplied drilled as per "Table E/F/ASA150" standards.

## UNDRILLED FLANGE

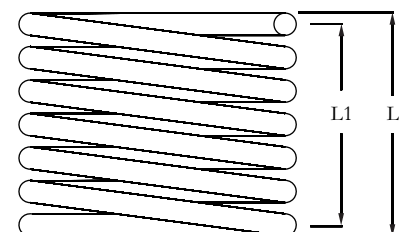
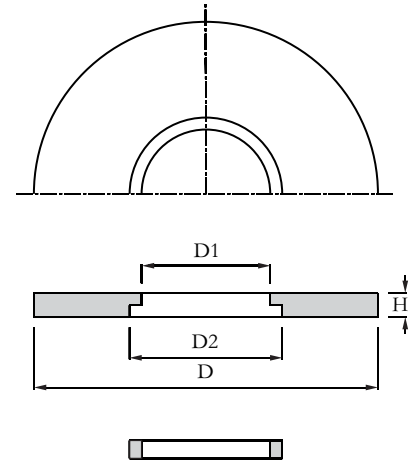
DN MM	D MM	D1 MM	D2 MM	H MM	CAT. REF.
15	70	29	30	7	ABFA07
25	115	44	53	7	ABFA 1
40	150	59	65	9	ABFA 1.5
50	165	70	81	8	ABFA 2
80	200	104	115	9	ABFA 3
100	220	133	149	9	ABFA 4
150	285	189	204	11	ABFA 6
225	395	261	280	12	ABFA 9
300	445	342	363	12	ABFA 12

DRILLED TABLE -E			DRILLED TABLE -F			DRILLED TABLE -ASA150		
CAT.REF.	PCD	n x D $\emptyset$	CAT.REF.	PCD	n x D $\emptyset$	CAT.REF.	PCD	n x D $\emptyset$
ABFA07/E	67	4 x 12 $\emptyset$	ABFA07/F	67	4 x 16 $\emptyset$	ABFA07/A	60	4 x 12 $\emptyset$
ABFA 1/E	82	4 x 12 $\emptyset$	ABFA 1/F	87	4 x 16 $\emptyset$	ABFA 1/A	79	4 x 12 $\emptyset$
ABFA 1.5/E	98	4 x 12 $\emptyset$	ABFA 1.5/F	105	4 x 16 $\emptyset$	ABFA 1.5/A	98	4 x 12 $\emptyset$
ABFA 2/E	114	4 x 16 $\emptyset$	ABFA 2/F	127	4 x 16 $\emptyset$	ABFA 2/A	121	4 x 16 $\emptyset$
ABFA 3/E	146	4 x 16 $\emptyset$	ABFA 3/F	165	8 x 16 $\emptyset$	ABFA 3/A	152	4 x 16 $\emptyset$
ABFA 4/E	178	8 x 16 $\emptyset$	ABFA 4/F	190	8 x 16 $\emptyset$	ABFA 4/A	190	8 x 16 $\emptyset$
ABFA 6/E	235	8 x 19 $\emptyset$	ABFA 6/F	260	12 x 19 $\emptyset$	ABFA 6/A	241	8 x 19 $\emptyset$
ABFA 9/E	324	12 x 19 $\emptyset$	ABFA 9/F	356	12 x 23 $\emptyset$	ABFA 9/A	298	8 x 19 $\emptyset$
ABFA 12/E	406	12 x 23 $\emptyset$	ABFA 12/F	438	16 x 23 $\emptyset$	ABFA 12/A	432	12 x 23 $\emptyset$

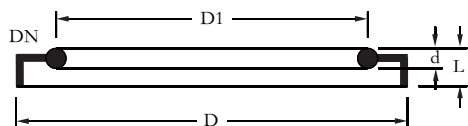
## COMPRESSION SPRING

Compression spring is used to set the correct bolt load and to maintain it after the gasket has settled, thus ensuring that the coupling remains leak-free. Standard compression spring has a corrosion resistant coating and is also available in stainless steel.

