



- For accurate and gentle transportation
- Lightweight and sturdy
- 6 suction cup designs in various sizes
- Suction cup diameters 2 – 100 mm
- Long service life








# Suction cups, complete ESS

Product range overview

FESTO


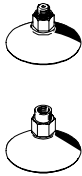
Suction grippers

2.1

| Type   | Suction cup<br>Ø  | Suction cup<br>holder | Mounting thread | Nominal size | Materials     |                |                               |          |              |                                | → Page |            |   |
|--|---|-----------------------|-----------------|--------------|---------------|----------------|-------------------------------|----------|--------------|--------------------------------|--------|------------|---|
|  |   |                       |                 |              | Fluoro rubber | Nitrile rubber | Nitrile rubber,<br>antistatic | Silicone | Polyurethane | Polyurethane<br>heat-resistant |        |            |   |
|  | [mm]  | Size                  |                 | [mm]         |               |                |                               |          |              |                                |        |            |   |
| Standard, round<br>ESS-...-S...                        |    | 2                     | 1               | Ø 3          | 0.6           | ■              | ■                             | ■        | ■            | ■                              | -      | 6 / 2.1-7  |   |
|  |   | 4                     |                 |              | 1.2           | ■              | ■                             | ■        | ■            | ■                              | -      |            |   |
|  |   | 6                     | 2               | Ø 4          | 2.0           | ■              | ■                             | ■        | ■            | ■                              | -      |            |   |
|  |   | 8                     |                 |              |               |                | ■                             | ■        | ■            | ■                              | ■      |            | - |
|  |    | 10                    | 3               | M4x0.7       | 2.0           | ■              | ■                             | ■        | ■            | ■                              | -      | 6 / 2.1-7  |   |
|  |   | 15                    |                 |              |               |                | ■                             | ■        | ■            | ■                              | ■      |            | - |
|  |   | 20                    | 4               | M6x1         | 3.0           | ■              | ■                             | ■        | ■            | ■                              | -      |            |   |
|  |   | 30                    |                 |              |               |                | ■                             | ■        | ■            | ■                              | ■      |            | - |
|  |   | 40                    |                 |              |               |                | ■                             | ■        | ■            | ■                              | ■      |            | - |
|  |   | 50                    |                 |              |               |                | ■                             | ■        | ■            | ■                              | ■      |            | - |
|  |   | 60                    | 5               | M10x1.5      | 6.0           | ■              | ■                             | ■        | ■            | ■                              | -      |            |   |
|  |   | 80                    |                 |              |               |                | ■                             | ■        | ■            | ■                              | ■      |            | - |
|  |   | 100                   |                 |              |               |                | ■                             | ■        | ■            | ■                              | ■      |            | - |
|  |   | 150                   | 6               | M20x2        | 10.0          | ■              | ■                             | ■        | ■            | ■                              | -      |            |   |
| 200  |   |                       |                 |              | ■             | ■              | ■                             | ■        | ■            | -                              |        |            |   |
| Round, extra deep<br>ESS-...-E...                      |  | 15                    | 3               | M4x0.7       | 2.0           | ■              | ■                             | -        | ■            | ■                              | -      | 6 / 2.1-11 |   |
|  |   | 20                    | 4               | M6x1         | 3.0           | ■              | ■                             | -        | ■            | ■                              | -      |            |   |
|  |   | 30                    |                 |              |               |                | ■                             | ■        | -            | ■                              | ■      |            | - |
|  |   | 40                    |                 |              |               |                | ■                             | ■        | -            | ■                              | ■      |            | - |
|  |   | 50                    |                 |              |               |                | ■                             | ■        | -            | ■                              | ■      |            | - |
|  |   | 60                    | 5               | M10x1.5      | 6.0           | ■              | ■                             | -        | ■            | ■                              | -      |            |   |
|  |   | 80                    |                 |              |               |                | ■                             | ■        | -            | ■                              | ■      |            | - |
|  |   | 100                   |                 |              |               |                | ■                             | ■        | -            | ■                              | ■      |            | - |
| Bellows, round,<br>1.5 convolutions<br>ESS-...-B...    |  | 10                    | 3               | M4x0.7       | 2.0           | -              | ■                             | -        | ■            | ■                              | -      | 6 / 2.1-14 |   |
|  |   | 20                    | 4               | M6x1         | 3.0           | -              | ■                             | -        | ■            | ■                              | -      |            |   |
|  |   | 30                    |                 |              |               |                | -                             | ■        | -            | ■                              | ■      |            | - |
|  |   | 40                    |                 |              |               |                | -                             | ■        | -            | ■                              | ■      |            | - |
|  |   | 50                    |                 |              |               |                | -                             | ■        | -            | ■                              | ■      |            | - |
| Bellows, round,<br>1.5 convolutions<br>ESS-...-BT...   |  | 40                    | 4               | M6           | 2.5           | -              | -                             | -        | -            | -                              | ■      | 6 / 2.1-16 |   |
|  |   |                       |                 | M10          |               | -              | -                             | -        | -            | -                              | ■      |            |   |
|  |   |                       |                 | G1/4-l       |               | -              | -                             | -        | -            | -                              | ■      |            |   |
|  |   |                       |                 | G1/4         |               | -              | -                             | -        | -            | -                              | ■      |            |   |
|  |  | 50                    | 4               | M6           | 2.5           | -              | -                             | -        | -            | -                              | ■      |            |   |
|  |   |                       |                 | M10          |               | -              | -                             | -        | -            | -                              | ■      |            |   |
|  |   |                       |                 | G1/4-l       |               | -              | -                             | -        | -            | -                              | ■      |            |   |
|  |   |                       |                 | G1/4         |               | -              | -                             | -        | -            | -                              | ■      |            |   |
|  |   | 80                    | 5               | M10          | 2.5           | -              | -                             | -        | -            | -                              | ■      |            |   |
|  |   |                       |                 | G1/4-l       |               | -              | -                             | -        | -            | -                              | ■      |            |   |
| Bellows,<br>round,<br>3.5 convolutions<br>ESS-...-C... |  | 10                    | 3               | M4x0.7       | 2.0           | -              | ■                             | -        | ■            | -                              | -      | 6 / 2.1-18 |   |
|  |   | 20                    | 4               | M6x1         | 3.0           | -              | ■                             | -        | ■            | -                              | -      |            |   |
|  |   | 30                    |                 |              |               |                | -                             | ■        | -            | ■                              | -      |            |   |
|  |   | 40                    |                 |              |               |                | -                             | ■        | -            | ■                              | -      |            |   |
|  |   | 50                    | 5               | M10x1        | 3.0           | -              | ■                             | -        | ■            | -                              | -      |            |   |





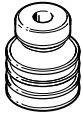

# Suction cups, complete ESS

Product range overview

| Type                             | Suction cup $\varnothing$<br>or suction cup<br>size                                | Suction cup<br>holder | Mounting thread    | Nominal size       | Materials      |                                | → Page |            |   |
|----------------------------------|--|-----------------------|--------------------|--------------------|----------------|--------------------------------|--------|------------|---|
|                                  |  |                       |                    |                    | Nitrile rubber | Polyurethane<br>heat-resistant |        |            |   |
|                                  | [mm]   | Size                  |                    | [mm]               |                |                                |        |            |   |
| Oval suction cup<br>ESS-...-O... |   | 4x10                  | 4                  | M6x1               | 3.0            | ■                              | -      | 6 / 2.1-20 |   |
|                                  |  | 4x20                  |                    |                    |                |                                |        |            |   |
|                                  |  | 6x10                  |                    |                    |                |                                |        |            |   |
|                                  |  | 6x20                  |                    |                    |                |                                |        |            |   |
|                                  |  | 8x20                  |                    |                    |                |                                |        |            |   |
|                                  |  | 8x30                  |                    |                    |                |                                |        |            |   |
|                                  |  | 10x30                 |                    |                    |                |                                |        |            |   |
|                                  |  | 15x45                 | 5                  | M10x1.5            | 6.0            | ■                              | -      |            |   |
|                                  |  | 20x60                 |                    |                    |                |                                |        |            |   |
|                                  |  | 25x75                 |                    |                    |                |                                |        |            |   |
| 30x90                            |  |                       |                    |                    |                |                                |        |            |   |
| Bell-shaped<br>ESS-...-GT...     |  | 30                    | 4                  | M6                 | 2.5            | -                              | ■      | 6 / 2.1-22 |   |
|                                  |  |                       |                    | M10                |                |                                |        |            |   |
|                                  |  |                       |                    | G $\frac{1}{8}$ -l |                |                                |        |            |   |
|                                  |  |                       | G $\frac{1}{8}$    | 4                  | M6             | 2.5                            | -      |            | ■ |
|                                  |  | 40                    | M10                |                    |                |                                |        |            |   |
|                                  |  |                       | G $\frac{1}{4}$ -l |                    |                |                                |        |            |   |
|                                  |  |                       | G $\frac{1}{4}$    | 4                  | M6             | 2.5                            | -      |            | ■ |
|                                  |  | 50                    | M10                |                    |                |                                |        |            |   |
|                                  |  |                       | G $\frac{1}{8}$ -l |                    |                |                                |        |            |   |
|                                  |  |                       | G $\frac{1}{8}$    | 5                  | M10            | 2.5                            | -      |            | ■ |
|                                  |  | 60                    | G $\frac{1}{4}$ -l |                    |                |                                |        |            |   |
|                                  |  |                       | G $\frac{1}{4}$    |                    |                |                                |        |            |   |
|                                  |  |                       | M10                | 5                  | 5.5            | -                              | ■      |            |   |
|                                  |  | 80                    | G $\frac{1}{4}$ -l |                    |                |                                |        |            |   |
|                                  |  |                       | G $\frac{1}{4}$    |                    |                |                                |        |            |   |
|                                  |  |                       | M10                | 5                  | 5.5            | -                              | ■      |            |   |
|                                  |  | 100                   | G $\frac{1}{4}$ -l |                    |                |                                |        |            |   |
|                                  |  |                       | G $\frac{1}{4}$    |                    |                |                                |        |            |   |

