










# Suction Pads









## Suction Pads

### Overview

Flat suction cup, round	Technical details	Application	Page
 G 10 - 60 soft	Dimensions Ø: 10 - 60 Carrying capacity (N): 3,9 - 93 Materials: NBR, SI, CR	universal	2.5
 G 1,5 - 95 hard	Dimensions Ø: 10 - 60 Carrying capacity (N): 3,9 - 93 Materials: NBR, SI, CR, PU, FKM	universal	2.7
 G 20 - 100 VU	Dimensions Ø: 20 - 100 Carrying capacity (N): 19 - 300 Materials: VU	universal	2.9
 GR 75 - 115	Dimensions Ø: 75 - 115 Carrying capacity (N): 170 - 380 Materials: NBR, SI	universal	2.11
 FSRL 110 - 290	Dimensions Ø: 110 - 290 Carrying capacity (N): 50 - Materials: NBR, SI, PU, FKM	universal	2.13
 FSL 300 - 630	Dimensions Ø: 300 - 630 Carrying capacity (N): 19 - 300 Materials: NBR, SI	universal	2.15

Flat suction plate, oval	Technical details	Application	Page
 FSL 20x60 - 80x370	Dimensions Ø: 20x60 - 80x370 Carrying capacity (N): 50 - 570 Materials: NBR, SI	universal	2.17
 FSRL 100x200 - 350x600	Dimensions Ø: 100x200 - 350x600 Carrying capacity (N): 750 - 7.350 Materials: NBR, SI	universal	2.19
 FSRL 100x200 - 350x600	Dimensions Ø: 450x850 Carrying capacity (N): 18.750 Materials: NBR, SI	universal	2.21

Bellows suction cup, round	Technical details	Application	Page
 GF 30 - 115 soft	Dimensions Ø: 30 - 115 Carrying capacity (N): 26 - 320 Materials: NBR, SI	universal	2.23
 GF 10 - 75 hard	Dimensions Ø: 10 - 75 Carrying capacity (N): 1 - 197 Materials: NBR, SI, CR, PU, FKM	universal	2.25
 GF 20 - 85 VU	Dimensions Ø: 20 - 100 Carrying capacity (N): 19 - 300 Materials: VU	universal	2.27
 GF 120 - 350	Dimensions Ø: 120 - 350 Carrying capacity (N): 350 - 3230 Materials: NBR, SI	universal	2.29
 GFD 5 - 90	Dimensions Ø: 5 - 90 Carrying capacity (N): 1 - 256 Materials: NBR, SI	universal	2.31
 GFD 20 - 85 VU	Dimensions Ø: 20 - 85 Carrying capacity (N): 24 - 290 Materials: VU	universal	2.33

# Suction pad

## Overview

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Image	Product Name	Technical details	Application	Page
	GF 60x140 - 200x400	Dimensions Ø: 60x140 - 200x400 Carrying capacity (N): 196 - 2345 Materials: NBR, SI	universal	2.35
<b>Grip suction cup</b>				
	GS 40 - 125	Dimensions Ø: 40 - 125 Carrying capacity (N): Materials: NBR, SI	Metal sheets oily, wet surfaces	2.37
	GS 30x60 - 70x140	Dimensions Ø: 30x60 - 70x140 Carrying capacity (N): Materials: NBR, SI	Metal sheets oily, wet surfaces	2.39
	GFS 40 - 125	Dimensions Ø: 40 - 125 Carrying capacity (N): Materials: NBR, SI	Metal sheets oily, wet surfaces	2.41
	GFS 30x60 - 70x140	Dimensions Ø: 30x60 - 70x140 Carrying capacity (N): Materials: NBR, SI	Metal sheets oily, wet surfaces	2.43
<b>Bubble cap suction plate</b>				
	GG 30 - 80	Dimensions Ø: 30 - 80 Carrying capacity (N): 63 - 210 Materials: NBR, SI	curved surfaces	2.45
	GG 40x120 - 80x200	Dimensions Ø: 40x120 - 80x200 Carrying capacity (N): 168 - 427 Materials: NBR, SI	curved surfaces	2.47
<b>Soft suction cup</b>				
	GP 20 - 140	Dimensions Ø: 10 - 60 Carrying capacity (N): 3,9 - 93 Materials: NBR, SI, CR	Solar wafers, extremely thin materials	2.49
<b>Foil suction cup</b>				
	GO 20 - 140	Dimensions Ø: 10 - 60 Carrying capacity (N): 3,9 - 93 Materials: NBR, SI, CR	Foils and packing	2.51
<b>Structure suction plate</b>				
	FSD 85 - 260	Dimensions Ø: 85 - 260 Carrying capacity (N): Materials: NOR, SI	Studded and checkered plates structured surfaces	2.53
	FSM 100 - 320	Dimensions Ø: 100 - 320 Carrying capacity (N): 300 - 3580 Materials: M	Wood handling rough surfaces	2.55
	FSM 35x170 - 250x460	Dimensions Ø: 35x170 - 250x460 Carrying capacity (N): 180 - 5420 Materials: M, Z	Wood handling rough surfaces	2.57
	FSGM 35x170 - 250x460	Dimensions Ø: 35x170 - 250x460 Carrying capacity (N): 1130 - 5420 Materials: NBR, SI	gluelam beams rough surfaces	2.59

# Suction pad

## Overview

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Image	Product Name	Technical details	Application	Page
<b>Separation suction plate</b>				
	FSRLB 110 - 290	Dimensions Ø: 110 - 290 Carrying capacity (N): Materials: NBR, SI	Metal sheets Separation of sheets	2.61
	FSRLI 110 - 290	Dimensions Ø: 110 - 290 Carrying capacity (N): Materials: NBR, SI	Wood handling Separation of porous plates	2.63
<b>Bar suction plate</b>				
	FSLB 30x50 - 60x470	Dimensions Ø: 30x50 - 60x470 Carrying capacity (N): Materials: NBR, SI	Handling of bars and tubes	2.65
	FSLSE 120x300 - 200x750	Dimensions Ø: 120x300 ... 200x750 Carrying capacity (N): Materials: NBR		2.67
<b>High temperature suction plate</b>				
	FSHB 90 - 250	Dimensions Ø: 90 - 250 Carrying capacity (N): 290 - 2080 Materials: VI	High temperature applications	2.69
<b>Rectangular suction plate</b>				
	FSRL 30x100 - 30x300	Dimensions Ø: 30x100 - 30x300 Carrying capacity (N): 3,9 - 93 Materials: NBR, SI	universal with protruding body	2.71
	EP 13x43 - 96x96	Dimensions Ø: 13x43 - 96x96 Carrying capacity (N): 19 - 300 Materials: NBR	universal	2.73
<b>Sealing profiles</b>				
	RS 5 - PGR 20x25	Dimensions Ø: 5 - 15, 6x8 - 20x25 Materials: M, SI		2.75
<b>Accessories for suction pads</b>				
	Special glue		to glue on sealing profiles	2.77
	Textile cover	Dimensions Ø: 90 - 300	for sensitive surfaces	2.78

## Flat suction cup, round

G10 - G60, soft design

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### Description

Very elastic rubber cup with smooth pad (G) or burling pad (GN) and single lip. The suction pads are clipped on and can be easily removed when worn out. Please order connection nipples separately.

### Application

- workpieces with flat and even surface
- workpieces with extremely sensitive surfaces



FS-G 10 ... FS-G 60, FS-GN38 ... FS-GN 47

### Article numbers

Type	NBR-S	SI-T	CR-W	Connection nipple	
				M5-A	G1/4-A
FS-G 10	1.01.1.0004	1.01.1.0007	1.01.1.0001	---	1.31.1.0002
FS-G 20	1.01.1.0017	1.01.1.0021	1.01.1.0015	1.31.1.0012	1.31.1.0011
FS-G 28	1.01.1.0030	1.01.1.0031	1.01.1.0029	1.31.1.0012	1.31.1.0011
FS-G 38	1.01.1.0050	1.01.1.0051	1.01.1.0049	1.31.1.0013	1.31.1.0014
FS-GN 38	1.01.1.0082	1.01.1.0083	1.01.1.0081	1.31.1.0013	1.31.1.0014
FS-G 47	1.01.1.0058	1.01.1.0059	1.01.1.0057	1.31.1.0013	1.31.1.0014
FS-GN 47	1.01.1.0085	1.01.1.0086	1.01.1.0084	1.31.1.0013	1.31.1.0014
FS-G 60	---	1.01.1.0072	1.01.1.0066	1.31.1.0006	1.31.1.0014

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FS-G 10	4	0,001	0,001
FS-G 20	13	0,001	0,001
FS-G 28	20	0,001	0,004
FS-G 38	46	0,002	0,004
FS-GN 38	45	0,002	0,004
FS-G 47	60	0,006	0,014
FS-GN 47	62	0,006	0,014
FS-G 60	93	0,014	0,016

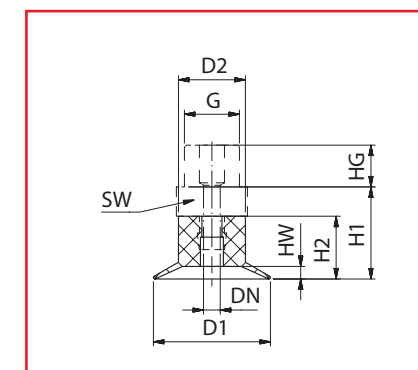
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

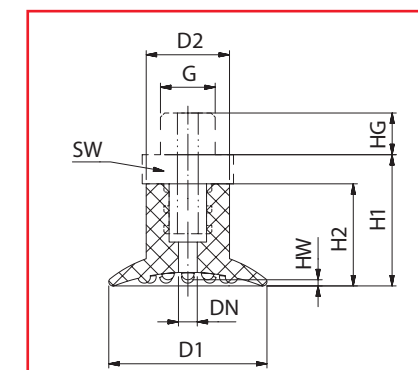
## Flat suction cup, round

G10 - G60, soft design

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FS-G 10 ... FS-G 60



FS-GN 38 ... FS-GN 47

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FS-G 10	10	5	2,5	1,5	11	7,5	4,5	M5	8
FS-G 20	20	11,5	5,5	3	22	15	10	G1/4	17
FS-G 28	28	16	5,5	3	26	15	6	G1/4	17
FS-G 38	38	20	4,5	3,5	30,5	23,5	10	G1/4	19
FS-GN 38	38	20	4,5	4	30,5	23,5	10	G1/4	19
FS-G 47	47	20	4,5	5,5	33	26	10	G1/4	19
FS-GN 47	47	20	4,5	6	33	26	10	G1/4	19
FS-G 60	55	20	4	8	33	26	10	G1/4	19

### Suitable connection elements

Type	Suction pad retainers		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-G 10 ... FS-G28	SAS-M8x1-M5	---	HSW-M8x1-M5	HSB-M5-1/8	HSG-M8x1	FS ... -M8x1
FS-G 38 ... FS-G60	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1	FS ... -M12x1

## Flat suction cup, round

G 2 - G 95 hard design

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### Description

Very elastic rubber cup with smooth pad and single lip. The suction pads are clipped on the connection nipples and can be easily exchanged when worn out. Please order connection nipple separately.

### Application

- workpieces with smooth and slightly rough surface
- many materials for various requirements
- low imprinting designs



FS-G 5...FS-G 95

### Article numbers

Type	NBR-S	SI-T	CR-GR	PU-B	VI-S	Connection nipple	
						M5-A	G1/4-A
FS-G 5	1.01.1.0116	1.01.1.0118	1.01.1.0120	1.01.1.0121	1.01.1.0122	1.31.1.0002	---
FS-G 10	1.01.1.0004	1.01.1.0007	1.01.1.0001	1.01.1.0005	1.01.1.0134	1.31.1.0002	---
FS-G 15	1.01.1.0010	1.01.1.0013	1.01.1.0008	1.01.1.0011	1.01.1.0136	1.31.1.0002	---
FS-G 20	---	---	---	1.01.1.0019	1.01.1.0138	---	1.31.1.0005
FS-G 25	1.01.1.0140	1.01.1.0142	1.01.1.0144	1.01.1.0145	1.01.1.0146	---	1.31.1.0005
FS-G 30	1.01.1.0148	1.01.1.0149	1.01.1.0150	1.01.1.0046	1.01.1.0151	---	1.31.1.0005
FS-G 35	1.01.1.0153	1.01.1.0155	1.01.1.0157	1.01.1.0158	1.01.1.0159	---	1.31.1.0005
FS-G 40	1.01.1.0161	1.01.1.0162	1.01.1.0163	1.01.1.0055	1.01.1.0164	---	1.31.1.0005
FS-G 50	1.01.1.0166	1.01.1.0167	1.01.1.0168	1.01.1.0063	1.01.1.0169	---	1.31.1.0004
FS-G 60	1.01.1.0171	1.01.1.0172	1.01.1.0173	1.01.1.0070	1.01.1.0174	---	1.31.1.0006
FS-G 80	1.01.1.0176	1.01.1.0178	1.01.1.0180	1.01.1.0181	1.01.1.0182	---	1.31.1.0006
FS-G 95	1.01.1.0184	1.01.1.0186	1.01.1.0188	1.01.1.0189	1.01.1.0190	---	1.31.1.0006

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FS-G 5	0,6	0,001	0,001
FS-G 10	3,9	0,001	0,001
FS-G 15	6	0,001	0,005
FS-G 20	12,1	0,001	0,006
FS-G 25	23	0,001	0,007
FS-G 30	33	0,002	0,008
FS-G 35	46	0,004	0,010
FS-G 40	62	0,006	0,012
FS-G 50	78	0,008	0,025
FS-G 60	139	0,012	0,034
FS-G 80	275	0,025	0,048
FS-G 95	360	0,040	0,062

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

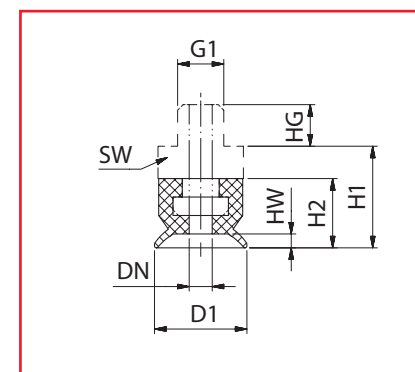
\*\* Volume with suction pad not engaged and unloaded

## Flat suction cup, round

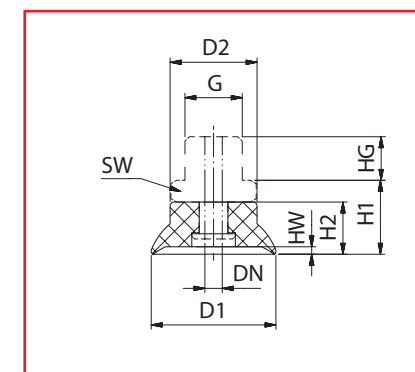
G 2 - G 95 hard design

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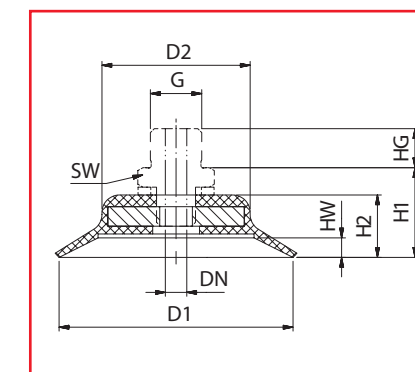
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FS-G 5...FS-G 15



FS-G 20... FS-G 50



FS-G 60... FS-G 95

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FS-G 5	5	7,5	2,5	0,5	10	4	4,5	M5	8
FS-G 10	10	8,5	2,5	1,5	11,5	8	4,5	M5	8
FS-G 15	15	12	2,5	2	11,5	8	4,5	M5	8
FS-G 20	20	15	3	2	17,5	10	10	G1/4	17
FS-G 25	25	15	4	2	19	14	10	G1/4	17
FS-G 30	30	15	4	1,7	17	12	10	G1/4	17
FS-G 35	35	24	4	3	19	14	10	G1/4	17
FS-G 40	40	24	4	3,8	19	14	10	G1/4	17
FS-G 50	50	27	4	3,8	20	14	10	G1/4	17
FS-G 60	60	38	5,5	5	23	18	10	G1/4	17
FS-G 80	80	55	5,5	6	26	21	10	G1/4	17
FS-G 95	100	70	5,5	6	26	21	10	G1/4	17

### Suitable connection elements

Type	Suction pad retainers		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-G 5 ... FS-G 30	SAS-M8x1-M5	---	HSW-M8x1-M5	HSB-M5-1/8	HSG-M8x1	FS ... -M8x1
FS-G 35 ... FS-G 60	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1	FS ... -M12x1
FS-G 80 ... FS-G 95	SAS-M16x1,5-1/4	---	HSW-M16x1,5-1/4	HSB-1/4-1/4	HSG-M16x1,5	FS ... -M16x1,5

## Flat suction cup, round

G 20 - G 100 Vulkollane

### Description

Very robust and extremely resistant flat suction cup made of vulkollane. Vulkollane has an up to 10-fold higher durability than other materials and is suitable for the highest strains. The cups are clipped on connection nipples and can be easily exchanged when worn out. Please order the connection nipples separately.

### Application

- workpieces with smooth and flat surface
- highest strains, especially in multi-shift processes
- minimum abrasion and very good chemical resistance



FS-G 20 VU ... FS-G 100 VU

### Article numbers

Type	VU-BR	Connection nipple	
		G1/8-A	G1/4-A
FS-G 20 VU	1.01.1.0100	1.31.1.0018	---
FS-G 30 VU	1.01.1.0101	1.31.1.0018	---
FS-G 40 VU	1.01.1.0102	---	1.31.1.0019
FS-G 50 VU	1.01.1.0103	---	1.31.1.0019
FS-G 60 VU	1.01.1.0104	---	1.31.1.0019
FS-G 80 VU	1.01.1.0105	---	1.31.1.0019
FS-G 100 VU	1.01.1.0106	---	1.31.1.0019

### Technical details

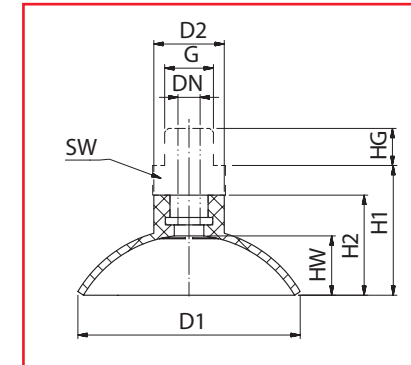
Type	Holding force* (N)	Volume** (l)	Weight (kg)
FS-G 20 VU	16	0,001	0,008
FS-G 30 VU	45	0,003	0,012
FS-G 40 VU	68	0,006	0,014
FS-G 50 VU	82	0,009	0,025
FS-G 60 VU	128	0,016	0,034
FS-G 80 VU	225	0,063	0,085
FS-G 100 VU	300	0,180	0,120

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Flat suction cup, round

G 20 - G 100 Vulkollane



FS-G 20 VU ... FS-G 100 VU

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FS-G 20 VU	20	14	3	9	19	13	9,5	G1/8	14
FS-G 30 VU	30	19	3	14	23,5	17	9,5	G1/8	14
FS-G 40 VU	40	19	6	11	25	17	10	G1/4	17
FS-G 50 VU	50	19	6	16	30	22	10	G1/4	17
FS-G 60 VU	60	19	6	20	35	27	10	G1/4	17
FS-G 80 VU	80	24	6	19	34	26	10	G1/4	17
FS-G 100 VU	100	24	6	22	40	32	10	G1/4	17

### Suitable connection elements

Type	Suction pad retainers		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-G 20VU ... FS-G 30VU	SAS-M8x1-1/8	---	HSW-M8x1-1/8	HSB-1/8-1/8	HSG-M8x1	FS ... -M8x1
FS-G 40VU ... FS-G 60VU	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1	FS ... -M12x1
FS-G 80VU ... FS-G 100VU	SAS-M16x1,5-1/4	---	HSW-M16x1,5-1/4	HSB-1/4-1/4	HSG-M16x1,5	FS ... -M16x1,5

## Flat suction cup, round

GR 75 - GR 115 with grooved pad

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### Description

Very robust and resistant suction pad with grooved pad and vulcanized connection nipple. The grooved pad guarantees a wide support of the load and higher cross acceleration.

