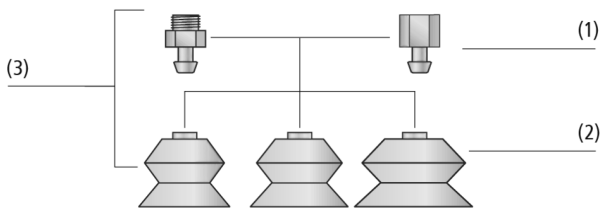


## Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (Ø) from 30 mm to 110 mm



Bellows Suction Cups FSGA VU1 (1.5 Folds)



System Design Bellows Suction Cups FSGA VU1 (1.5 Folds)



Bellows suction cups FSGA VU1 being used for handling cardboard boxes

### Suitability for Industry Specific Applications

#### Applications

- Round bellows suction cup with 1.5 folds for use in multi-shift operations with very short cycle times
- Handling of extremely abrasive workpieces such as rough cardboard sheets
- Suction cup with special slot: for handling oily metal sheets (better handling of lateral Forces due to discharge of oil)
- Suction cup without special slot: for handling cardboard, wood and similar material

#### Design

- Robust and wear-resistant suction cup FSGA (3) with single sealing lip, consisting of suction cup FGA (2) made of Vulkollan VU1 with 1.5 folds and connection nipple (1)
- Suction cup connected positively to nipple; no turning even when handling heavy loads
- Suction cups with supports on the bottom
- With each nipple family, the replacement cups and nipples can be combined as desired

#### Product Highlights

- Highly tear resistant material Vulkollan VU1 withstands enormous stress
- Insensitive to oils thanks to good chemical resistance
- Minimal abrasion (approx. 10 - 12 mm<sup>3</sup> according to DIN 53516) allows up to 20 times longer service life than standard NBR
- Support surfaces on the bottom prevent permanent deformation of thin-walled workpieces

# Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (Ø) from 30 mm to 110 mm

## Designation Code Bellows Suction Cups FSGA VU1 (1.5 Folds)

<b>FSGA</b>	-	<b>60</b>	-	<b>VU1-72</b>	-	<b>G1/4-AG</b>	-	<b>ON</b>
<b>1</b>		<b>2</b>		<b>3</b>		<b>4</b>		<b>5</b>

### 1 – Abbreviated designation

Code	Version
FSGA	1.5 folds

### 2 – Suction area

Code	Diameter in mm
30...110	ø 30 to 110

### 3 – Material

Code	Material
VU1-72	VU1-72

### 4 – Connection

Code	Connection
G1/4-AG	G1/4-AG (AG = male (M))
G1/4-IG	G1/4-IG (IG = female (F))
G1/2-IG	G1/2-IG

### 5 – Product addition

Code	Type
ON	Oil groove

Suction cup FSGA VU1 (elastomer part + connection nipple) is delivered assembled. The assembly consists of:

- Suction cup of type FGA VU1 – elastomer part, available in various diameters, optional with oil groove
- Connection nipple of type SA-NIP – available with various threads

Available spare parts: suction cup FGA VU1, connection nipple SA-NIP / connection disc SA-SCHE

## Ordering Data Bellows Suction Cups FSGA VU1 (1.5 Folds)

Type*				Vacuum connection:		
				G1/4"-M	G1/4"-F	G1/2"-F
FSGA	30	-	10.01.06.00197	10.01.06.00169	-	
FSGA	40	ON	10.01.06.00306	10.01.06.00299	-	
FSGA	50	ON	10.01.06.00307	10.01.06.00300	-	
FSGA	60	-	10.01.06.00242	10.01.06.00240	-	
FSGA	60	ON	10.01.06.00198	10.01.06.00172	-	
FSGA	85	-	10.01.06.00243	10.01.06.00241	-	
FSGA	85	ON	10.01.06.00199	10.01.06.00170	-	
FSGA	110	ON	-	-	10.01.06.00497	

\*Additional material specifications at beginning of the section "Vacuum Suction Cups"

## Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (Ø) from 30 mm to 110 mm

### Ordering Data Spare Parts Bellows Suction Cups FSGA VU1 (1.5 Folds)

Type			Spare Parts		Part no.
FSGA	30	G1/4-AG	Suction cup connection nipple	SA-NIP N013 G1/4-AG DN350	10.01.06.00183
FSGA	30	G1/4-IG	Suction cup connection nipple	SA-NIP N013 G1/4-IG DN350	10.01.06.00180
FSGA	40	G1/4-AG	Suction cup connection nipple	SA-NIP N011 G1/4-AG DN350	10.01.01.10663
FSGA	40	G1/4-IG	Suction cup connection nipple	SA-NIP N011 G1/4-IG DN350	10.01.01.00412
FSGA	50	G1/4-AG	Suction cup connection nipple	SA-NIP N011 G1/4-AG DN350	10.01.01.10663
FSGA	50	G1/4-IG	Suction cup connection nipple	SA-NIP N011 G1/4-IG DN350	10.01.01.00412
FSGA	60	G1/4-AG	Suction cup connection nipple	SA-NIP N014 G1/4-AG DN600	10.01.06.00184
FSGA	60	G1/4-IG	Suction cup connection nipple	SA-NIP N014 G1/4-IG DN600	10.01.06.00181
FSGA	85	G1/4-AG	Suction cup connection nipple	SA-NIP N015 G1/4-AG DN600	10.01.06.00185
FSGA	85	G1/4-IG	Suction cup connection nipple	SA-NIP N015 G1/4-IG DN600	10.01.06.00182
FSGA	110	G1/2-IG	Suction-cup connection disc	SA-SCHE 77 G1/2-IG FSGA	10.01.06.00593

