

Suction cups

Introduction

A suction cup allows you to lift and move objects that differ in shape, size and weight by means of a vacuum. The Venturi phenomenon allows a vacuum to be created inside the cup lowering the internal atmospheric pressure by 30 to 98%, thus creating a near vacuum.

The theoretical holding force (N) of a suction cup is calculated by multiplying the surface area of the suction cup by the decrease in pressure (%):

$$\text{Suction force (N)} = \text{suction cup surface area (cm}^2\text{)} \times \text{vacuum level (\%)} \times 0.099366$$

To guarantee operational safety and to allow for movement and acceleration, safety coefficients should be applied, these are a Factor of 3 for horizontally applied suction cups and 5 for those vertically applied to allow for any sliding.

You will find the typical forces (N) of the suction cups at different vacuum rates (%) in the table below.

Example: for a 50mm diameter suction cup and a 90% vacuum, the theoretical suction force = $175.5N = 17.5kg = 5.83kg$ (when Fos of 3 applied).

Suction cup diameter (mm)	Surface area cm ²	Theoretical force (N) of the suction cup at vacuum level (%)								
		10%	20%	30%	40%	50%	60%	70%	80%	90%
5	0,196	0,195	0,390	0,585	0,780	0,975	1,170	1,365	1,560	1,755
6	0,282	0,280	0,561	0,842	1,123	1,404	1,685	1,966	2,247	2,528
8	0,502	0,499	0,998	1,498	1,997	2,497	2,996	3,496	3,995	4,495
10	0,785	0,780	1,560	2,341	3,121	3,902	4,682	5,462	6,243	7,023
15	1,767	1,755	3,511	5,267	7,023	8,779	10,53	12,29	14,04	15,80
20	3,141	3,121	6,243	9,365	12,48	15,60	18,73	21,85	24,97	28,09
25	4,908	4,877	9,755	14,63	19,51	24,38	29,26	34,14	39,02	43,89
30	7,068	7,023	14,04	21,07	28,09	35,11	42,14	49,16	56,19	63,21
35	9,621	9,560	19,12	28,68	38,24	47,80	57,36	66,92	76,48	86,04
40	12,56	12,48	24,97	37,46	49,94	62,43	74,92	87,40	99,89	112,3
50	19,63	19,51	39,02	58,53	78,04	97,55	117,0	136,5	156,0	175,5
60	28,27	28,09	56,19	84,28	112,3	140,4	168,5	196,6	224,7	252,8

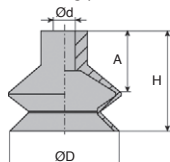
Materials	Working temperature C°	Shore hardness	Colour	Information
NBR = Nitrile	-25 to +110	55 ±5	black	most common
SI = Silicone	-30 to +220	55 ±5	translucent	resistant to high and low temperatures, suitable for food prep.
NR = Natural rubber	-25 to +90	50 ±5	grey	good friction resistance and very supple

Materials	tearing	cracking	elasticity	wear	friction	age	ozone	petrol	oil and grease	acid	alkali	hot water
NBR = Nitrile	4	5	4	4	4	4	4	5	6	2	4	4
SI = Silicone	5	4	5	4	5	4	6	4	6	3	3	3
NR = Natural rubber	4	3	4	2	2	2	3	3	3	1	2	2

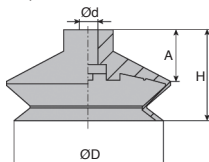
- Materials:
nitrile (NBR)
silicone (SI)
natural rubber (NR)