### Application

- materials with smooth and even surface
- very thin materials
- applications with high cross acceleration
- imprint-free design in viton



FS-GR 75 ... FS-GR 115

### Article numbers

Type	NBR-S	NBR-G	SI-T	VI-S
FS-GR 75	1.01.2.0006	1.01.2.0005	1.01.2.0007	1.01.2.0086
FS-GR 95	1.01.2.0010	1.01.2.0008	1.01.2.0011	1.01.2.0087
FS-GR 115	1.01.2.0003	1.01.2.0002	1.01.2.0004	1.01.2.0088

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FS-GR 75	170	0,03	0,06
FS-GR 95	270	0,04	0,09
FS-GR 115	380	0,06	0,13

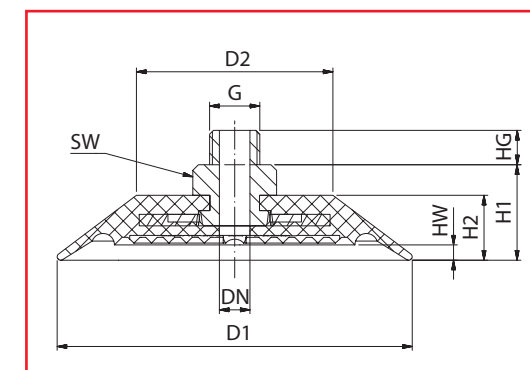
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Flat suction cup, round

GR 75 - GR 115 with grooved pad

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FS-GR 75 ... FS-GR 115

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FS-GR 75	73	31,5	8	4,5	17	35	9	G1/4	19
FS-GR 95	93	51,5	8	4,5	17	35	9	G1/4	19
FS-GR 115	113	70,5	8	5	17	35	9	G1/4	19

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-GR 75	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1	FS ... -M12x1
FS-GR 95 - FS-GR 115	SAS-M16x1,5-1/4	---	HSW-M16x1,5-1/4	HSB-1/4-1/4	HSG-M16x1,5	FS ... -M16x1,5

## Flat suction plate, round

FSRL 120 - FSRL 600 with grooved pad

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### Description

Robust and extremely resistant flat suction pad with grooved pad, long lips and additional inner sealing. The gasket is pulled over the body and can be easily exchanged when worn out. The suction pads are available with central (Z) or lateral (S) vacuum feed. Please order the connection screw separately.

### Application

- flat, sensitive workpieces
- smooth to slightly rough surfaces
- suitable for short suction resp. cycle times
- imprint-free design in viton

### Dimensions

Type	Suction pad			Replacement gasket			Connection screw	
	NBR-G	SI-T	VI-S	NBR-G	SI-T	VI-S	Type	Art.-Nr:
FSRL 120 Z	1.11.1.0248	1.11.1.0382	1.11.1.0530	2.11.2.0089	2.11.2.0102	2.11.2.0104	ASB-M16-20	1.31.2.0084
FSRL 120 S	1.11.1.0293	1.11.1.0384	1.11.1.0532	2.11.2.0114	2.11.2.0126	2.11.2.0174	AS-M16-22	1.31.2.0035
FSRL 170 Z	1.11.1.0250	1.11.1.0385	1.11.1.0526	2.11.2.0090	2.11.2.0119	2.11.2.0170	ASB-M16-20	1.31.2.0084
FSRL 170 S	1.11.1.0343	1.11.1.0356	1.11.1.0533	2.11.2.0127	2.11.2.0128	2.11.2.0175	AS-M16-22	1.31.2.0035
FSRL 230 Z	1.11.1.0251	1.11.1.0387	1.11.1.0525	2.11.2.0091	2.11.2.0120	2.11.2.0122	ASB-M16-20	1.31.2.0084
FSRL 230 S	1.11.1.0350	1.11.1.0388	1.11.1.0534	2.11.2.0130	2.11.2.0131	2.11.2.0176	AS-M16-22	1.31.2.0035
FSRL 290 Z	1.11.1.0271	1.11.1.0389	1.11.1.0531	2.11.2.0094	2.11.2.0121	2.11.2.0173	ASB-M16-20	1.31.2.0084
FSRL 290 S	1.11.1.0383	1.11.1.0390	1.11.1.0535	2.11.2.0132	2.11.2.0133	2.11.2.0177	AS-M16-22	1.31.2.0035
FSRL 340 S	1.11.1.0179	1.11.1.0142	1.11.1.0541	vulcanized			AS-M24x1,5-28	1.31.2.0069
FSRL 400 S	1.11.1.0180	1.11.1.0144	1.11.1.0542	vulcanized			AS-M24x1,5-28	1.31.2.0069
FSRL 500 S	1.11.1.0181	1.11.1.0146	1.11.1.0543	vulcanized			AS-M24x1,5-28	1.31.2.0069
FSRL 600 S	1.11.1.0182	1.11.1.0148	1.11.1.0544	vulcanized			AS-M24x1,5-28	1.31.2.0069

Z = central vacuum feed  
S = lateral Vacuum feed

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FSRL 120 Z / S	550	0,06	0,33
FSRL 170 Z / S	1.150	0,12	0,55
FSRL 230 Z / S	2.100	0,20	1,00
FSRL 290 Z / S	3.040	0,78	1,95
FSRL 340 S	3.640	1,30	2,50
FSRL 400 S	4.000	2,60	6,00
FSRL 500 S	7.100	4,30	11,80
FSRL 600 S	9.500	6,80	18,40

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded



FSRL 120 ... FERL 600

## Flat suction plate, round

FSRL 120 - FSRL 600 with grooved pad

**FEZER**  
Simply move more.

### Description

Robust and extremely resistant flat suction pad with grooved pad, long lips and additional inner sealing. The gasket is pulled over the body and can be easily exchanged when worn out. The suction pads are available with central (Z) or lateral (S) vacuum feed. Please order the connection screw separately.

### Application

- flat, sensitive workpieces
- smooth to slightly rough surfaces
- suitable for short suction resp. cycle times
- imprint-free design in viton

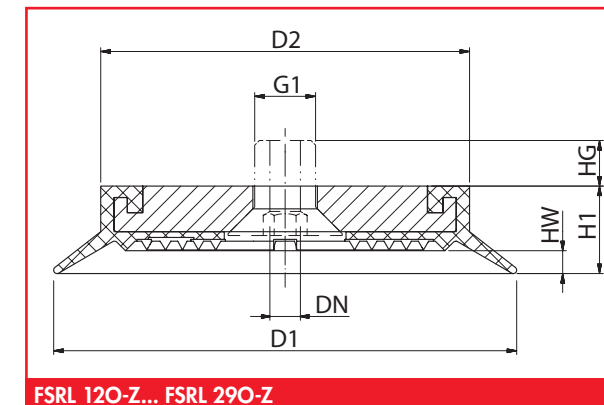
### Dimensions

Type	D1	D2	DN	HW	H1	HG	G1	G2
FSRL 120 Z	120	97	8	6	23	8,5	M16	---
FSRL 120 S	120	97	---	6	23	8,5	M16	G1/4
FSRL 170 Z	170	147	8	6	23	8,5	M16	---
FSRL 170 S	170	147	---	6	23	8,5	M16	G1/4
FSRL 230 Z	220	197	8	6	23	13	M16	---
FSRL 230 S	220	197	---	6	23	13	M16	G1/2
FSRL 290 Z	290	267	8	6	23	13	M16	---
FSRL 290 S	290	267	---	6	23	13	M16	G1/2
FSRL 340 S	340	300	---	14	32	22	M20	G1/2
FSRL 400 S	400	300	---	17	46	22	M20	G1/2
FSRL 500 S	500	400	---	17	46	22	M24	G3/4
FSRL 600 S	600	500	---	17	46	22	M24	G3/4

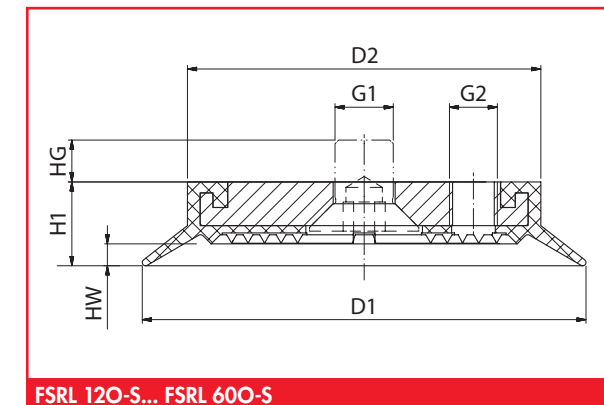
### Suitable connection elements

Type	Suction pad retainers		Suspension bolt
	SAS	SAK	
FSRL 120 ... FSRL 170	SAS-M16x1,5-M16	SAK-M16x1,5-M16	FS ... -M16x1,5
FSRL 230 ... FSRL 290	SAS-M20x1,5-M16	SAK-M20x1,5-M16	FS ... -M20x1,5
FSRL 340 ... FSRL 400	SAS-M20x1,5-M24x1,5	SAK-M20x1,5-M24x1,5	FS ... -M20x1,5*
FSRL 500 ... FSRL 600	SAS-M30x1,5-M24x1,5	SAK-M30x1,5-M24x1,5	FS ... -M30x1,5*

\* Stössel ohne integrierte Vacuum feed



FSRL 120-Z... FSRL 290-Z



FSRL 120-S... FSRL 600-S

## Flat suction plate, round

FSL 300 - FSL 630

**FEZER**  
Simply move more.

### Description

Very robust and extremely resistant flat suction pad with long lip and additional inner sealings. The sealing is screwed onto the body and can be easily exchanged when worn out. The suction plates have a lateral vacuum feed.

### Application

- large, heavy workpiece with scaled or slightly rough surface
- heavy-duty processes



FSL 300 ... FSL 630

### Article numbers

Type	Suction pad		Replacement gasket		Connection screw	
	NBR-S	SI-T	NBR-S	SI-T	Type	Art.-Nr:
DP-FSL 300 S	1.11.1.0395	1.11.1.0396	1.13.1.0315	1.13.1.0316	AS-M24x1,5-30	1.31.2.0029
DP-FSL 360 S	1.11.1.0149	1.11.1.0150	1.13.1.0245	1.13.1.0031	AS-M24x1,5-30	1.31.2.0029
DP-FSL 400 S	1.11.1.0170	1.11.1.0171	1.13.1.0244	1.13.1.0034	AS-M24x1,5-30	1.31.2.0029
DP-FSL 450 S	1.11.1.0151	1.11.1.0152	1.13.1.0243	1.13.1.0040	AS-M24x1,5-30	1.31.2.0029
DP-FSL 540 S	1.11.1.0153	1.11.1.0154	1.13.1.0241	1.13.1.0043	AS-M24x1,5-30	1.31.2.0029
DP-FSL 630 S	1.11.1.0155	1.11.1.0156	1.13.1.0242	1.13.1.0046	on request	

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
DP-FSL 300 S	2.900	1,3	7,0
DP-FSL 360 S	5.230	2,0	8,8
DP-FSL 400 S	6.140	2,3	10,1
DP-FSL 450 S	7.500	4,5	16,5
DP-FSL 540 S	12.500	6,8	27,8
DP-FSL 630 S	16.600	12,1	35,8

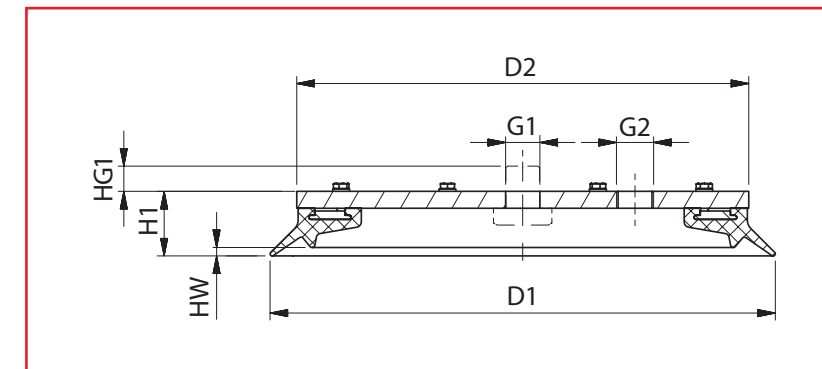
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Flat suction plate, round

FSL 300 - FSL 630

**FEZER**  
Simply move more.



FSL 300 ... FSL 630

### Dimensions

Type	D1	D2	HW	H1	HG1	G1	G2
DP-FSL 300 S	300	262	6	34	12	25	G3/4
DP-FSL 360 S	360	322	6	34	12	25	G3/4
DP-FSL 400 S	400	346	14	29	12	25	G3/4
DP-FSL 450 S	450	375	17	50	15	25	G3/4
DP-FSL 540 S	540	465	17	50	15	25	G3/4
DP-FSL 630 S	630	555	17	50	15	25	G1

### Suitable connection elements

Type	Suction pad retainers		Bolt type	Clamping plates
	SAS	SAK		
FSL 300 ... FSL 400	SAS-M20x1,5-M24x1,5	SAK-M20x1,5-M20x1,5	STG-M20x1,5	KP-AL-20
FSL 450 ... FSL 540	SAS-M30x1,5-M24x1,5	SAK-M30x1,5-M24x1,5	STG-M30x1,5	KP-AL-30
FSL 630	auf Anfrage			



## Flat suction plate, oval

FSL 20x60 - FSL 80x370

**FEZER**  
Simply move more.

### Description

Robust and universally suitable flat suction pad with aluminum body and vulcanized sealing. Connection by flat head screws which allow to easily exchange the sealing. Please order connection screw separately.

### Application

- workpieces with narrow suction areas (door elements, rods, bars, profiles)
- workpieces with smooth, slightly rough surfaces



FSL 20x60 ... FSL 80x370

### Article numbers

Type	NBR-G	SI-T	Connection screw	
			Type	Art.-Nr.
DP-FSL 20x60	1.11.1.0398	1.11.1.0399	ASB-M5-20	1.31.2.0009
DP-FSL 30x80	1.11.1.0401	1.11.1.0402	ASB-M8-16	1.31.2.0068
DP-FSL 30x100	1.11.1.0404	1.11.1.0405	ASB-M8-16	1.31.2.0068
DP-FSL 35x200	1.11.1.0407	1.11.1.0408	AS-M5	1.31.2.0108
DP-FSL 40x110	1.11.1.0410	1.11.1.0411	ASB-M8-16	1.31.2.0068
DP-FSL 55x85	1.11.1.0413	1.11.1.0414	ASB-M12-17	1.31.2.0003
DP-FSL 55x100	1.11.1.0416	1.11.1.0417	ASB-M12-17	1.31.2.0003
DP-FSL 55x125	1.11.1.0419	1.11.1.0420	ASB-M12-17	1.31.2.0003
DP-FSL 55x150	1.11.1.0422	1.11.1.0423	AS-M8-16	1.31.2.0068
DP-FSL 55x200	1.11.1.0172	1.11.1.0426	AS-M8-16	1.31.2.0068
DP-FSL 55x250	1.11.1.0428	1.11.1.0429	AS-M8-16	1.31.2.0068
DP-FSL 55x300	1.11.1.0431	1.11.1.0432	AS-M8-16	1.31.2.0068
DP-FSL 80x250	1.11.1.0434	1.11.1.0435	AS-M16-22	1.31.2.0035
DP-FSL 80x370	1.11.1.0437	1.11.1.0438	AS-M16-22	1.31.2.0035

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
DP-FSL 20x60	50	18	0,004	0,018
DP-FSL 30x80	90	20	0,010	0,025
DP-FSL 30x100	110	25	0,015	0,030
DP-FSL 35x200	210	25	0,055	0,030
DP-FSL 40x110	140	30	0,035	0,045
DP-FSL 55x85	150	60	0,035	0,060
DP-FSL 55x100	175	60	0,040	0,080
DP-FSL 55x125	220	60	0,050	0,120
DP-FSL 55x150	270	60	0,060	0,150
DP-FSL 55x200	350	60	0,090	0,180
DP-FSL 55x250	440	60	0,100	0,210
DP-FSL 55x300	525	60	0,110	0,260
DP-FSL 80x250	670	80	0,190	0,370
DP-FSL 80x370	1.280	80	0,260	0,620

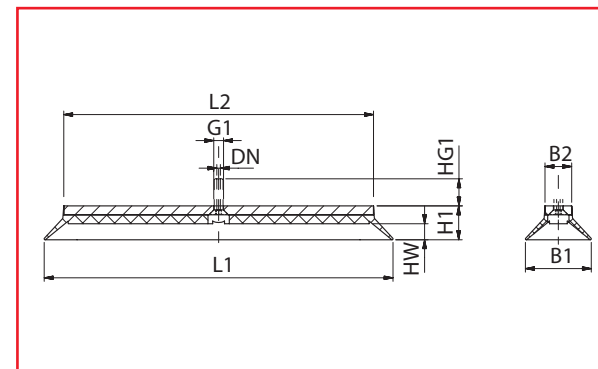
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

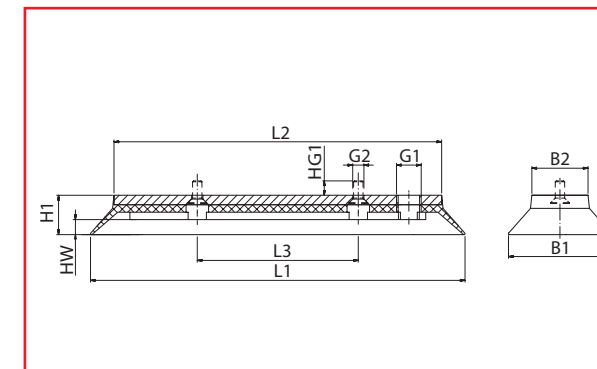
## Flat suction plate, oval

FSL 20x60 - FSL 80x370

**FEZER**  
Simply move more.



FSL 20x60 ... FSL 35x200



FSL 55x150 ... FSL 80x370

### Dimensions

Type	L1	L2	L3	B1	B2	HW	H1	G1	HG1	G2
DP-FSL 20x60	60	50	---	20	12	4	13	5,2	15	---
DP-FSL 30x80	80	65	---	30	15	5	14	8,2	11	---
DP-FSL 30x100	100	85	---	30	15	5	15	8,2	11	---
DP-FSL 35x200	195	174	---	35	15	9	19	5,2	15	---
DP-FSL 40x110	110	85	---	40	15	10	20	8,2	11	---
DP-FSL 55x85	85	62	---	55	32	8	21	12,2	8	---
DP-FSL 55x100	100	70	---	55	32	9	21	12,2	8	---
DP-FSL 55x125	125	100	---	55	32	9	21	12,2	8	---
DP-FSL 55x150	150	125	50	55	32	9	21	G1/4	10	8,2
DP-FSL 55x200	200	160	75	55	32	9	21	G1/4	10	8,2
DP-FSL 55x250	250	220	90	55	32	8	21	G1/4	10	8,2
DP-FSL 55x300	300	277	110	55	32	8	21	G1/4	10	8,2
DP-FSL 80x250	250	222	90	80	52	10	26	G3/8	10	16,2
DP-FSL 80x370	370	347	140	80	52	10	26	G3/8	10	16,2

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FSL 20x60 ... 55x125	SAS-M12x1-M5	---	HSW-M12x1-M5	HSB-1/8-M5	HSG-1/8-M5	FS ... -M12x1*
FSL 35x200	SAS-M12x1-M5	---	---	---	---	FS ... -M12x1**
FSL 55x150 ... FSL 55x200	SAS-M12x1-M12	SAK-M12x1-M12	---	---	---	FS ... -M12x1**
FSL 55x250 ... FSL 80x370	SAS-M16x1,5-M16	SAK-M16x1,5-M16	---	---	---	FS ... -M16x1,5**

\* Single connection, mounted with rotation-protected suspension bolt

\*\* Double connection, mounted with 2 suspension bolts

## Flat suction plate, oval

FSL 100x200 - FSL 350x600

**FEZER**  
Simply move more.

### Description

Robust and universal flat suction pad with aluminum body and vulcanized sealing. Connection by flat head screws which allow to easily exchange the sealing. Please order connection screw separately.

