



METAL DETECTABLE CUPS



VACUUM CUP MATERIALS



There are various reasons for choosing a particular vacuum cup material. The first choice is normally the hardness. This will determine the ability of a vacuum cup to seal against the surface of the product being handled. The most commonly used hardness measurement scale is Shore Hardness, often referred to as Durometer. In fact, a durometer is the actual instrument used to measure hardness but is often referred to as the measuring unit throughout industry.

There are different hardness scales based on the materials being measured, such as plastics or rubbers or metals. The scale used to identify the hardness of vacuum cup materials is Durometer Scale A, which ranges from 100 (hard) to 5 (soft). Vacuum cups are typically available in compounds with a hardness between 35 to 70 Durometer.

Another, sometimes very important characteristic of a vacuum cup material, is the temperature resistance. Most pick-and-place applications occur at “room temperature”, but in the plastic injection industry for example, part temperature is often considered in vacuum cup choice due to the high temperature of parts being removed from the mold tool. At the other end of the scale is the handling of cold products, such as refrigerated or frozen food packaging. Typical vacuum cup materials have a temperature range from -40°C to 204°C (-40°F to +400°F).

NBR (Vacuforce code suffix N) is the most common material and is the same as **Nitrile rubber and Buna-N**. NBR is used in general industrial applications and is found in steel handling, plastics handling, and any other application where the cup should be resistant to oils and related chemicals. In most applications, this is the “go-to” material choice based on its fair cost and good wear resistance. The hardness of this compound is typically 60 durometer, although this can be as low as 40 or as high as 70. NBR is often overlooked for high temperature applications such as injection molding as the user specifies a very high temperature and therefore opts for silicone. NBR is suitable for most plastic injection parts handling as its temperature rating is often in excess of 90°C/200°F.

SILICONE (Vacuforce code suffix S & ST) is a very popular cup compound but is more expensive than NBR. Silicone does offer the advantage of having extreme temperature resistance both cold and hot, ideal for handling frozen packaged food and hot plastic-injected molded parts with a temperature range from -40°C (-40°F) to 204°C (400°F). Silicone is softer than NBR, having a typical Durometer rating of 40, allowing it to seal against contoured or rough surfaces, such as cardboard sheet, corrugated plastic, and plastic food packaging. Vacuforce silicone is offered as standard with FDA (title 21) compliance to allow direct contact with food and drug products. Vacuforce Code S - Red Silicone, Vacuforce Code ST - White Translucent.

METAL IMPREGNATED SILICONE (Vacuforce code SMI & STMI) has the same basic characteristics as the standard silicone described above, but the metal impregnated compound has been design specifically for the food industry. Iron filings inside the actual silicone compound allow metal detectors to sense that a vacuum cup has fallen into the food packaging that contains food stuffs like bread loaves, rolls, and buns or confectionery foodstuffs. Vacuforce Code SMI - Red Silicone, Code STMI - White Translucent.

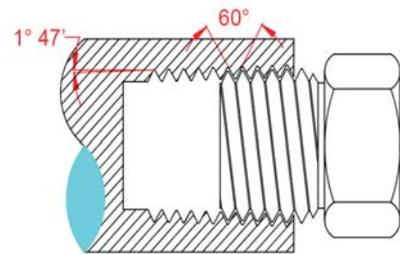
An important note about silicone that must be understood by the vacuum cup user. Silicone should never be used on surfaces which are to be painted, such as automotive body panels, as the paint will not bond properly on the area touched by the silicone compound cup. Also, it should not be used to handle decorative stone such as marble or quartz, or glass products as it will permanently etch the surface.

In the pneumatics and vacuum industry there are 4 types of popular thread forms in use today. This page highlights the technical data of each which should be understood when applying vacuum cup fittings shown in this catalogue to applications found in the field.

National Pipe Taper (NPT)

Referred to as NPT, this American pipe thread is by far the most common thread used in American made fluid power components and is the standard thread in the USA and Canada. This tapered thread seals using a thread sealant or tape. The Pneuforce NPT male threaded fittings have a pre applied thread sealant to allow speed of connection to female threaded ports.