Uses

- For moving parts with uneven surfaces



DCA05 to DCA16



DCA20 to DCA43



DISCOUNTS

Qty.	1+	50+	100+	150+	200+
Disc. List	-	-5%	-10%	-15%	On request

Part number	ØD	H	Ød	A	Corresponding thread insert	Stock*	Price each 1 to 49
Nitrile							
DCA05-NBR	5,5	11,1	4	8	TM5M5	-	4,06 €
DCA11-NBR	11,0	16,0	4	9	CTM10M5	✓	3,74 €
DCA14-NBR	14,0	16,0	4	9		✓	3,89 €
DCA16-NBR	16,0	19,0	4	9		✓	3,89 €
DCA20-NBR	20,0	16,0	4	9		✓	4,44 €
DCA22-NBR	22,0	19,0	4	9		-	4,06 €
DCA25-NBR	25,0	23,0	4	9	-	4,25 €	
DCA33-NBR	33,0	27,5	8	13	SCR30M6	-	4,40 €
DCA43-NBR	43,0	28,0	8	13		✓	4,67 €
Silicone							
DCA05-SI	5,5	11,1	4	8	TM5M5	-	4,93 €
DCA11-SI	11,0	16,0	4	9	CTM10M5	✓	4,77 €
DCA14-SI	14,0	16,0	4	9		-	4,77 €
DCA16-SI	16,0	19,0	4	9		-	4,77 €
DCA20-SI	20,0	16,0	4	9		✓	4,77 €
DCA22-SI	22,0	19,0	4	9		✓	4,77 €
DCA25-SI	25,0	23,0	4	9	✓	4,93 €	
DCA33-SI	33,0	27,5	8	13	SCR30M6	-	5,45 €
DCA43-SI	43,0	28,0	8	13		✓	5,53 €
Natural rubber							
DCA05-NR	5,5	11,1	4	8	TM5M5	✓	4,06 €
DCA11-NR	11,0	16,0	4	9	CTM10M5	-	3,74 €
DCA14-NR	14,0	16,0	4	9		✓	3,89 €
DCA16-NR	16,0	19,0	4	9		-	3,89 €
DCA20-NR	20,0	16,0	4	9		✓	3,89 €
DCA22-NR	22,0	19,0	4	9		-	4,06 €
DCA25-NR	25,0	23,0	4	9	-	4,25 €	
DCA33-NR	33,0	27,5	8	13	SCR30M6	-	4,40 €
DCA43-NR	43,0	28,0	8	13		✓	4,67 €

*Depending on availability - Dimensions in mm

Suction cup, 2.5 bellows

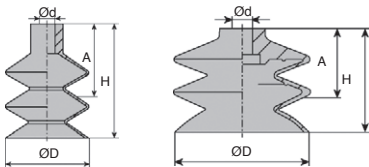


DCG For uneven and curved surfaces

- Suction cup to lift and move objects
- Materials:
nitrile (NBR), silicone (SI), natural rubber (NR)

Uses

- For moving parts with irregular or curved surfaces
- These bellows allow for a more supple and faster grip, and also compensate for differences in height



DCG07C to DCG25

DCG30 to DCG60

DISCOUNTS

Qty.	1+	50+	100+	150+	200+
Disc.	List	-5%	-10%	-15%	On request

Part number	ØD	H	Ød	A	Corresponding thread insert	Stock*	Price each 1 to 49
Nitrile							
DCG07C-NBR	7	14,2	4	10	CTM10M5	-	3,74 €
DCG10-NBR	9	15,0	4	12		✓	3,57 €
DCG15-NBR	14	23,0	4	13		✓	3,89 €
DCG18-NBR	18	23,0	4	13		-	4,06 €
DCG20-NBR	20	23,0	4	13		-	4,06 €
DCG25-NBR	25	34,0	4	16		-	4,06 €
DCG30-NBR	32	38,0	8	23	-	5,04 €	
DCG40-NBR	42	46,0	8	24	-	4,57 €	
DCG60-NBR	62	55,0	8	24	SCR30M6	-	6,99 €
Silicone							
DCG07C-SI	7	14,2	4	10	CTM10M5	-	4,77 €
DCG10-SI	9	15,0	4	12		✓	4,57 €
DCG15-SI	14	23,0	4	13		✓	4,77 €
DCG18-SI	18	23,0	4	13		✓	4,93 €
DCG20-SI	20	23,0	4	13		✓	4,93 €
DCG25-SI	25	34,0	4	16		✓	4,93 €
DCG30-SI	32	38,0	8	23	✓	5,45 €	
DCG40-SI	42	46,0	8	24	✓	5,45 €	
DCG60-SI	62	55,0	8	24	SCR30M6	-	8,37 €
Natural rubber							
DCG07C-NR	7	14,2	4	10	CTM10M5	-	3,74 €
DCG10-NR	9	15,0	4	12		-	3,57 €
DCG15-NR	14	23,0	4	13		-	3,89 €
DCG18-NR	18	23,0	4	13		-	4,06 €
DCG20-NR	20	23,0	4	13		-	4,06 €
DCG25-NR	25	34,0	4	16		-	4,06 €
DCG30-NR	32	38,0	8	23	-	4,40 €	
DCG40-NR	42	46,0	8	24	✓	4,57 €	
DCG60-NR	62	55,0	8	24	✓	6,99 €	