### Application

- heavy, narrow workpieces
- workpieces with smooth, slightly rough surface
- heavy-duty areas



FSL 100x200 ... FSL 350x600

### Article numbers

Type	NBR-G	SI-T	Connection screw	
			Type	Art.-Nr.
DP-FSL 100x200	1.11.1.0157	1.11.1.0159	AS-M12-17	1.31.2.0010
DP-FSL 100x300	1.11.1.0161	1.11.1.0162	AS-M12-17	1.31.2.0010
DP-FSL 120x300	1.11.1.0440	1.11.1.0441	AS-M12-17	1.31.2.0010
DP-FSL 130x450	1.11.1.0443	1.11.1.0444	AS-M16-22	1.31.2.0035
DP-FSL 160x450	1.11.1.0449	1.11.1.0450	AS-M16-22	1.31.2.0035
DP-FSL 180x430	1.11.1.0452	1.11.1.0453	AS-M16-22	1.31.2.0035
DP-FSL 180x500	1.11.1.0455	1.11.1.0456	AS-M16-22	1.31.2.0035
DP-FSL 180x580	1.11.1.0458	1.11.1.0459	AS-M16-22	1.31.2.0035
DP-FSL 200x750	1.11.1.0461	1.11.1.0462	AS-M16-22	1.31.2.0035
DP-FSL 350x600	1.11.1.0464	1.11.1.0465	AS-M24x1,5-28	1.31.2.0069

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
DP-FSL 100x200	750	0,17	1,25
DP-FSL 100x300	1.250	0,28	1,60
DP-FSL 120x300	1.450	0,32	1,80
DP-FSL 130x450	2.450	0,40	2,80
DP-FSL 160x450	3.000	0,60	3,60
DP-FSL 180x430	3.225	1,20	3,80
DP-FSL 180x500	3.750	1,40	4,10
DP-FSL 180x580	4.350	1,65	4,90
DP-FSL 200x750	6.250	4,20	6,30
DP-FSL 350x600	7.650	6,30	10,8

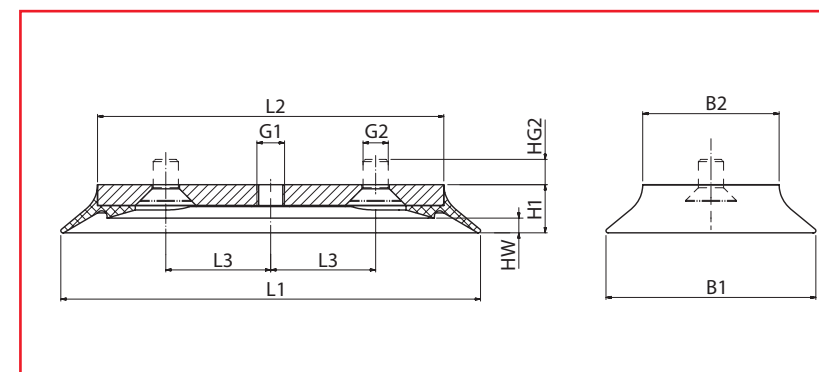
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Flat suction plate, oval

FSL 100x200 - FSL 350x600

**FEZER**  
Simply move more.



FSL 100x200 ... FSL 350x600

### Dimensions

Type	L1	L2	L3	B1	B2	HW	H1	G1	HG1	G2	HG2
DP-FSL 100x200	200	160	50	100	65	7	23	G1/4	---	12,2	10
DP-FSL 100x300	300	260	100	100	65	7	23	G1/4	---	12,2	10
DP-FSL 120x300	300	245	100	120	70	6	24	G1/4	---	12,2	10
DP-FSL 130x450	450	415	150	130	100		23	G1/4	---	16,2	12
DP-FSL 160x450	450	413	150	160	120	9	26	G1/2	---	16,2	12
DP-FSL 180x430	430	395	150	180	150	6	20	G1/2	---	16,2	12
DP-FSL 180x500	500	433	150	180	120	20	42	G1/2	---	16,2	12
DP-FSL 180x580	580	544	200	180	150	10	26	G3/4	---	16,2	12
DP-FSL 200x750	750	663	200	200	120	29	54	G3/4	---	16,2	12
DP-FSL 350x600	600	460	200	350	210	30	55	G1	---	25	---

### Suitable connection elements

Type	Suction pad retainers		Suspension bolt
	SAS	SAK	
FSL 100x200 ... FSL 120x300	SAS-M16x1,5-M12	SAK-M16x1,5-M12	FS ... -M16x1,5*
FSL 130x450 ... FSL 200x750	SAS-M20x1,5-M16	SAK-M20x1,5-M16	FS ... -M20x1,5*
FSL 350x600	SAS-M30x1,5-M20	SAK-M30x1,5-M20	FS ... -M20x1,5*

\* Double connection, mounted with 2 suspension bolts

## Flat suction plate, oval

FSL 450x850

### Description

Robust and resistant flat suction pad. The suction pad is available in two designs. With a steel body for heavy duty or an aluminum body for the handling of porous materials. Connection via thread in the body. Separate vacuum feed via designated connection threads.

### Application

- extremely heavy and inherent workpieces
- workpieces with smooth, slightly rough surface
- handling of heavy, porous materials

### Article numbers

Type	NBR-S	NBR-G	SI-R	VI-S
DP-FSL 450x850-ST	1.11.1.0119	---	1.11.1.0120	1.11.1.0225
DP-FSL 450x850-AL	---	1.11.1.0117	---	---

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
DP-FSL 450x850-ST	18.750	8,20	12,8
DP-FSL 450x850-AL	18.750	8,20	28,6

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

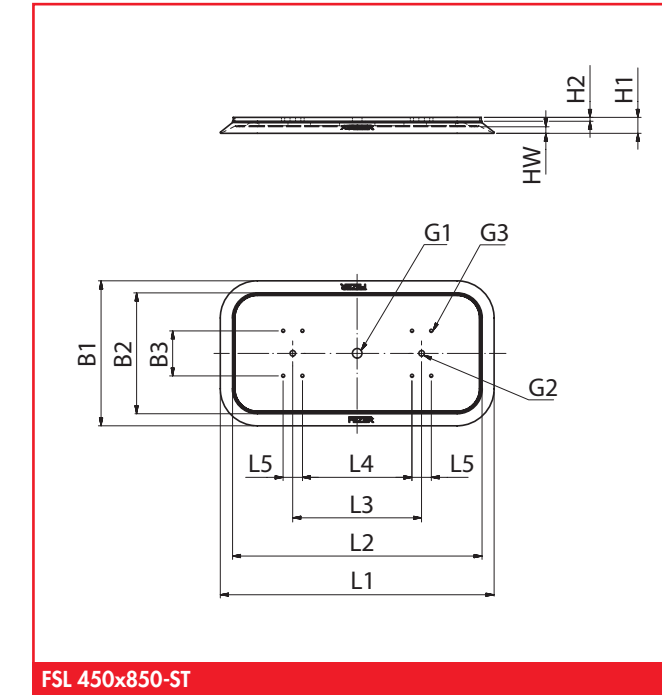
\*\* Volume with suction pad not engaged and unloaded



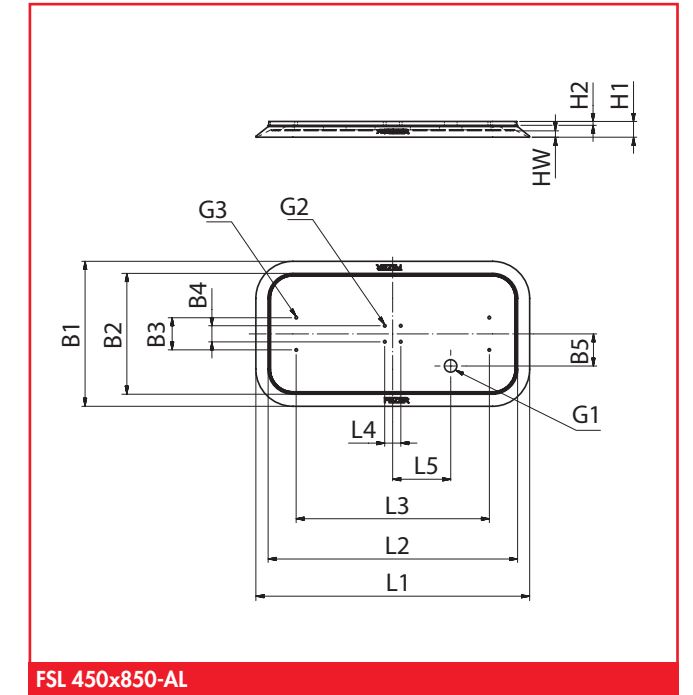
FSL 450x850

## Flat suction plate, oval

FSL 450x850



FSL 450x850-ST



FSL 450x850-AL

### Dimensions

Type	L1	L2	L3	L4	L5	B1	B2	B3	B4	B5	H1	H2	HW	G1	G2	G3
DP-FSL 450x850-ST	850	770	400	340	60	450	370	140	---	---	49	12	20	G1	M20	M12x1,75
DP-FSL 450x850-AL	850	770	600	50	180	450	370	100	50	100	49	12	20	G11/4	M10x1,5	M10x1,5

## Bellows suction cup, round

GF 30 - GF 115 soft design

**FEZER**  
Simply move more.

### Description

Very elastic bellows suction pad with 1,5 bellows and inner support. The suction pads are clipped on the connection nipple and can be easily exchanged when worn out. Please order connection nipple separately.

### Application

- workpieces with curved or uneven surfaces
- workpieces with extremely sensitive surfaces
- for especially soft setting-down
- autonomous height adjustment on uneven workpieces



FBS-GF 30 ... FBS-GF 115

### Article numbers

Type	NBR-S	SI-R	Connection nipple G1/4-A
FBS-GF 30	1.02.1.0018	1.02.1.0021	1.31.1.0014
FBS-GF 55	1.02.1.0028	1.02.1.0031	1.31.1.0014
FBS-GF 75	1.02.1.0034	1.02.1.0037	1.31.1.0014
FBS-GF 95	1.02.2.0003	1.02.2.0004	vulcanized
FBS-GF 115	1.02.2.0001	1.02.2.0002	vulcanized

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FBS-GF 30	26	25	0,01	0,008
FBS-GF 55	57	50	0,04	0,020
FBS-GF 75	92	70	0,10	0,045
FBS-GF 95	171	90	0,12	0,090
FBS-GF 115	320	110	0,21	0,150

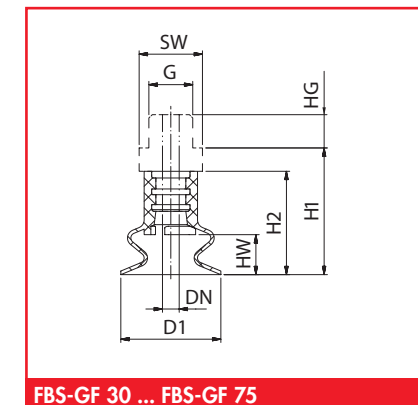
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

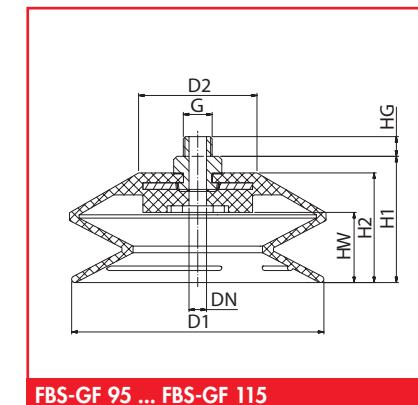
## Bellows suction cup, round

GF 30 - GF 115 soft design

**FEZER**  
Simply move more.



FBS-GF 30 ... FBS-GF 75



FBS-GF 95 ... FBS-GF 115

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FBS-GF 30	30	22	5	11	31	38	10	G1/4	19
FBS-GF 55	55	22	5	15	41	48	10	G1/4	19
FBS-GF 75	75	22	5	19	41	48	10	G1/4	19
FBS-GF 95	95	28	8	22	36	44	9	G1/4	19
FBS-GF 115	115	54	8	32	50	58	9	G1/4	19

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Holding joint	Suspension bolt
	SAS	SAK		Bushing			
FBS-GF 30 ... FBS-GF 75	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1	
FBS-GF 95 ... FBS-GF 115	SAS-M16x1,5-1/4	---	HSW-M16x1,5-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M16x1,5	

## Bellows suction cup, round

GF 10 - GF 75 hard design

**FEZER**  
Simply move more.

### Description

Very elastic and robust bellows suction pad with 1,5 bellows and inner support. The suction pads are clipped on the connection nipple aufgesteckt and can be easily exchanged when worn out. Please order connection nipple separately.

### Application

- workpieces with curved or uneven surfaces
- for especially soft setting-down
- autonomous height adjustment on uneven workpieces
- various materials for different requirements



FBS-GF 10 S ... FBS-GF 75 S

### Article numbers

Type	NBR-S	SI-T	CR-W	PU-B	FKM-S	NR-BR	Connection nipple	
							MS-A	G1/4-A
FBS-GF 10 S	1.02.1.0160	1.02.1.0161	1.02.1.0162	1.02.1.0003	1.02.1.0163	1.02.1.0164	1.31.1.0002	---
FBS-GF 15 S	1.02.1.0165	1.02.1.0166	1.02.1.0167	1.02.1.0008	1.02.1.0168	1.02.1.0169	1.31.1.0002	---
FBS-GF 20 S	1.02.1.0170	1.02.1.0171	1.02.1.0172	1.02.1.0014	1.02.1.0173	1.02.1.0174	---	1.31.1.0005
FBS-GF 30 S	1.02.1.0175	1.02.1.0176	1.02.1.0177	1.02.1.0019	1.02.1.0178	1.02.1.0179	---	1.31.1.0005
FBS-GF 40 S	1.02.1.0180	1.02.1.0181	1.02.1.0182	1.02.1.0024	1.02.1.0183	1.02.1.0184	---	1.31.1.0005
FBS-GF 50 S	1.02.1.0185	1.02.1.0186	1.02.1.0187	1.02.1.0195	1.02.1.0188	1.02.1.0189	---	1.31.1.0004
FBS-GF 75 S	1.02.1.0190	1.02.1.0191	1.02.1.0192	1.02.1.0035	1.02.1.0193	---	---	1.31.1.0006

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FBS-GF 10 S	1	10	0,001	0,001
FBS-GF 15 S	6	13	0,001	0,002
FBS-GF 20 S	12	18	0,003	0,005
FBS-GF 30 S	33	28	0,008	0,013
FBS-GF 40 S	55	37	0,014	0,019
FBS-GF 50 S	89	47	0,035	0,031
FBS-GF 75 S	197	70	0,10	0,090

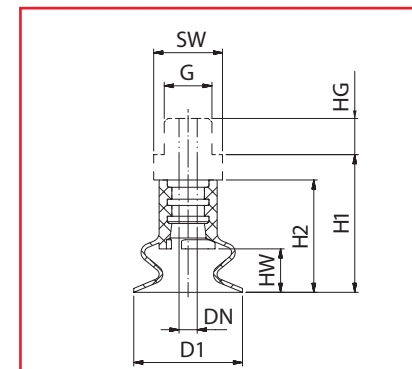
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

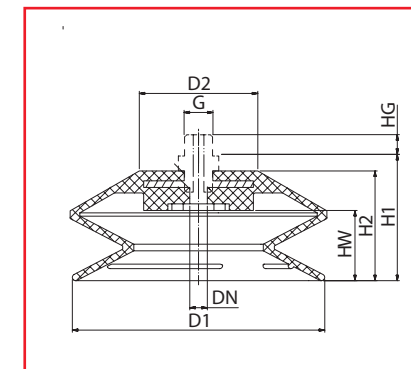
## Bellows suction cup, round

GF 10 - GF 75 hard design

**FEZER**  
Simply move more.



FBS-GF 10 S ... FBS-GF 50 S



FBS-GF 75 S

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FBS-GF 10 S	10	15	2,5	4	13,5	17	4,5	M5	8
FBS-GF 15 S	15	15	2,5	4	16	19,5	4,5	M5	8
FBS-GF 20 S	20	20	3	9	22	27	10	G1/4	17
FBS-GF 30 S	30	20	4	13	30,5	35,5	10	G1/4	17
FBS-GF 40 S	40	20	4	12,5	30,5	35,5	10	G1/4	17
FBS-GF 50 S	50	32	4	20	36,5	41,5	10	G1/4	17
FBS-GF 75 S	75	40	4	22	41	48	10	G1/4	17

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FBS-GF 10 ... FBS-GF 15	SAS-M8x1-M5	---	HSW-M8x1-M5	HSB-M5-1/4	HSG-M8x1-M5	FS ... -M8x1
FBS-GF 20 ... FBS-GF 75	SAS-M12x1-1/4	SAK-M12x1-1/4	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1

## Bellows suction cup, round

GF 20 - GF 85 Vulkollane

**FEZER**  
Simply move more.

### Description

Very robust and extremely resistant bellows suction pad with 1,5 bellows made of vulkollane. Vulkollane has an up to 10-fold higher durability than other materials and is suitable for the highest strains. The cups are clipped on connection nipples and can be easily exchanged when worn out. Please order the connection nipples separately.