Type*			Spare Parts		Part no.	
FSGA	30	VU1-72	-	Bellows suction cup (round)	FGA 30 VU1-72 N013	10.01.06.00177
FSGA	40	VU1-72	ON	Bellows suction cup (round)	FGA 40 VU1-72 N011 ON	10.01.06.00301
FSGA	50	VU1-72	ON	Bellows suction cup (round)	FGA 50 VU1-72 N011 ON	10.01.06.00302
FSGA	60	VU1-72	-	Bellows suction cup (round)	FGA 60 VU1-72 N014	10.01.06.00178
FSGA	60	VU1-72	ON	Bellows suction cup (round)	FGA 60 VU1-72 N014 ON	10.01.06.00207
FSGA	85	VU1-72	ON	Bellows suction cup (round)	FGA 85 VU1-72 N015 ON	10.01.06.00190
FSGA	85	VU1-72	-	Bellows suction cup (round)	FGA 85 VU1-72 N015	10.01.06.00179
FSGA	110	VU1-72	ON	Bellows suction cup (round)	FGA 110 VU1-72 N037 ON	10.01.06.00492

\*Additional material specifications at beginning of the section "Vacuum Suction Cups"

### Technical Data Bellows Suction Cups FSGA VU1 (1.5 Folds)

Type		Suction force (-600 mbar) [N]*	Pull-off force [N]	Volume [cm <sup>3</sup> ]	Workpiece radius min. (convex) [mm]	Hose diameter (recom.) d [mm]**	Nipple family
FSGA	30	13.50	32	5.8	25	6	N 013
FSGA	40	33.00	56	11.3	30	6	N 011
FSGA	50	52.00	88	22.6	40	6	N 011
FSGA	60	75.00	120	34.3	50	6	N 014
FSGA	85	140.00	250	78.0	80	6	N 015
FSGA	110	295.00	420	350.0	100	9	N 037

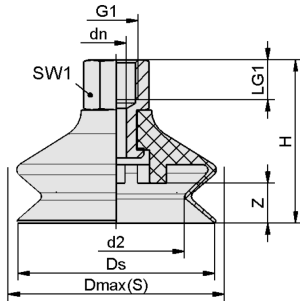
\*The specified suction forces are theoretical values at a vacuum of -0.6 bar and with a smooth, dry workpiece surface - they do not include a safety factor

\*\*The recommended hose diameter is based on a hose length of approx. 2 m

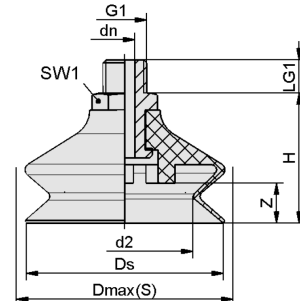
# Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area ( $\emptyset$ ) from 30 mm to 110 mm

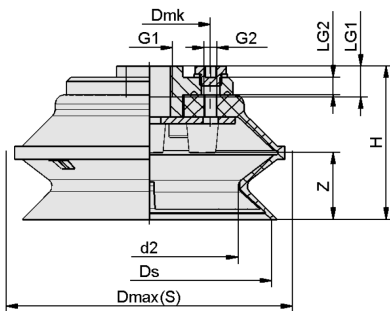
Design Data Bellows Suction Cups FSGA VU1 (1.5 Folds)