DN	FREE L	INSTALLED L1	CAT. REF.
25 - 100	14.5	11.0	ADF 8.5
150 - 300	22.0	18.0	ADF 10.5
450 - 600	28.7	22.7	ADF 13



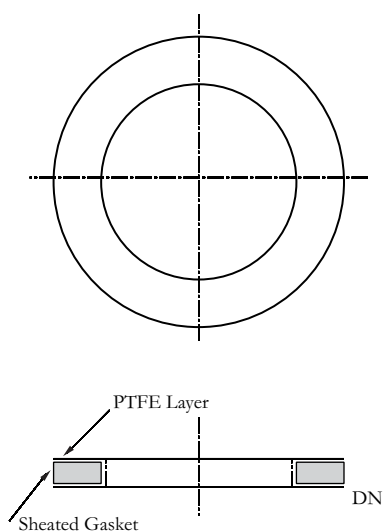
# COUPLINGS & GASKETS



## PTFE 'O' RING

PTFE 'O' ring is the most widely used gaskets in glass fittings. It is provided with a locking collar which helps to lock the two glass surfaces correctly.

DN MM	D MM	D1 MM	d MM	L MM	CAT. REF.
15	29	23	3	5	ATR07
25	42	33	3	5	ATR 1
40	57	48	3	5	ATR 1.5
50	70	59	3	5	ATR 2
80	100	88	3	5	ATR 3
100	134	119	4	6	ATR 4
150	186	168	4	6	ATR 6
225	260	236	4	7	ATR 9
300	342	318	4	7	ATR 12
400	467	455	6	7	ATR16
450	537	490	6	7	ATR 18
600	686	640	8	10	ATR 24



## PTFE SHEATHED GASKET

This gasket takes the form of a PTFE sheath fitted over a compressed asbestos fiber gasket. When using this type of gasket, a higher bolting force is required for DN 450 and above. Please consult our Technical Department for further information.

DN	CAT. REF.
25	ATMP 1
40	ATMP 1.5
50	ATMP 2
80	ATMP 3
100	ATMP 4
150	ATMP 6
225	ATMP 9
300	ATMP 12
450	ATMP 18
600	ATMP 24

## PTFE BELLOW

PTFE bellow is an important support in the construction of glass plant and pipeline. It can be used to compensate for different thermal movement between glass and associated equipments, absorb vibrations from associated equipments or foundations. In particular, bellow can be used for connecting glass to other material.

When bellow is used, the support and restraint of the glass should be such that the force resulting from pressure/vacuum in the pipeline and forces resulting from movement of the bellows do not result in undue stresses in the glass.

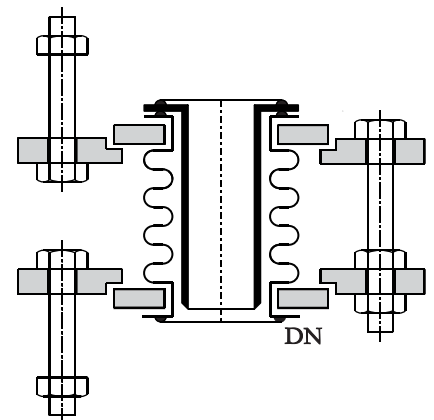
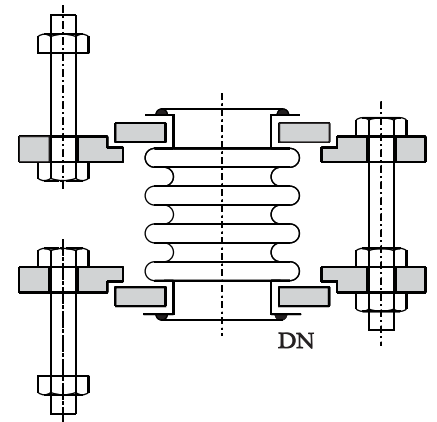
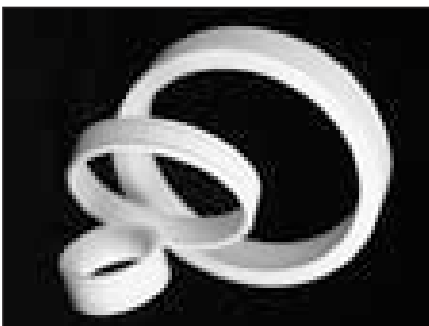
The maximum operating temperature for PTFE bellow is 200°C. Bellow DN 80 and above should not be used under vacuum. For such application we recommend the use of vacuum bellow as detailed on the following page.