# Suction cups ESV

Product range overview

| Type   | Suction cup $\varnothing$<br><br>[mm]   | Suction cup holder<br><br>Size | Mounting thread | Materials     |                |                           |          |              |                             | → Page |            |
|--|---|--------------------------------|-----------------|---------------|----------------|---------------------------|----------|--------------|-----------------------------|--------|------------|
|  |   |                                |                 | Fluoro rubber | Nitrile rubber | Nitrile rubber antistatic | Silicone | Polyurethane | Polyurethane heat-resistant |        |            |
| Standard, round<br>ESV-...-S...                      |    | 20                             | 4               | M6x1          |                |                           |          |              |                             |        | 6 / 2.1-7  |
|  |   | 30                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 40                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 50                             | 5               | M10x1.5       |                |                           |          |              |                             |        |            |
|  |   | 60                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 80                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 100                            | 6               | M20x2         |                |                           |          |              |                             |        |            |
| 150  |   |                                |                 |               |                |                           |          |              |                             |        |            |
| 200  |   |                                |                 |               |                |                           |          |              |                             |        |            |
| Round, extra deep<br>ESV-...-E...                    |    | 20                             | 4               | M6x1          |                |                           |          |              |                             |        | 6 / 2.1-11 |
|  |   | 30                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 40                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 50                             | 5               | M10x1.5       |                |                           |          |              |                             |        |            |
|  |   | 60                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 80                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 100                            |                 |               |                |                           |          |              |                             |        |            |
| Bellows, round,<br>1.5 convolutions<br>ESV-...-B...  |  | 20                             | 4               | M6x1          |                |                           |          |              |                             |        | 6 / 2.1-14 |
|  |   | 30                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 40                             | 5               | M10x1.5       |                |                           |          |              |                             |        |            |
|  |   | 50                             |                 |               |                |                           |          |              |                             |        |            |
| Bellows, round,<br>1.5 convolutions<br>ESV-...-BT... |  | 40                             | 4               | -             |                |                           |          |              |                             |        | 6 / 2.1-16 |
|  |   | 50                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 80                             | 5               |               |                |                           |          |              |                             |        |            |
| Bellows, round,<br>3.5 convolutions<br>ESV-...-C...  |  | 20                             | 4               | M6x1          |                |                           |          |              |                             |        | 6 / 2.1-18 |
|  |   | 30                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 40                             | 5               | M10x1         |                |                           |          |              |                             |        |            |
|  |   | 50                             |                 |               |                |                           |          |              |                             |        |            |
| Bell-shaped<br>ESV-...-GT...                         |  | 30                             | 4               | -             |                |                           |          |              |                             |        | 6 / 2.1-22 |
|  |   | 40                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 50                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 60                             | 5               | -             |                |                           |          |              |                             |        |            |
|  |   | 80                             |                 |               |                |                           |          |              |                             |        |            |
|  |   | 100                            |                 |               |                |                           |          |              |                             |        |            |

# Suction cups, complete ESS/suction cups ESV

Type code

ESS - 10 - S - N - M6


| Type |                       |
|------|-----------------------|
| ESS  | Suction cup, complete |
| ESV  | Suction cup           |

| Suction cup Ø or suction cup size [mm] |       |
|--|-------|
| 2...200                                | Round |
| 4x10                                   | Oval  |
| 4x20                                   | Oval  |
| 6x10                                   | Oval  |
| 6x20                                   | Oval  |
| 8x20                                   | Oval  |
| 8x30                                   | Oval  |
| 10x30                                  | Oval  |
| 15x45                                  | Oval  |
| 20x60                                  | Oval  |
| 25x75                                  | Oval  |
| 30x90                                  | Oval  |

| Suction cup design |                                  |
|--------------------|----------------------------------|
| S                  | Standard, round                  |
| E                  | Extra deep                       |
| B                  | Bellows, round, 1.5 convolutions |
| C                  | Bellows, round, 3.5 convolutions |
| O                  | Oval                             |
| G                  | Bell-shaped                      |

| Materials |                              |
|-----------|------------------------------|
| F         | Fluoro rubber                |
| N         | Nitrile rubber               |
| NA        | Nitrile rubber, antistatic   |
| S         | Silicone                     |
| U         | Polyurethane                 |
| T         | Polyurethane, heat-resistant |

| Connection sizes |                      |
|------------------|----------------------|
| M6               | M6 thread            |
| M10              | M10 thread           |
| G1/8             | G1/8 thread          |
| G1/4             | G1/4 thread          |
| G1/8-I           | G1/8-I female thread |
| G1/4-I           | G1/4-I female thread |

-  - Note  
Possible combinations can be found in the ordering data.

# Suction cups, complete ESS/suction cups ESV

Technical data

| General technical data |   |                |                            |               |              |                             |
|------------------------|---|----------------|----------------------------|---------------|--------------|-----------------------------|
| Type                   | ESS/ESV-...   |                |                            |               |              |                             |
|                        | F   | N              | NA                         | S             | U            | T                           |
| Operating medium       | Atmospheric air   |                |                            |               |              |                             |
| Mounting position      | Any   |                |                            |               |              |                             |
| Material               | Fluoro rubber   | Nitrile rubber | Nitrile rubber, antistatic | Silicone      | Polyurethane | Polyurethane heat-resistant |
| Shore hardness         | 60±5  | 50±5           | 50±5                       | 50±5          | 60±5         | 72±5                        |
| Colour                 | Grey  | Black          | Black with white dot       | Transparent   | Blue         | Reddish brown               |
| Material note          | PWIS-free (free of paint wetting impairment substances) |                |                            | Contains PWIS |              |                             |
|                        | Free of copper, PTFE and silicone → Ordering data       |                |                            |               |              |                             |

| Ambient conditions   |                   |              |             |             |              |             |             |
|----------------------|-------------------|--------------|-------------|-------------|--------------|-------------|-------------|
| Type                 |                   | ESS/ESV-...  |             |             |              |             |             |
|                      |                   | F            | N           | NA          | S            | U           | T           |
| Ambient temperature  | [°C]              | -10 ... +200 | -10 ... +70 | -10 ... +70 | -30 ... +180 | -20 ... +60 | -10 ... +80 |
| Corrosion resistance | CRC <sup>1)</sup> | 1            |             |             |              |             | 2           |

- 1) Corrosion resistance class 1 according to Festo standard 940 070  
 Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.  
 Corrosion resistance class 2 according to Festo standard 940 070  
 Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

# Suction cups, complete ESS/suction cups ESV, standard round

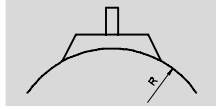
FESTO

Technical data

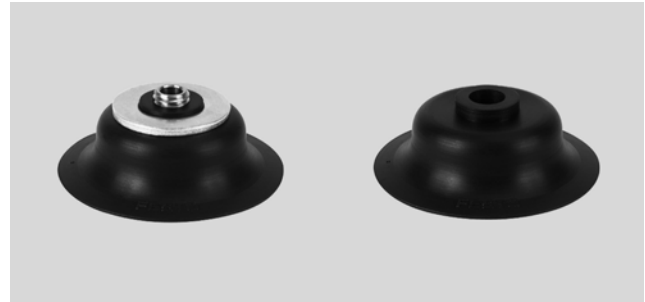
ESS-...-S...  
ESV-...-S...

Temperature range  
-30 ... +200 °C

Function



Diameter  
2 ... 200 mm



| General technical data |                         |                   |                                 |                                    |  |  |            |            |
|------------------------|-------------------------|-------------------|---------------------------------|------------------------------------|--|--|------------|------------|
| Suction cup Ø<br>[mm]  | Suction cup holder fits | Mounting thread   | Effective suction cup Ø<br>[mm] | Breakaway force at -0.7 bar<br>[N] | Suction cup volume <sup>3)</sup><br>[cm <sup>3</sup> ] | Min. radius R <sup>2)</sup> of workpiece<br>[mm] | Weight     |            |
|                        |                         |                   |                                 |                                    |  |  | ESS<br>[g] | ESV<br>[g] |
| 2                      | Size 1                  | Ø 3 <sup>1)</sup> | 1.4                             | 0.1                                | 0.002  | 10   | 0.1        | –          |
| 4                      |                         |                   | 3.3                             | 0.4                                | 0.008  | 10   | 0.1        | –          |
| 6                      | Size 2                  | Ø 4 <sup>1)</sup> | 5.2                             | 1.1                                | 0.015  | 15   | 0.2        | –          |
| 8                      |                         |                   | 7.2                             | 2.3                                | 0.030  | 20   | 0.2        | –          |
| 10                     | Size 3                  | M4x0.7            | 8.3                             | 3.9                                | 0.050  | 30   | 1.5        | –          |
| 15                     |                         |                   | 13.5                            | 8.5                                | 0.208  | 35   | 1.9        | –          |
| 20                     | Size 4                  | M6x1              | 17.6                            | 16.3                               | 0.318  | 60   | 6.4        | 1.6        |
| 30                     |                         |                   | 18.4                            | 40.8                               | 0.867  | 110  | 9          | 2.7        |
| 40                     |                         |                   | 26.5                            | 69.6                               | 1.566  | 230  | 16.3       | 7.4        |
| 50                     |                         |                   | 33.3                            | 105.8                              | 2.387  | 330  | 22         | 11.2       |
| 60                     | Size 5                  | M10x1.5           | 42.0                            | 166.1                              | 3.953  | 350  | 49         | 22         |
| 80                     |                         |                   | 57.8                            | 309.7                              | 19.312   | 400  | 133        | 33         |
| 100                    |                         |                   | 75.2                            | 503.6                              | 29.779   | 460  | 222        | 59         |
| 150                    | Size 6                  | M20x2             | 114.3                           | 900                                | 173.826  | 480  | 719        | 361        |
| 200                    |                         |                   | 151.7                           | 1,610                              | 245.454  | 680  | 1,198      | 840        |

- 1) Is plugged onto or into the suction cup holder
- 2) Minimum arc radius of the workpiece to be gripped
- 3) Volume to be evacuated

| Lateral force F [N] at pu = -0.7 bar; Ra = 7 µm |            |            |            |            |             |
|---|------------|------------|------------|------------|-------------|
| Suction cup Ø<br>[mm]                           | ESS-...-SN | ESS-...-SS | ESS-...-SU | ESS-...-SF | ESS-...-SNA |
| 2   | 0.5        | 0.5        | 0.5        | 0.5        | 0.5         |
| 4   | 0.5        | 0.5        | 0.5        | 0.5        | 0.5         |
| 6   | 3.5        | 2.5        | 3          | 1.5        | 2           |
| 8   | 9.5        | 3.5        | 5          | 3.5        | 4           |
| 10  | 3.5        | 4          | 7          | 4.5        | 7.5         |
| 15  | 10.5       | 6.5        | 9          | 10.5       | 13.5        |
| 20  | 11.5       | 10.5       | 23         | 15.5       | 14.5        |
| 30  | 19.5       | 23.5       | 19         | 22         | 20          |
| 40  | 60         | 25         | 83         | 25         | 49          |
| 50  | 135        | 84         | 130        | 69.5       | 81.5        |
| 60  | 136        | 85         | 151        | 117.5      | –           |
| 80  | 315        | 104        | 295        | 139.5      | –           |
| 100   | 600        | 130        | 482.5      | 299        | –           |
| 150   | 675        | 400        | 1,000      | 480        | –           |
| 200   | 850        | 425        | 1,000      | 500        | –           |

