

Bellows Suction Cups(Round)



Bellows Suction Cups FGA(1.5Folds)

Suction area (ϕ)11mm to 78mm

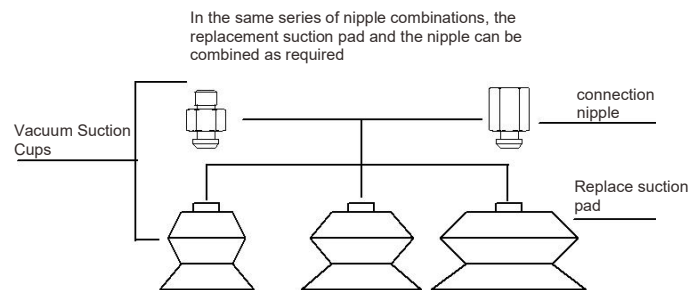
Bellows Suction Cups FGA1.5Folds

Introduction and application

- ◆ Handling fragile and vulnerable parts such as electronic components, injection molded parts, etc.
- ◆ Handling workpieces with flat or uneven surfaces, such as cartons, tubes, etc.



System design Bellows Suction Cups FGA (1.5 Folds)



Design

- ◆ Robust, wear-resistant suction cup FGA with single sealing lip, consisting of with 1.5 folds suction pad FGA and support plate.
- ◆ All nipples are plugged in.
- ◆ Suction cups with a diameter of 25 mm or more with supports on the bottom.

Ordering Data Bellows Suction Cups FGA (1.5 Folds)

Item no.	Suction area ϕ [mm]	Material and Shore hardness	Connecting thread
FGA	11 to 78	HT1-60 NBR-55 SI-55	M5-AG
			G1/8-AG
			G1/8-IG
			G1/4-AG
			G1/4-IG

Note:FGA AG=external thread M IG=internal threadRFE

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Type	Suction cup material*/Hardness in Shore		
	High-temperature material HT1 60±5shA	nitrile rubber NBR 55±5shA	Silicone rubber SI 55±5shA
FGA 11 G1/8-AG	90.02.01.00199	90.02.01.00253	90.02.01.00280
FGA 11 G1/8-IG	90.02.01.00200	90.02.01.00254	90.02.01.00281
FGA 11 M5-AG	90.02.01.00201	90.02.01.00255	90.02.01.00282
FGA 14 G1/8-AG	90.02.01.00202	90.02.01.00256	90.02.01.00283
FGA 14 G1/8-IG	90.02.01.00203	90.02.01.00257	90.02.01.00284
FGA 14 M5-AG	90.02.01.00204	90.02.01.00258	90.02.01.00285
FGA 16 G1/8-AG	90.02.01.00205	90.02.01.00259	90.02.01.00286
FGA 16 G1/8-IG	90.02.01.00206	90.02.01.00260	90.02.01.00287
FGA 16 M5-AG	90.02.01.00207	90.02.01.00261	90.02.01.00288
FGA 20 G1/8-AG	90.02.01.00208	90.02.01.00262	90.02.01.00289
FGA 20 G1/8-IG	90.02.01.00209	90.02.01.00263	90.02.01.00290
FGA 20 M5-AG	90.02.01.00210	90.02.01.00264	90.02.01.00291
FGA 22 G1/8-AG	90.02.01.00211	90.02.01.00265	90.02.01.00292
FGA 22 G1/8-IG	90.02.01.00212	90.02.01.00266	90.02.01.00293
FGA 22 M5-AG	90.02.01.00213	90.02.01.00267	90.02.01.00294
FGA 25 G1/8-AG	90.02.01.00214	90.02.01.00268	90.02.01.00295
FGA 25 G1/8-IG	90.02.01.00215	90.02.01.00269	90.02.01.00296
FGA 33 G1/4-AG	90.02.01.00216	90.02.01.00270	90.02.01.00297
FGA 33 G1/4-IG	90.02.01.00217	90.02.01.00271	90.02.01.00298
FGA 43 G1/4-AG	90.02.01.00218	90.02.01.00272	90.02.01.00299
FGA 43 G1/4-IG	90.02.01.00219	90.02.01.00273	90.02.01.00300
FGA 53 G1/4-AG	90.02.01.00220	90.02.01.00274	90.02.01.00301
FGA 53 G1/4-IG	90.02.01.00221	90.02.01.00275	90.02.01.00302
FGA 63 G1/4-AG	90.02.01.00222	90.02.01.00276	90.02.01.00303
FGA 63 G1/4-IG	90.02.01.00223	90.02.01.00277	90.02.01.00304
FGA 78 G1/4-AG	90.02.01.00224	90.02.01.00278	90.02.01.00305
FGA 78 G1/4-IG	90.02.01.00225	90.02.01.00279	90.02.01.00306