### Application

- workpieces with curved surfaces
- heavy-duty with minimum abrasion, especially on multi-shift processes
- Design „ÖN“ with oil groove for higher cross acceleration on oily workpieces



FBS-GF 20 VU ... FBS-GF 85 VU-ÖN

### Article numbers

Type	VU-BR	Connection nipple G1/4-A
FBS-GF 20 VU	1.02.1.0100	1.31.1.0021
FBS-GF 30 VU	1.02.1.0101	1.31.1.0021
FBS-GF 40 VU	1.02.1.0102	1.31.1.0020
FBS-GF 40 VU-ÖN	1.02.1.0103	1.31.1.0020
FBS-GF 50 VU	1.02.1.0104	1.31.1.0019
FBS-GF 60 VU	1.02.1.0105	1.31.1.0022
FBS-GF 60 VU-ÖN	1.02.1.0106	1.31.1.0022
FBS-GF 85 VU	1.02.1.0107	1.31.1.0022
FBS-GF 85 VU-ÖN	1.02.1.0108	1.31.1.0022

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FBS-GF 20 VU	25	15	0,003	0,008
FBS-GF 30 VU	39	25	0,007	0,015
FBS-GF 40 VU	73	30	0,013	0,021
FBS-GF 40 VU-ÖN	75	30	0,015	0,020
FBS-GF 50 VU	106	40	0,028	0,028
FBS-GF 60 VU	160	50	0,034	0,039
FBS-GF 60 VU-ÖN	170	50	0,038	0,035
FBS-GF 85 VU	220	70	0,092	0,098

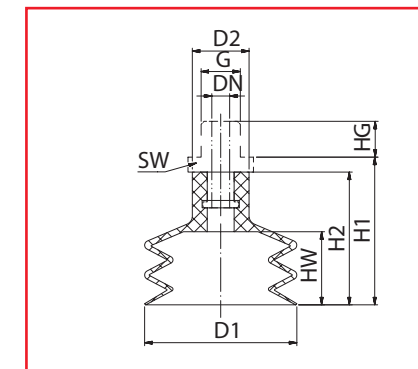
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Bellows suction cup, round

GF 20 - GF 85 Vulkollane

**FEZER**  
Simply move more.



FBS-GF 20 VU ... FBS-GF 85 VU-ÖN

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FBS-GF 20 VU	20	15	6	13	18	18	12	G1/4	19
FBS-GF 30 VU	30	15	6	13	22	22	12	G1/4	19
FBS-GF 40 VU	40	21	6	17	30	35	12	G1/4	19
FBS-GF 40 VU-ÖN	40	21	6	17	30	35	12	G1/4	19
FBS-GF 50 VU	51	23	6	24	41	49	10	G1/4	17
FBS-GF 60 VU	60	27	6	28	40	45	10	G1/4	19
FBS-GF 60 VU-ÖN	60	27	6	16	40	45	10	G1/4	19
FBS-GF 85 VU	85	30	6	26	57	62	10	G1/4	19
FBS-GF 85 VU-ÖN	85	30	6	26	57	62	10	G1/4	19

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FBS-GF 20 VU ... FBS-GF 30 VU	SAS-M8x1-1/4	---	HSW-M8x1-1/4	HSB-1/4-1/4	HSG-M8x1-1/4	FS ... -M8x1
FBS-GF 40 VU ... FBS-GF 60 VU	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1
FBS-GF 85 VU	SAS-M12x1-1/4	---	HSW-M16x1,5-1/4	HSB-1/4-1/4	HSG-M16x1,5-1/4	FS ... -M16x1,5

## Bellows suction plate, round

GF 100 - GF 350

**FEZER**  
Simply move more.

### Description

Robust bellows suction pad with 1,5 bellows with aluminum body and vulcanized sealing. The suction pads have a central vacuum feed, starting with diameter 200 mm with lateral vacuum feed. Connection by flat head screws which allow a quick exchange of the sealing. Please order connection screw separately.

### Application

- workpieces with curved, uneven surfaces
- for especially soft setting-down
- height adjustment on uneven workpieces



GF 100 ... GF 350

### Article numbers

Type	NBR-G	SI-T	Connection screw	
			Type	Art.-Nr:
GF 100	1.12.1.0057	1.12.1.0058	ASB-M16-20	1.31.2.0084
GF 120	1.12.1.0005	1.12.1.0006	ASB-M16-20	1.31.2.0084
GF 150	1.12.1.0008	1.12.1.0009	ASB-M16-20	1.31.2.0084
GF 200	1.12.1.0011	1.12.1.0013	AS-M16-22	1.31.2.0035
GF 250	1.12.1.0015	1.12.1.0017	AS-M16-22	1.31.2.0035
GF 300	1.12.1.0019	1.12.1.0020	AS-M16-22	1.31.2.0035
GF 350	1.12.1.0022	1.12.1.0023	AS-M16-22	1.31.2.0035

### Technical details

Type	Holding force* (N)	Ansaugradius min: (mm)	Volume** (l)	Weight (kg)
GF 100	220	180	0,15	0,12
GF 120	350	220	0,29	0,21
GF 150	500	280	0,48	0,40
GF 200	900	380	0,88	0,99
GF 250	1.630	480	1,40	1,85
GF 300	2.390	580	3,15	2,95
GF 350	3.230	680	4,20	4,40

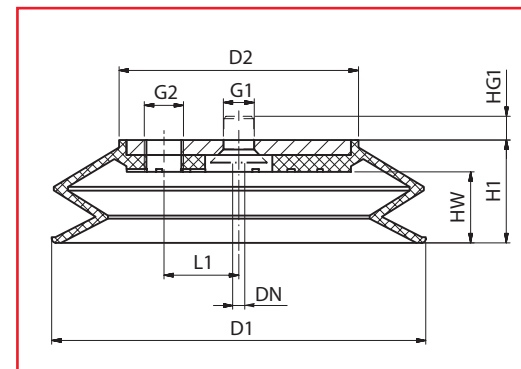
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Bellows suction plate, round

GF 100 - GF 350

**FEZER**  
Simply move more.



GF 100 ... GF 350

### Dimensions

Type	D1	D2	DN	HW	H1	HG1	G1	G2
GF 100	100	60	8	25	38	13	16,2	---
GF 120	120	82	8	35	55	13	16,2	---
GF 150	150	102	8	41	65	13	16,2	---
GF 200	200	128	8	38	55	13	16,2	G1/2
GF 250	250	178	8	42	59	13	16,2	G3/4
GF 300	300	200	8	58	78	13	16,2	G3/4
GF 350	350	248	8	57	82	13	16,2	G3/4

### Suitable connection elements

Type	Suction pad retainer		Suspension bolt
	SAS	SAK	
GF 100 ... GF 150	SAS-M16x1,5-M16	SAK-M16x1,5-M16	FS ... -M16x1,5
GF 200 ... GF 350	SAS-M20x1,5-M16	SAK-M20x1,5-M16	FS ... -M20x1,5

## Bellows suction cup, round

GFD 5 - GFD 90 hard design

**FEZER**  
Simply move more.

### Description

Very elastic and robust bellows suction pad with 2,5 bellows and inner support. The suction pads are clipped on the connection nipple and can be easily exchanged when worn out. Please order connection nipple separately.

### Application

- workpieces with curved, uneven surfaces
- for especially soft setting-down
- autonomous height-adjustment on uneven workpieces
- various materials for various requirements



FBS-GFD 5 ... FBS-GFD 90

### Article numbers

Type	NBR-S	NBR-S/AS	SI-T	SI-T/AS	CR-W	PU-B	FKM-S	NR-BR	Connection nipple	
									M5-A	G1/4-A
FBS-GFD 5	1.021.0116	1.021.0117	1.021.0118	1.021.0119	1.021.0120	1.021.0121	--	1.021.0122	1.311.0002	--
FBS-GFD 7	1.021.0123	1.021.0124	1.021.0125	1.021.0126	1.021.0127	1.021.0128	--	1.021.0133	1.311.0002	--
FBS-GFD 10	1.021.0038	1.021.0130	1.021.0040	1.021.0131	1.021.0132	1.021.0039	--	1.021.0133	1.311.0003	--
FBS-GFD 15	1.021.0041	1.021.0134	1.021.0043	1.021.0135	1.021.0136	1.021.0042	--	1.021.0137	1.311.0003	--
FBS-GFD 18	1.021.0138	1.021.0139	1.021.0140	1.021.0141	1.021.0142	1.021.0143	1.021.0144	1.021.0145	1.311.0003	--
FBS-GFD 20	1.021.0044	1.021.0146	1.021.0046	1.021.0147	1.021.0148	1.021.0045	1.021.0149	1.021.0150	1.311.0003	--
FBS-GFD 30	1.021.0047	1.021.0151	1.021.0049	1.021.0152	1.021.0153	1.021.0048	1.021.0154	1.021.0155	--	1.311.0005
FBS-GFD 40	1.021.0050	1.021.0156	1.021.0052	1.021.0157	1.021.0158	1.021.0051	--	1.021.0159	--	1.311.0005
FBS-GFD 60	1.021.0056	--	1.021.0058	--	--	1.021.0057	--	--	--	1.311.0005
FBS-GFD 90	1.021.0059	--	1.021.0061	--	--	--	--	--	--	1.311.0008

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FBS-GFD 5	0,2	---	0,003	0,001
FBS-GFD 7	0,2	---	0,003	0,001
FBS-GFD 10	1,0	10	0,004	0,001
FBS-GFD 15	1,3	15	0,004	0,001
FBS-GFD 18	6,0	18	0,005	0,001
FBS-GFD 20	13	20	0,005	0,003
FBS-GFD 30	30	28	0,034	0,010
FBS-GFD 40	51	38	0,040	0,029
FBS-GFD 60	96	55	0,080	0,055
FBS-GFD 90	246	85	0,198	0,140

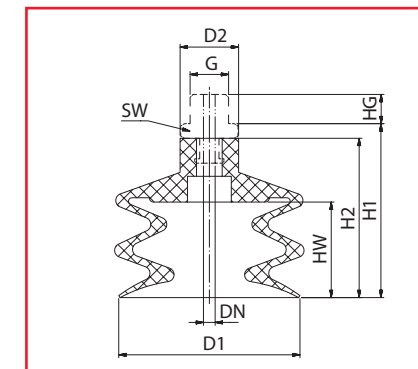
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Bellows suction cup, round

GFD 5 - GFD 90 hard design

**FEZER**  
Simply move more.



FBS-GFD 5 ... FBS-GFD 90

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FBS-GFD 5	5	6	2,5	3	10	13,5	4,5	M5	8
FBS-GFD 7	7	6	2,5	3	10	13,5	4,5	M5	8
FBS-GFD 10	9	9	3,5	3	15	17,5	4,5	M5	8
FBS-GFD 15	14	10	3,5	7	23	25,5	4,5	M5	8
FBS-GFD 18	18	10	3,5	8	23	25,5	4,5	M5	8
FBS-GFD 20	20	10	3,5	9	23	25,5	4,5	M5	8
FBS-GFD 30	32	18	3,5	14	37,5	42,5	10	G1/4	17
FBS-GFD 40	42	20	3,5	17	46	51	10	G1/4	17
FBS-GFD 60	62	22	3,5	23	55	60	10	G1/4	17
FBS-GFD 90	88	25	3,5	27	87,5	92,5	10	G1/4	17

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FBS-GFD 5 ... FBS-GFD 30	SAS-M8x1-M5	---	HSW-M8x1-M5	HSB-M5-1/4	HSG-M8x1-M5	FS ... -M8x1
FBS-GFD 40 ... FBS-GFD 60	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1
FBS-GFD 90	SAS-M16x1,5-1/4	---	HSW-M16x1,5-1/4	HSB-1/4-1/4	HSG-M16x1,5-1/4	FS ... -M16x1,5



## Bellows suction cup, round

GDF 20 - GFD 85 Vulkollane

# FEZER

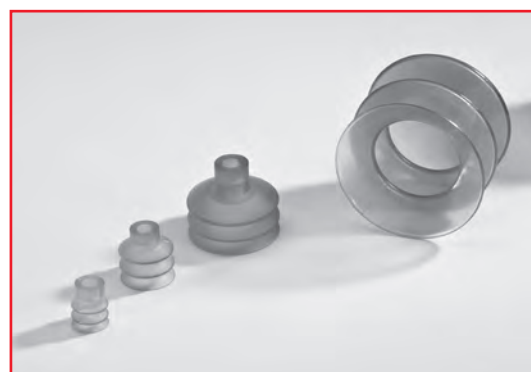
Simply move more.

### Description

Very robust and extremely resistant bellows suction pad with 2,5 bellows made of vulkollane. Vulkollane has an up to 10-fold higher durability than other materials and is suitable for the highest strains. The cups are clipped on connection nipples and can be easily exchanged when worn out. Please order the connection nipples separately.

### Application

- workpieces with curved surfaces
- heavy-duty with minimum abrasion, especially in multi-shift processes
- Design „ÖN“ with oil groove for higher cross acceleration in oily workpieces



FBS-GFD 20 VU ... FBS-GFD 85 VU-ÖN

### Article numbers

Type	VU-BR	Connection nipple G1/4-A
FBS-GFD 20 VU	1.02.1.0110	1.31.1.0021
FBS-GFD 30 VU	1.02.1.0111	1.31.1.0021
FBS-GFD 50 VU	1.02.1.0112	1.31.1.0020
FBS-GFD 60 VU	1.02.1.0113	1.31.1.0020
FBS-GFD 85 VU	1.02.1.0114	1.31.1.0022
FBS-GFD 85 VU-ÖN	1.02.1.0115	1.31.1.0022

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FBS-GFD 20 VU	24	20	0,004	0,019
FBS-GFD 30 VU	38	30	0,011	0,024
FBS-GFD 50 VU	95	45	0,048	0,031
FBS-GFD 60 VU	150	55	0,063	0,042
FBS-GFD 85 VU	280	80	0,170	0,112
FBS-GFD 85 VU-ÖN	290	80	0,170	0,112

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

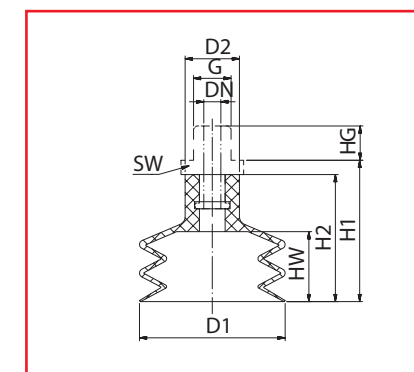
\*\* Volume with suction pad not engaged and unloaded

## Bellows suction cup, round

GDF 20 - GFD 85 Vulkollane

# FEZER

Simply move more.



FBS-GFD 20 VU ... FBS-GFD 85 VU-ÖN

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG	G	SW
FBS-GFD 20 VU	20	12	6	16	25	33	12	G1/4	19
FBS-GFD 30 VU	30	12	6	16	32	38	12	G1/4	19
FBS-GFD 50 VU	51	15	6	20	45	51	12	G1/4	19
FBS-GFD 60 VU	60	15	6	31	75	81	12	G1/4	19
FBS-GFD 85 VU	85	21	6	41	98	104	10	G1/4	19
FBS-GFD 85 VU-ÖN	85	21	6	41	86	92	10	G1/4	19

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FBS-GFD 20 VU ... FBS-GFD 30 VU	SAS-M8x1-1/4	---	HSW-M8x1-1/4	HSB-1/4-1/4	HSG-M8x1-1/4	FS ... -M8x1
FBS-GFD 50 VU ... FBS-GFD 60 VU	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1
FBS-GFD 85 VU	SAS-M16x1,5-1/4	---	HSW-M16x1,5-1/4	HSB-1/4-1/4	HSG-M16x1,5-1/4	FS ... -M16x1,5

## Bellows suction plate, oval

GF 60x140 - GF 200x400

**FEZER**  
Simply move more.

### Description

Robust bellows suction pad in 1,5 bellows design with aluminum body and vulcanized sealing. The suction pads have central or lateral vacuum feed. Connection via flat head screws which allow a quick exchange of the pad when worn out. Please order the connection screw separately.

### Application

- narrow workpieces with curved, uneven surfaces
- for especially soft setting-down
- height-adjustment on uneven workpieces



GF 60x140 ... GF 200x400

### Article numbers

Type	NBR-G	SI-T	Connection screw	
			Type	Art.-Nr.
GF 60x140	1.12.1.0025	1.12.1.0026	ASB-M8-16	1.31.2.0068
GF 70x150	1.12.1.0065	1.12.1.0066	ASB-M8-16	1.31.2.0068
GF 100x200	1.12.1.0002	1.12.1.0003	AS-M16-25	1.31.2.0013
GF 100x350	1.12.1.0061	1.12.1.0062	AS-M16-25	1.31.2.0013
GF 150x300	1.12.1.0059	1.12.1.0060	AS-M16-25	1.31.2.0013
GF 200x400	1.12.1.0063	1.12.1.0064	AS-M16-25	1.31.2.0013

### Technical details

Type	Holding force* (N)	Suction radius (mm)	Volume** (l)	Weight (kg)
GF 60x140	190	35	0,12	0,24
GF 70x150	260	40	0,18	0,40
GF 100x200	510	55	0,98	1,00
GF 100x350	1.050	55	0,78	1,60
GF 150x300	1.280	90	1,08	2,05
GF 200x400	2.280	140	1,78	3,40

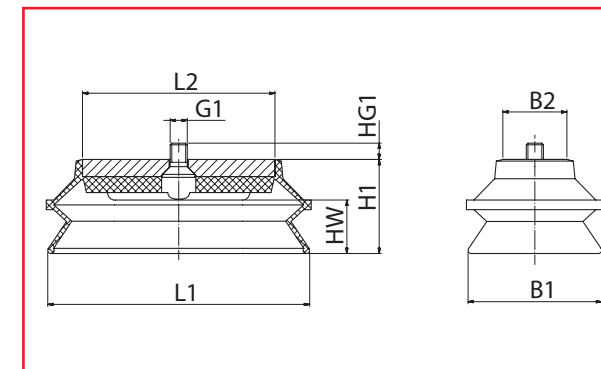
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

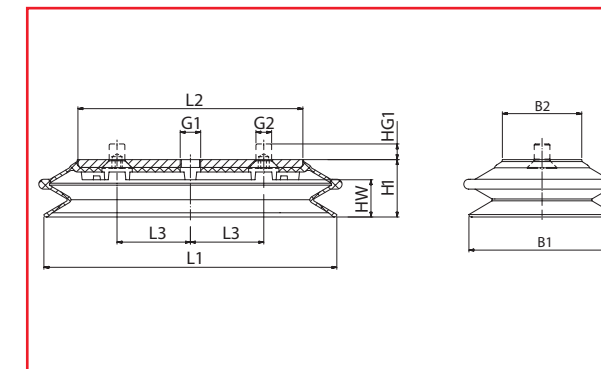
## Bellows suction plate, oval

GF 60x140 - GF 200x400

**FEZER**  
Simply move more.



GF 60x140 ... GF 70x150



GF 100x200 ... GF 200x400

### Dimensions

Type	L1	L2	L3	B1	B2	HW	H1	G1	HG1	G2
GF 60x140	140	90	---	60	30	25	44	8,2	8	---
GF 70x150	150	110	---	70	30	15	26	8,2	8	---
GF 100x200	200	160	100	100	80	41	62	G1/2	12	16,5
GF 100x350	350	298	150	100	50	39	58	G1/2	12	16,5
GF 150x300	300	228	150	150	80	39	58	G1/2	12	16,5
GF 200x400	400	325	200	200	130	39	58	G3/4	12	16,5

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
GF 60x140 ... GF 70x150	SAS-M16x1,5-M8	---	HSW-M16x1,5-M8	HSB-M8-1/8	HSG-M12x1-1/8	FS ... -M12x1*
GF 100x200 ... GF 100x350	SAS-M16x1,5-M16	SAK-M16x1,5-M16	---	---	---	FS ... -M16x1,5**
GF 150x300 ... GF 200x400	SAS-M20x1,5-M16	SAK-M20x1,5-M16	---	---	---	FS ... -M20x1,5**

\* Single connection, mounted with rotation-protected suspension bolt

\*\* Double connection, mounted with 2 suspension bolts

## Grip suction cup, round

GS 35 - GS 125 - Flat design

**FEZER**  
Simply move more.

### Description

Very robust and resistant flat suction cup with specially structured suction pad and connection screw. The special pad increases the friction coefficient which allows higher cross acceleration also on oily or wet surfaces.