# Suction cups, complete ESS/suction cups ESV, standard round

Technical data

**Dimensions**

ESS-2/4-S      ESS-6/8-S      ESS-10/15-S      ESS-20/30-S      ESS-40/50/60-S

ESS-80/100-S      ESS-150/200-S

1 Spigot for insertion into holder  
2 Hole for sliding over holder

| Type Suction cup | For Suction gripper | D1<br>Ø<br>ND | D2<br>Ø | D3      | D4<br>Ø | D5<br>Ø | L1   | L2  | T1  | ⊖  |
|------------------|---------------------|---------------|---------|---------|---------|---------|------|-----|-----|----|
| ESS-2-S...       | ESG-2-S...          | 0.6           | 2       | -       | 3.2     | 4       | 8    | 4   | 0.2 | -  |
| ESS-4-S...       | ESG-4-S...          | 1.2           | 4       | -       | 3.2     | 4       | 8    | 4   | 0.6 | -  |
| ESS-6-S...       | ESG-6-S...          | 2             | 6       | -       | 6       | -       | 7    | -   | 1   | -  |
| ESS-8-S...       | ESG-8-S...          | 2             | 8       | -       | 6       | -       | 5.5  | -   | 1.1 | -  |
| ESS-10-S...      | ESG-10-S...         | 2             | 10      | M4x0.7  | 10      | -       | 8    | 3   | 1   | -  |
| ESS-15-S...      | ESG-15-S...         | 2             | 15      | M4x0.7  | 11      | -       | 9    | 3   | 2.4 | -  |
| ESS-20-S...      | ESG-20-S...         | 3             | 20      | M6x1    | 15      | -       | 11.6 | 2.4 | 1.8 | -  |
| ESS-30-S...      | ESG-30-S...         | 3             | 30      | M6x1    | 17      | -       | 12.6 | 3.4 | 2   | -  |
| ESS-40-S...      | ESG-40-S...         | 3             | 40      | M6x1    | 25      | -       | 15.6 | 3.2 | 1.9 | -  |
| ESS-50-S...      | ESG-50-S...         | 3             | 50      | M6x1    | 30      | -       | 16.6 | 3.2 | 1.6 | -  |
| ESS-60-S...      | ESG-60-S...         | 6             | 60      | M10x1.5 | 40      | -       | 20.6 | 4.5 | 2.6 | 14 |
| ESS-80-S...      | ESG-80-S...         | 6             | 80      | M10x1.5 | 68      | -       | 23   | 9.4 | 4.7 | 14 |
| ESS-100-S...     | ESG-100-S...        | 6             | 100     | M10x1.5 | 85      | -       | 25   | 8.4 | 5.5 | 14 |
| ESS-150-S...     | ESG-150-S...        | 10            | 150     | M20x2   | 105     | 115     | 45   | 13  | 12  | 27 |
| ESS-200-S...     | ESG-200-S...        | 10            | 200     | M20x2   | 105     | 160     | 50   | 13  | 15  | 27 |


# Suction cups, complete ESS/suction cups ESV, standard round

FESTO

Technical data

| Ordering data                        |          |                          |                    |
|--------------------------------------|----------|--------------------------|--------------------|
| Suction cup Ø<br>[mm]                | ESS      |                          | ESV                |
|                                      | Part No. | Type                     | Part No. Type      |
| <b>Fluoro rubber F</b>               |          |                          |                    |
| 2                                    | 189 267  | ESS-2-SF <sup>1)</sup>   | -                  |
| 4                                    | 189 272  | ESS-4-SF <sup>1)</sup>   | -                  |
| 6                                    | 189 277  | ESS-6-SF <sup>1)</sup>   | -                  |
| 8                                    | 189 282  | ESS-8-SF <sup>1)</sup>   | -                  |
| 10                                   | 189 287  | ESS-10-SF <sup>1)</sup>  | -                  |
| 15                                   | 189 292  | ESS-15-SF <sup>1)</sup>  | -                  |
| 20                                   | 189 297  | ESS-20-SF <sup>1)</sup>  | 190 982 ESV-20-SF  |
| 30                                   | 189 302  | ESS-30-SF <sup>1)</sup>  | 190 987 ESV-30-SF  |
| 40                                   | 189 307  | ESS-40-SF <sup>1)</sup>  | 190 992 ESV-40-SF  |
| 50                                   | 189 312  | ESS-50-SF <sup>1)</sup>  | 190 997 ESV-50-SF  |
| 60                                   | 189 317  | ESS-60-SF <sup>1)</sup>  | 191 002 ESV-60-SF  |
| 80                                   | 189 321  | ESS-80-SF <sup>1)</sup>  | 191 006 ESV-80-SF  |
| 100                                  | 189 325  | ESS-100-SF <sup>1)</sup> | 191 010 ESV-100-SF |
| 150                                  | 189 329  | ESS-150-SF <sup>1)</sup> | 191 014 ESV-150-SF |
| 200                                  | 189 333  | ESS-200-SF <sup>1)</sup> | 191 018 ESV-200-SF |
| <b>Nitrile rubber N</b>              |          |                          |                    |
| 2                                    | 189 264  | ESS-2-SN <sup>1)</sup>   | -                  |
| 4                                    | 189 269  | ESS-4-SN <sup>1)</sup>   | -                  |
| 6                                    | 189 274  | ESS-6-SN <sup>1)</sup>   | -                  |
| 8                                    | 189 279  | ESS-8-SN <sup>1)</sup>   | -                  |
| 10                                   | 189 284  | ESS-10-SN <sup>1)</sup>  | -                  |
| 15                                   | 189 289  | ESS-15-SN <sup>1)</sup>  | -                  |
| 20                                   | 189 294  | ESS-20-SN <sup>1)</sup>  | 190 979 ESV-20-SN  |
| 30                                   | 189 299  | ESS-30-SN <sup>1)</sup>  | 190 984 ESV-30-SN  |
| 40                                   | 189 304  | ESS-40-SN <sup>1)</sup>  | 190 989 ESV-40-SN  |
| 50                                   | 189 309  | ESS-50-SN <sup>1)</sup>  | 190 994 ESV-50-SN  |
| 60                                   | 189 314  | ESS-60-SN <sup>1)</sup>  | 190 999 ESV-60-SN  |
| 80                                   | 189 318  | ESS-80-SN <sup>1)</sup>  | 191 003 ESV-80-SN  |
| 100                                  | 189 322  | ESS-100-SN <sup>1)</sup> | 191 007 ESV-100-SN |
| 150                                  | 189 326  | ESS-150-SN <sup>1)</sup> | 191 011 ESV-150-SN |
| 200                                  | 189 330  | ESS-200-SN <sup>1)</sup> | 191 015 ESV-200-SN |
| <b>Nitrile rubber, antistatic NA</b> |          |                          |                    |
| 2                                    | 189 268  | ESS-2-SNA <sup>1)</sup>  | -                  |
| 4                                    | 189 273  | ESS-4-SNA <sup>1)</sup>  | -                  |
| 6                                    | 189 278  | ESS-6-SNA <sup>1)</sup>  | -                  |
| 8                                    | 189 283  | ESS-8-SNA <sup>1)</sup>  | -                  |
| 10                                   | 189 288  | ESS-10-SNA <sup>1)</sup> | -                  |
| 15                                   | 189 293  | ESS-15-SNA <sup>1)</sup> | -                  |
| 20                                   | 189 298  | ESS-20-SNA <sup>1)</sup> | 190 983 ESV-20-SNA |
| 30                                   | 189 303  | ESS-30-SNA <sup>1)</sup> | 190 988 ESV-30-SNA |
| 40                                   | 189 308  | ESS-40-SNA <sup>1)</sup> | 190 993 ESV-40-SNA |
| 50                                   | 189 313  | ESS-50-SNA <sup>1)</sup> | 190 998 ESV-50-SNA |

1) Free of copper, PTFE and silicone

 Core Range

# Suction cups, complete ESS/suction cups ESV, standard round

FESTO

Technical data

Suction grippers

2.1


| Ordering data         |          |            |                    |
|-----------------------|----------|------------|--------------------|
| Suction cup Ø<br>[mm] | ESS      |            | ESV                |
|                       | Part No. | Type       | Part No. Type      |
| <b>Silicone S</b>     |          |            |                    |
| 2                     | 189 266  | ESS-2-SS   | –                  |
| 4                     | 189 271  | ESS-4-SS   | –                  |
| 6                     | 189 276  | ESS-6-SS   | –                  |
| 8                     | 189 281  | ESS-8-SS   | –                  |
| 10                    | 189 286  | ESS-10-SS  | –                  |
| 15                    | 189 291  | ESS-15-SS  | –                  |
| 20                    | 189 296  | ESS-20-SS  | 190 981 ESV-20-SS  |
| 30                    | 189 301  | ESS-30-SS  | 190 986 ESV-30-SS  |
| 40                    | 189 306  | ESS-40-SS  | 190 991 ESV-40-SS  |
| 50                    | 189 311  | ESS-50-SS  | 190 996 ESV-50-SS  |
| 60                    | 189 316  | ESS-60-SS  | 191 001 ESV-60-SS  |
| 80                    | 189 320  | ESS-80-SS  | 191 005 ESV-80-SS  |
| 100                   | 189 324  | ESS-100-SS | 191 009 ESV-100-SS |
| 150                   | 189 328  | ESS-150-SS | 191 013 ESV-150-SS |
| 200                   | 189 332  | ESS-200-SS | 191 017 ESV-200-SS |
| <b>Polyurethane U</b> |          |            |                    |
| 2                     | 189 265  | ESS-2-SU   | –                  |
| 4                     | 189 270  | ESS-4-SU   | –                  |
| 6                     | 189 275  | ESS-6-SU   | –                  |
| 8                     | 189 280  | ESS-8-SU   | –                  |
| 10                    | 189 285  | ESS-10-SU  | –                  |
| 15                    | 189 290  | ESS-15-SU  | –                  |
| 20                    | 189 295  | ESS-20-SU  | 190 980 ESV-20-SU  |
| 30                    | 189 300  | ESS-30-SU  | 190 985 ESV-30-SU  |
| 40                    | 189 305  | ESS-40-SU  | 190 990 ESV-40-SU  |
| 50                    | 189 310  | ESS-50-SU  | 190 995 ESV-50-SU  |
| 60                    | 189 315  | ESS-60-SU  | 191 000 ESV-60-SU  |
| 80                    | 189 319  | ESS-80-SU  | 191 004 ESV-80-SU  |
| 100                   | 189 323  | ESS-100-SU | 191 008 ESV-100-SU |
| 150                   | 189 327  | ESS-150-SU | 191 012 ESV-150-SU |
| 200                   | 189 331  | ESS-200-SU | 191 016 ESV-200-SU |

# Suction cups, complete ESS/suction cups ESV, round, extra deep

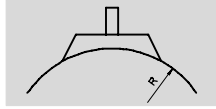
FESTO


Technical data

ESS-...-E...  
ESV-...-E...