Ordering Data Spare Parts Bellows Suction Cups

Type	Suction cup material*/Hardness in Shore		
	High-temperature material HT1 60±5shA	nitrile rubber NBR 55±5shA	Silicone rubber SI 55±5shA
FGA 11	90.02.03.00116	90.02.03.00138	90.02.03.00149
FGA 14	90.02.03.00117	90.02.03.00139	90.02.03.00150
FGA 16	90.02.03.00118	90.02.03.00140	90.02.03.00151
FGA 20	90.02.03.00119	90.02.03.00141	90.02.03.00152
FGA 22	90.02.03.00120	90.02.03.00142	90.02.03.00153
FGA 25	90.02.03.00121	90.02.03.00143	90.02.03.00154
FGA 33	90.02.03.00122	90.02.03.00144	90.02.03.00155
FGA 43	90.02.03.00123	90.02.03.00145	90.02.03.00156
FGA 53	90.02.03.00124	90.02.03.00146	90.02.03.00157
FGA 63	90.02.03.00125	90.02.03.00147	90.02.03.00158
FGA 78	90.02.03.00126	90.02.03.00148	90.02.03.00159

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Suction area (ϕ)11mm to 78mm

TC-Grip

Ordering Data Spare Parts Suction Cups Nipples FGA

Type	Suction cup connector nipples [AG]		Suction cup connector nipples [IG]	
	Part No.	Part No.	Part No.	Part No.
FGA 11 M5	S016 M5-AG	90.02.04.00017		
FGA 11 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FGA 14 M5	S016 M5-AG	90.02.04.00017		
FGA 14 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FGA 16 M5	S016 M5-AG	90.02.04.00017		
FGA 16 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FGA 20 M5	S016 M5-AG	90.02.04.00017		
FGA 20 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FGA 22 M5	S016 M5-AG	90.02.04.00017		
FGA 22 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FGA 25 G1/8	S016 G1/8-AG	90.02.04.00018	S016 G1/8-IG	90.02.04.00021
FGA 33 G1/4	S018 G1/4-AG	90.02.04.00019	S018 G1/4-IG	90.02.04.00022
FGA 43 G1/4	S018 G1/4-AG	90.02.04.00019	S018 G1/4-IG	90.02.04.00022
FGA 53 G1/4	S018 G1/4-AG	90.02.04.00019	S018 G1/4-IG	90.02.04.00022
FGA 63 G1/4	S018 G1/4-AG	90.02.04.00019	S018 G1/4-IG	90.02.04.00022
FGA 78 G1/4	S019 G1/4-AG	90.02.04.00020	S019 G1/4-IG	90.02.04.00023

