

# Bellows Suction Cups(Round)

## Bellows Suction Cups FG (2.5 Folds)

Suction area ( $\phi$ )5mm to 88mm

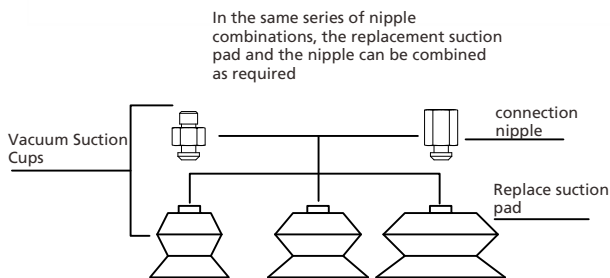
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### Introduction and application

- ◆ Handling fragile and vulnerable parts such as electronic components, injection molded parts, etc.
- ◆ Handling of workpieces with extremely uneven surfaces such as cartons, tubes, etc. for optimal fit on uneven surfaces.
- ◆ Internal support (from diameter 52 mm) prevents workpiece from being sucked in.
- ◆ Special design of the folds permits use in systems with very short cycle times.

System design Bellows Suction Cups FG (2.5 Folds)



### Design

- ◆ Robust, wear-resistant suction cup FG with single sealing lip, consisting of suction cup FG with 2.5 folds and connection nipple.
- ◆ All nipples are plugged in.
- ◆ Suction cups with a diameter of 52 mm or more with supports on the bottom.

### Ordering Data Bellows Suction Cups FG (2.5 Folds)

Item no.	Suction area $\phi$ [mm]	Material and Shore hardness	Connection thread
FG	5 to 88	HT1-60 NBR-55 SI-55	M5-AG M5-IG G1/8-AG G1/8-IG G1/4-AG G1/4-IG

Note:FG AG=external thread (M) IG=internal thread (F)

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Type	Suction cup material*/Hardness in Shore		
	High-temperature material	nitrile rubber	Silicone rubber
	HT1 60 ± 5shA	NBR 55 ± 5shA	SI 55 ± 5shA
FG 5 M5-AG	90.02.01.00307	90.02.01.00371	90.02.01.00403
FG 5 M5-IG	90.02.01.00308	90.02.01.00372	90.02.01.00404
FG 7 G1/8-AG	90.02.01.00309	90.02.01.00373	90.02.01.00405
FG 7 G1/8-IG	90.02.01.00310	90.02.01.00374	90.02.01.00406
FG 7 M5-AG	90.02.01.00311	90.02.01.00375	90.02.01.00407
FG 9 G1/8-AG	90.02.01.00312	90.02.01.00376	90.02.01.00408
FG 9 G1/8-IG	90.02.01.00313	90.02.01.00377	90.02.01.00409
FG 9 M5-AG	90.02.01.00314	90.02.01.00378	90.02.01.00410
FG 12 G1/8-AG	90.02.01.00315	90.02.01.00379	90.02.01.00411
FG 12 G1/8-IG	90.02.01.00316	90.02.01.00380	90.02.01.00412
FG 12 M5-AG	90.02.01.00317	90.02.01.00381	90.02.01.00413
FG 14 G1/8-AG	90.02.01.00318	90.02.01.00382	90.02.01.00414
FG 14 G1/8-IG	90.02.01.00319	90.02.01.00383	90.02.01.00415
FG 14 M5-AG	90.02.01.00320	90.02.01.00384	90.02.01.00416
FG 18 G1/8-AG	90.02.01.00321	90.02.01.00385	90.02.01.00417
FG 18 G1/8-IG	90.02.01.00322	90.02.01.00386	90.02.01.00418
FG 18 M5-AG	90.02.01.00323	90.02.01.00387	90.02.01.00419
FG 20 G1/8-AG	90.02.01.00324	90.02.01.00388	90.02.01.00420
FG 20 G1/8-IG	90.02.01.00325	90.02.01.00389	90.02.01.00421
FG 20 M5-AG	90.02.01.00326	90.02.01.00390	90.02.01.00422
FG 25 G1/8-AG	90.02.01.00327	90.02.01.00391	90.02.01.00423
FG 25 G1/8-IG	90.02.01.00328	90.02.01.00392	90.02.01.00424
FG 32 G1/4-AG	90.02.01.00329	90.02.01.00393	90.02.01.00425
FG 32 G1/4-IG	90.02.01.00330	90.02.01.00394	90.02.01.00426
FG 42 G1/4-AG	90.02.01.00331	90.02.01.00395	90.02.01.00427
FG 42 G1/4-IG	90.02.01.00332	90.02.01.00396	90.02.01.00428
FG 52 G1/4-AG	90.02.01.00333	90.02.01.00397	90.02.01.00429
FG 52 G1/4-IG	90.02.01.00334	90.02.01.00398	90.02.01.00430
FG 62 G1/4-AG	90.02.01.00335	90.02.01.00399	90.02.01.00431
FG 62 G1/4-IG	90.02.01.00336	90.02.01.00400	90.02.01.00432
FG 88 G1/4-AG	90.02.01.00337	90.02.01.00401	90.02.01.00433
FG 88 G1/4-IG	90.02.01.00338	90.02.01.00402	90.02.01.00434