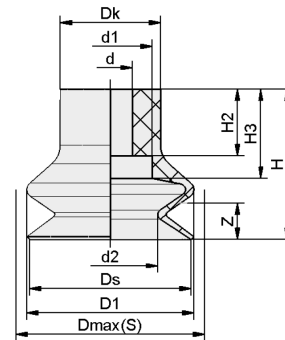
FSGA 30 - 85 VU1 IG



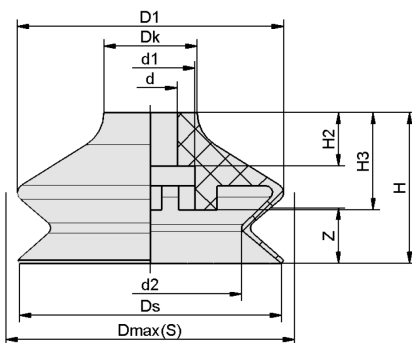
FSGA 30 - 85 VU1 AG



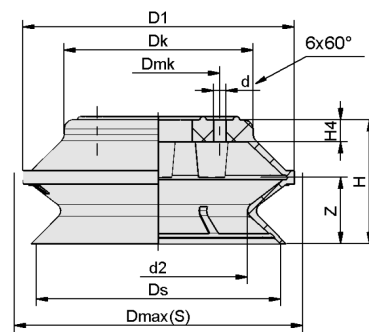
FSGA 110 VU1 IG



FGA 30 VU1



FGA 40 - 85 VU1



FGA 110 VU1

## Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (Ø) from 30 mm to 110 mm

### Design Data Bellows Suction Cups FSGA VU1 (1.5 Folds)

Type*	d2 [mm]	Dmax(S) [mm]**	Dmk [mm]	dn [mm]	Ds [mm]	G1	G2	H [mm]	LG1 [mm]	LG2 [mm]	SW1 [mm]	Z (Stroke) [mm]
FSGA 30 VU1-72 G1/4-AG	17.0	31.5	-	3.5	29.0	G1/4"-M	-	32.0	10	-	17	9
FSGA 30 VU1-72 G1/4-IG	17.0	31.5	-	3.5	29.0	G1/4"-F	-	42.0	12	-	17	9
FSGA 40 VU1-72 G1/4-AG ON	26.8	42.5	-	3.5	38.0	G1/4"-M	-	31.0	10	-	17	13
FSGA 40 VU1-72 G1/4-IG ON	26.8	42.5	-	3.5	38.0	G1/4"-F	-	41.0	12	-	17	13
FSGA 50 VU1-72 G1/4-AG ON	33.5	53.0	-	3.5	47.0	G1/4"-M	-	37.5	10	-	17	15
FSGA 50 VU1-72 G1/4-IG ON	33.5	53.0	-	3.5	47.0	G1/4"-F	-	47.5	12	-	17	15
FSGA 60 VU1-72 G1/4-AG	41.0	61.5	-	6.0	59.0	G1/4"-M	-	39.0	10	-	17	13
FSGA 60 VU1-72 G1/4-AG ON	40.0	61.5	-	6.0	57.0	G1/4"-M	-	39.0	10	-	17	13
FSGA 60 VU1-72 G1/4-IG	41.0	61.5	-	6.0	59.0	G1/4"-F	-	49.0	12	-	17	13
FSGA 60 VU1-72 G1/4-IG ON	40.0	61.5	-	6.0	57.0	G1/4"-F	-	49.0	12	-	17	13
FSGA 85 VU1-72 G1/4-AG	50.2	86.5	-	6.0	82.5	G1/4"-M	-	52.0	10	-	22	15
FSGA 85 VU1-72 G1/4-AG ON	50.2	86.5	-	6.0	82.5	G1/4"-M	-	52.0	10	-	22	15
FSGA 85 VU1-72 G1/4-IG	50.2	86.5	-	6.0	82.5	G1/4"-F	-	62.0	12	-	22	15
FSGA 85 VU1-72 G1/4-IG ON	50.2	86.5	-	6.0	82.5	G1/4"-F	-	62.0	12	-	22	15
FSGA 110 VU1-72 G1/2-IG ON	80.0	127.0	55.0	-	110.0	G1/2"-F	G1/8"-F	69.0	14	8	-	30

\*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 E3

\*\*External dimension of the suction cup when it is pressed against the workpiece by the vacuum

Type*	d [mm]	d1 [mm]	d2 [mm]	Dk [mm]	Dmax(S) [mm]**	Dmk [mm]	Ds [mm]	H [mm]	H2 [mm]	H3 [mm]	H4 [mm]	Z (Stroke) [mm]
FGA 30 VU1-72 N013	8	15.0	17.0	18.0	31.5	-	29.0	27.0	12.0	16.0	-	8.5
FGA 40 VU1-72 N011 ON	8	13.6	26.8	14.0	42.5	-	38.0	27.0	8.0	15.0	-	12.8

## Bellows Suction Cups FSGA VU1 (1.5 Folds)

Suction area (Ø) from 30 mm to 110 mm

Type*	d [mm]	d1 [mm]	d2 [mm]	Dk [mm]	Dmax(S) [mm]**	Dmk [mm]	Ds [mm]	H [mm]	H2 [mm]	H3 [mm]	H4 [mm]	Z (Stroke) [mm]
FGA 50 VU1-72 N011 ON	8	13.6	33.5	17.5	53.0	-	47.0	32.5	8.0	17.8	-	14.5
FGA 60 VU1-72 N014	12	20.0	41.0	21.0	61.5	-	59.0	34.0	12.0	22.0	-	12.0
FGA 85 VU1-72 N015	12	25.0	55.0	25.0	86.5	-	82.0	47.0	20.0	25.0	-	15.0
FGA 110 VU1-72 N037 ON	6	-	80.0	85.0	127.0	55	110.0	56.0	-	-	10.0	30.0

\*Acceptable dimensional tolerances for rubber parts concerning to DIN ISO 3302-1 E3

\*\*External dimension of the suction cup when it is pressed against the workpiece by the vacuum