Technical Data Bellows Suction Cups FGA (1.5Folds)C

Type	Suction Force	Pull-off force	Volume	Workpiece radius min.	Recom. internal hose diameter	Connection nipple Series
	[N]	[N]	[cm ³]	[mm](Convex)	d[mm]	
FGA 11	0.95	3.8	0.225	10	4	S016
FGA 14	1.20	5.0	0.420	13	4	S016
FGA 16	2.30	6.7	0.750	20	4	S016
FGA 20	4.70	10.7	1.150	30	4	S016
FGA 22	5.70	15.2	1.400	25	4	S016
FGA 25	5.30	17.3	3.150	20	4	S016
FGA 33	13.60	39.6	4.750	40	6	S016
FGA 43	22.80	64.5	9.250	60	6	S016
FGA 53	51.30	95.0	26.250	75	6	S016
FGA 63	85.00	135.0	39.000	75	6	S016
FGA 78	137.40	218.0	76.000	70	6	S016

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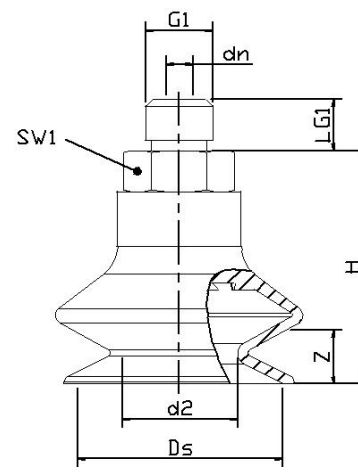
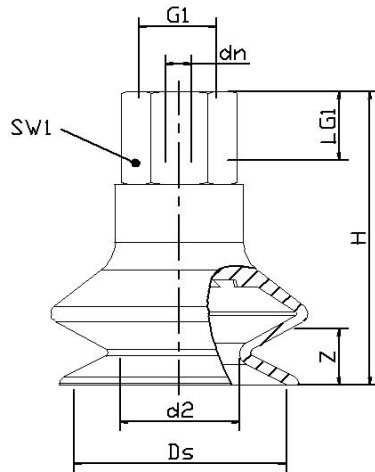
TC-Grip



Design Data Spare Parts Bellows Suction Cups FGA(1.5 Folds)

FGA 11 to 78IG

FGA 11 to 78 AG



Type	Dimensions [mm]								
	d2	dn	Ds	G1	H	LG1	SW1	Z(Stroke)	
FGA 11 G1/8-AG	5.1	3.5	10.4	G1/8"-M	22.0	7.5	14	4	
FGA 11 G1/8-IG	5.1	3.5	10.4	G1/8"-F	28.0	8.0	14	4	
FGA 11 M5-AG	5.1	2.5	10.4	M5-M	21.0	5.0	7	4	
FGA 14 G1/8-AG	5.0	3.5	12.8	G1/8"-M	21.5	7.5	14	5	
FGA 14 G1/8-IG	5.0	3.5	12.8	G1/8"-F	27.5	8.0	14	5	
FGA 14 M5-AG	5.0	2.5	12.8	M5-M	20.5	5.0	7	5	
FGA 16 G1/8-AG	8.4	3.5	15.6	G1/8"-M	25.2	7.5	14	7	
FGA 16 G1/8-IG	8.4	3.5	15.6	G1/8"-F	31.2	8.0	14	7	
FGA 16 M5-AG	8.4	2.5	15.6	M5-M	24.2	5.0	7	7	
FGA 20 G1/8-AG	11.0	3.5	18.1	G1/8"-M	21.2	7.5	14	5	
FGA 20 G1/8-IG	11.0	3.5	18.1	G1/8"-F	27.2	8.0	14	5	
FGA 20 M5-AG	11.0	2.5	18.1	M5-M	20.2	5.0	7	5	
FGA 22 G1/8-AG	11.7	3.5	21.5	G1/8"-M	25.0	7.5	14	6	
FGA 22 G1/8-IG	11.7	3.5	21.5	G1/8"-F	31.0	8.0	14	6	
FGA 22 M5-AG	11.7	2.5	21.5	M5-M	24.0	5.0	7	6	
FGA 25 G1/8-AG	9.9	3.5	22.5	G1/8"-M	29.0	7.5	14	9	
FGA 25 G1/8-IG	9.9	3.5	22.5	G1/8"-F	35.0	8.0	14	9	
FGA 33 G1/4-AG	17.0	4.4	30.0	G1/4"-M	31.0	11.0	17	9	
FGA 33 G1/4-IG	17.0	4.4	30.0	G1/4"-F	42.0	12.0	17	9	
FGA 43 G1/4-AG	21.9	4.4	38.0	G1/4"-M	31.6	11.0	17	10	
FGA 43 G1/4-IG	21.9	4.4	38.0	G1/4"-F	42.6	12.0	17	10	
FGA 53 G1/4-AG	33.0	4.4	50.0	G1/4"-M	38.0	11.0	17	12	
FGA 53 G1/4-IG	33.0	4.4	50.0	G1/4"-F	49.0	12.0	17	12	
FGA 63 G1/4-AG	44.5	4.4	60.0	G1/4"-M	38.0	11.0	17	14	
FGA 63 G1/4-IG	44.5	4.4	60.0	G1/4"-F	49.0	12.0	17	14	
FGA 78 G1/4-AG	54.0	8.2	74.0	G1/4"-M	53.0	11.0	21	14	
FGA 78 G1/4-IG	54.0	8.2	74.0	G1/4"-F	62.0	12.0	21	14	