### Ordering Data Spare Parts Bellows Suction Cups

Type	Suction cup material*/Hardness in Shore		
	High-temperature material	nitrile rubber	Silicone rubber
	HT1 60 ± 5shA	NBR 55 ± 5shA	SI 55 ± 5shA
FG 5	90.02.03.00160	90.02.03.00186	90.02.03.00199
FG 7	90.02.03.00161	90.02.03.00187	90.02.03.00200
FG 9	90.02.03.00162	90.02.03.00188	90.02.03.00201
FG 12	90.02.03.00163	90.02.03.00189	90.02.03.00202
FG 14	90.02.03.00164	90.02.03.00190	90.02.03.00203
FG 18	90.02.03.00165	90.02.03.00191	90.02.03.00204
FG 20	90.02.03.00166	90.02.03.00192	90.02.03.00205
FG 25	90.02.03.00167	90.02.03.00193	90.02.03.00206
FG 32	90.02.03.00168	90.02.03.00194	90.02.03.00207
FG 42	90.02.03.00169	90.02.03.00195	90.02.03.00208
FG 52	90.02.03.00170	90.02.03.00196	90.02.03.00209
FG 62	90.02.03.00171	90.02.03.00197	90.02.03.00210
FG 88	90.02.03.00172	90.02.03.00198	90.02.03.00211

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### Ordering Data Spare Parts Suction Cups Nipples FG

Type	Suction cup connector nipples [AG]		Suction cup connector nipples [IG]	
FG 5 M5	S017 M5-AG	90.02.04.00024	S017 M5-IG	90.02.04.00025
FG 7 M5	S016 M5-AG	90.02.04.00017		
FG 7 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FG 9 M5	S016 M5-AG	90.02.04.00017		
FG 9 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FG 12 M5	S016 M5-AG	90.02.04.00017		
FG 12 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FG 14 M5	S016 M5-AG	90.02.04.00017		
FG 14 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FG 18 M5	S016 M5-AG	90.02.04.00017		
FG 18 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FG 20 M5	S016 M5-AG	90.02.04.00017		
FG 20 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FG 25 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FG 32 G1/4	S018 G1/4-AG	90.02.04.00019	S018 G1/4-IG	90.02.04.00022
FG 42 G1/4	S018 G1/4-AG	90.02.04.00019	S018 G1/4-IG	90.02.04.00022
FG 52 G1/4	S018 G1/4-AG	90.02.04.00019	S018 G1/4-IG	90.02.04.00022
FG 62 G1/4	S018 G1/4-AG	90.02.04.00019	S018 G1/4-IG	90.02.04.00022
FG 88 G1/4	S018 G1/4-AG	90.02.04.00020	S019 G1/4-IG	90.02.04.00023

### Technical Data Bellows Suction Cups FG (2.5 Folds)

Type	Suction Force [N]	Pull-off force [N]	Volume [cm <sup>3</sup> ]	Workpiece radius min. [mm] ( Convex )	Recom. internal hose diameter d[mm]	Connection
FG 5	0.1	0.8	0.033	8	2	S017
FG 7	0.1	0.9	0.043	8	4	S016
FG 9	0.7	2.3	0.150	10	4	S016
FG 12	0.9	3.5	0.600	13	4	S016
FG 14	1.2	5.7	0.975	15	4	S016
FG 18	2.3	8.5	1.350	20	4	S016
FG 20	3.8	12.1	2.000	30	4	S016
FG 25	4.5	19.0	5.400	30	4	S016
FG 32	12.0	36.9	10.000	35	6	S018
FG 42	13.6	44.0	19.500	75	6	S018
FG 52	27.0	96.0	62.000	75	6	S018
FG 62	39.6	137.0	72.500	75	6	S018
FG 88	45.2	286.0	165.000	100	9	S019