Thread Taper Angle	1° 47'
Thread Angle	60°
Thread Crest & Root	Flat

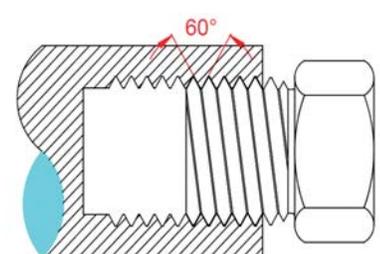


	1/8NPT	1/4NPT	3/8NPT	1/2NPT
TPI	27	18	18	14
Major Ø (mm)	10.3	13.7	17.1	21.3
Pitch (mm)	0.94	1.41	1.41	1.81

National Pipe Straight (NPS)

Often referred to as NPSF, the NPS thread has the same fundamental characteristics as NPT except that it is a straight thread. NPSF stands for National Pipe Straight Fuel and is often used in female threads for fuel line connections or in the pneumatics industry it is often found in plastic body parts where a tapered thread could split the component body as the fitting is tightened.

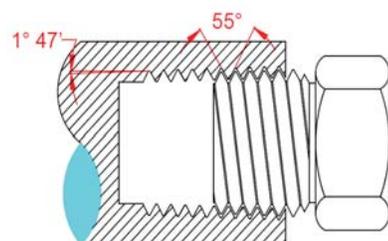
Thread Taper Angle	0°
Thread Angle	60°
Thread Crest & Root	Flat



British Standard Pipe Taper (BSPT)

Sometimes referred to as an "R" thread, the BSP Thread (British Standard Pipe) is used throughout the world as a pipe thread except for the USA which uses NPT. BSPT is a tapered thread and is used in male threaded components to connect to female BSPT and also BSPP thread forms. Of course using a BSPT male to BSPT female is the preferred method which offers a full tapered seal, BSPT threads need a thread sealant to seal. However, Pneuforce BSPT male threads have a pre applied thread sealant and do not require additional thread tape.

Thread Taper Angle	1° 47'
Thread Angle	55°
Thread Crest & Root	Radius

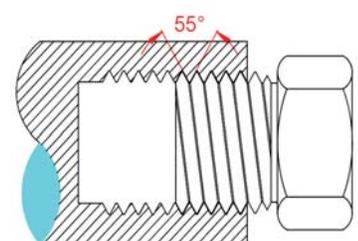


	1/8BSP	1/4BSP	3/8BSP	1/2BSP
TPI	28	19	19	14
Major Ø (mm)	9.7	13.2	16.6	20.9
Pitch (mm)	0.91	1.34	1.34	1.81

British Standard Pipe Parallel (BSPP)

Often referred to as a "G" thread, the BSPP thread form is by far the most popular female thread for pneumatic components throughout the world except for the USA where NPT is the standard. A parallel thread, the male fittings seal with an O ring ensuring a perfect seal each time and also in multiple connections such as a manifold, ensure common fitting height. A further advantage is that the male fitting can be used repeatedly without the need for reapplying thread sealant. Male G threads cannot be connected to female BSPT thread ports.

Thread Taper Angle	0°
Thread Angle	55°
Thread Crest & Root	Radius



VFB SINGLE BELLOWS CUP



- Single bellows design
- Compensates for height variances in part picking
- Can seal on convex and concave surfaces
- Available from 5mm to 150mm diameter
- NBR, FDA Silicone and metal detectable materials

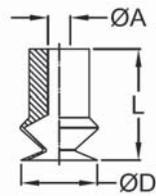


VFB		20		N	
Series	Model	Diameter	Cup Material		
	5	5	N	Nitrile	
	8	8	S	Red Silicone	
	10-2	11	ST	White Translucent Silicone	
	15-2	16	SMI	Metal Impregnated Red Silicone	
	20	22	STMI	Metal Impregnated White Translucent Silicone	
	30-2	34	<i>Part number example VFB30-2SMI 34mm diameter single bellows vacuum cup in red metal impregnated silicone</i>		
	40	43			
	50-2	53			
	75	75			
	110	110			
	150	150			



This cup series is available in metal detectable FDA compliant silicone.
 For red colored metal detectable silicone use material code SMI.
 For white translucent metal detectable silicone use material code STMI.