-  - Temperature range  
-30 ... +200 °C

Function



-  - Diameter  
15 ... 100 mm



| General technical data |                         |                 |                                 |                                    |  |  |            |            |
|------------------------|-------------------------|-----------------|---------------------------------|------------------------------------|--|--|------------|------------|
| Suction cup Ø<br>[mm]  | Suction cup holder fits | Mounting thread | Effective suction cup Ø<br>[mm] | Breakaway force at -0.7 bar<br>[N] | Suction cup volume <sup>2)</sup><br>[cm <sup>3</sup> ] | Min. radius R <sup>1)</sup> of workpiece<br>[mm] | Weight     |            |
|                        |                         |                 |                                 |                                    |  |  | ESS<br>[g] | ESV<br>[g] |
| 15                     | Size 3                  | M4x0.7          | 13.8                            | 9.8                                | 0.350  | 20   | 1.9        | -          |
| 20                     | Size 4                  | M6x1            | 17.2                            | 17                                 | 0.840  | 30   | 6.4        | 1.6        |
| 30                     |                         |                 | 20.9                            | 37.2                               | 2.120  | 50   | 9.2        | 2.9        |
| 40                     |                         |                 | 28.1                            | 67.6                               | 4.040  | 80   | 16.9       | 8          |
| 50                     | Size 5                  | M10x1.5         | 36.9                            | 103.6                              | 7.900  | 100  | 23.4       | 12.6       |
| 60                     |                         |                 | 40.5                            | 162.5                              | 19.770   | 120  | 48         | 21         |
| 80                     |                         |                 | 62.7                            | 275                                | 51.610   | 160  | 141        | 41         |
| 100                    |                         |                 | 78.5                            | 440.8                              | 84.660   | 200  | 228        | 65         |

- 1) Minimum arc radius of the workpiece to be gripped  
2) Volume to be evacuated

| Lateral force F [N] at pu = -0.7 bar; Ra = 7 µm |            |            |            |            |
|---|------------|------------|------------|------------|
| Suction cup Ø<br>[mm]                           | ESS-...-EN | ESS-...-ES | ESS-...-EU | ESS-...-EF |
| 15  | 9          | 10         | 15         | 14.5       |
| 20  | 14         | 13         | 16         | 15.5       |
| 30  | 24.5       | 21.5       | 41.5       | 18.5       |
| 40  | 53         | 28.5       | 46.5       | 22         |
| 50  | 115        | 42.5       | 62         | 60         |
| 60  | 130        | 63.5       | 134        | 62.5       |
| 80  | 216        | 107.5      | 136.5      | 148.5      |
| 100   | 351        | 150        | 352.5      | 254.5      |

Suction grippers

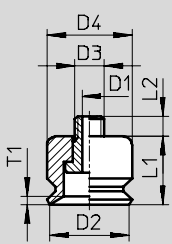
2.1

# Suction cups, complete ESS/suction cups ESV, round, extra deep

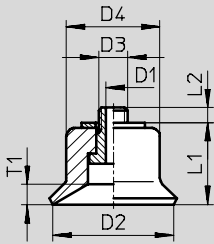
Technical data

## Dimensions

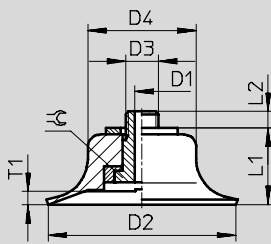
ESS-15-E



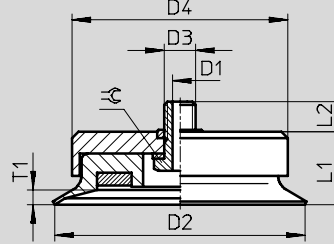
ESS-20/30-E



ESS-40/50/60-E



ESS-80/100-E



| Type Suction cup | For Suction gripper | D1<br>Ø<br>ND | D2<br>Ø | D3      | D4<br>Ø | L1   | L2  | T1   | ⊕  |
|------------------|---------------------|---------------|---------|---------|---------|------|-----|------|----|
| ESS-15-E...      | ESG-15-E...         | 2             | 15      | M4x0.7  | 11      | 10   | 3   | 2.8  | -  |
| ESS-20-E...      | ESG-20-E...         | 3             | 20      | M6x1    | 15      | 12.6 | 2.4 | 3    | -  |
| ESS-30-E...      | ESG-30-E...         | 3             | 30      | M6x1    | 17      | 15.6 | 3.4 | 4.5  | -  |
| ESS-40-E...      | ESG-40-E...         | 3             | 40      | M6x1    | 25      | 19.1 | 3.2 | 4.5  | -  |
| ESS-50-E...      | ESG-50-E...         | 3             | 50      | M6x1    | 30      | 21.1 | 3.7 | 6.5  | -  |
| ESS-60-E...      | ESG-60-E...         | 6             | 60      | M10x1.5 | 40      | 27.6 | 5.4 | 9.5  | 14 |
| ESS-80-E...      | ESG-80-E...         | 6             | 80      | M10x1.5 | 68      | 33   | 9.4 | 8.6  | 14 |
| ESS-100-E...     | ESG-100-E...        | 6             | 100     | M10x1.5 | 85      | 33   | 8.4 | 10.7 | 14 |

# Suction cups, complete ESS/suction cups ESV, round, extra deep

FESTO

Technical data

| Ordering data           |          |                          |          |            |
|-------------------------|----------|--------------------------|----------|------------|
| Suction cup Ø<br>[mm]   | ESS      |                          | ESV      |            |
|                         | Part No. | Type                     | Part No. | Type       |
| <b>Fluoro rubber F</b>  |          |                          |          |            |
| 15                      | 189 337  | ESS-15-EF <sup>1)</sup>  | –        |            |
| 20                      | 189 341  | ESS-20-EF <sup>1)</sup>  | 191 026  | ESV-20-EF  |
| 30                      | 189 345  | ESS-30-EF <sup>1)</sup>  | 191 030  | ESV-30-EF  |
| 40                      | 189 349  | ESS-40-EF <sup>1)</sup>  | 191 034  | ESV-40-EF  |
| 50                      | 189 353  | ESS-50-EF <sup>1)</sup>  | 191 038  | ESV-50-EF  |
| 60                      | 189 357  | ESS-60-EF <sup>1)</sup>  | 191 042  | ESV-60-EF  |
| 80                      | 189 361  | ESS-80-EF <sup>1)</sup>  | 191 046  | ESV-80-EF  |
| 100                     | 189 365  | ESS-100-EF <sup>1)</sup> | 191 050  | ESV-100-EF |
| <b>Nitrile rubber N</b> |          |                          |          |            |
| 15                      | 189 334  | ESS-15-EN <sup>1)</sup>  | –        |            |
| 20                      | 189 338  | ESS-20-EN <sup>1)</sup>  | 191 023  | ESV-20-EN  |
| 30                      | 189 342  | ESS-30-EN <sup>1)</sup>  | 191 027  | ESV-30-EN  |
| 40                      | 189 346  | ESS-40-EN <sup>1)</sup>  | 191 031  | ESV-40-EN  |
| 50                      | 189 350  | ESS-50-EN <sup>1)</sup>  | 191 035  | ESV-50-EN  |
| 60                      | 189 354  | ESS-60-EN <sup>1)</sup>  | 191 039  | ESV-60-EN  |
| 80                      | 189 358  | ESS-80-EN <sup>1)</sup>  | 191 043  | ESV-80-EN  |
| 100                     | 189 362  | ESS-100-EN <sup>1)</sup> | 191 047  | ESV-100-EN |
| <b>Silicone S</b>       |          |                          |          |            |
| 15                      | 189 336  | ESS-15-ES                | –        |            |
| 20                      | 189 340  | ESS-20-ES                | 191 025  | ESV-20-ES  |
| 30                      | 189 344  | ESS-30-ES                | 191 029  | ESV-30-ES  |
| 40                      | 189 348  | ESS-40-ES                | 191 033  | ESV-40-ES  |
| 50                      | 189 352  | ESS-50-ES                | 191 037  | ESV-50-ES  |
| 60                      | 189 356  | ESS-60-ES                | 191 041  | ESV-60-ES  |
| 80                      | 189 360  | ESS-80-ES                | 191 045  | ESV-80-ES  |
| 100                     | 189 364  | ESS-100-ES               | 191 049  | ESV-100-ES |
| <b>Polyurethane U</b>   |          |                          |          |            |
| 15                      | 189 335  | ESS-15-EU                | –        |            |
| 20                      | 189 339  | ESS-20-EU                | 191 024  | ESV-20-EU  |
| 30                      | 189 343  | ESS-30-EU                | 191 028  | ESV-30-EU  |
| 40                      | 189 347  | ESS-40-EU                | 191 032  | ESV-40-EU  |
| 50                      | 189 351  | ESS-50-EU                | 191 036  | ESV-50-EU  |
| 60                      | 189 355  | ESS-60-EU                | 191 040  | ESV-60-EU  |
| 80                      | 189 359  | ESS-80-EU                | 191 044  | ESV-80-EU  |
| 100                     | 189 363  | ESS-100-EU               | 191 048  | ESV-100-EU |

1) Free of copper, PTFE and silicone

Suction grippers


2.1

# Suction cups, complete ESS/suction cups ESV, bellows, round 1.5 convolutions

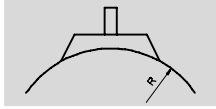
FESTO


Technical data

ESS-...-B...  
ESV-...-B...

-  - Temperature range  
-30 ... +180 °C

Function



-  - Diameter  
10 ... 80 mm



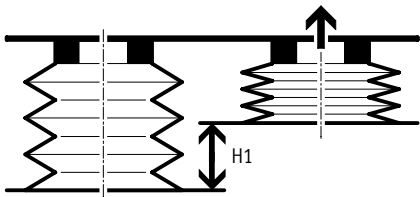
| General technical data   |                            |                 |                                       |  |   |   |   |            |            |
|--------------------------|----------------------------|-----------------|---------------------------------------|--|---|---|---|------------|------------|
| Suction cup<br>Ø<br>[mm] | Suction cup<br>holder fits | Mounting thread | Effective<br>suction cup<br>Ø<br>[mm] | Breakaway<br>force at<br>-0.7 bar<br>[N] | Suction cup<br>volume <sup>2)</sup><br>[cm <sup>3</sup> ] | Min. radius R <sup>1)</sup> of<br>workpiece<br>[mm] | Max. height<br>compensation<br>H1<br>[mm] | Weight     |            |
|                          |                            |                 |                                       |  |   |   |   | ESS<br>[g] | ESV<br>[g] |
| 10                       | Size 3                     | M4x0.7          | 7.4                                   | 4.7                                      | 0.380   | 20  | 4   | 1.8        | -          |
| 20                       | Size 4                     | M6x1            | 14.3                                  | 12.9                                     | 1.600   | 40  | 6   | 6.7        | 1.9        |
| 30                       |                            |                 | 20.3                                  | 26.2                                     | 4.070   | 80  | 8   | 9.9        | 3.6        |
| 40                       |                            |                 | 25.2                                  | 52.3                                     | 8.870   | 90  | 9.5                                       | 18.7       | 9.8        |
| 50                       | Size 5                     | M10x1.5         | 31.8                                  | 72.6                                     | 14.230  | 150   | 11  | 24.7       | 13.9       |
| 80                       |                            |                 | 55                                    | 213.6                                    | 63.900  | 430   | 10  | 139        | 39         |

- 1) Minimum arc radius of the workpiece to be gripped
- 2) Volume to be evacuated