### Application

- thin-walled workpieces with smooth, oily or wet surfaces
- exact positioning of sheets
- highly dynamic process requirements



FS-GS 35 ... FS-GS 125

### Article numbers

Type	PU
FS-GS 35	1.01.2.0031
FS-GS 50	1.01.2.0032
FS-GS 75	1.01.2.0033
FS-GS 100	1.01.2.0034
FS-GS 125	1.01.2.0035

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FS-GS 35	34	40	0,005	0,04
FS-GS 50	72	50	0,010	0,06
FS-GS 75	163	100	0,030	0,08
FS-GS 100	236	150	0,070	0,11
FS-GS 125	405	150	0,100	0,17

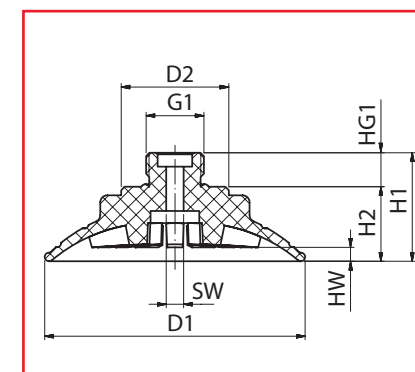
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Grip suction cup, round

GS 35 - GS 125 - Flat design

**FEZER**  
Simply move more.



FS-GS 40 ... FS-GS 125

### Dimensions

Type	D1	D2	HW	H1	H2	HG1	G1	SW
FS-GS 35	35	24	2	29	18	10	G3/8	5
FS-GS 50	50	31	3	34	24	10	G3/8	7
FS-GS 75	75	43	4	31	20	10	G3/8	5
FS-GS 100	100	55	6	36	25	10	G3/8	10
FS-GS 125	126	55	8	42	29	10	G3/8	10

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-GS 35 ... FS-GS 75	SAS-M12x1-3/8	---	HSW-M12x1-3/8	HSB-3/8-3/8	HSG-M12x1-3/8	FS ... -M12x1
FS-GS 100 ... FS-GS 125	SAS-M16x1,5-3/8	---	HSW-M16x1,5-3/8	HSB-3/8-3/8	HSG-M16x1,5-3/8	FS ... -M16x1,5

## Grip suction cup, round

GFS 40 - GFS 115 - Bellows design

**FEZER**  
Simply move more.

### Description

Very robust and resistant bellows suction cup with 1,5 bellows and a specially structured pad and connection screw. The special pad increases the friction coefficient which allows higher cross acceleration also on oily or wet surfaces.

### Application

- thin-walled workpieces with smooth, oily or wet surfaces
- especially adaptable to work piece radiuses
- exact positioning of sheets
- highly dynamic process requirements



FBS-GFS 40 ... FBS-GFS 115

### Article numbers

Type	PU
FBS-GFS 40	1.02.2.0013
FBS-GFS 60	1.02.2.0014
FBS-GFS 85	1.02.2.0015
FBS-GFS 110	1.02.2.0016

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FBS-GFS 40	45	23	0,01	0,032
FBS-GFS 60	82	35	0,02	0,056
FBS-GFS 85	174	50	0,05	0,095
FBS-GFS 110	284	95	0,11	0,176

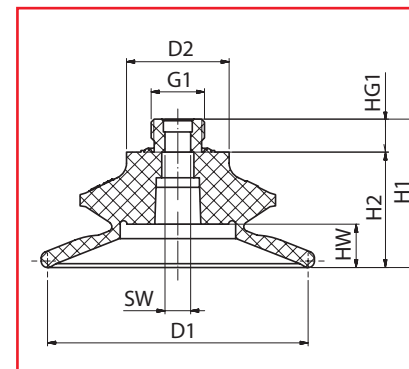
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Grip suction pad, round

GFS 40 - GFS 115 - Bellows design

**FEZER**  
Simply move more.



FBS-GFS 40 ... FBS-GFS 115

### Dimensions

Type	D1	D2	HW	H1	H2	HG1	G1	SW
FBS-GFS 40	45	23	7	32	22	10	G3/8	8
FBS-GFS 60	61	23	10	36	25	10	G3/8	8
FBS-GFS 85	85	32	14	46	38	10	G3/8	5
FBS-GFS 110	115	45	21	63	52	10	G3/8	5

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FBS-GFS 40 ... FBS-GFS 60	SAS-M12x1-3/8	---	HSW-M12x1-3/8	HSB-3/8-3/8	HSG-M12x1-3/8	FS ... -M12x1
FBS-GFS 85 ... FBS-GFS 110	SAS-M16x1,5-3/8	---	HSW-M16x1,5-3/8	HSB-3/8-3/8	HSG-M16x1,5-3/8	FS- ... -M16x1,5

## Grip suction plate, oval

GS 20x80 - GS 40x110 - Flat design

**FEZER**  
Simply move more.

### Description

Very robust and resistant flat suction cup in oval design with a specially structured pad and connection screw. The special pad increases the friction coefficient which allows higher cross acceleration also on oily or wet surfaces. The position of the cup can be adjusted by the connection screw.

### Application

- thin-walled workpieces with smooth, oily or wet surfaces
- exact positioning of sheets
- highly dynamic process requirements



FS-GS 20x80 ... FS-GS 40x110

### Article numbers

Type	PU
FS-GS 20x80	1.01.2.0054
FS-GS 30x90	1.01.2.0055
FS-GS 40x110	1.01.2.0056

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FS-GS 20x80	82	20	0,015	0,025
FS-GS 30x90	115	25	0,017	0,030
FS-GS 40x110	185	42	0,034	0,055

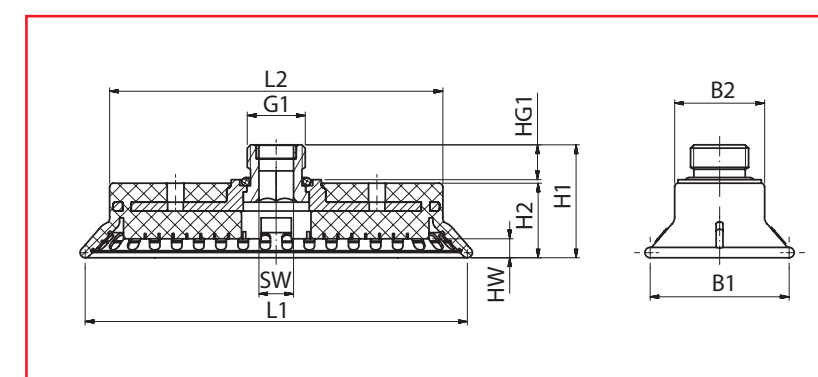
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Grip suction plate, oval

GS 20x80 - GS 40x110 - Flat design

**FEZER**  
Simply move more.



FS-GS 20x80 ... FS-GS 40x110

### Dimensions

Type	L1	L2	B1	B2	HW	H1	H2	HG1	G1	SW
FS-GS 20x80	84	79	24	19	3	28	16	10	G3/8	5
FS-GS 30x90	92	79	33	19	4	28	16	10	G3/8	5
FS-GS 40x110	113	97	43	26	5	31	22	10	G3/8	8

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-GS 20x80 ... 30x90	SAS-M12x1-3/8	---	HSW-M12x1-3/8	HSB-3/8-3/8	HSG-M12x1-3/8	FS ... -M12x1*
FS-GS 40x110	SAS-M16x1,5-3/8	---	HSW-M16x1,5-3/8	HSB-3/8-3/8	HSG-M16x1,5-3/8	FS ... -M16x1,5*

\* Single connection, mounted with rotation-protected suspension bolt

## Grip suction plate, oval

GFS 50x100 - GFS 80x180 - Bellows design

**FEZER**  
Simply move more.

### Description

Very robust and resistant bellows suction cup in oval design with 1,5 bellows and specially structured pad. The special pad increases the friction coefficient which increases cross acceleration also on oily or wet surfaces. The position of the suction cup can be adjusted by the connection screw.

### Application

- formed workpieces with smooth oily or wet surfaces (workpiece is not pulled in)
- exact positioning of sheets
- highly dynamic process requirements



FBS-GFS 50x100 ... FBS-GFS 80x180

### Article numbers

Type	PU
FBS-GFS 35x90	1.02.2.0017
FBS-GFS 50x140	1.02.2.0018
FBS-GFS 65x170	1.02.2.0019

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FBS-GFS 35x90	110	30	0,036	0,010
FBS-GFS 50x140	245	50	0,095	0,190
FBS-GFS 65x170	400	50	0,200	0,310

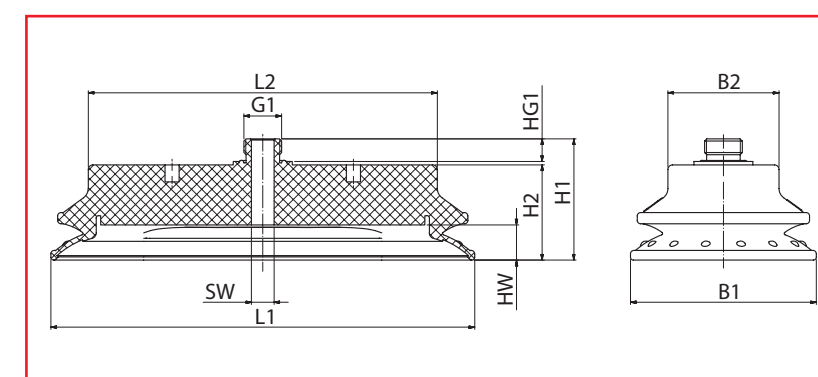
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Grip suction plate, oval

GFS 50x100 - GFS 80x180 - Bellows design

**FEZER**  
Simply move more.



FBS-GFS 50x100 ... FBS-GFS 80x180

### Dimensions

Type	L1	L2	B1	B2	HW	H1	H2	HG1	G1	SW
FBS-GFS 35x90	105	84	50	28	11	37	29	10	G3/8	10
FBS-GFS 50x140	157	130	67	38	13	46	38	10	G3/8	10
FBS-GFS 65x170	187	160	82	49	15	54	45	10	G3/8	10

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FBS-GFS 35x90 ... 50x140	SAS-M12x1-3/8	---	HSW-M12x1-3/8	HSB-3/8-3/8	HSG-M12x1-3/8	FS ... -M12x1*
FBS-GFS 65x170	SAS-M16x1,5-3/8	---	HSW-M16x1,5-3/8	HSB-3/8-3/8	HSG-M16x1,5-3/8	FS ... -M16x1,5*

\* Single connection, mounted with rotation-protected suspension bolt

## Bubble cap suction cup, round

GG 30 - GG 80

**FEZER**  
Simply move more.

### Description

Robust and resistant flat suction pad in bubble-cap design with inner pad. The suction pad has vulcanized connection nipple and is available in different materials.

### Application

- workpieces with large curves and unevenness
- handling of chassis parts, also with oily surfaces



FS-GG 30 ... FS-GG 80

### Article numbers

Type	NBR-G	SI-T
FS-GG 30	1.01.2.0073	1.01.2.0078
FS-GG 40	1.01.2.0074	1.01.2.0079
FS-GG 55	1.01.2.0075	1.01.2.0080
FS-GG 70	1.01.2.0076	1.01.2.0081
FS-GG 80	1.01.2.0077	1.01.2.0082

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (g)
FS-GG 30	21	20	0,004	0,008
FS-GG 40	42	25	0,010	0,018
FS-GG 55	83	30	0,020	0,025
FS-GG 70	125	45	0,030	0,045
FS-GG 80	150	55	0,040	0,095

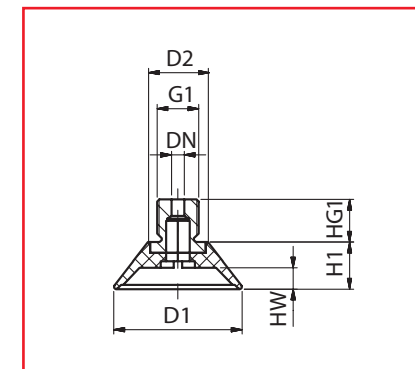
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Bubble cap suction cup, round

GG 30 - GG 80

**FEZER**  
Simply move more.



FS-GG 30 ... FS-GG 80

### Dimensions

Type	D1	D2	DN	HW	H1	HG1	G1
FS-GG 30	30	15	3	5	11	10	G1/8
FS-GG 40	40	20	3	8	14	10	G1/8
FS-GG 55	55	30	3	9	23	10	G1/4
FS-GG 70	70	50	3	12	23	10	G1/4
FS-GG 80	80	55	3	9	22	10	G3/8

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-GG 30 ... FS-GG 40	SAS-M12x1-1/8	---	HSW-M12x1-1/8	HSB-1/8-1/8	HSG-M12x1-1/8	FS ... -M12x1
FS-GG 55 ... FS-GG 70	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1
FS-GG 80	SAS-M12x1-3/8	---	HSW-M12x1-3/8	HSB-3/8-3/8	HSG-M12x1-3/8	FS ... -M12x1

## Bubble cap suction cup, oval

GG 40x120 - GG 80x200

# FEZER

Simply move more.

### Description

Robust and resistant flat suction pad in bubble-cap design with inner pad. The suction pad has a body made of aluminum and is connected by a screw. When worn out the pad can be easily exchanged. Please order the connection screws separately.

### Application

- workpieces with large curves and unevenness
- handling of chassis parts, also with oily surfaces



FS-GG 40x120 ... FS-GG 80x200

### Article numbers

Type	NBR-G	SI-T	Connection screw	
			Type	Art.-Nr.
FS-GG 40x120	1.111.0484	1.111.0485	ASB-M8-16	1.31.2.0068
FS-GG 60x200	1.111.0286	1.111.0488	ASB-M8-16	1.31.2.0068
FS-GG 75x135	1.111.0281	1.111.0482	ASB-M12-17	1.31.2.0003
FS-GG 80x200	1.111.0287	1.111.0489	ASB-M12-17	1.31.2.0003

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FS-GG 40x120	126	30	0,080	0,160
FS-GG 60x200	273	35	0,180	0,280
FS-GG 75x135	230	50	0,100	0,230
FS-GG 80x200	320	60	0,240	0,450

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

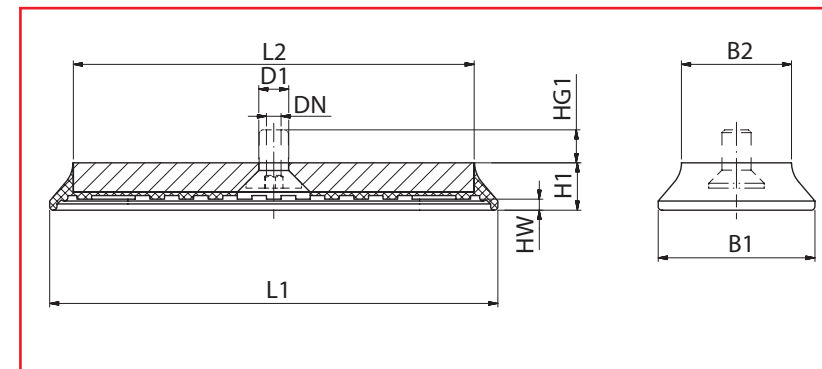
\*\* Volume with suction pad not engaged and unloaded

## Bubble cap suction cup, oval

GG 40x120 - GG 80x200

# FEZER

Simply move more.



FS-GG 40x120 ... FS-GG 80x200

### Dimensions

Type	L1	L2	L3	B1	B2	HW	H1	D1	DN	G1	HG1
FS-GG 40x120	123	110	---	40	30	4	13	8,2	4	---	10
FS-GG 60x200	205	180	70	65	40	4	18	8,2	---	G1/4	10
FS-GG 75x135	135	90	---	75	30	12	27	8,2	4	---	10
FS-GG 80x200	200	160	60	80	40	5	20	8,2	---	G1/4	10

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-GG 40x120, 75x135	SAS-M12x1-M8	---	HSW-M12x1-M8	HSB-M8-1/8	HSG-M12x1	FS ... -M12x1*
FS-GG 60x200, 80x200	SAS-M16x1,5-M12	---	HSW-M16x1,5-M12	HSB-M12-1/4	HSG-M16x1,5	FS ... -M16x1,5*

\* Single connection, mounted with rotation-protected suspension bolt



## Soft suction cup

GP 20 - GP 140

# FEZER

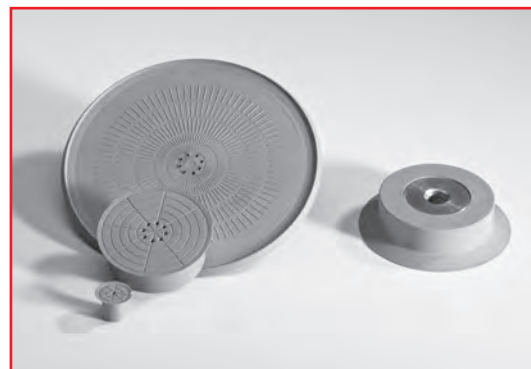
Simply move more.

### Description

Robust and resistant flat suction cup with specially plane pad. With the few vacuum distribution grooves the pad has almost a completely plane area which does not pass on any deformation force to the workpiece. The suction cups are screwed on, the sealing can be easily exchanged when worn out (save for FS-GP 140 with vulcanized body)

### Application

- workpieces with very sensitive surfaces
- extremely thin-walled workpieces like solar cells, silicium discs, semiconductors etc.



FS-GP 20 ... FS-GP 140

### Article numbers

Type	NK-R	Connection nipple	
		Type	Art.-Nr:
FS-GP 20	1.01.2.0083	ANM-8-1/8	1.31.1.0032
FS-GP 40	1.01.2.0024	ANM-13-1/4	1.31.1.0033
FS-GP 60	1.01.2.0084	---	---
FS-GP 80	1.01.2.0085	---	---
FS-GP 140	1.01.2.0023	---	---

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FS-GP 20	11	0,002	0,008
FS-GP 40	45	0,003	0,010
FS-GP 60	100	0,004	0,060
FS-GP 80	195	0,008	0,080
FS-GP 140	480	0,012	0,180

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

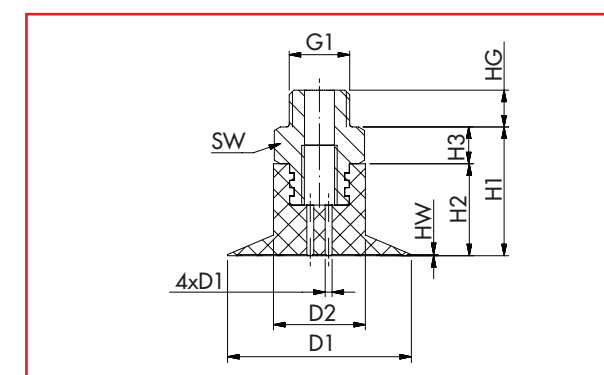
\*\* Volume with suction pad not engaged and unloaded

## Soft suction cup

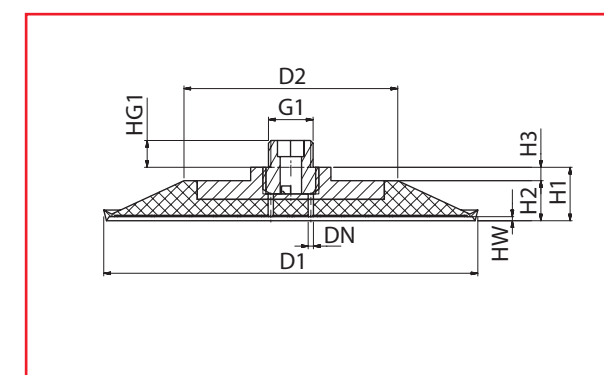
GP 20 - GP 140

# FEZER

Simply move more.