Permissible operating conditions for ABFN bellow

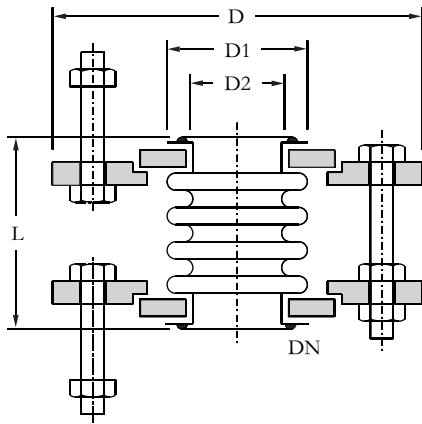
DN	Permissible operating pressures (bar. g)				200 °C
	20°C	100°C	160°C	200 °C	
15	-1 / +4	-1 / +3	-1 / +1,5	unpressurised	
25	-1 / +4	-1 / +3	-1 / +1,5		
40	-1 / +4	-1 / +3	-1 / +1,5		
50	-1 / +4	-1 / +2	-1 / +1		
80	-1 / +3	-1 / +2	0 / +1		
100	-1 / +2	-1 / +2	0 / +1		
150	-1 / +2	-1 / +1,5	0 / +0,7		
200	-1 / +1	-1 / +1	0 / +0,5		
300	-1 / +1	-1 / +0,7	0 / +0,3		

Permissible operating conditions for AVBN bellow

DN	Permissible operating pressures (bar. g)				200 °C
	20°C	100°C	160°C	200 °C	
80	-1 / +3	-1 / +2	-1 / +1	unpressurised	
100	-1 / +2	-1 / +2	-1 / +1		
150	-1 / +2	-1 / +1,5	-1 / +0,7		
200	-1 / +1	-1 / +1	-1 / +0,5		
300	-1 / +1	-1 / +0,7	-1 / +0,3		



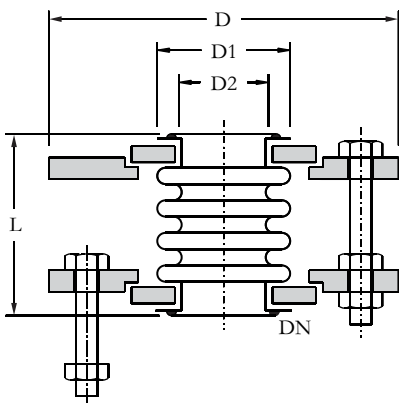
# COUPLINGS & GASKETS



## PTFE BELLOWS FOR CONNECTING GLASS TO GLASS (LINE BELLOWS)

DN	D	D1	D2	L	CAT. REF.
15	65	28	21	60	AFBN1
25	95	41	31	60	AFBN 1
40	105	56	43	60	AFBN 1.5
50	121	69	55	60	AFBN 2
80	155	98	82	65	AFBN 3
100	200	132	111	65	AFBN 4
150	274	184	162	65	AFBN 6
225	340	258	230	65	AFBN 9
300	425	340	308	65	AFBN 18

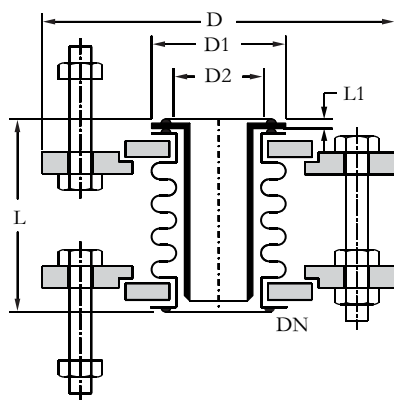
\*Tolerances for above bellows in length is  $\pm 3\text{mm}$ .