Suction grippers

2.1

Max. height compensation H1

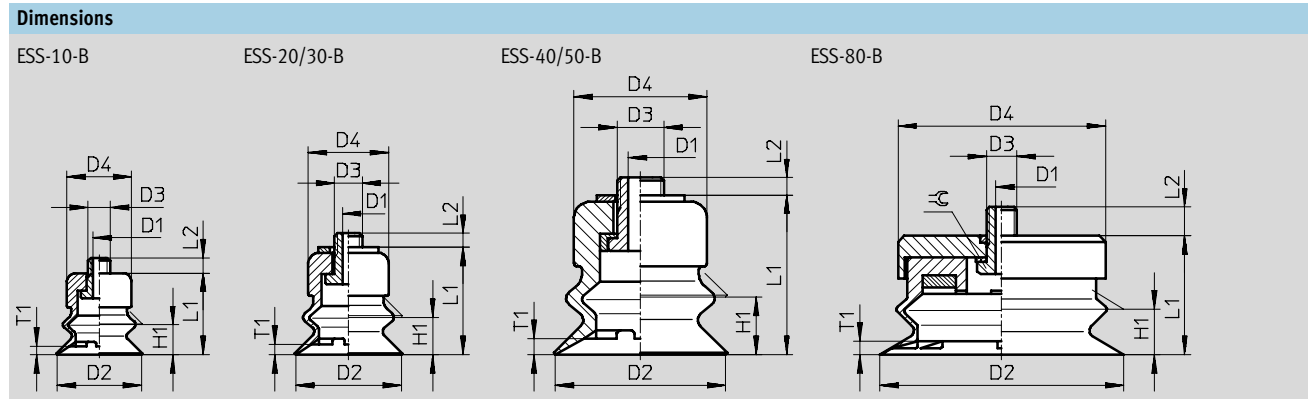


| Lateral force F [N] at pu = -0.7 bar; Ra = 7 µm |            |            |            |
|---|------------|------------|------------|
| Suction cup Ø<br>[mm]                           | ESS-...-BN | ESS-...-BS | ESS-...-BU |
| 10  | 4.5        | 2.5        | 3          |
| 20  | 9.5        | 8          | 9.5        |
| 30  | 24.5       | 16         | 21.5       |
| 40  | 32.5       | 32.5       | 33         |
| 50  | 55.5       | 38         | 47         |
| 80  | 199.5      | 93         | 132.5      |

# Suction cups, complete ESS/suction cups ESV, bellows, round 1.5 convolutions

FESTO

Technical data



| Type Suction cup | For Suction gripper | D1<br>Ø<br>ND | D2<br>Ø | D3      | D4<br>Ø | H1  | L1   | L2  | T1  | ⊕  |
|------------------|---------------------|---------------|---------|---------|---------|-----|------|-----|-----|----|
| ESS-10-B...      | ESG-10-B...         | 2             | 15      | M4x0.7  | 10      | 4   | 16   | 3   | 1   | -  |
| ESS-20-B...      | ESG-20-B...         | 3             | 20      | M6x1    | 15      | 6   | 20.6 | 2.4 | 2   | -  |
| ESS-30-B...      | ESG-30-B...         | 3             | 30      | M6x1    | 17      | 8   | 24.6 | 3.4 | 2.5 | -  |
| ESS-40-B...      | ESG-40-B...         | 3             | 40      | M6x1    | 25      | 9.5 | 31.6 | 3.2 | 4   | -  |
| ESS-50-B...      | ESG-50-B...         | 3             | 50      | M6x1    | 30      | 11  | 33.6 | 3.2 | 4   | -  |
| ESS-80-B...      | ESG-80-B...         | 6             | 80      | M10x1.5 | 68      | 10  | 39   | 9.4 | 2   | 14 |

| Ordering data           |          |                         |          |           |
|-------------------------|----------|-------------------------|----------|-----------|
| Suction cup Ø<br>[mm]   | ESS      |                         | ESV      |           |
|                         | Part No. | Type                    | Part No. | Type      |
| <b>Nitrile rubber N</b> |          |                         |          |           |
| 10                      | 189 374  | ESS-10-BN <sup>1)</sup> | -        | -         |
| 20                      | 189 378  | ESS-20-BN <sup>1)</sup> | 191 054  | ESV-20-BN |
| 30                      | 189 382  | ESS-30-BN <sup>1)</sup> | 191 057  | ESV-30-BN |
| 40                      | 189 386  | ESS-40-BN <sup>1)</sup> | 191 060  | ESV-40-BN |
| 50                      | 189 390  | ESS-50-BN <sup>1)</sup> | 191 063  | ESV-50-BN |
| 80                      | 189 394  | ESS-80-BN <sup>1)</sup> | 191 066  | ESV-80-BN |
| <b>Silicone S</b>       |          |                         |          |           |
| 10                      | 189 376  | ESS-10-BS               | -        | -         |
| 20                      | 189 380  | ESS-20-BS               | 191 056  | ESV-20-BS |
| 30                      | 189 384  | ESS-30-BS               | 191 059  | ESV-30-BS |
| 40                      | 189 388  | ESS-40-BS               | 191 062  | ESV-40-BS |
| 50                      | 189 392  | ESS-50-BS               | 191 065  | ESV-50-BS |
| 80                      | 189 396  | ESS-80-BS               | 191 068  | ESV-80-BS |
| <b>Polyurethane U</b>   |          |                         |          |           |
| 10                      | 189 375  | ESS-10-BU               | -        | -         |
| 20                      | 189 379  | ESS-20-BU               | 191 055  | ESV-20-BU |
| 30                      | 189 383  | ESS-30-BU               | 191 058  | ESV-30-BU |
| 40                      | 189 387  | ESS-40-BU               | 191 061  | ESV-40-BU |
| 50                      | 189 391  | ESS-50-BU               | 191 064  | ESV-50-BU |
| 80                      | 189 395  | ESS-80-BU               | 191 067  | ESV-80-BU |

1) Free of copper, PTFE and silicone


Core Range

# Suction cups, complete ESS/suction cups ESV, bellows, round 1.5 convolutions

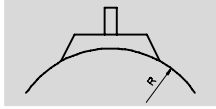
FESTO


Technical data

ESS-...-BT-...  
ESV-...-BT

-  - Temperature range  
-10 ... +80 °C

Function



-  - Diameter  
40 ... 80 mm



| General technical data |                         |                                  |                                    |  |                              |            |            |
|------------------------|-------------------------|----------------------------------|------------------------------------|--|------------------------------|------------|------------|
| Suction cup Ø<br>[mm]  | Suction cup holder fits | Mounting thread                  | Breakaway force at -0.7 bar<br>[N] | Min. radius R <sup>1)</sup> of workpiece<br>[mm] | Volume<br>[cm <sup>3</sup> ] | Weight     |            |
|                        |                         |                                  |                                    |  |                              | ESS<br>[g] | ESV<br>[g] |
| 40                     | Size 4                  | M6x1                             | 59                                 | 35   | 9.70                         | 18         | 10.5       |
|                        | Size 5                  | M10x1.5                          |                                    |  | 9.71                         | 19         |            |
|                        | -                       | G $\frac{1}{4}$ -I female thread |                                    |  | 10.00                        | 19         |            |
|                        | -                       | G $\frac{1}{4}$ male thread      |                                    |  | 9.73                         | 20.5       |            |
| 50                     | Size 4                  | M6x1                             | 100                                | 40   | 17.50                        | 24         | 16.2       |
|                        | Size 5                  | M10x1.5                          |                                    |  | 17.51                        | 25         |            |
|                        | -                       | G $\frac{1}{4}$ -I female thread |                                    |  | 17.80                        | 25         |            |
|                        | -                       | G $\frac{1}{4}$ male thread      |                                    |  | 17.53                        | 26         |            |
| 80                     | Size 5                  | M10x1.5                          | 237                                | 100  | 58.50                        | 84.5       | 57.2       |
|                        | -                       | G $\frac{1}{4}$ -I female thread |                                    |  | 58.50                        | 87.5       |            |
|                        | -                       | G $\frac{1}{4}$ male thread      |                                    |  | 58.50                        | 85.5       |            |

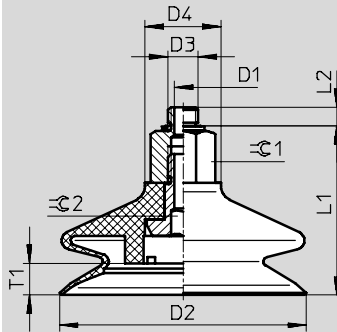
1) Minimum arc radius of the workpiece to be gripped

# Suction cups, complete ESS/suction cups ESV, bellows, round 1.5 convolutions

FESTO

Technical data

## Dimensions



| Type        | D1<br>Ø<br>ND | D2<br>Ø | D3              | D4<br>Ø | L1    | L2   | T1   | R1 | R2 |
|-------------|---------------|---------|-----------------|---------|-------|------|------|----|----|
| ESS-40-BT   | 2.5           | 40      | M6              | 20      | 36    | 3.45 | 9    | 15 | 4  |
| ESS-40-BT-I |               |         | M10             |         | 36.3  | 6.2  |      | 17 |    |
| ESS-40-BT-I |               |         | G $\frac{1}{4}$ |         | 48.3  | -    |      |    |    |
| ESS-50-BT   | 2.5           | 50      | M6              | 20      | 38.05 | 3.45 | 8    | 15 | 4  |
| ESS-50-BT-I |               |         | M10             |         | 38.3  | 6.2  |      | 17 |    |
| ESS-50-BT-I |               |         | G $\frac{1}{4}$ |         | 50.3  | 5.8  |      |    |    |
| ESS-80-BT   | 2.5           | 80      | M10             | 20      | 53.3  | 6.2  | 10.5 | 17 | 8  |
| ESS-80-BT-I |               |         | G $\frac{1}{4}$ |         | 60.8  | 5.8  |      |    |    |
| ESS-80-BT-I |               |         | G $\frac{1}{4}$ |         |       | -    |      |    |    |

## Ordering data

| Suction cup<br>Ø<br>[mm] | Connection                    | ESS      |  | ESV      |                         |
|--------------------------|-------------------------------|----------|--|----------|-------------------------|
|                          |                               | Part No. | Type                                       | Part No. | Type                    |
| 40                       | M6                            | 525 989  | ESS-40-BT-M6 <sup>1)</sup>                 | -        |                         |
|                          | M10                           | 525 990  | ESS-40-BT-M10 <sup>1)</sup>                | -        |                         |
|                          | G $\frac{1}{4}$ female thread | 525 991  | ESS-40-BT-G $\frac{1}{4}$ -I <sup>1)</sup> | -        |                         |
|                          | G $\frac{1}{4}$               | 525 992  | ESS-40-BT-G $\frac{1}{4}$ <sup>1)</sup>    | -        |                         |
| -                        | -                             | -        | -  | 526 006  | ESV-40-BT <sup>1)</sup> |
| 50                       | M6                            | 525 993  | ESS-50-BT-M6 <sup>1)</sup>                 | -        |                         |
|                          | M10                           | 525 994  | ESS-50-BT-M10 <sup>1)</sup>                | -        |                         |
|                          | G $\frac{1}{4}$ female thread | 525 995  | ESS-50-BT-G $\frac{1}{4}$ -I <sup>1)</sup> | -        |                         |
|                          | G $\frac{1}{4}$               | 525 996  | ESS-50-BT-G $\frac{1}{4}$ <sup>1)</sup>    | -        |                         |
| -                        | -                             | -        | -  | 526 007  | ESV-50-BT <sup>1)</sup> |
| 80                       | M10                           | 525 997  | ESS-80-BT-M10 <sup>1)</sup>                | -        |                         |
|                          | G $\frac{1}{4}$ female thread | 525 998  | ESS-80-BT-G $\frac{1}{4}$ -I <sup>1)</sup> | -        |                         |
|                          | G $\frac{1}{4}$               | 525 999  | ESS-80-BT-G $\frac{1}{4}$ <sup>1)</sup>    | -        |                         |
|                          | -                             | -        | -  | -        | 526 008                 |


1) Free of copper, PTFE and silicone

# Suction cups, complete ESS/suction cups ESV, bellows, round 3.5 convolutions

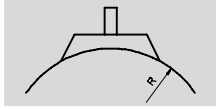
FESTO


Technical data

ESS-...-C...  
ESV-...-C...