FS-GP 20 ... FS-GP 40



FS-GP 60 ... FS-GP 140

### Dimensions

Type	D1	D2	DN	HW	H1	H2	H3	HG1	G1	SW
FS-GP 20	20	12	1,5	0,25	29	15	7	7	G1/8	14
FS-GP 40	40	20	1,5	0,25	36	20	8	8	G1/4	17
FS-GP 60	60	50	1,5	0,25	30	20	10	10	G1/4	---
FS-GP 80	80	60	1,5	0,25	30	20	10	10	G1/4	---
FS-GP 140	140	80	1,5	1,5	20	15	5	10	G3/8	---

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-GP 20	SAS-M8x1-1/8	---	HSW-M8x1-1/8	HSB-1/8-1/8	HSG-M8x1-1/8	FS ... -M8x1
FS-GP 40 ... FS-GP 80	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1
FS-GP 140	SAS-M16x1,5-3/8	---	HSW-M6x1,5-1/4	HSB-3/8-3/8	HSG-M16x1,5-3/8	FS ... -M16x1,5

## Foil suction cup

GO 30 - GO 50

**FEZER**  
Simply move more.

### Description

Special suction cup for handling of foils or foil-wrapped parts. The suction have a special pad which prevents that the foils are completely sucked in. The cup is clipped on a tube socket or connection nipple. To increase the safety the cups can be additionally fastened by hose clamps or cable ties. They can be easily exchanged when worn out. Please order the connection nipple separately.

### Application

- handling of foil material
- handling of foil-wrapped parts



FS-GO 30 ... FS-GO 100

### Article numbers

Type	NBR-G	SI-T	Connection nipple	
			Type	Art.-Nr:
FS-GO 30	1.11.1.0290	1.11.1.0468	ANF-10-1/4	1.31.1.0026
FS-GO 40	1.11.1.0470	1.11.1.0471	ANF-10-1/4	1.31.1.0026
FS-GO 50	1.11.1.0473	1.11.1.0474	ANF-10-1/4	1.31.1.0026
FS-GO 70	1.11.1.0476	1.11.1.0477	ANF-16-1/4	1.31.1.0031
FS-GO 100	1.11.1.0479	1.11.1.0480	ANF-16-1/4	1.31.1.0031

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FS-GO 30	32	0,008	0,004
FS-GO 40	47	0,015	0,006
FS-GO 50	65	0,023	0,009
FS-GO 70	94	0,050	0,015
FS-GO 100	152	0,092	0,020

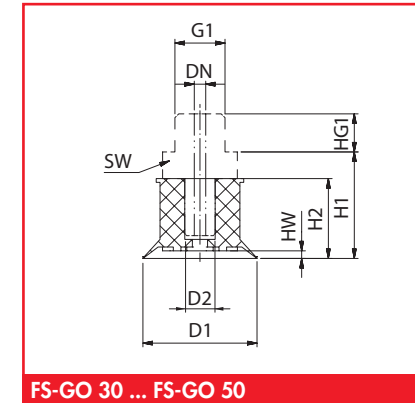
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Foil suction cup

GO 30 - GO 50

**FEZER**  
Simply move more.



FS-GO 30 ... FS-GO 50

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG1	G	SW
FS-GO 30	30	8	5	2	36	21	10	G1/4	19
FS-GO 40	40	8	5	2	36	21	10	G1/4	19
FS-GO 50	50	10	5	5	39	24	10	G1/4	19
FS-GO 70	70	16	5	10	49	34	10	G1/4	19
FS-GO 100	80	16	5	10	58	43	10	G1/4	19

### Suitable connection elements

Type	Suction pad retainer		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FS-GO 30 ... FS-GO 100	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1

## Structure suction plate, round

FSD 85 - FSD 260

**FEZER**  
Simply move more.

### Description

Flat suction plate with aluminum body in round design with vulcanized sealing and tapered pad. The suction pad has a very soft sealing and is available with central (Z) or lateral (S) vacuum feed. Please order connection screw separately.

### Application

- workpieces with very rough or structured surface like chequered or studded sheets
- structures up to 5 mm height possible
- increased contact pressure required for suction



FSD 85-Z ... FSD 260-S

### Article numbers

Type	Suction plate		Connection screw	
	NRS-G	SI-T	Type	Art.-Nr.
FSD 85 Z	1.11.1.0078	1.11.1.0079	ASB-M12-17	1.31.2.0003
FSD 85 S	1.11.1.0076	1.11.1.0077	AS-M12-17	1.31.2.0010
FSD 140 Z	1.11.1.0066	1.11.1.0067	ASB-M12-17	1.31.2.0003
FSD 140 S	1.11.1.0064	1.11.1.0065	AS-M12-17	1.31.2.0010
FSD 200 Z	1.11.1.0070	1.11.1.0071	ASB-M16-25	1.31.2.0007
FSD 200 S	1.11.1.0068	1.11.1.0069	AS-M16-25	1.31.2.0014
FSD 230 Z	1.11.1.0133	1.11.1.0138	ASB-M16-25	1.31.2.0007
FSD 230 S	1.11.1.0139	1.11.1.0140	AS-M16-25	1.31.2.0014
FSD 260 Z	1.11.1.0074	1.11.1.0075	ASB-M16-25	1.31.2.0007
FSD 260 S	1.11.1.0072	1.11.1.0073	AS-M16-25	1.31.2.0014

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
DP-FSD 85 Z/S	300	0,07	0,13
DP-FSD 140 Z/S	760	0,13	0,40
DP-FSD 200 Z/S	1.580	0,24	1,20
DP-FSD 230 Z/S	2.050	0,58	1,28
DP-FSD 260 Z/S	2.600	0,95	1,40

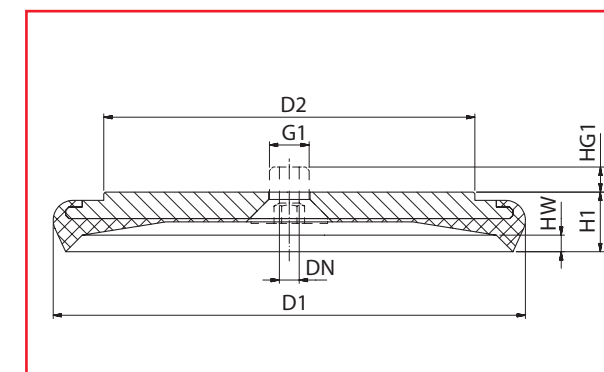
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

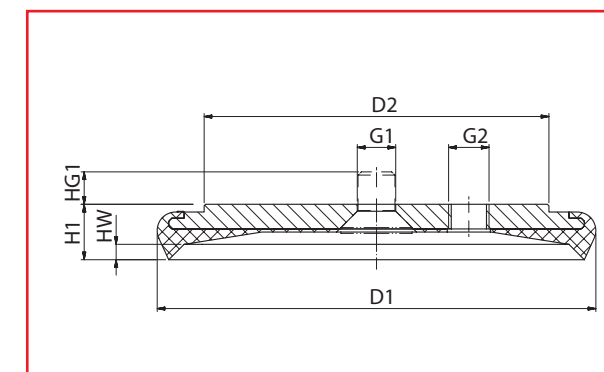
## Structure suction plate, round

FSD 85 - FSD 260

**FEZER**  
Simply move more.



FSD 85-Z ... FSD 260-Z



FSD 85-S ... FSD 260-S

### Dimensions

Type	D1	D2	DN	HW	H1	HG1	G1	G2
FSD 85 Z	85	66	8	5	20	10	M16	---
FSD 85 S	85	66	---	5	20	---	---	G1/4
FSD 140 Z	140	112	8	5	20	10	M16	---
FSD 140 S	140	112	---	5	20	---	---	G1/4
FSD 200 Z	200	75	8	5	25	10	M16	---
FSD 200 S	200	75	---	5	25	---	---	G3/8
FSD 230 Z	230	75	8	5	25	10	M16	---
FSD 230 S	230	75	---	5	25	---	---	G3/8
FSD 260 Z	260	75	8	5	25	10	M16	---
FSD 260 S	260	75	---	5	25	---	---	G1/2

### Suitable connection elements

Type	Suction pad retainer		Holders			Suspension bolt
	SAS	SAK	Holding bracket	Bushing	Holding joint	
FSD 85 ... FSD 140	SAS-M16x1,5-M16	SAK-M16x1,5-M16	HSW-M16x1,5-M16	HSB-M16-1/4	---	FS ... -M16x1,5
FSD 200 ... FSD 260	SAS-M20x1,5-M16	SAK-M20x1,5-M16	HSW-M20x1,5-M16	HSB-M20-M16	---	FS ... -M20x1,5

## Structure suction plate, round

FSM 100 - FSM 320

**FEZER**  
Simply move more.

### Description

Flat suction plate with aluminum body in round design with pushed-in froth-rubber sealing and studded pad. The suction pad has a very soft sealing and is available with central (Z) or lateral (S) vacuum feed. The sealing can be easily exchanged when worn out. The pad is fastened with a connection nipple. Please order the connection nipple separately.

### Application

- workpieces with very rough or structured surface, like raw wooden boards
- structures up to 3 mm height possible
- increased contact pressure required for suction



FSM 100-Z ... FSM 320-S

### Article numbers

Type	Suction plate M-G	Replacement sealing M-G	Replacement pad NBR-S	Connection screw	
				Type	Art.-Nr:
FSM 100-Z	1.11.1.0163	2.13.2.0043	2.13.2.0005	ASB-M16-20	1.31.2.0084
FSM 100-S	1.11.1.0523	2.13.2.0043	2.13.2.0005	AS-M16-22	1.31.2.0035
FSM 160-Z	1.11.1.0164	2.13.2.0046	2.13.2.0007	ASB-M16-20	1.31.2.0084
FSM 160-S	1.11.1.0522	2.13.2.0046	2.13.2.0007	AS-M16-22	1.31.2.0035
FSM 210-Z	1.11.1.0165	2.13.2.0048	2.13.2.0008	ASB-M16-20	1.31.2.0084
FSM 210-S	1.11.1.0521	2.13.2.0048	2.13.2.0008	AS-M16-22	1.31.2.0035
FSM 320-Z	1.11.1.0166	2.13.2.0050	2.13.2.0008	ASB-M16-20	1.31.2.0084
FSM 320-S	1.11.1.0520	2.13.2.0050	2.13.2.0008	AS-M16-22	1.31.2.0035

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FSM 100-Z/S	300	0,04	0,6
FSM 160-Z/S	900	0,05	0,8
FSM 210-Z/S	1.550	0,13	1,2
FSM 320-Z/S	3.580	0,33	3,4

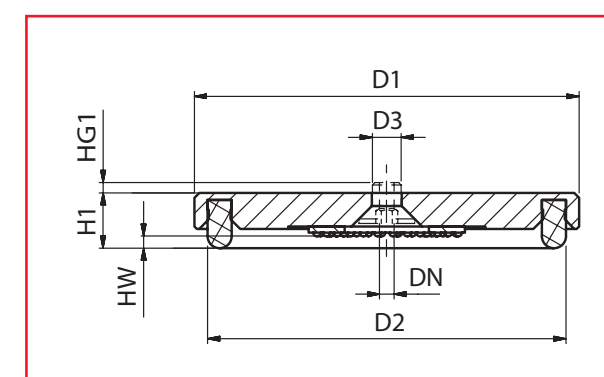
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

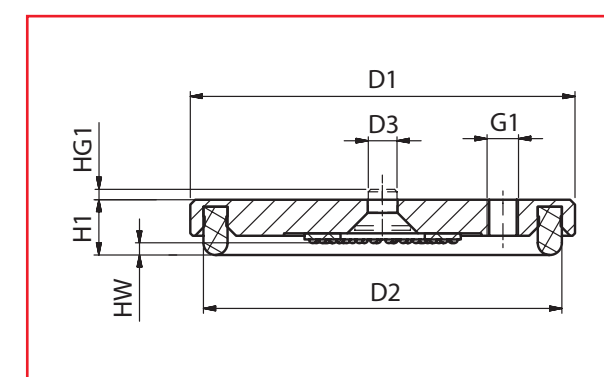
## Structure suction plate, round

FSM 100 - FSM 320

**FEZER**  
Simply move more.



FSM 100-Z ... FSM 320-Z



FSM 100-S ... FSM 320-S

### Dimensions

Type	D1	D2	D3	HW	H1	HG1	G1
FSM 100-Z	100	90	16,2	3	18	10	---
FSM 100-S	100	90	16,2	3	18	10	G1/4
FSM 160-Z	160	150	16,2	3	18	10	---
FSM 160-S	160	150	16,2	3	18	10	G1/4
FSM 210-Z	206	195	16,2	3	18	10	---
FSM 210-S	206	195	16,2	3	18	10	G3/8
FSM 320-Z	312	300	16,2	4	26	10	---
FSM 320-S	312	300	16,2	4	26	10	G1/2

### Suitable connection elements

Type	Suction pad retainer		Suspension bolt
	SAS	SAK	
FSM 100 ... FSM 160	SAS-M16x1,5-M16	SAK-M16x1,5-M16	FSB/FSH-M16x1,5
FSM 210 ... FSM 320	SAS-M20x1,5-M16	SAK-M20x1,5-M16	FSB/FSH-M20x1,5

## Structure suction plate, oval

FSM 75x180 - FSM 250x460

# FEZER

Simply move more.

### Description

Flat suction plate with aluminum body in oval design with pushed-in froth rubber sealing and grooved pad. The suction plate has a very soft sealing and are available with central vacuum connection. When worn out the sealing can be easily exchanged. The sealing plate is screwed on with 2 screws and double connection on 2 suspension bolts. Please order connection screws separately.

### Application

- narrow workpieces with very rough or structured surface like wooden planks
- structures up to 2 mm height possible
- increased contact pressure required for suction



FSM 75x180 ... FSM 250x460

### Article numbers

Type	Suction plate M-G	Replacement gasket M-G	Replacement pad NBR-G	Connection screw	
				Type	Art.-Nr:
FSM 75x180	1.13.1.0324	2.13.2.0093	2.13.2.0167	ASB-M16-20	1.31.2.0084
FSM 80x460	1.13.1.0310	2.13.2.0160	2.13.2.0165	AS-M16-22	1.31.2.0035
FSM 100x460	1.13.1.0311	2.13.2.0037	2.13.2.0166	AS-M16-22	1.31.2.0035
FSM 120x460	1.13.1.0217	2.13.2.0038	2.13.2.0168	AS-M16-22	1.31.2.0035
FSM 170x460	1.13.1.0313	2.13.2.0040	2.13.2.0169	AS-M16-22	1.31.2.0035
FSM 250x460	1.13.1.0314	2.13.2.0041	2.13.2.0170	AS-M16-22	1.31.2.0035

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FSM 75x180	430	0,11	0,52
FSM 80x460	1130	0,20	1,37
FSM 100x460	1720	0,39	1,72
FSM 120x460	2200	0,58	2,05
FSM 170x460	3400	0,88	2,90
FSM 250x460	5420	1,25	4,25

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

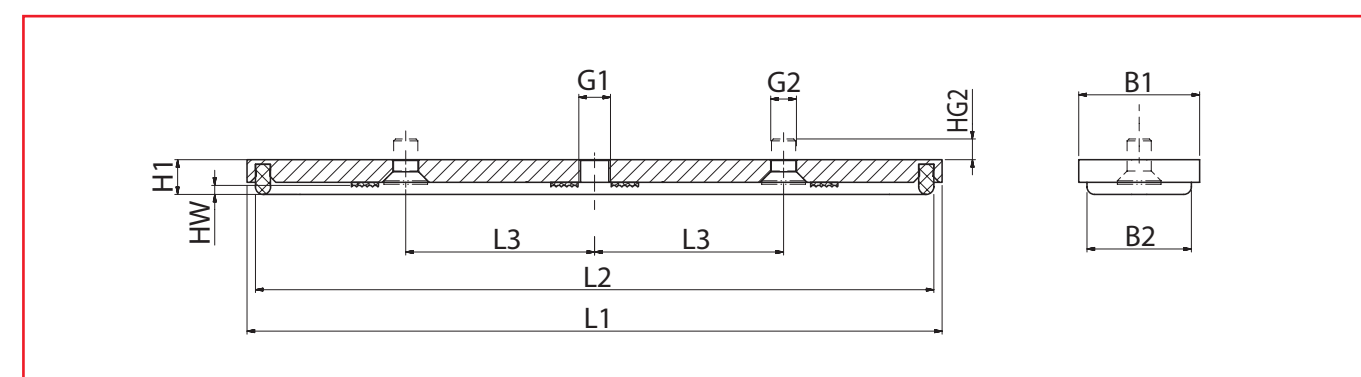
\*\* Volume with suction pad not engaged and unloaded

## Structure suction plate, oval

FSM 75x180 - FSM 250x460

# FEZER

Simply move more.



FSM 75x180 ... FSM 250x460

### Dimensions

Type	L1	L2	L3	B1	B2	HW	H1	HG1	HG2	G1	G2
FSM 75x180	180	170	---	75	65	6	23	---	---	17	---
FSM 80x460	460	450	125	80	70	6	23	---	10	G1/2	16,2
FSM 100x460	460	450	125	100	90	6	23	---	10	G1/2	16,2
FSM 120x460	460	450	125	120	110	6	23	---	10	G1/2	16,2
FSM 170x460	460	450	125	170	160	6	23	---	10	G1/2	16,2
FSM 250x460	460	450	125	250	240	6	23	---	10	G1/2	16,2

### Suitable connection elements

Type	Suction pad retainer		Suspension bolt
	SAS	SAK	
FSM 75x180	SAS-M16x1,5-M16	---	FS ... -M16x1,5*
FSM 80x460 ... FSM 120x460	SAS-M16x1,5-M16	SAK-M16x1,5-M16	FS ... -M16x1,5**
FSM 170x460 ... FSM 250x460	SAS-M20x1,5-M16	SAK-M20x1,5-M16	FS ... -M20x1,5**

\* Single connection, mounted with rotation-protected suspension bolt

\*\* Double connection, mounted with 2 suspension bolts

**Structure suction plate, oval**

FSM 80x460 - FSM 250x460 with joint

**Description**

Flat suction pad with aluminum body and joint retainer in oval design with clipped in sponge rubber sealing an grooved pad. The joint retainer allows an excellent adjustment to the bending of long workpieces. The suction pad has a very soft sealing and is equipped with a lateral vacuum connection. When worn off the sealing can be easily exchanged.

