



*Borolab*  
*Scientific Glass Pvt. Ltd.*

## **COLUMN COMPONENTS**

In many operations like reaction, extraction and absorption, the transparency of glass is a particular advantage. For such processes a range of column components are available in Borosilicate glass which offers many advantages like :

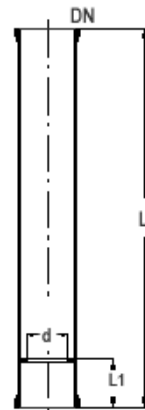
- ✧ Inert to almost all chemicals hence no risk of contamination.
- ✧ Transparency allows visual monitoring of the process, flow patterns, colour changes, etc.
- ✧ Almost universal resistance to corrosion.
- ✧ Smooth surface permits easy cleaning and prevents fouling.

## **MEASUREMENT & CONTROLS**

In this part we have introduced equipment for efficient measure and control like Digital Temperature Indicators and Controllers, Electromagnets and timers for reflux control and Liquid level controller.

## COLUMN SECTIONS

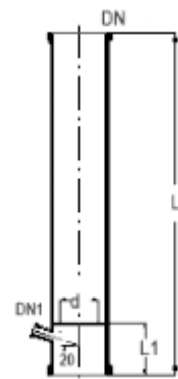
Cat. Ref	DN	L	L1	Minimum packing Size	Usual packing Size
BCS3/1000	80	1000	75	9	12
BCS4/1000	100	1000	75	12	15
BCS6/1000	150	1000	100	15	25
BCS6/1500	150	1500	100	15	25
BCS9/1000	225	1000	100	20	25
BCS9/1500	225	1500	100	20	25
BCS12/1000	300	1000	125	25	25
BCS12/1500	300	1500	125	25	25
BCS16/1000	400	1000	150	25	25
BCS16/1500	400	1500	150	25	25
BCS18/1000	450	1000	150	25	25
BCS18/1500	450	1500	150	25	25
BCS24/1000	600	1000	200	40	40



Column can be constructed either by using pipe sections with support support plates or using column sections with packing supports.

Column sections are provided with fused shelf where packing support can rest.

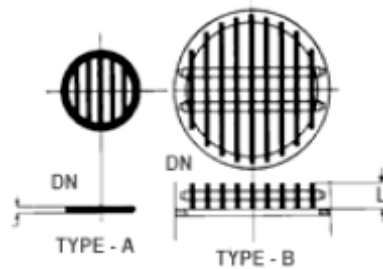
## COLUMN SECTIONS WITH THERMOMETER BRANCH



Cat. Ref.	DN	DN1	L	L1	d
BCST3/1000	80	25	1000	150	50
BCST4/1000	100	25	1000	150	75
BCST6/1000	150	25	1000	150	125
BCST6/1500	150	25	1500	150	125
BCST9/1000	225	25	1000	150	175
BCST9/1500	225	25	1500	150	175
BCST12/1000	300	25	1000	150	250
BCST12/1500	300	25	1500	150	250
BCST16/1000	400	25	1000	200	250
BCST16/1500	400	25	1500	200	350
BCST18/1000	450	25	1000	200	400
BCST18/1500	450	25	1500	200	400

Above column sections can be provided with a thermometer branch below the packing shelf at 20 slope.

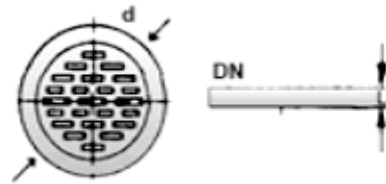
## PACKING SUPPORTS



Cat. Ref	DN	L	Cross Section Area	Max. Load Kgs.	Minimum Packing Size	Type
BCP3	80	10	45%	10	12	A
BCP4	100	12	50%	15	15	A
BCP6	150		55%	30	25	A
BCP9	225	19	60%	50	25	A
BCP12	300	19	65%	75	25	A
BHD16	400	70	70%	150	25	B
BHD18	450	70	70%	200	25	B
BHD24	600	95	70%	300	40	B

Packing supports Type A are made of fused glass rods. packing supports Type B (heavy duty) are made of glass plates vertically arranged and tied with PTFE tie rods.