*Depending on availability - Dimensions in mm

- Suction cup to lift and move objects

- Materials:

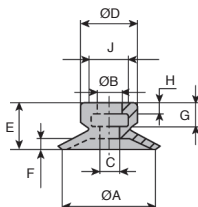
nitrile (NBR)

silicone (SI)

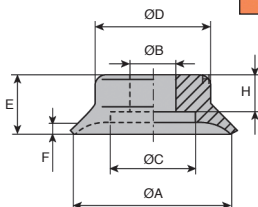
Uses

- Ideal where accuracy is required

- Only for use on flat surfaces



DFG05A to DFG10A



DFG15 to DFG50

DISCOUNTS

Qty.	1+	50+	100+150+	200+
Disc.	List	-5%	-10%-15%	On request

Part number	ØA	ØB	ØC	ØD	E	F	G	H	J	Corresponding thread insert	Stock*	Price each 1 to 49
Nitrile												
DFG05A-NBR	5,0	4,0	1,4	7,5	6,5	0,80	4	2,0	6		-	2,55 €
DFG06A-NBR	6,0	4,0	2,0	7,5	6,5	0,80	4	2,0	6	TM5M5	✓	2,55 €
DFG08A-NBR	8,0	4,0	2,0	8,0	7,0	1,20	4	2,0	6		✓	2,55 €
DFG10A-NBR	10,0	4,0	2,0	8,5	7,0	1,50	4	2,0	6		✓	2,55 €
DFG15-NBR	15,7	4,5	-	12,0	8,0	2,00	-	3,5	-	SCR15M5	✓	2,55 €
DFG20-NBR	20,9	5,5	11,0	15,0	10,0	2,17	-	4,6	-	SCR20M5	✓	2,88 €
DFG25-NBR	25,0	6,0	11,0	16,0	14,0	3,00	-	7,0	-		-	2,55 €
DFG30-NBR	30,0	6,0	11,0	14,0	12,0	2,00	-	7,0	-	SCR20BM6	✓	2,55 €
DFG40-NBR	40,0	6,0	11,0	24,0	14,0	4,00	-	7,0	-		-	3,38 €
DFG50-NBR	50,0	8,0	20,0	27,0	15,0	3,50	-	7,0	-	SCR50M6	✓	5,24 €
Silicone												
DFG05A-SI	5,0	4,0	1,4	7,5	6,5	0,80	4	2,0	6		-	3,38 €
DFG06A-SI	6,0	4,0	2,0	7,5	6,5	0,80	4	2,0	6	TM5M5	-	3,38 €
DFG08A-SI	8,0	4,0	2,0	8,0	7,0	1,20	4	2,0	6		-	3,38 €
DFG10A-SI	10,0	4,0	2,0	8,5	7,0	1,50	4	2,0	6		✓	3,38 €
DFG15-SI	15,7	4,5	-	12,0	8,0	2,00	-	3,5	-	SCR15M5	✓	3,38 €
DFG20-SI	20,9	5,5	11,0	15,0	10,0	2,17	-	4,6	-	SCR20M5	✓	3,38 €
DFG25-SI	25,0	6,0	11,0	16,0	14,0	3,00	-	7,0	-		-	3,38 €
DFG30-SI	30,0	6,0	11,0	14,0	12,0	2,00	-	7,0	-	SCR20BM6	✓	3,38 €
DFG40-SI	40,0	6,0	11,0	24,0	14,0	4,00	-	7,0	-		-	4,40 €
DFG50-SI	50,0	8,0	20,0	27,0	15,0	3,50	-	7,0	-	SCR50M6	✓	8,35 €