VFB5 | VFB8 | VFB10-2 | VFB15-2

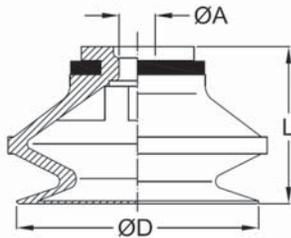


DIMENSIONS (mm)

Model	ØD	ØA	L	Fitting Type
VFB5	5	2	9	A
VFB8	8	2	12	
VFB10-2	11	4	17	B
VFB15-2	16	4	20	

* add cup material code

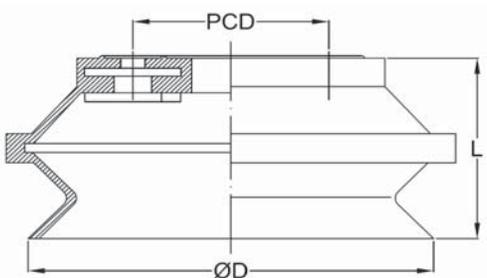
VFB20 | VFB30 | VFB30-2 | VFB40 | VFB50-2



Model	ØD	ØA	L	Fitting Type
VFB20	22	5	19	C
VFB30	34			
VFB30-2	34	6.5	26	D
VFB40	43			
VFB50-2	53	10	35	E

* add cup material code

VFB75 | VFB110 | VFB150



Model	ØD	PCD x # Positions	L	Fitting Type
VFB75W*	75	35 x 4	37	J
VFB110W*	115	55 x 8	54	K
VFB150W*	150	71 x 8	71	L

* add cup material code



For cup fittings refer to page 1.34

VFBL MULTIPLE BELLOWS



- Multiple bellows design
- Compensates for height variances in part picking
- Thin web design allows for sealing on crinkled or uneven surfaces such as plastic wrapping in the food industry
- Available from 20mm to 50mm Diameter
- NBR, FDA Silicone and Metal Detectable Materials



VFBL		40-2		N	
Series	Model	Diameter	Cup Material		
	20-2	20	N	Nitrile	
	30-2	30	S	Red Silicone	
	40-2	40	ST	White Translucent Silicone	
	50-2	50	SMI	Metal Impregnated Red Silicone	
			STMI	Metal Impregnated White Translucent Silicone	

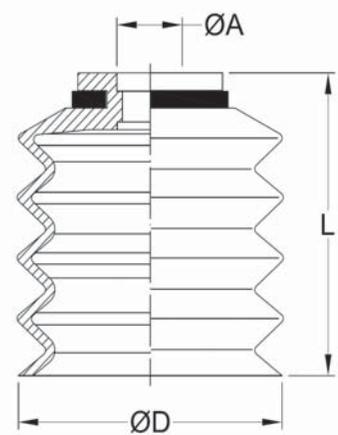
Part number example VFBL30-2SMI
 30mm diameter single bellows vacuum cup in red metal impregnated silicone

DIMENSIONS (mm)

VFBL20-2 | VFBL30-2 | VFBL40-2 | VFBL50-2



Model	ØD	ØA	L	Fitting Type
VFBL20-2	20	5.5	23	C
VFBL30-2	30	6.5	32	D
VFBL40-2	40		42	
VFBL50-2	50	10	53	E



This cup series is available in metal detectable FDA compliant silicone.
 For red colored metal detectable silicone use material code SMI.
 For white translucent metal detectable silicone use material code STMI.