## PTFE PERFORATED PLATES

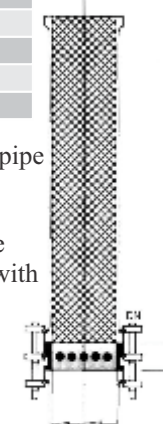


Cat. Ref.	DN	d	L
BTCP3	80	99	7
BTCP4	100	132	9
BTCP6	150	184	10
BTCP9	225	254	12
BTCP12	300	340	16

These are used as packing retainers to prevent the packing from lifting due to vapour velocity. These can be clamped between two components without using any gasket.

## SUPPORT PLATE ASSEMBLY

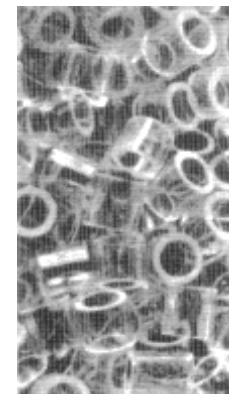
Cat. Ref	DN	L	Cross Section Area	Max. Load Kgs.	Suitable Packing Size
BLBE3	80	25	70%	20	12
BLBE4	100	25	70%	30	15
BLBE6	150	50	70%	60	25
BLBE9	225	50	80%	90	25
BLBE12	300	50	90%	150	25



Support plate assembly can be coupled with a pipe section (PS) so as to use the pipe section as a column section and to fill packing into it. This system provides following advantages over the conventional system of using column section with a packing support.

- Higher cross section area.
- More packing height.
- No separate inventory of column sections.
- Delivery period of pipe sections are shorter.

## COLUMN PACKING-RASCHIG RINGS



Cat. Ref.	Size	Bulk Density Kg/Ltr	Specific Surface m2/m3	Glass
BFC9	9x9	0.6	500	Neutral
BFC12	12x12	0.5	400	Neutral
BFC15	15x15	0.4	300	Neutral
BFC25	25x25	0.3	200	Neutral
BFCB40	40x40	0.3	160	Borosilicate
BFCB50	50x50	0.32	120	Borosilicate

Raschig rings upto 25mm are of Neutral glass. 40mm and 50mm raschig rings are available only in Borosilicate glass.

## Packings require for various pipe sections (Kgs.)

Pipe Section	Vol (L)	Packing Size					
		FC	FC 12	FC 15	FC 25	FCB 40	FCB 50
BPS3/1000	5	3	3	2	-	-	-
BPS4/1000	8	-	4	3	3	-	-
BPS6/1000	18	-	9	7	7	-	-
BPS9/1000	37	-	-	15	15	15	-
BPS12/1000	66	-	-	17	30	25	-
BPS16/1000	125	-	-	-	65	50	53
BPS18/1000	165	-	-	-	90	65	70
BPS24/1000	295	-	-	-	-	115	125

## Notes of use of Column Packing

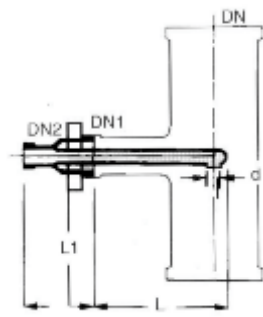
- Due to their low bulk densities, Glass Raschig rings are particularly suitable for packing glass columns.
- Generally, the ratio of Column diameter to packing diameter should not be less than 8:1.
- When using smaller packing size, a small layer of larger packing should be used on packing support, to prevent the smaller packing falling through.
- In vacuum application and applications involving high vapour velocities, packing may be lifted and may damage to other parts. To prevent this, a packing retainer (PTFE perforated plates) should be used above the packed section.