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TC-Grip

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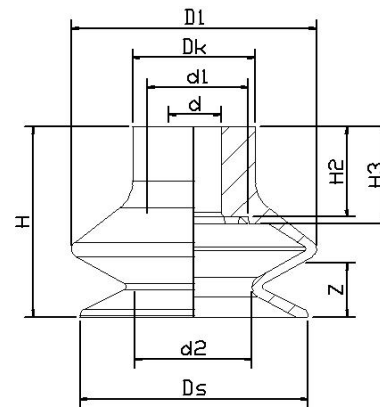
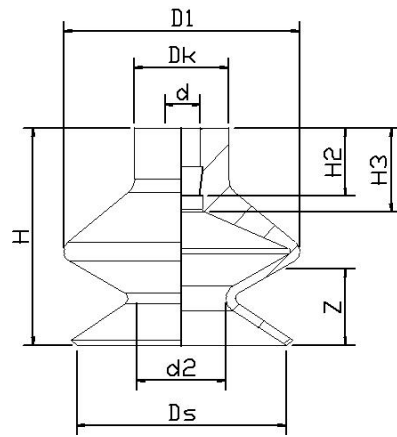
Suction area (ϕ)11mm to 78mm



Design Data Spare Parts Bellows Suction Cups FGA"

FGA 11 to 25

FGA 33 to 78



Type	Dimensions [mm]									
	d	d1	d2	D1	DK	Ds	H	H2	H3	Z(Stroke)
FGA 11	4.5	-	5.1	12.0	10	10.4	16.0	6.9	9.3	4
FGA 14	4.5	-	5.0	13.7	10	12.8	15.5	6.9	8.5	5
FGA 16	4.5	-	8.4	17.0	10	15.6	19.2	6.9	9.3	7
FGA 20	4.5	-	11.0	19.9	10	18.1	15.2	6.9	8.7	5
FGA 22	4.5	-	11.7	24.2	10	21.5	19.0	6.9	9.1	6
FGA 25	4.5	-	9.9	25.0	10	22.5	23.0	6.9	8.9	9
FGA 33	8.0	16.0	17.0	36.0	18	30.0	27.0	13.0	14.0	9
FGA 43	8.0	14.5	21.9	45.9	18	38.0	27.6	13.0	17.1	10
FGA 53	8.0	14.5	33.0	58.6	18	50.0	34.0	13.0	19.0	12
FGA 63	8.0	14.5	44.5	67.0	18	60.0	34.0	13.0	18.8	14
FGA 78	11.8	21.8	54.0	83.0	25	74.0	47.0	19.7	31.4	14