*Depending on availability - Dimensions in mm

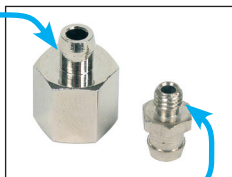
Suction cup threaded insert

TM
CTM
CTF

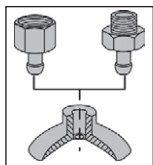
Snap-on

- Threaded insert for suction cup
- Material: nickel brass

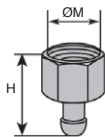
Female



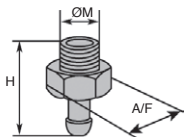
Male



Assembly diagram



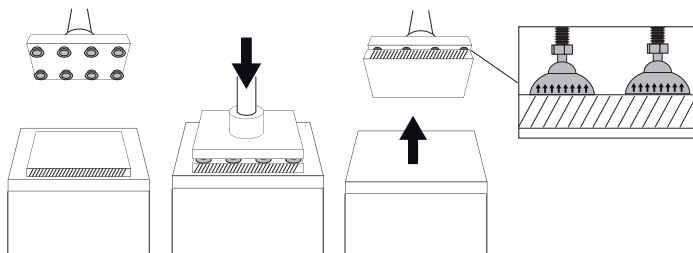
female



male



Assembly example



DISCOUNTS

Qty.	1+	50+	100+	150+	200+
Disc. List	-5%	-10%	-15%	On request	

Part number	ØM	H	A/F	type	For suction cup	Stock*	Price each 1 to 49
TM5M5	M5	12,0	8	mâle	DFG05A, DFG06A, DFG08A, DFG10A, DCA05	✓	1,48 €
CTM10M5	M5	13,5	13	mâle	DCA11, DCA14, DCA16, DCA22, DCA25,	✓	1,74 €
CTM10G18 1/8»	19,5	13	mâle	DCG05C, DCG07C, DCG10, DCG12, DCG15,	✓	1,87 €	
CTF10G18 1/8»	18,5	13	femelle	DCG18, DCG20, DCG25	✓	1,93 €	

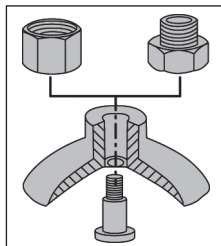
*Depending on availability - Dimensions in mm

Suction cup threaded insert

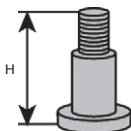
Socket screw

SCR
ADAG

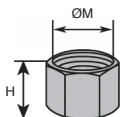
- Material: nickel brass



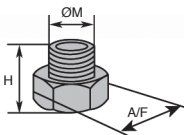
Assembly diagram



Socket screw insert



female



male



Adaptor

Insert socket head

DISCOUNTS

Qty.	1+	50+	100+	150+	200+
Disc. List	-5%	-10%	-15%	On request	

Part number	Ø	H	For suction cup	For adaptor	Stock*	Price each 1 to 49
SCR15M5	M5	9	DFG15	ADAG18M5F	✓	2,34 €
SCR20M5	M5	11	DFG20	ADAG18F5F	✓	3,06 €
SCR30M6	M6	19	DCA33, DCA43, DCG30,	ADAG18F6F,	✓	1,48 €
			DCG40, DCG60	ADAG18M6F		
SCR20BM6	M6	14	DFG25, DFG30, DFG40	ADAG14F6F	✓	3,06 €
SCR50M6	M6	17	DFG50	ADAG14M6F	-	4,26 €

Adaptor

DISCOUNTS

Qty.	1+	50+	100+	150+	200+
Disc. List	-5%	-10%	-15%	On request	

Part number	ØM	H	A/F	type	For socket screw insert	Stock*	Price each 1 to 49
ADAG18F6F	1/8»	14,0	13	female	SCR30M6, SCR20BM6, SCR50M6	-	1,93 €
ADAG14F6F	1/4»	17,5	17	female		-	2,88 €
ADAG18M6F	1/8»	13,0	13	male	SCR15M5, SCR20M5	✓	1,93 €
ADAG14M6F	1/4»	15,0	17	male		✓	1,93 €
ADAG18M5F	1/8»	13,0	13	male	SCR15M5, SCR20M5	✓	2,88 €
ADAG18F5F	1/8»	14,0	13	female		-	1,93 €

*Depending on availability - Dimensions in mm