For cup fittings refer to page 1.34

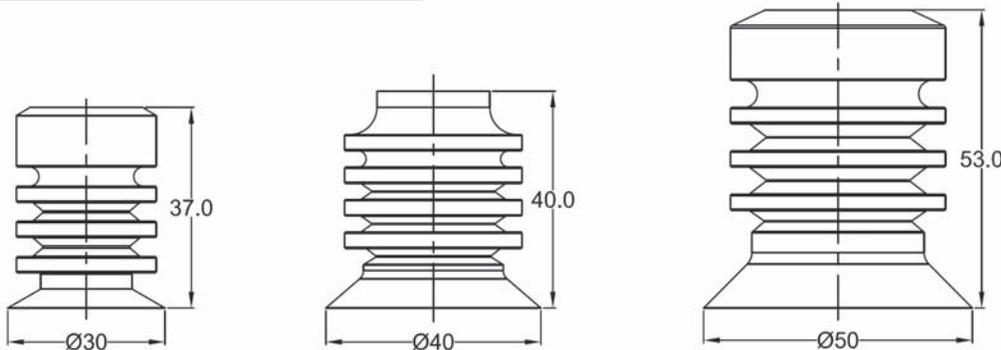
- Designed for handling thin plastic and paper bags
- Ultra thin seal lip ensures vacuum tight seal
- Ideal for bag opening and transfer
- High flow cup fitting
- Available in FDA silicone as standard



SBLP		30		S		G1/4	
Series	Model	Diameter	Cup Material			Fitting Thread	
	30	30	S	Red Silicone		G1/4	G1/4
	40	40	SMI	Metal Impregnated Red Silicone		N1/4	1/4NPT
	50	50	STMI	Metal Impregnated White Translucent Silicone		G3/8	3/8NPT
						N3/8	3/8NPT
						G1/2	G1/2
						N1/2	1/2NPT

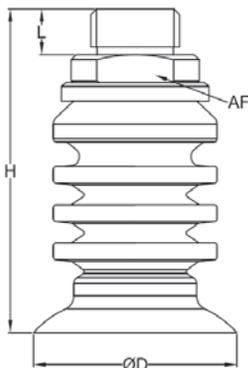
Part number example SBLP40S
 40mm vacuum suction cup in silicone
 Part number example SBLP40S-G3/8
 40mm vacuum suction cup in silicone with male G3/8 Cup Fitting

CUP DIMENSIONS (mm)



This cup series is available in metal detectable FDA compliant silicone.
 For red colored metal detectable silicone use material code SMI.
 For white translucent metal detectable silicone use material code STMI.

CUP + FITTING DIMENSIONS (mm)



Model	ØD	H	L	AF
SBLP30-G1/4	30	51.5	9	19
SBLP30-N1/4	30	51.5	11.5	
SBLP40-G3/8	40	56	10	22
SBLP40-N3/8	40	57.5	11.5	
SBLP50-G1/2	50	69	10	28
SBLP50-N1/2	50	69	16	

SBLP Vacuum cup fittings are designed to ensure maximum flow is applied to the cup sealing lip to ensure maximum grip.



EHC EGG HANDLING CUPS



- Egg handling vacuum cups
- Available in FDA silicone as standard
- Multiple bellows offers vacuum lift independent of machine movement

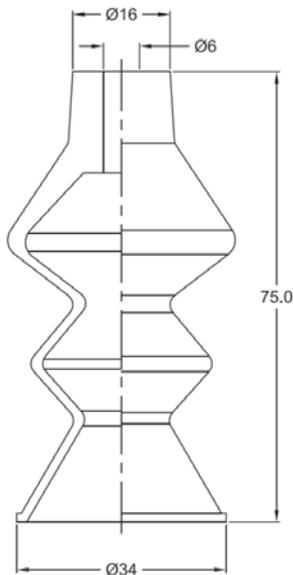


EHC		3475		N	
Series	Model	Diameter	Cup Material		
	3475	34	N	NBR Black 50 Durometer	
	3566	35	S	Silicone White 30 Durometer	
	3776	37	SBLK	Silicone Black 50 Durometer	
			SR	Silicone Red 50 Durometer	
			SBLU	Silicone Blue 50 Durometer	

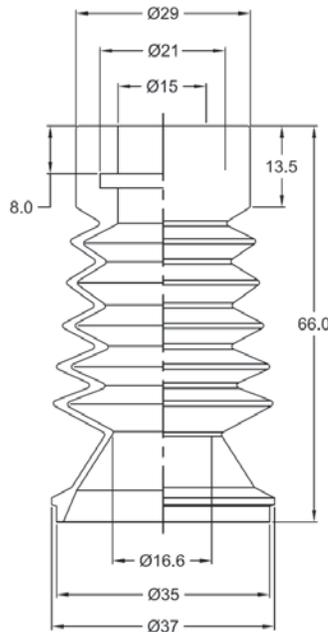
Part number example EHC3475N
34mm Egg Handling Cup in NBR