## PTFE SUPPORT PLATES

Cat. Ref.	DN	OD	ID	L
BCPS9	225	258	175	15
BCPS12	300	340	250	15
BCPS16	400	463	350	20
BCPS18	450	535	370	20
BCPS24	600	684	540	25

PTFE Support plates are sandwiched between two pipe sections to provide base to packing supports.

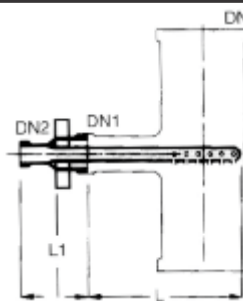
## COLUMN FEED PIPE



Cat. Ref.	DN	DN 1	DN2	L	L 1	d
BFP3	80	25	25	100	100	12
BFP4	100	25	25	125	100	12
BFP6	150	40	25	150	100	19
BFP12	300	40	25	225	100	19
BFP16	400	40	25	275	100	19
BFP18	450	40	25	300	100	19
BFP24	600	50	40	450	100	25

Feed pipe directs the process fluid to the centre of the column. DN refers the nominal diameter of the column.

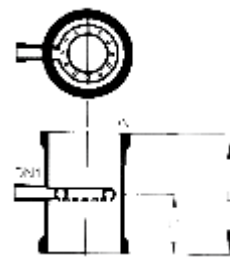
## COLUMN FEED SPARGERS



Cat. Ref.	DN	DN 1	DN2	L	L 1	Holes
BSPG3	80	25	25	125	100	21x2mm
BSPG4	100	25	25	150	100	21x2mm
BSPG6	150	40	25	200	100	27x2mm
BSPG9	225	40	25	275	100	27x2mm
BSPG12	300	40	25	350	100	30x3mm
BSPG16	400	40	25	450	100	39x3mm
BSPG18	450	40	25	500	100	39x3mm
BSPG24	600	50	40	650	100	60x3mm

In column feed spargers holes are provided at three sides of pipe. DN refers the nominal diameter of the column.

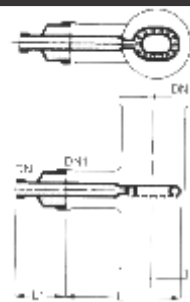
## SPRAY FEED SECTION



Cat. Ref.	DN	DN 1	L	L 1	Holes
BFR3	80	25	200	100	21x2mm
BFR4	100	25	250	125	21x2mm
BFR6	150	40	250	125	27x2mm
BFR9	225	40	250	125	27x2mm
BFR12	300	40	300	150	30x3mm

Spray feed section are provided with circular tube having holes at the bottom.

## SPRAY FEED PIPES

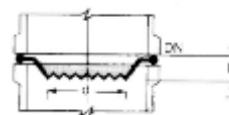


Cat. Ref.	DN	DN 1	DN 2	L	L 1	Holes Size	Tee Suitable
BFD6	150	80	25	225	125	27x2mm	BPTU6/3
BFD9	225	100	25	325	150	27x2mm	BPTU6/4
BFD12	300	150	25	400	200	30x3mm	BPTU12/6
BFD16	400	150	50	500	200	39x3mm	BPTU16/6
BFD18	450	150	50	550	200	39x3mm	BPTU18/6
BFD24	600	150	50	700	200	60x3mm	BPTU24/6

Spray feed pipes are provided with oval tube having holes at the bottom. These should be used with unequal tees. DN refers the nominal diameter of the column.

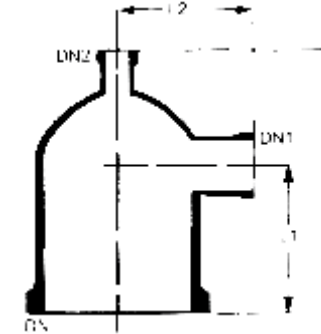
## PTFE REDISTRIBUTORS

Cat. Ref.	DN	d	L
BTL3	80	55	20
BTL4	100	80	20
BTL6	150	100	20
BTL9	225	175	22
BTL12	300	215	25
BTL16	400	315	25
BTL18	450	365	30
BTL24	600	420	30



PTFE redistributors are used to prevent channeling in columns. These can be clamped between two components without using any gasket.