**Application**

- narrow and very long workpieces with very rough of structured surface like wooden planks, gluelam beams etc.
- structures up to 2 mm height possible
- increased contact pressure required for suction



FSM 80x460 ... FSM 250x460

**Article numbers**

Type	Suction plate M-G	Gasket M-G	Replacement pad NBR-G
FSM-G 80x460	1.13.2.0054	2.13.2.0160	2.13.2.0165
FSM-G 100x460	1.13.2.0055	2.13.2.0037	2.13.2.0166
FSM-G 120x460	1.13.2.0056	2.13.2.0038	2.13.2.0168
FSM-G 170x460	1.13.2.0057	2.13.2.0040	2.13.2.0169
FSM-G 250x460	1.13.2.0058	2.13.2.0041	2.13.2.0170

**Technical details**

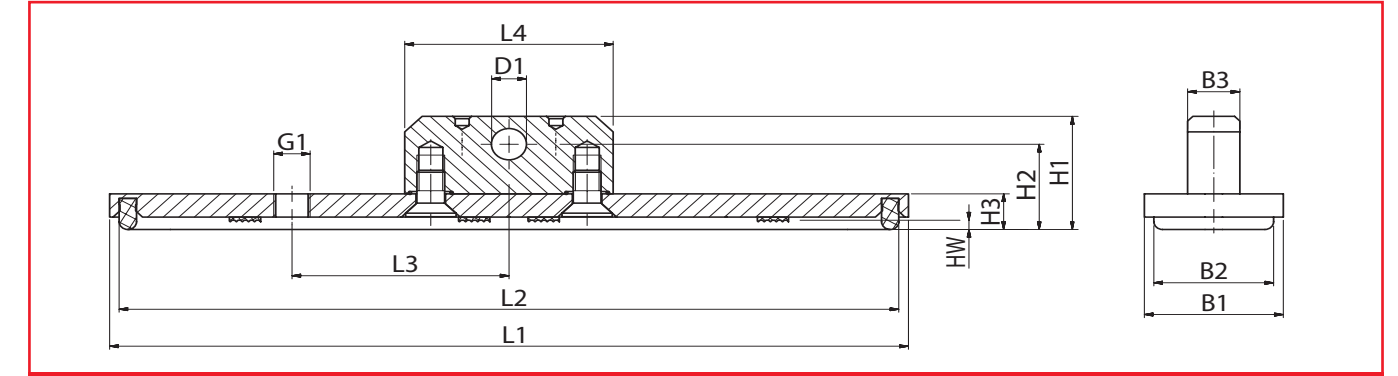
Type	Holding force* (N)	Volume** (l)	Weight (kg)
FSM-G 80x460	1130	0,20	1,87
FSM-G 100x460	1720	0,39	2,22
FSM-G 120x460	2200	0,58	2,55
FSM-G 170x460	3400	0,88	3,40
FSM-G 250x460	5420	1,25	4,75

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

**Structure suction plate, oval**

FSM 80x460 - FSM 250x460 with joint



FSM 80x460 ... FSM 250x460

**Dimensions**

Type	L1	L2	L3	L4	B1	B2	B3	HW	H1	H2	H3	D1	G1
FSM-G 80x460	460	450	125	120	80	70	30	6	73	55	22	20	G1/2
FSM-G 100x460	460	450	125	120	100	90	30	6	73	55	22	20	G1/2
FSM-G 120x460	460	450	125	120	120	110	30	6	73	55	22	20	G1/2
FSM-G 170x460	460	450	125	120	170	160	30	6	73	55	22	20	G1/2
FSM-G 250x460	460	450	125	120	250	240	30	6	73	55	22	20	G1/2

## Separation suction plate

FSRLB 120 - FSRLB 290 with convex insert

**FEZER**  
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### Description

Very robust and resistant flat suction pad with aluminum body, grooved pad and a centered convex insert. This convex insert supports the separation of stacked plates. The gasket and the insert are clipped on and can be easily exchanged when worn out. The suction plates are available with central (Z) or lateral (S) vacuum feed.

### Application

- separation and destacking of plates
- automated and robot technology



FSRLB 120-Z ... FSRLB 290-Z

### Article numbers

Type	Suction plate		Replacement gasket		Connection screw	
	NBR-G	SI-T	NBR-G	SI-T	Type	Art.-Nr:
FSRLB 120 Z	1.11.1.0296	1.11.1.0368	2.11.2.0089	2.11.2.0102	ASB-M16-20	1.31.2.0084
FSRLB 120 S	1.11.1.0297	1.11.1.0369	2.11.2.0114	2.11.2.0126	AS-M16-22	1.31.2.0035
FSRLB 170 Z	1.11.1.0370	1.11.1.0371	2.11.2.0090	2.11.2.0119	ASB-M16-20	1.31.2.0084
FSRLB 170 S	1.11.1.0373	1.11.1.0372	2.11.2.0127	2.11.2.0128	AS-M16-22	1.31.2.0035
FSRLB 230 Z	1.11.1.0374	1.11.1.0375	2.11.2.0091	2.11.2.0120	ASB-M16-20	1.31.2.0084
FSRLB 230 S	1.11.1.0376	1.11.1.0377	2.11.2.0130	2.11.2.0131	AS-M16-22	1.31.2.0035
FSRLB 290 Z	1.11.1.0378	1.11.1.0379	2.11.2.0094	2.11.2.0121	ASB-M16-20	1.31.2.0084
FSRLB 290 S	1.11.1.0380	1.11.1.0381	2.11.2.0132	2.11.2.0133	AS-M16-22	1.31.2.0035

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FSRLB 120 Z / S	550	0,06	0,35
FSRLB 170 Z / S	1.150	0,12	0,60
FSRLB 230 Z / S	2.100	0,20	1,12
FSRLB 290 Z / S	3.600	0,78	2,34

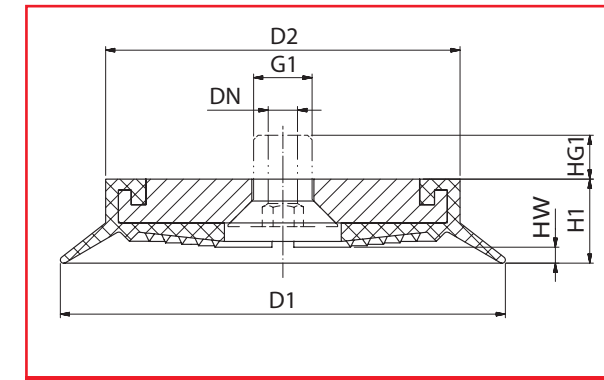
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

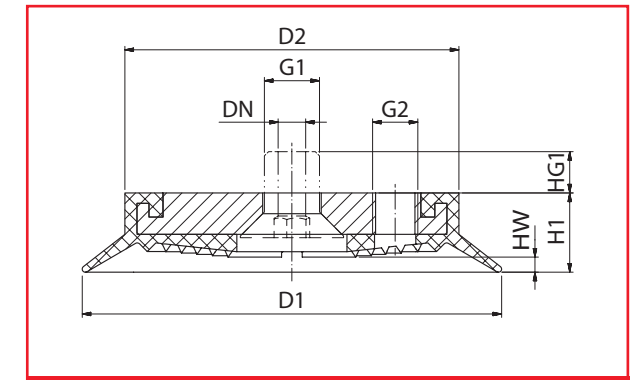
## Separation suction plate

FSRLB 120 - FSRLB 290 with convex insert

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FSRLB 120-Z ... FSRLB 290-Z



FSRLB 120-S ... FSRLB 290-S

### Dimensions

Type	D1	D2	DN	HW	H1	HG1	G1	G2
FSRLB 120 Z	120	97	8	4,5	23	7	M16	---
FSRLB 120 S	120	97	---	4,5	23	7	---	G1/4
FSRLB 170 Z	170	147	8	4	23	7	M16	---
FSRLB 170 S	170	147	---	4	23	7	---	G1/4
FSRLB 230 Z	230	197	8	4	23	7	M16	---
FSRLB 230 S	230	197	---	4	23	7	---	G1/2
FSRLB 290 Z	290	267	8	4	23	7	M16	---
FSRLB 290 S	290	267	---	4	23	7	---	G1/2

### Suitable connection elements

Type	Suction pad retainer		Suspension bolt
	SAS	SAK	
FSRLB 120 ... FSRLB 170	SAS-M16x1,5-M16	SAK-M16x1,5-M16	FS ...-M16x1,5
FSRLB 230 ... FSRLB 290	SAS-M20x1,5-M16	SAK-M20x1,5-M16	FS ...-M20x1,5

## Separation suction plate

FSRLI 120 - FSRLI 290 with pressured air impulse connection

### Description

Very robust and extremely resistant flat suction plate with integrated pressured air impulse connection. The gasket and the impulse insert are clipped on and can be easily exchanged when worn out. The suction plates have a lateral vacuum feed and a central pneumatic feed.

### Application

- separation and destacking of porous workpieces like chip boards, MDF- or OSB-boards
- by applying pressurized air on the inner sealing ring an engagement of several plates is prevented



FSRLI 120 ... FSRLI 290

### Article numbers

Type	Suction pad		Replacement gasket		Connection screw	
	NBR-G	SI-T	NBR-G	SI-T	Type	Art.-Nr:
FSRLI 120 S	1.11.1.0295	1.11.1.0506	2.11.2.0113	2.11.2.0154	ASB-M16-20	1.31.2.0084
FSRLI 170 S	1.11.1.0507	1.11.1.0508	2.11.2.0157	2.11.2.0156	ASB-M16-20	1.31.2.0084
FSRLI 230 S	1.11.1.0509	1.11.1.0510	2.11.2.0158	2.11.2.0159	ASB-M16-20	1.31.2.0084
FSRLI 290 S	1.11.1.0511	1.11.1.0512	2.11.2.0160	2.11.2.0161	ASB-M16-20	1.31.2.0084

### Technical details

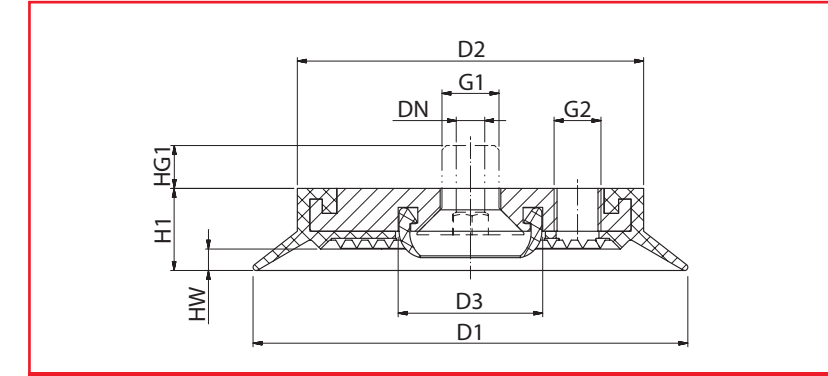
Type	Holding force* (N)	max. Abblasdruck (bar)	Volume** (l)	Weight (kg)
FSRLI 120	550	4	0,06	0,33
FSRLI 170	1.150	4	0,12	0,55
FSRLI 230	2.100	4	0,20	1,00
FSRLI 290	3.600	4	0,78	1,95

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Separation suction plate

FSRLI 120 - FSRLI 290 with pressured air impulse connection



FSRLI 120 ... FSRLI 290

### Dimensions

Type	D1	D2	D3	DN	H1	HW	HG1	G1	G2
FSRLI 120	120	97	40	8	23	6	7	M16	G1/4
FSRLI 170	170	147	40	8	23	6	7	M16	G1/4
FSRLI 230	230	197	40	8	23	6	7	M16	G1/4
FSRLI 290	290	267	40	8	23	6	7	M16	G1/4

### Suitable connection elements

Type	Suction pad retainern		Suspension bolt
	SAS	SAK	
FSRLI 120 ... FSRLI 170	SAS-M16x1,5-M16	SAK-M16x1,5-M16	FS ... -M16x1,5
FSRLI 230 ... FSRLI 290	SAS-M20x1,5-M16	SAK-M20x1,5-M16	FS ... -M20x1,5



## Bar suction plate

FSLs 30x50 - FSLs 60x470

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### Description

Special suction plate for handling of bars, spindles and tubes. The suction plates have a slightly curved and extremely long sealing lip, that adjusts to various diameters. The suction plates FSLs 30x50 ... 30x100 can be connected to a tube or with the suitable connection nipples to connection elements. Starting with type FSLs 35x200 only via suitable connection elements. When worn out the suction plates can be easily exchanged.

### Application

- Handling of tubes, bars, spindles or other round surfaces
- covers a relatively large area of diameters without having to change the pads



FSLs 30x50 ... FSLs 60x470

### Article numbers

Type	NBR-G	SI-T	Connection nipple/screw	
			Type	Art.-Nr:
FSLs 30x50	1.11.1.0490	1.11.1.0494	ANF-10-1/4	1.31.1.0026
FSLs 30x100	1.11.1.0289	1.11.1.0495	ANF-10-1/4	1.31.1.0026
FSLs 35x200	1.11.1.0288	1.11.1.0496	AS-M8-16	1.31.2.0076
FSLs 35x300	1.11.1.0491	1.11.1.0497	AB-M8-16	1.31.2.0076
FSLs 60x140	1.11.1.0492	1.11.1.0498	ASB-M12-20	1.31.2.0011
FSLs 60x470	1.11.1.0493	1.11.1.0499	AS-M12-20	1.31.2.0011

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FSLs 30x50	70	35	0,006	0,007
FSLs 30x100	140	35	0,010	0,010
FSLs 35x200	180	20	0,050	0,013
FSLs 35x300	300	20	0,070	0,026
FSLs 60x140	200	40	0,100	0,120
FSLs 60x470	750	40	0,450	0,350

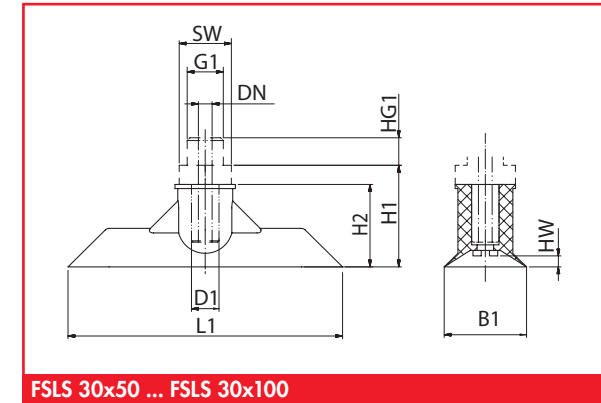
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

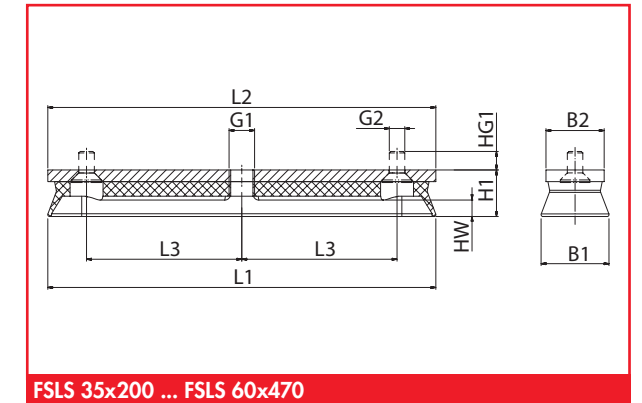
## Bar suction plate

FSLs 30x50 - FSLs 60x470

**FEZER**  
Simply move more.



FSLs 30x50 ... FSLs 30x100



FSLs 35x200 ... FSLs 60x470

### Dimensions

Type	L1	L2	L3	B1	B2	HW	H1	HG1	D1	G1	G2
FSLs 30x50	50	---	---	30	---	2	23	10	10	G1/4	---
FSLs 30x100	100	---	---	30	---	4	30	10	10	G1/4	---
FSLs 35x200	200	200	70	35	30	8,5	24	8	---	G1/4	8,2
FSLs 35x300	300	300	100	35	30	8,5	24	8	---	G1/4	8,2
FSLs 60x140	140	83	---	60	35	13	27	10	---	12,2	---
FSLs 60x470	470	411	100	60	35	13	27	8	---	G1/4	12,2

### Suitable connection elements

Type	Suction pad retainer		Suspension bolt
	SAS	SAK	
FSLs 30x50, 30x100, 60x140	SAS-M12x1-1/4	---	FS ... -M12x1*
FSLs 60x140	SAS-M16x1,5-1/4	---	FS ... -M16x1,5*
FSLs 35x200 ... FSLs 60x470	SAS-M12x1-M12	SAK-M12x1-M12	FS ... -M12x1**

\* Single connection, mounted with rotation-protected suspension bolt

\*\* Double connection, mounted with 2 suspension bolts

## Bar suction plate

FSLSE 120x300 - FSLSE 200x750

**FEZER**  
Simply move more.

### Description

Special suction plate for the handling of bars, tubes and spindles. The suction plates have a divided body, which allows adjustment to specified diameters. The special retainers allow to simply adapt to designated angles. When worn out the pads can be easily exchanged.

### Application

- handling of tubes, rods, spindles or other round surfaces
- covers a relatively large range of diameters without having to change the pads



FSLSE 120x300 ... FSLSE 200x750

### Article numbers

Type	NBR-G	SI-T
FSLSE 120x300	1.11.2.0004	1.11.2.0005
FSLSE 180x500	1.11.2.0006	1.11.2.0007
FSLSE 200x750	1.11.2.0008	1.11.2.0009

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
FSLSE 120x300	735	60	0,4	1,8
FSLSE 180x500	1.470	90	1,4	3,1
FSLSE 200x750	4.350	100	4,2	4,2

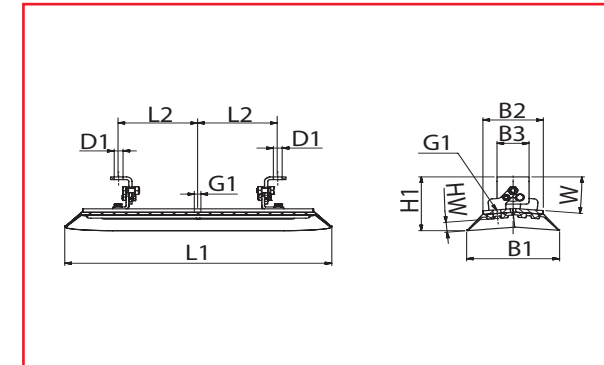
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

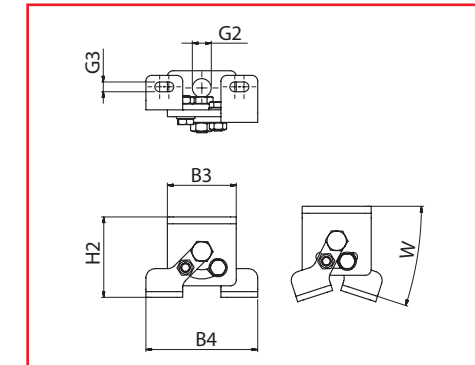
## Bar suction plate

FSLSE 120x300 - FSLSE 200x750

**FEZER**  
Simply move more.



FSLSE 120x300 ... FSLSE 200x750



Holding bracket

### Dimensions

Type	L1	L2	B1	B2	B3	B4	HW	H1	H2	W	G1	G2	G3
FSLSE 120x300	300	100	120	70	30	35	16	34	70	0-18°	G1/4	16,5	8,5
FSLSE 180x500	500	150	180	110	50	55	22	41	70	0-18°	G3/8	16,5	8,5
FSLSE 200x750	750	275	200	110	50	55	29	54	70	0-18°	G3/4	16,5	8,5

### Suitable connection elements

Type	Suction pad retainer		Suspension bolt
	SAS	SAK	
FSLSE 120x300 ... FSLSE 200x750	SAS-M20x1,5-M16	---	FS ... -M16x1,5*

\* Double connection, mounted with 2 suspension bolts

## High temperature suction plate

FSHB 90 - FSHB 250

# FEZER

Simply move more.