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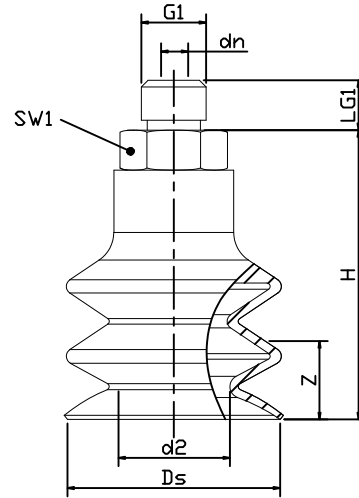
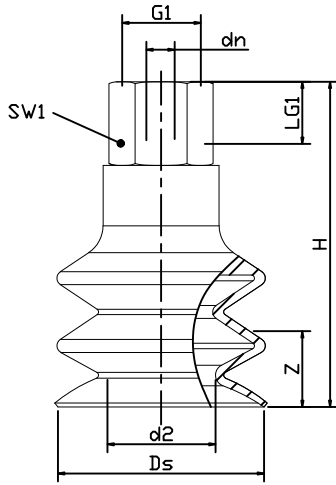
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### Technical Data Bellows Suction Cups FG (2.5 Folds)

FG 5 to 88 IG

FG 5 to 88 AG



Type	Dimensions [mm]								Z(Stroke)
	d2	dn	Ds	G1	H	LG1	SW1		
FG 5 M5-AG	2.6	2.0	5.0	M5-M	19.0	5.0	8	3	
FG 5 M5-IG	2.6	2.0	5.0	M5-F	24.0	5.5	8	3	
FG 7 G1/8-AG	1.8	3.5	5.9	G1/8"-M	20.0	7.5	14	3	
FG 7 G1/8-IG	1.8	3.5	5.9	G1/8"-F	26.0	8.5	14	3	
FG 7 M5-AG	1.8	2.5	5.9	M5-M	19.0	5.0	7	3	
FG 9 G1/8-AG	4.1	3.5	9.0	G1/8"-M	21.0	7.5	14	3	
FG 9 G1/8-IG	4.1	3.5	9.0	G1/8"-F	27.0	8.5	14	3	
FG 9 M5-AG	4.1	2.5	9.0	M5-M	20.0	5.0	7	3	
FG 12 G1/8-AG	5.0	3.5	12.0	G1/8"-M	27.0	7.5	14	7	
FG 12 G1/8-IG	5.0	3.5	12.0	G1/8"-F	33.0	8.5	14	7	
FG 12 M5-AG	5.0	2.5	12.0	M5-M	26.0	5.0	7	7	
FG 14 G1/8-AG	5.4	3.5	14.5	G1/8"-M	28.0	7.5	14	9	
FG 14 G1/8-IG	5.4	3.5	14.5	G1/8"-F	34.0	8.5	14	9	
FG 14 M5-AG	5.4	2.5	14.5	M5-M	27.0	5.0	7	9	
FG 18 G1/8-AG	8.0	3.5	17.2	G1/8"-M	28.0	7.5	14	9	
FG 18 G1/8-IG	8.0	3.5	17.2	G1/8"-F	34.0	8.5	14	9	
FG 18 M5-AG	8.0	2.5	17.2	M5-M	27.0	5.0	7	9	
FG 20 G1/8-AG	10.5	3.5	20.0	G1/8"-M	28.0	7.5	14	9	
FG 20 G1/8-IG	10.5	3.5	20.0	G1/8"-F	34.0	8.5	14	9	
FG 20 M5-AG	10.5	2.5	20.0	M5-M	27.0	5.0	7	9	
FG 25 G1/8-AG	10.0	3.5	23.0	G1/8"-M	40.0	7.5	14	18	
FG 25 G1/8-IG	10.0	3.5	23.0	G1/8"-F	46.0	8.5	14	18	
FG 32 G1/4-AG	16.0	4.4	32.0	G1/4"-M	41.5	11.0	17	15	
FG 32 G1/4-IG	16.0	4.4	32.0	G1/4"-F	52.5	12.0	17	15	
FG 42 G1/4-AG	17.8	4.4	42.6	G1/4"-M	50.0	11.0	17	20	
FG 42 G1/4-IG	17.8	4.4	42.6	G1/4"-F	61.0	12.0	17	20	
FG 52 G1/4-AG	24.6	4.4	52.5	G1/4"-M	53.0	11.0	17	25	
FG 52 G1/4-IG	24.6	4.4	52.5	G1/4"-F	64.0	12.0	17	25	
FG 62 G1/4-AG	29.5	4.4	62.2	G1/4"-M	59.0	11.0	17	29	
FG 62 G1/4-IG	29.5	4.4	62.2	G1/4"-F	70.0	12.0	17	29	
FG 88 G1/4-AG	33.0	8.0	89.0	G1/4"-M	92.0	11.0	21	34	
FG 88 G1/4-IG	33.0	8.0	89.0	G1/4"-F	103.0	12.0	21	34	