## COLUMN FEED PIPE



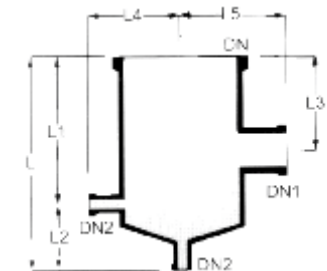
Cat. Ref.	DN	DN 1	DN2	L	L 1	L 2
BCA3/1/1	80	25	25	150	75	100
BCA3/1.5/1	80	40	25	175	100	100
BCA3/2/1	80	50	25	175	100	100
BCA4/1/1	100	25	25	150	75	125
BCA4/1.5/1	100	40	25	175	100	125
BCA4/2/1	100	50	25	225	125	125
BCA4/3/1	100	80	25	225	115	115
BCA6/1/1	150	25	25	200	100	150
BCA6/1.5/1	150	40	25	200	100	150
BCA6/2/1	150	50	25	250	125	150
BCA6/3/1	150	80	25	250	150	150
BCA6/4/1	150	100	25	250	150	175
BCA9/1.5/1.5	225	40	40	250	150	175
BCA9/2/1.5	225	50	40	250	150	175
BCA9/3/1.5	225	80	40	300	175	200
BCA9/4/1.5	225	100	40	300	175	200
BCA9/6/1.5	225	150	40	400	200	250
BCA12/1.5/1.5	300	40	40	300	150	225
BCA12/2/1.5	300	50	40	300	150	225
BCA12/3/1.5	300	80	40	300	150	250
BCA12/4/1.5	300	100	40	350	175	250
BCA12/6/1.5	300	150	40	425	225	250
BCA12/9/1.5	300	225	40	450	225	300
BCA16/2/2	400	50	50	400	200	300
BCA16/3/2	400	80	50	450	250	300
BCA16/4/2	400	100	50	450	250	300
BCA16/6/2	400	150	50	550	300	350
BCA16/9/2	400	225	50	550	300	350
BCA18/2/2	450	50	50	400	200	325
BCA18/3/2	450	80	450	450	250	350
BCA18/4/2	450	100	50	450	250	350
BCA18/6/2	450	150	50	550	300	350
BCA18/9/2	450	225	50	550	300	400
BCA18/12/2	450	300	50	750	400	400
BCA24/2/2	600	50	50	450	200	400
BCA24/3/2	600	80	50	500	250	400
BCA24/4/2	600	100	50	500	250	400
BCA24/6/2	600	150	50	650	300	450
BCA24/9/2	600	225	50	650	300	450
BCA24/12/2	600	300	50	800	400	500

Column adaptors with DN2 of different size (maximum equalant to DN1) can be manufactured with the same dimensions.

## FLAT TOP COLUMN ADAPTORS



Cat. Ref.	DN	DN 1	L	L 1
BCA3/1	80	25	100	75
BCA3/1.5	80	40	125	100
BCA4/1	100	25	100	75
BCA4/1.5	100	40	125	100
BCA6/1	150	25	150	100
BCA6/1.5	150	40	150	100
BCA6/2	150	50	200	125
BCA6/3	150	80	200	150
BCA9/1.5	225	40	200	150
BCA9/2	225	50	200	150
BCA9/3	225	80	250	175
BCA9/4	225	100	250	175
BCA12/2	300	50	250	150
BCA12/3	300	80	250	150
BCA12/4	300	100	300	175
BCA12/6	300	150	350	225

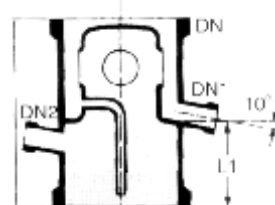


Cat. Ref.	DN	DN 1	DN 2	L	L 1	L 2	L 3	L 4	L 5
BCAM6/3/1/1	150	80	25	400	250	150	150	150	150
BCAM9/3/1/1	225	80	25	400	275	125	175	175	200
BCAM12/3/1/1	300	80	25	400	250	150	150	225	250
BCAM4/2/1/1	100	50	25	400	250	150	150	125	125

These are generally used as headers of shell and tube heat exchangers and columns.