-  - Temperature range  
-30 ... +180 °C

Function



-  - Diameter  
10 ... 50 mm



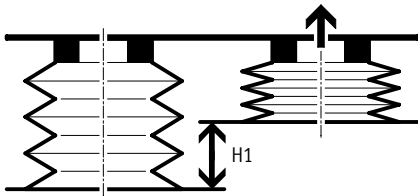
| General technical data   |                            |                    |                                       |  |   |   |   |            |            |
|--------------------------|----------------------------|--------------------|---------------------------------------|--|---|---|---|------------|------------|
| Suction cup<br>Ø<br>[mm] | Suction cup<br>holder fits | Mounting<br>thread | Effective<br>suction cup<br>Ø<br>[mm] | Breakaway<br>force at<br>-0.7 bar<br>[N] | Suction cup<br>volume <sup>2)</sup><br>[cm <sup>3</sup> ] | Min. radius R <sup>1)</sup> of<br>workpiece<br>[mm] | Max. height<br>compensation<br>H1<br>[mm] | Weight     |            |
|                          |                            |                    |                                       |  |   |   |   | ESS<br>[g] | ESV<br>[g] |
| 10                       | Size 3                     | M4x0.7             | 6.9                                   | 3.9                                      | 0.290   | 25  | 3.3                                       | 1.6        | -          |
| 20                       | Size 4                     | M6x1               | 14.5                                  | 8.2                                      | 2.750   | 50  | 7   | 6.9        | 2.1        |
| 30                       |                            |                    | 20.9                                  | 20.8                                     | 9.470   | 80  | 10.5                                      | 12.2       | 5.8        |
| 40                       |                            |                    | 28.2                                  | 42.4                                     | 19.720  | 100   | 12.8                                      | 21.9       | 13         |
| 50                       |                            |                    | 32.8                                  | 63.4                                     | 38.920  | 180   | 17.5                                      | 32.1       | 21.3       |

- 1) Minimum arc radius of the workpiece to be gripped  
2) Volume to be evacuated

Suction grippers

## 2.1

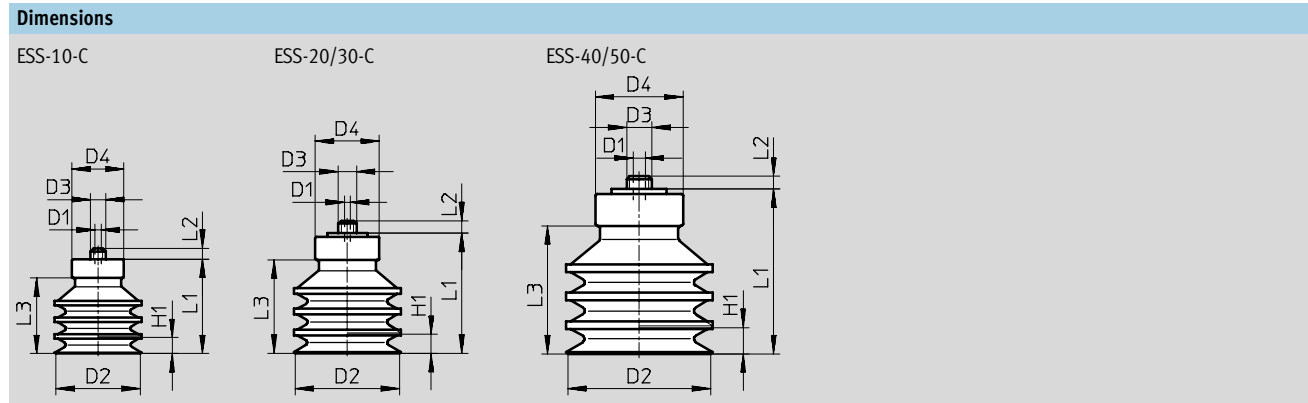
Max. height compensation H1



| Lateral force F [N] at pu = -0.7 bar; Ra = 7 µm |            |            |
|---|------------|------------|
| Suction cup Ø<br>[mm]                           | ESS-...-CN | ESS-...-CS |
| 10  | 1.5        | 1          |
| 20  | 6.5        | 7          |
| 30  | 11.5       | 11         |
| 40  | 47.5       | 13         |
| 50  | 49         | 45.5       |

# Suction cups, complete ESS/suction cups ESV, bellows, round 3.5 convolutions

Technical data



| Type        | For             | D1      | D2 | D3     | D4 | H1   | L1   | L2  | L3   |
|-------------|-----------------|---------|----|--------|----|------|------|-----|------|
| Suction cup | Suction gripper | ∅<br>ND | ∅  |        | ∅  |      |      |     |      |
| ESS-10-C... | ESG-10-C...     | 2       | 10 | M4x0.7 | 10 | 3.3  | 12.7 | 3   | 8.7  |
| ESS-20-C... | ESG-20-C...     | 3       | 20 | M6x1   | 15 | 7    | 23   | 2.4 | 16.4 |
| ESS-30-C... | ESG-30-C...     | 3       | 30 | M6x1   | 18 | 10.5 | 34.3 | 3.4 | 26.2 |
| ESS-40-C... | ESG-40-C...     | 3       | 40 | M6x1   | 25 | 12.8 | 39.6 | 3.2 | 31   |
| ESS-50-C... | ESG-50-C...     | 3       | 50 | M6x1   | 30 | 17.5 | 48   | 3.2 | 39.4 |

| Ordering data           |          |                         |          |           |
|-------------------------|----------|-------------------------|----------|-----------|
| Suction cup ∅<br>[mm]   | ESS      |                         | ESV      |           |
|                         | Part No. | Type                    | Part No. | Type      |
| <b>Nitrile rubber N</b> |          |                         |          |           |
| 10                      | 189 398  | ESS-10-CN <sup>1)</sup> | -        |           |
| 20                      | 189 400  | ESS-20-CN <sup>1)</sup> | 191 071  | ESV-20-CN |
| 30                      | 189 402  | ESS-30-CN <sup>1)</sup> | 191 073  | ESV-30-CN |
| 40                      | 189 404  | ESS-40-CN <sup>1)</sup> | 191 075  | ESV-40-CN |
| 50                      | 189 406  | ESS-50-CN <sup>1)</sup> | 191 077  | ESV-50-CN |
| <b>Silicone S</b>       |          |                         |          |           |
| 10                      | 189 399  | ESS-10-CS               | -        |           |
| 20                      | 189 401  | ESS-20-CS               | 191 072  | ESV-20-CS |
| 30                      | 189 403  | ESS-30-CS               | 191 074  | ESV-30-CS |
| 40                      | 189 405  | ESS-40-CS               | 191 076  | ESV-40-CS |
| 50                      | 189 407  | ESS-50-CS               | 191 078  | ESV-50-CS |

1) Free of copper, PTFE and silicone

Core Range

# Suction cup ESS, oval

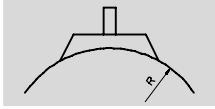
Technical data



ESS-...-0...

- - Temperature range  
-10 ... +70 °C

Function



| General technical data   |                         |                 |                                    |                                       |  |               |
|--------------------------|-------------------------|-----------------|------------------------------------|---------------------------------------|--|---------------|
| Suction cup size<br>[mm] | Suction cup holder fits | Mounting thread | Effective suction cup<br>Ø<br>[mm] | Breakaway force at<br>-0.7 bar<br>[N] | Suction cup volume <sup>1)</sup><br>[cm <sup>3</sup> ] | Weight<br>[g] |
| 4x10                     | Size 4                  | M6x1            | 0.29                               | 2                                     | 0.064  | 2             |
| 4x20                     |                         |                 | 0.57                               | 3.4                                   | 0.112  | 2.5           |
| 6x10                     |                         |                 | 0.35                               | 2.9                                   | 0.106  | 2             |
| 6x20                     |                         |                 | 0.74                               | 5.9                                   | 0.196  | 2.5           |
| 8x20                     |                         |                 | 0.89                               | 8                                     | 0.256  | 2.5           |
| 8x30                     |                         |                 | 1.36                               | 10.9                                  | 0.376  | 3             |
| 10x30                    |                         |                 | 2.23                               | 15.2                                  | 0.350  | 2.9           |
| 15x45                    | Size 5                  | M10x1.5         | 4.84                               | 32                                    | 1.570  | 23.8          |
| 20x60                    |                         |                 | 9.12                               | 62.8                                  | 3.690  | 30.8          |
| 25x75                    |                         |                 | 14.67                              | 92.5                                  | 6.700  | 46.8          |
| 30x90                    |                         |                 | 21.83                              | 134.4                                 | 10.170   | 55.3          |

1) Volume to be evacuated

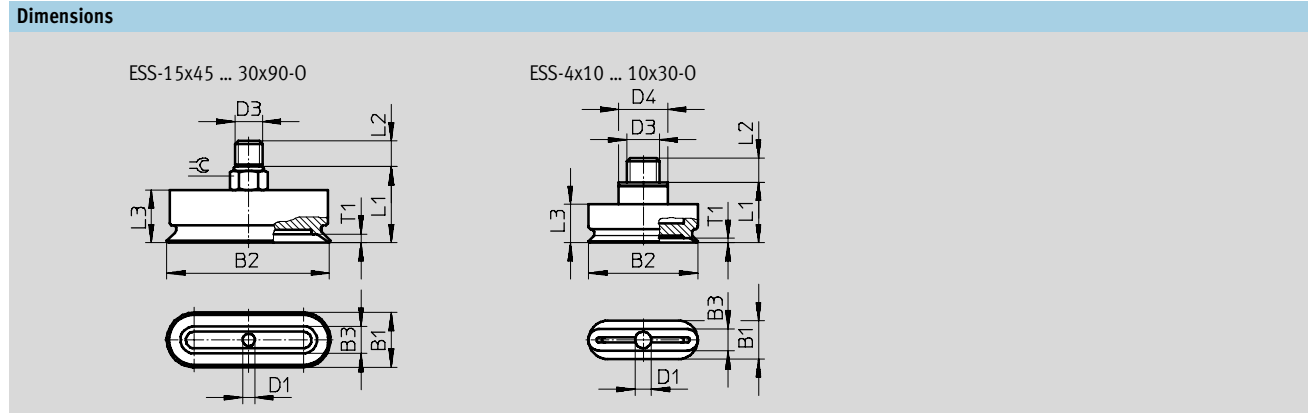
| Lateral force F [N] at pu = -0.7 bar and Ra = 7 µm |            |          |
|--|------------|----------|
| Suction cup size<br>[mm]                           | horizontal | vertical |
| 4x10   | 3.5        | 5        |
| 4x20   | 4.5        | 11       |
| 6x10   | 8.5        | 12       |
| 6x20   | 9          | 12.5     |
| 8x20   | 11         | 13       |
| 8x30   | 17         | 13.5     |
| 10x30  | 23         | 16       |
| 15x45  | 43         | 35       |
| 20x60  | 116        | 63       |
| 25x75  | 125.5      | 115      |
| 30x90  | 201        | 134.5    |