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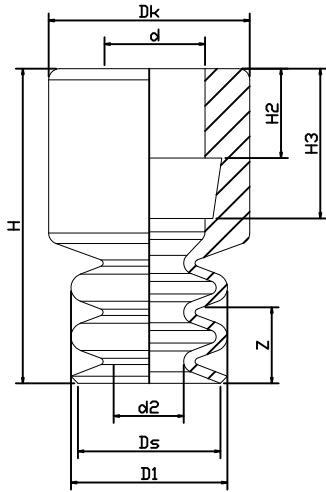
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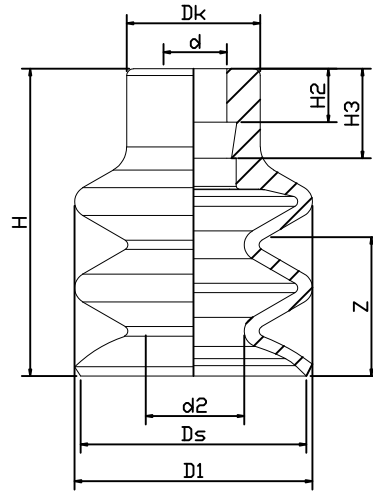


### Design Data Spare Parts Bellows Suction Cups FG (2.5 Folds)

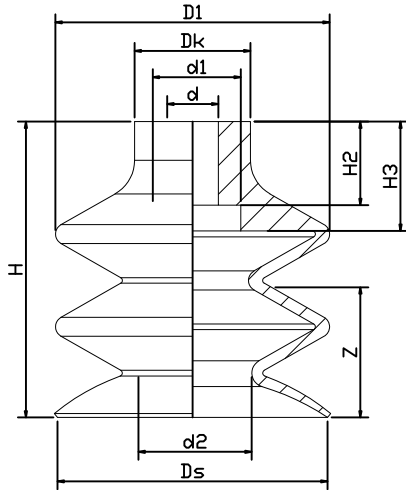
FG 5-9



FG 12 to 25



FG 32 to 88



Type	Dimensions [mm]									
	d	d1	d2	D1	DK	Ds	H	H2	H3	Z(Stroke)
FG 5	3.5	-	2.6	6.0	7	5.0	14.0	8.0	-	2
FG 7	4.5	-	1.8	6.5	9	5.9	14.0	6.5	-	3
FG 9	4.5	-	4.1	8.9	9	9.0	15.0	8.2	-	3
FG 12	4.5	-	5.0	12.0	10	12.0	21.0	6.9	9.0	6
FG 14	4.5	-	5.4	13.9	10	14.5	22.8	6.9	9.0	9
FG 18	4.5	-	8.0	17.8	10	17.2	22.6	6.9	9.0	9
FG 20	4.5	-	10.5	20.0	10	20.0	22.1	6.9	9.0	9
FG 25	4.5	-	10.0	25.0	10	23.0	34.0	6.9	9.0	18
FG 32	8.0	15	16.0	32.6	18	32.0	37.5	13.0	17.0	15
FG 42	8.0	15	17.8	43.5	18	42.6	46.0	13.0	17.0	20
FG 52	8.0	-	24.6	52.0	18	52.5	48.7	13.0	-	25
FG 62	8.0	-	29.5	62.0	18	62.2	54.0	13.0	-	29
FG 88	11.7	25	33.0	88.2	25	89.0	86.5	19.7	26.0	34

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