### Description

Robust and resistant suction plate in heat-resistant design. The sealing material consists of a silicone or viton mixture with special felt pad for high temperatures. When worn out the pad can be easily exchanged. Central vacuum feed via connection nipple or inside thread.

### Application

- handling of hot workpieces
- long-time temperature 250/300°C (SI/VI)
- short-time temperature 350/400°C (SI/VI)

### NB:

Since the felt pad does not seal perfectly, please use a larger vacuum pump!



FSHB 90 ... FSHB 250

### Article numbers

Type	Suction pad SI-T	Suction pad VI-S	Replacement gasket SI-T	Replacement gasket VI-S	Connection nipple/screw	
FSHB 25	1.01.1.0194	1.01.1.0195	---	---	ANF-8-1/8	1.31.1.0030
FSHB 40	1.01.1.0196	1.01.1.0197	---	---	ANF-8-1/8	1.31.1.0030
FSHB 70	1.01.1.0198	1.01.1.0199	---	---	ANF-8-1/8	1.31.1.0030
FSHB 90	1.11.1.0084	1.11.1.0545	2.11.2.0005	2.11.2.0004	ASB-3/8	1.31.2.0123
FSHB 120	1.11.1.0080	1.11.1.0548	2.11.2.0181	2.11.2.0001	ASB-3/8	1.31.2.0123
FSHB 180	1.11.1.0081	1.11.1.0547	2.11.2.0180	2.11.2.0002	ASB-3/8	1.31.2.0123
FSHB 250	1.11.1.0083	1.11.1.0546	2.11.2.0179	2.11.2.0003	ASB-1/2	1.31.2.0008

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
FSHB 25	10	0,06	0,03
FSHB 40	21	0,08	0,05
FSHB 70	50	0,12	0,16
FSHB 90	150	0,16	0,34
FSHB 120	210	0,21	0,56
FSHB 180	930	0,26	0,82
FSHB 250	1280	0,69	2,60

\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

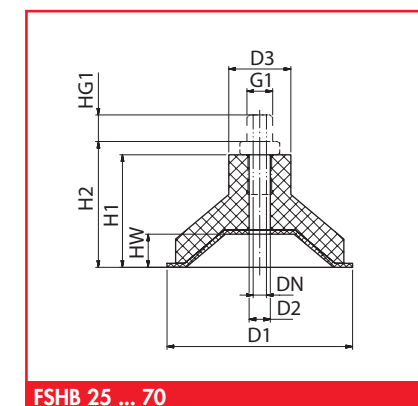
\*\* Volume with suction pad not engaged and unloaded

## High temperature suction plate

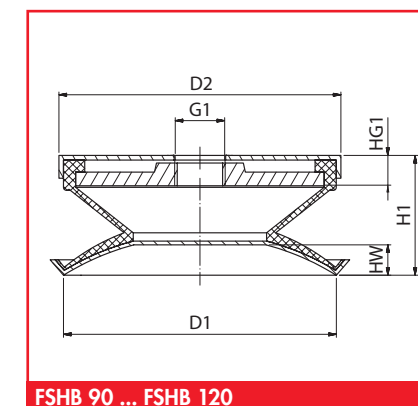
FSHB 90 - FSHB 250

# FEZER

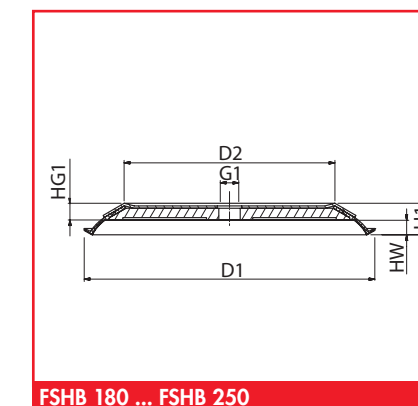
Simply move more.



FSHB 25 ... 70



FSHB 90 ... FSHB 120



FSHB 180 ... FSHB 250

### Dimensions

Type	D1	D2	DN	HW	H1	H2	HG1	G1
FSHB 25	24	24	8	3	36	44	10	G1/8
FSHB 40	37	24	8	5	37	47	10	G1/8
FSHB 70	70	24	8	8	37	47	10	G1/8
FSHB 90	90	93	---	10	40	---	12	G3/8
FSHB 120	120	110	---	14	40	---	12	G3/8
FSHB 180	180	126	---	12,5	27	---	10	G3/8
FSHB 250	250	194	---	12,5	27	---	10	G1/2

### Suitable connection elements

Type	Suction pad retainern		Holding bracket	Holders		Suspension bolt
	SAS	SAK		Bushing	Holding joint	
FSHB 25 ... FSHB 70	SAS-M12x1-1/4	---	HSW-M12x1-1/4	HSB-1/4-1/4	HSG-M12x1-1/4	FS ... -M12x1
FSHB 90 ... FSHB 120	SAS-M16x1,5-3/8	---	---	---	---	FS ... -M16x1,5
FSHB 180 ... FSHB 250	SAS-M20x1,5-1/2	---	---	---	---	FS ... -M20x1,5

## Rectangular suction plate

EP 30x100 - 50x300 with base plate

**FEZER**  
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### Description

Robust and resistant holding plate with protruding base plate which allows to connect and exchange them from the top. The sealing is vulcanized onto the base plate.

### Application

- to screw onto holding tables with o-ring sealing
- also suitable for engagement of rods and tubes



EP 30x100 ... EP 100x300

### Article numbers

Type	NBR-G	SI-T	Connection screw	
			Type	
DP-EP 30x100	1.11.1.0012	1.11.1.0014	AS-M8-16	1.31.2.0076
DP-EP 30x200	1.11.1.0017	1.11.1.0018	AS-M8-16	1.31.2.0076
DP-EP 30x300	1.11.1.0021	1.11.1.0022	AS-M8-16	1.31.2.0076
DP-EP 40x100	1.11.1.0354	1.11.1.0415	AS-M8-16	1.31.2.0076
DP-EP 40x200	1.11.1.0355	1.11.1.0424	AS-M8-16	1.31.2.0076
DP-EP 40x300	1.11.1.0356	1.11.1.0425	AS-M8-16	1.31.2.0076
DP-EP 50x200	1.11.1.0357	1.11.1.0500	AS-M8-16	1.31.2.0076
DP-EP 50x300	1.11.1.0358	1.11.1.0501	AS-M8-16	1.31.2.0076

### Technical details

Type	Holding force* (N)	Suction radius min: (mm)	Volume** (l)	Weight (kg)
DP-EP 30x100	65	25	0,017	0,18
DP-EP 30x200	130	25	0,025	0,33
DP-EP 30x300	195	25	0,040	0,52
DP-EP 40x100	100	40	0,022	0,22
DP-EP 40x200	200	40	0,032	0,40
DP-EP 40x300	300	40	0,050	0,65
DP-EP 50x200	300	50	0,040	0,50
DP-EP 50x300	450	50	0,060	0,90

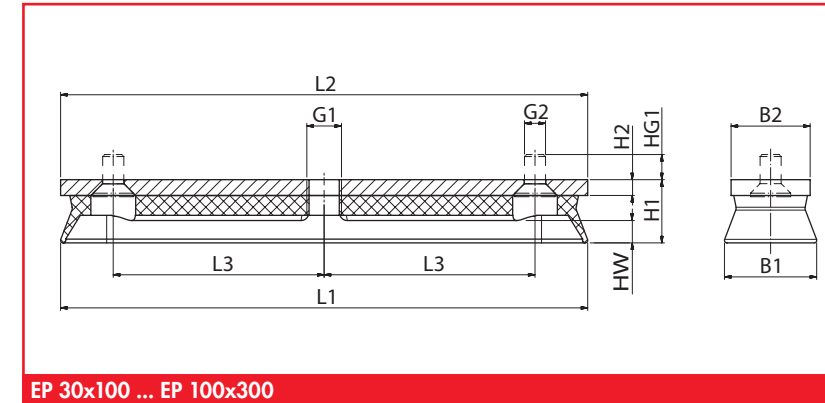
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

## Rectangular suction plate

EP 20x100 - 50x300 with base plate

**FEZER**  
Simply move more.



EP 30x100 ... EP 100x300

### Dimensions

Type	L1	L2	L3	B1	B2	HW	H1	H2	G1	G2
DP-EP 30x100	100	52	120	30	30	5	20	6	8,5	G1/8
DP-EP 30x200	200	102	220	30	30	5	20	6	8,5	G1/8
DP-EP 30x300	300	152	320	30	30	5	20	6	8,5	G1/8
DP-EP 40x100	100	52	120	40	30	6	22	6	8,5	G1/4
DP-EP 40x200	200	102	220	40	30	6	22	6	8,5	G1/4
DP-EP 40x300	300	152	320	40	30	6	22	6	8,5	G1/4
DP-EP 50x200	200	102	220	50	40	6	27	6	8,5	G1/4
DP-EP 50x300	300	152	320	50	40	6	27	6	8,5	G1/4

## Rectangular suction plate

EP 13x43 - EP 96x96

**FEZER**  
Simply move more.

### Description

Special suction plate for very small and narrow workpieces. Can also be used as holding plates in machines. The suction plate consists of an aluminum body with vulcanized sealing with burling pad.

### Application

- narrow, even workpieces
- small parts
- holding plates for machines, suction tables etc.



EP 13x43 ... EP 96x96

### Article numbers

Type	NBR-S	NBR-G	SI-T
DP-EP 13x43	---	1.16.1.0010	1.16.1.0011
DP-EP 19x58	---	1.16.1.0015	1.16.1.0016
DP-EP 23x83	---	1.16.1.0023	1.16.1.0024
DP-EP 25x65	---	1.16.1.0017	1.16.1.0018
DP-EP 33x65	---	1.16.1.0019	1.16.1.0020
DP-EP 35x105	---	1.16.1.0001	1.16.1.0003
DP-EP 40x45	1.16.1.0012	---	1.16.1.0013
DP-EP 42x42	1.16.1.0008	---	1.16.1.0009
DP-EP 47x65	---	1.16.1.0021	1.16.1.0022
DP-EP 96x96	---	1.16.1.0025	1.16.1.0026

### Technical details

Type	Holding force* (N)	Volume** (l)	Weight (kg)
DP-EP 13x43	21	0,006	0,02
DP-EP 19x58	36	0,003	0,06
DP-EP 23x83	36	0,006	0,10
DP-EP 25x65	45	0,005	0,06
DP-EP 33x65	72	0,009	0,07
DP-EP 35x105	141	0,014	0,14
DP-EP 40x45	73	0,006	0,06
DP-EP 42x42	73	0,006	0,08
DP-EP 47x65	123	0,011	0,11
DP-EP 96x96	440	0,050	0,41

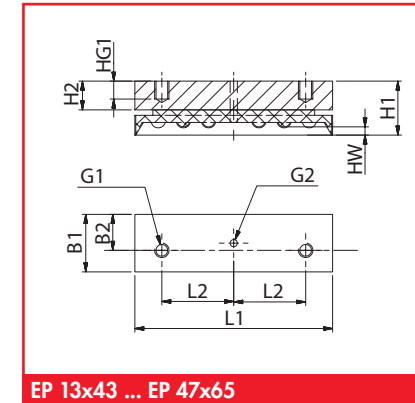
\* Specifications at 60 % vacuum w/o safety factor, on smooth, dry surfaces

\*\* Volume with suction pad not engaged and unloaded

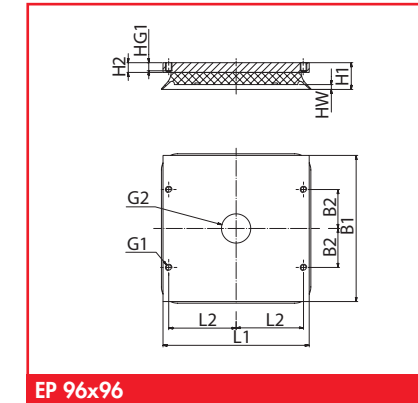
## Rectangular suction plate

EP 13x43 - EP 96x96

**FEZER**  
Simply move more.



EP 13x43 ... EP 47x65



EP 96x96

### Dimensions

Type	L1	L2	B1	B2	HW	H1	H2	G1	G2
DP-EP 13x43	40	16,5	10	5	2	15	8	M4	3
DP-EP 19x58	55	20	16	18	2,5	15	8	M4	2
DP-EP 23x83	80	28	20	25	2	15	8	M4	6
DP-EP 25x65	60	20	20	10	2	13	6	M4	6
DP-EP 33x65	60	20	28	14	2,5	13	6	M4	10
DP-EP 35x105	100	30	32	16	2,5	13	6	M4	18
DP-EP 40x45	40	16,5	35	17,5	2,5	13	6	M4	10
DP-EP 42x42	42	16,5	42	21	2,5	13	6	M4	8
DP-EP 47x65	60	20	42	21	2,5	13	6	M4	18
DP-EP 96x96	92	41,5	92	24	2,5	16,5	6	M4	18

## Sealing profiles

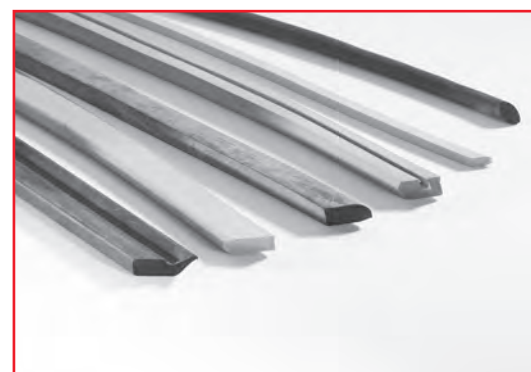
D-RS ... D-PGR

### Description

Sealing profiles in metre lengths to install on individually formed bodies. The sealing profiles can be either clipped on or glued.

### Application

- Individual suction plates for special geometries
- also suitable for curved and structured surfaces



D-RS 5 ... D-PGR 20x25

### Article numbers

Type	Sealing profile	
	M-S	M-SI-W
D-RS 5	6.11.7.0011	6.11.7.0015
D-RS 6	6.11.7.0022	6.11.7.0017
D-RS 8	6.11.7.0018	6.11.7.0019
D-RS 10	6.11.7.0003	6.11.7.0004
D-RS 12	6.11.7.0005	6.11.7.0006
D-RS 15	6.11.7.0007	6.11.7.0008
D-PGO 6x8	2.19.2.0060	---
D-PGO 10x20	2.19.2.0138*	---
D-PGO 12x17	2.19.2.0057	---
D-PGR 10x10	2.19.2.0009	---
D-PGR 10x18	2.19.2.0018	---
D-PGR 20x25	2.19.2.0038	---

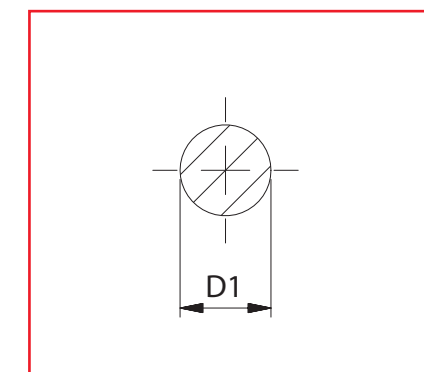
\* grey design

# FEZER

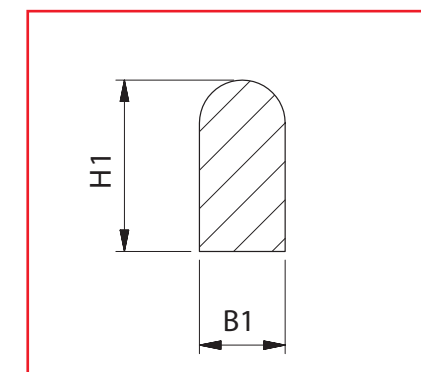
Simply move more.

## Sealing profiles

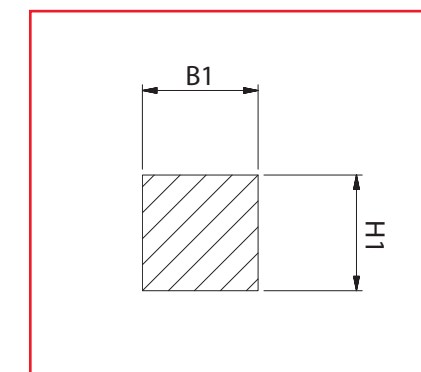
D-RS ... D-PGR



D-RS 5 ... D-RS 15



D-PGO 6x8 ... D-PGO 12x17



D-PGR 10x10 ... D-PGR 20x25

### Dimensions

Type	D1	B1	H1	Groove dimensions	
				Width	Depth
D-RS 5	5	---	---	5,2 - 5,5	3,5
D-RS 6	6	---	---	6,3 - 6,6	4,2
D-RS 8	8	---	---	8,4 - 8,8	5,5
D-RS 10	10	---	---	10,5 - 11	7,0
D-RS 12	12	---	---	12,5 - 13	8,5
D-RS 15	15	---	---	15,5 - 16	10,5
D-PGO 6x8	---	---	8	5,8 - 6	4 - 5,5
D-PGO 10x20	---	10	20	9,8 - 10	10 - 14
D-PGO 12x17	---	12	17	11,8 - 12	8,5 - 12
D-PGR 10x10	---	10	10	9,8 - 10	5 - 7
D-PGR 10x18	---	10	18	9,8 - 10	9 - 12,5
D-PGR 20x25	---	20	25	19,5 - 20	12,5 - 17,5

# FEZER

Simply move more.

## Accessories for suction pads

Special glue for sealing profiles

### Description

This glue is put onto both glued surfaces. Once it has become dry the surfaces are tightly pressed against each other. The pressure thus applied defines the firmness of the glued area.

### Application

- glueing of cut ends of sealing profiles
- glueing of sealing profiles into grooves



Spezialkleber

### Article numbers

	Contents	
Special glue for rubber-metal connections perbunane	670 g	1.55.9.0011
Special glue for rubber-metal connections perbunane	60 g	1.55.9.0008
Special glue for rubber-metal connections silicone	300 g	1.55.9.0002
Thinner for special glue	1000 g	1.55.9.0007

## Accessories for suction pads

Textile cover TÜZ

### Description

Special textile cover made of a porous fabric with elastic band to slip onto the suction pad.

### Application

- to protect workpieces with extremely sensitive surfaces like polished plates, etc.

### Advice

When using textile covers the vacuum generator needs more power as the covers do not seal the surface completely.



TÜZ 90 ... TÜZ 300

### Article numbers

		for diameter (mm)
TÜZ 90	1.55.2.0014	90
TÜZ 100	1.55.2.0002	100
TÜZ 110	1.55.2.0003	110
TÜZ 130	1.55.2.0004	130
TÜZ 160	1.55.2.0006	160
TÜZ 180	1.55.2.0007	180
TÜZ 210	1.55.2.0009	210
TÜZ 220	1.55.2.0010	220
TÜZ 250	1.55.2.0011	250
TÜZ 300	1.55.2.0012	300