# Suction cup ESS, oval

Technical data

FESTO

## Dimensions



| Typ            | für Sauggreifer | B1 | B2 | B3 | D1<br>Ø<br>NW | D3      | D4<br>Ø | L1   | L2  | L3   | T1  | ☉  |
|----------------|-----------------|----|----|----|---------------|---------|---------|------|-----|------|-----|----|
| ESS-4x10-0...  | ESG-4x10-0...   | 7  | 10 | 4  | 2,5           | M6x1    | 9       | 11,1 | 4,4 | 7    | 0,8 | -  |
| ESS-4x20-0...  | ESG-4x20-0...   | 7  | 20 | 4  | 2,5           | M6x1    | 9       | 11,1 | 4,4 | 7    | 0,8 | -  |
| ESS-6x10-0...  | ESG-6x10-0...   | 7  | 10 | 6  | 2,5           | M6x1    | 9       | 11,1 | 4,4 | 7    | 1   | -  |
| ESS-6x20-0...  | ESG-6x20-0...   | 7  | 20 | 6  | 2,5           | M6x1    | 9       | 11,1 | 4,4 | 7    | 1   | -  |
| ESS-8x20-0...  | ESG-8x20-0...   | 7  | 20 | 8  | 2,5           | M6x1    | 9       | 11,1 | 4,4 | 7    | 1   | -  |
| ESS-8x30-0...  | ESG-8x30-0...   | 7  | 30 | 8  | 2,5           | M6x1    | 9       | 11,1 | 4,4 | 7    | 1   | -  |
| ESS-10x30-0... | ESG-10x30-0...  | 10 | 30 | 7  | 2,5           | M6x1    | 9       | 11,1 | 4,4 | 7    | 1,1 | -  |
| ESS-15x45-0... | ESG-15x45-0...  | 15 | 45 | 15 | 6             | M10x1,5 | -       | 25,5 | 8,5 | 18,5 | 2,5 | 12 |
| ESS-20x60-0... | ESG-20x60-0...  | 20 | 60 | 20 | 6             | M10x1,5 | -       | 26,3 | 8,5 | 19,3 | 3,2 | 12 |
| ESS-25x75-0... | ESG-25x75-0...  | 25 | 75 | 25 | 6             | M10x1,5 | -       | 28   | 8,5 | 21   | 3,7 | 12 |
| ESS-30x90-0... | ESG-30x90-0...  | 30 | 90 | 30 | 6             | M10x1,5 | -       | 28,5 | 8,5 | 21,5 | 3,7 | 12 |

## Ordering data

| Suction cup size<br>[mm] | ESS      |                            |
|--------------------------|----------|----------------------------|
|                          | Part No. | Type                       |
| Nitrile rubber N         |          |                            |
| 4x10                     | 189 408  | ESS-4X10-ON <sup>1)</sup>  |
| 4x20                     | 189 409  | ESS-4X20-ON <sup>1)</sup>  |
| 6x10                     | 189 410  | ESS-6X10-ON <sup>1)</sup>  |
| 6x20                     | 189 411  | ESS-6X20-ON <sup>1)</sup>  |
| 8x20                     | 189 412  | ESS-8X20-ON <sup>1)</sup>  |
| 8x30                     | 189 413  | ESS-8X30-ON <sup>1)</sup>  |
| 10x30                    | 189 414  | ESS-10X30-ON <sup>1)</sup> |
| 15x45                    | 189 415  | ESS-15X45-ON <sup>1)</sup> |
| 20x60                    | 189 416  | ESS-20X60-ON <sup>1)</sup> |
| 25x75                    | 189 417  | ESS-25X75-ON <sup>1)</sup> |
| 30x90                    | 189 418  | ESS-30X90-ON <sup>1)</sup> |


1) Free of copper, PTFE and silicone

# Suction cups, complete ESS/suction cups ESV, bell-shaped

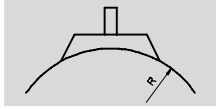
FESTO


Technical data

ESS-...-GT-...  
ESV-...-GT

-  - Temperature range  
-10 ... +80 °C

Function



-  - Diameter  
30 ... 100 mm



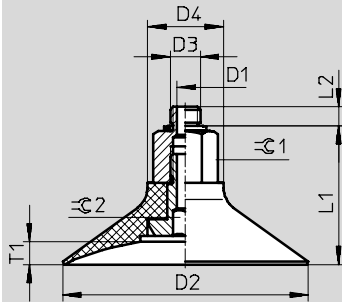
| General technical data |                            |                                  |                                       |   |                              |            |            |      |
|------------------------|----------------------------|----------------------------------|---------------------------------------|---|------------------------------|------------|------------|------|
| Suction cup Ø<br>[mm]  | Suction cup<br>holder fits | Mounting thread                  | Breakaway force<br>at -0.7 bar<br>[N] | Min. radius R <sup>1)</sup> of<br>workpiece<br>[mm] | Volume<br>[cm <sup>3</sup> ] | Weight     |            |      |
|                        |                            |                                  |                                       |   |                              | ESS<br>[g] | ESV<br>[g] |      |
| 30                     | Size 4                     | M6x1                             | 36                                    | 26  | 2.3                          | 12         | 4.2        |      |
|                        | Size 5                     | M10x1.5                          |                                       |   |                              | 13         |            |      |
|                        | -                          | G $\frac{1}{8}$ -I female thread |                                       |   |                              | 14         |            |      |
|                        | -                          | G $\frac{1}{8}$ male thread      |                                       |   |                              | 13         |            |      |
| 40                     | Size 4                     | M6x1                             | 64                                    | 35  | 5.1                          | 14         | 5.7        |      |
|                        | Size 5                     | M10x1.5                          |                                       |   |                              | 15         |            |      |
|                        | -                          | G $\frac{1}{4}$ -I female thread |                                       |   |                              | 5.4        |            | 14.5 |
|                        | -                          | G $\frac{1}{4}$ male thread      |                                       |   |                              | 5.1        |            | 16   |
| 50                     | Size 4                     | M6x1                             | 97                                    | 40  | 11.2                         | 17         | 9.2        |      |
|                        | Size 5                     | M10x1.5                          |                                       |   |                              | 18         |            |      |
|                        | -                          | G $\frac{1}{4}$ -I female thread |                                       |   |                              | 11.5       |            | 18   |
|                        | -                          | G $\frac{1}{4}$ male thread      |                                       |   |                              | 11.2       |            | 21   |
| 60                     | Size 5                     | M10x1.5                          | 134                                   | 75  | 12.3                         | 20         | 10.7       |      |
|                        | -                          | G $\frac{1}{4}$ -I female thread |                                       |   |                              | 19.5       |            |      |
|                        | -                          | G $\frac{1}{4}$ male thread      |                                       |   |                              | 21         |            |      |
| 80                     | Size 5                     | M10x1.5                          | 245                                   | 100   | 28.0                         | 28         | 30.9       |      |
|                        | -                          | G $\frac{1}{4}$ -I female thread |                                       |   |                              | 61         |            |      |
|                        | -                          | G $\frac{1}{4}$ male thread      |                                       |   |                              | 60         |            |      |
| 100                    | Size 5                     | M10x1.5                          | 375                                   | 135   | 53.2                         | 86.5       | 58.9       |      |
|                        | -                          | G $\frac{1}{4}$ -I female thread |                                       |   |                              | 89.5       |            |      |
|                        | -                          | G $\frac{1}{4}$ male thread      |                                       |   |                              | 87.5       |            |      |

1) Minimum arc radius of the workpiece to be gripped

# Suction cups, complete ESS/suction cups ESV, bell-shaped

Technical data

## Dimensions



| Type         | D1<br>Ø<br>ND | D2<br>Ø | D3              | D4<br>Ø | L1    | L2   | T1  | ⊘<br>1 | ⊘<br>2 |
|--------------|---------------|---------|-----------------|---------|-------|------|-----|--------|--------|
| ESS-30-GT    | 2.5           | 30      | M6              | 20      | 27.55 | 3.45 | 3.5 | 15     | 4      |
| ESS-30-GT-I  |               |         | M10             |         | 27.8  | 6.2  |     | 17     |        |
| ESS-40-GT    |               |         | G $\frac{1}{8}$ |         | 36.8  | 4.7  |     | 15     |        |
| ESS-40-GT-I  | 2.5           | 40      | G $\frac{1}{8}$ | 20      | 29.55 | 3.45 | 5.5 | 15     | 4      |
| ESS-50-GT    |               |         | M6              |         | 29.8  | 6.2  |     | 17     |        |
| ESS-50-GT-I  |               |         | M10             |         | 30.2  | 5.8  |     | 17     |        |
| ESS-60-GT    | 2.5           | 50      | G $\frac{1}{4}$ | 20      | 42.2  | -    | 8   | 15     | 4      |
| ESS-60-GT-I  |               |         | M6              |         | 32.05 | 3.45 |     | 15     |        |
| ESS-80-GT    |               |         | M10             |         | 32.3  | 6.2  |     | 17     |        |
| ESS-80-GT-I  | 5.5           | 60      | G $\frac{1}{4}$ | 20      | 32.7  | 5.8  | 6   | 17     | 4      |
| ESS-100-GT   |               |         | G $\frac{1}{4}$ |         | 44.7  | -    |     | 17     |        |
| ESS-100-GT-I |               |         | M10             |         | 34.3  | 6.2  |     | 17     |        |
| ESS-100-GT-I | 5.5           | 80      | G $\frac{1}{4}$ | 25      | 34.7  | 5.8  | 7.5 | 22     | 8      |
| ESS-100-GT   |               |         | G $\frac{1}{4}$ |         | 45.7  | -    |     | 22     |        |
| ESS-100-GT-I |               |         | M10             |         | 43.3  | 6.2  |     | 22     |        |
| ESS-100-GT-I | 5.5           | 100     | G $\frac{1}{4}$ | 25      | 54.7  | -    | 9   | 22     | 8      |
| ESS-100-GT   |               |         | G $\frac{1}{4}$ |         | 47.8  | 6.2  |     | 22     |        |
| ESS-100-GT-I |               |         | G $\frac{1}{4}$ |         | 48.2  | 5.8  |     | 22     |        |
| ESS-100-GT-I | 5.5           | 100     | G $\frac{1}{4}$ | 25      | 59.2  | -    | 9   | 22     | 8      |
| ESS-100-GT   |               |         | G $\frac{1}{4}$ |         | 59.2  | -    |     | 22     |        |