Note - #3566 only available in Blue Silicone
#3766 only available in Red Silicone

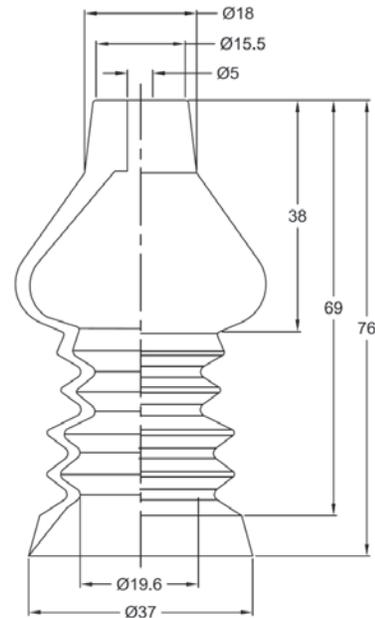
DIMENSIONS (mm)



Model 3475



Model 3566



Model 3776



This cup series is available in metal detectable FDA compliant silicone.
For red colored metal detectable silicone use material code SMI.
For white translucent metal detectable silicone use material code STMI.

VFF FLAT CUPS



- Flat design vacuum cup
- Internal cleats for increased grip in lateral movement
- Good for shear movement and grip
- Available from 15mm to 150mm diameter
- NBR, FDA Silicone and metal detectable materials



VFF		40-2		N	
Series	Model	Diameter	Cup Material		
	15	15	N	Nitrile	
	20	20	S	Red Silicone	
	30-2	30	ST	White Translucent Silicone	
	40-2	40	SMI	Metal Impregnated Red Silicone	
	50-2	50	STMI	Metal Impregnated White Translucent Silicone	

Part number example VFF30-2S 30mm diameter flat vacuum cup in red silicone

LEVEL COMPENSATORS

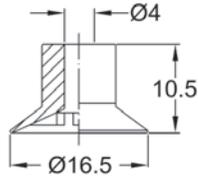


This cup series is available in metal detectable FDA compliant silicone.
 For red colored metal detectable silicone use material code SMI.
 For white translucent metal detectable silicone use material code STMI.

Refer to page 1.31 for suitable level compensators for this vacuum cup range.



VFF15-2

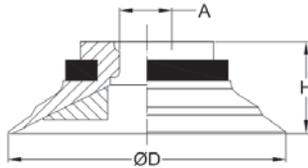


DIMENSIONS (mm)

Model	ØD	ØA	L	Fitting Type
VFF15-2*	16.5	4	16	B

* add cup material code

VFF20 | VFF30-2 | VFF40-2 | VFF50-2



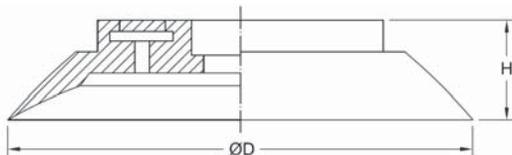
Model	ØD	ØA	L	Fitting Type
VFF20*	22	5.5	8	C
VFF30-2*	32		10	
VFF40-2*	40	6.5	13	D
VFF50-2*	50	10.5	13	E

* add cup material code

VFF75WN | VFF110WN | VFF150WN



The Vacuforce VFF75, 110 and 150 series have an integral metal washer to offer secure attachment to the associated cup fittings. These large diameter single bellows vacuum cups are used to handle objects with varying height differences. Due to the bellows design these cups assist in sheet separation due to movement as the vacuum force is applied independent of the machinery. These three models of cups are connected to the fitting with small bolts that attach from the inside of the vacuum cup. The image on the right shows the cup and fitting assembled.



Model	ØD	PCD x # Positions	L	Fitting Type
VFF75W*	75	35 x 4	13	J
VFF110W*	115	55 x 7	20	K
VFF150W*	150	71 x 7	26	L

* add cup material code



For cup fittings refer to page 1.34