## REFLUX DIVIDERS

Manually Operated :

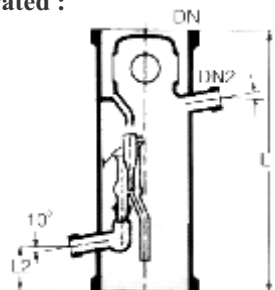


Cat. Ref.	DN	DN 1	DN2	L	L 1	Free Cross Section Cm2	Max. Product L/hr
BRDA3	80	25	25	200	100	20	300
BRDA4	100	25	25	250	150	50	500
BRDA6	150	25	25	250	150	100	700
BRDA9	225	25	25	375	150	150	900
BRDA12	300	25	25	375	150	250	1100
BRDA16	400	40	40	500	200	350	1300
BRDA18	450	40	40	600	275	500	1500

Reflux dividers are used to take off the distillate from the column. Usually a valve is to be fitted on distillate outlet which controls the reflux coarsely.

DN2 is used for insertion of a thermometer pocket. A bellow is recommended on the distillate outlet DN1

Magnetically Operated :

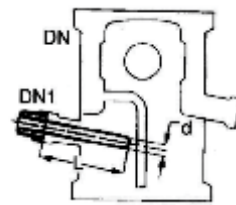


Cat. Ref.	DN	DN 1	DN2	L	L 1	Free Cross Section Cm2	Max. Product L/hr
BRHM3	80	25	25	375	75	20	90
BRHM4	100	25	25	400	750	50	180
BRHM6	150	25	25	450	1000	100	300
BRHM9	225	25	25	550	100	150	500
BRHM12	300	25	25	700	100	250	650
BRHM16	400	40	40	800	150	350	1000
BRHM18	450	40	40	900	150	500	1300

These reflux dividers are to be used with a electromagnet and a timer. These have a swinging funnel outside to remove the condensate or to return the reflux. Through this, correct control of reflux-ratio is possible. Funnel remains at 100% reflux position when magnet is inactive.

DN2 is used for insertion of a thermometer pocket. A liquid seal is recommended on the distillate outlet of this reflux divider to prevent the vapour passing directly to the receiver.

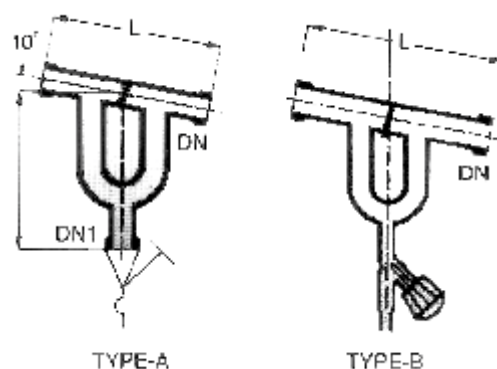
## THERMOMETER POCKETS FOR REFLUX DIVIDER



Cat. Ref.	DN	DN 1	d	L 1
BTP3	80	25	12	100
BTP4	100	25	12	125
BTP6	150	25	12	150
BTP9	225	25	12	200
BTP12	300	25	12	250
BTP16	400	40	19	350
BTP18	450	40	19	400

These thermometer pockets are to be used with reflux dividers or column sections. DN refers to the nominal diameter of the Reflux

## LIQUID SEALS



Cat. Ref.	DN	DN 1	L	Type
BLS1	25	25	200	A
BLS1.5	40	25	300	A
BLSV1	25	-	200	B

Liquid seals are to be fitted on the distillate outlet of magnetically operated reflux divider. This prevent the vapour passing directly



**Borolab**  
Scientific Glass Pvt. Ltd.

Does Things Better