## PTFE BELLOWS FOR CONNECTING GLASS TO OTHER MATERIALS (LINE BELLOWS)

DN	D	D1	D2	L	CAT. REF.
15	65	28	21	60	AFBF1
25	95	41	31	60	AFBF 1
40	105	56	43	60	AFBF 1.5
50	121	69	55	60	AFBF 2
80	155	98	82	65	AFBF 3
100	200	132	111	65	AFBF 4
150	274	184	162	65	AFBF 6
225	340	258	230	65	AFBF 9
300	425	340	308	65	AFBF 18

\*Tolerances for above bellows in length is  $\pm 3\text{mm}$ .



## PTFE VACUUM BELLOWS FOR CONNECTING GLASS TO GLASS (VACUUM BELLOWS)

DN	D	D1	D2	L	L1	CAT. REF.
80	155	98	82	70	5	AVBN 3
100	200	132	111	70	5	AVBN 4
150	275	184	162	70	5	AVBN 6
225	350	258	230	70	5	AVBN 9
300	425	340	308	70	5	AVBN 12

\*Tolerances for above bellows in length is  $\pm 3\text{mm}$ .



**PTFE VACUUM BELLOW FOR CONNECTING GLASS TO OTHER MATERIALS ( VACUUM BELLOW )**

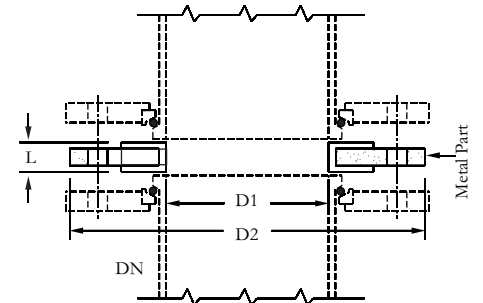
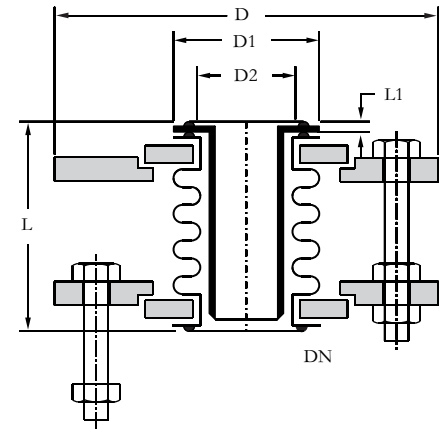
DN	D	D1	D2	L	L1	CAT. REF.
80	155	98	82	70	5	AVBF 3
100	200	132	111	70	5	AVBF 4
150	275	184	162	70	5	AVBF 6
225	350	258	230	70	5	AVBF 9
300	425	340	308	70	5	AVBF 12

Note: Bellows can be supplied with undrilled adaptor flanges. However, if specified, these bellows can be supplied drilled as per "Table E", Table F" and "ASA150" Standards.\* Tolerances for above bellows in length is  $\pm 3\text{mm}$  and diameter as per the glass buttress end tolerance as given in Technical Information.

**ADAPTOR PLATE FOR REACTORS.**

This component is used as interface spacer when connecting glass flat buttress end component to other process plant, pipeline and glass-lined reaction vessel. A combination of steel, rubber and PTFE provide an ideal sealing surface with only PTFE coming into contact with the process fluids to maintain resistance to corrosion.

DN	CAT. REF.
25	AEMP 1
40	AEMP 1.5
50	AEMP 2
80	AEMP 3
100	AEMP 4
150	AEMP 6
225	AEMP 9
300	AEMP 12
450	AEMP 18
600	AEMP 24



## NOTES

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---