# Suction cups, complete ESS/suction cups ESV, bell-shaped

FESTO

Technical data

Suction grippers

2.1

| Ordering data            |   |          |   |                                  |
|--------------------------|---|----------|---|----------------------------------|
| Suction cup<br>Ø<br>[mm] | Connection                                  | ESS      |   | ESV                              |
|                          |   | Part No. | Type  | Part No. Type                    |
| 30                       | M6  | 525 968  | ESS-30-GT-M6 <sup>1)</sup>                                | -                                |
|                          | M10   | 525 969  | ESS-30-GT-M10 <sup>1)</sup>                               | -                                |
|                          | G <sup>1</sup> / <sub>8</sub> female thread | 525 970  | ESS-30-GT-G <sup>1</sup> / <sub>8</sub> -I <sup>1)</sup>  | -                                |
|                          | G <sup>1</sup> / <sub>8</sub>               | 525 971  | ESS-30-GT-G <sup>1</sup> / <sub>8</sub> <sup>1)</sup>     | -                                |
|                          | -   | -        | -   | 526 000 ESV-30-GT <sup>1)</sup>  |
| 40                       | M6  | 525 972  | ESS-40-GT-M6 <sup>1)</sup>                                | -                                |
|                          | M10   | 525 973  | ESS-40-GT-M10 <sup>1)</sup>                               | -                                |
|                          | G <sup>1</sup> / <sub>4</sub> female thread | 525 974  | ESS-40-GT-G <sup>1</sup> / <sub>4</sub> -I <sup>1)</sup>  | -                                |
|                          | G <sup>1</sup> / <sub>4</sub>               | 525 975  | ESS-40-GT-G <sup>1</sup> / <sub>4</sub> <sup>1)</sup>     | -                                |
|                          | -   | -        | -   | 526 001 ESV-40-GT <sup>1)</sup>  |
| 50                       | M6  | 525 976  | ESS-50-GT-M6 <sup>1)</sup>                                | -                                |
|                          | M10   | 525 977  | ESS-50-GT-M10 <sup>1)</sup>                               | -                                |
|                          | G <sup>1</sup> / <sub>4</sub> female thread | 525 978  | ESS-50-GT-G <sup>1</sup> / <sub>4</sub> -I <sup>1)</sup>  | -                                |
|                          | G <sup>1</sup> / <sub>4</sub>               | 525 979  | ESS-50-GT-G <sup>1</sup> / <sub>4</sub> <sup>1)</sup>     | -                                |
|                          | -   | -        | -   | 526 002 ESV-50-GT <sup>1)</sup>  |
| 60                       | M10   | 525 980  | ESS-60-GT-M10 <sup>1)</sup>                               | -                                |
|                          | G <sup>1</sup> / <sub>4</sub> female thread | 525 981  | ESS-60-GT-G <sup>1</sup> / <sub>4</sub> -I <sup>1)</sup>  | -                                |
|                          | G <sup>1</sup> / <sub>4</sub>               | 525 982  | ESS-60-GT-G <sup>1</sup> / <sub>4</sub> <sup>1)</sup>     | -                                |
|                          | -   | -        | -   | 526 003 ESV-60-GT <sup>1)</sup>  |
| 80                       | M10   | 525 983  | ESS-80-GT-M10 <sup>1)</sup>                               | -                                |
|                          | G <sup>1</sup> / <sub>4</sub> female thread | 525 984  | ESS-80-GT-G <sup>1</sup> / <sub>4</sub> -I <sup>1)</sup>  | -                                |
|                          | G <sup>1</sup> / <sub>4</sub>               | 525 985  | ESS-80-GT-G <sup>1</sup> / <sub>4</sub> <sup>1)</sup>     | -                                |
|                          | -   | -        | -   | 526 004 ESV-80-GT <sup>1)</sup>  |
| 100                      | M10   | 525 986  | ESS-100-GT-M10 <sup>1)</sup>                              | -                                |
|                          | G <sup>1</sup> / <sub>4</sub> female thread | 525 987  | ESS-100-GT-G <sup>1</sup> / <sub>4</sub> -I <sup>1)</sup> | -                                |
|                          | G <sup>1</sup> / <sub>4</sub>               | 525 988  | ESS-100-GT-G <sup>1</sup> / <sub>4</sub> <sup>1)</sup>    | -                                |
|                          | -   | -        | -   | 526 005 ESV-100-GT <sup>1)</sup> |

1) Free of copper, PTFE and silicone



- Suction retention of workpieces with smooth, impervious surfaces
- Silicone suction cups are approved in the manufacture of food products
- Bellows suction cups can adapt to suit uneven, curved and inclined surfaces
- Excellent thermal resistance

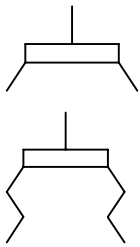
# Suction grippers

Key features

FESTO

## Product overview

Suction gripper and suction cup



Festo vacuum suction grippers offer outstanding functionality and quality.

An extensive range of modular suction cups in different shapes, materials and sizes, plus a wide selection of suction cup holders, angle and height compensators and filters within the

modular suction gripper system, provide users with a huge range of possible combinations for a wide variety of applications.

## Suction grippers ESG

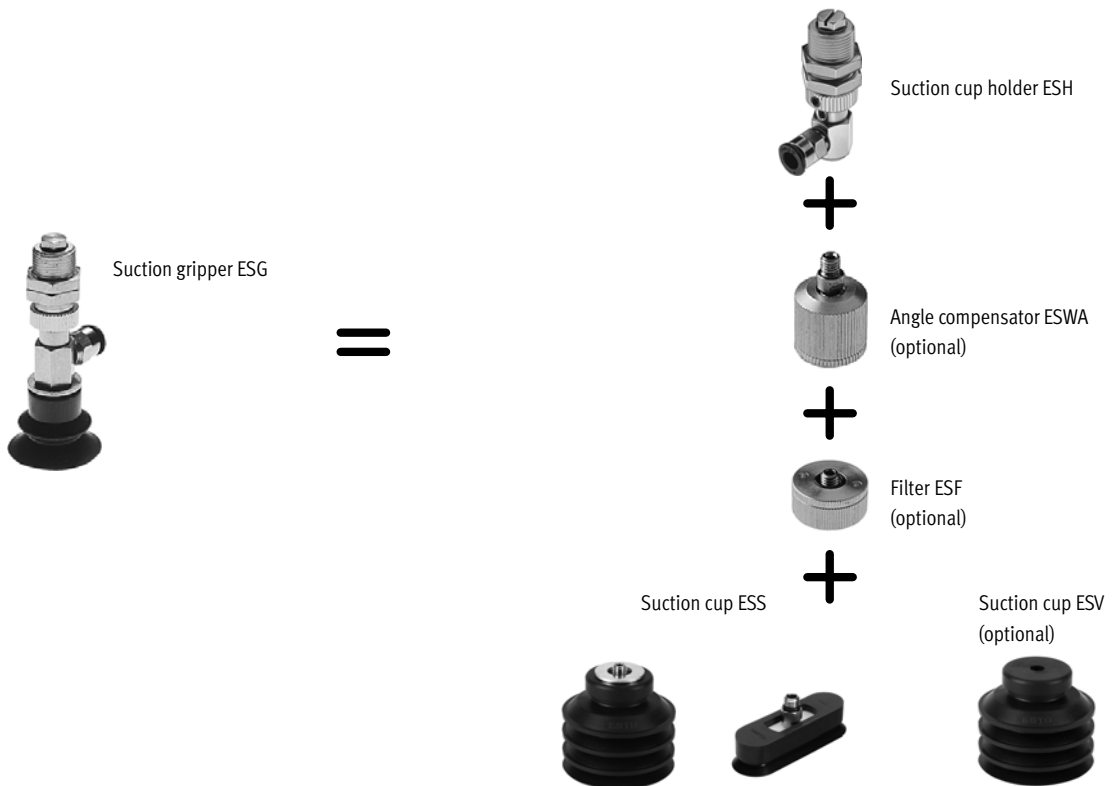
→ NO TAG

Modular products with over 2000 variants

- The ideal solution for the transport of workpieces of different weights, surfaces and shapes
- Choose from:
  - 15 suction cup diameters
  - 5 different materials – including antistatic types
  - 5 suction cup shapes
  - Various suction cup holders
  - Optional accessories (filters and angle compensators)
- Wide range of variants
- A suitable solution for every task
- Wide range to suit applications with various temperature ranges and workpiece surfaces
- Suction cups made from silicone are approved for use in the food industry

Suction grippers as a complete solution

Suction grippers made from individual components



# Suction grippers

Key features

FESTO

## Suction cups VAS/VASB

→ 6 / 2.1-30

Sturdy and reliable

- The ideal solution for the transport of workpieces of different weights, surfaces and shapes
- Choose from:
  - 15 suction cup diameters: standard, extra deep and bellows designs
  - 2 suction cup shapes: round and oval
  - 5 suction cup materials: nitrile rubber, antistatic nitrile rubber, polyurethane, silicone and fluoro rubber for use in a wide variety of applications
- Wide range to suit applications with various temperature ranges and workpiece surfaces
- Suction cups made from silicone are approved for use in the food industry
- All tubing connector sizes correspond to a holder size



# Suction cups VAS/VASB

Features

## Suction cups with fixed connecting thread

- VAS: 1 ... 125 mm diameter  
VASB: 8 ... 125 mm diameter
- Suction retention of workpieces with smooth, impervious surfaces
- Bellows suction cups can adapt to suit uneven, curved and inclined surfaces

- Nitrile rubber (NBR)**
- Minimal markings left on shiny surfaces
- Polyurethane (PUR)**
- Long service life
  - Gentle handling with soft suction cup material

- Silicone (SI)**
- Excellent thermal resistance
  - Approved for use in the food industry



## Accessories

Vacuum security valve ISV NO TAG

- Vacuum does not dissipate when any of several suction cups arranged in parallel fail to maintain contact
- Saves compressed air and energy



Height compensator VAL NO TAG

- Gentle handling of the workpieces by compensating for tolerance differences in the workpiece thickness.



Elbow fitting LJK NO TAG

- Redirection of air connection
- Swivel joint rotatable 360°



Adapter AD NO TAG

- For connection of suction cup with piston rod thread, for example

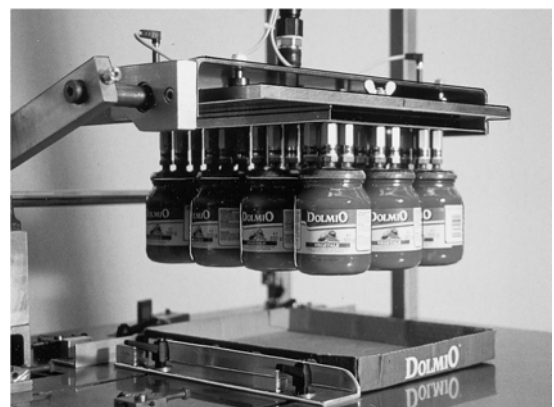


Suction grippers

2.1

## Vacuum technology can be used in a wide range of applications

- Lifting
- Placing
- Moving
- Insertion
- Conveying
- Gripping
- Holding
- Loading
- Clamping
- Transporting
- Repositioning
- Turning



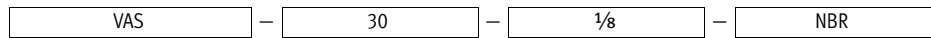
Flexible automation technology is an important field of application for vacuum technology:

- Small, mid-sized and large series manufacturing
- Assembly
- Conveyor and packaging technology



# Suction cups VAS

Type code

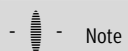


| Type |             |
|------|-------------|
| VAS  | Suction cup |

| Suction cup Ø [mm] |     |
|--------------------|-----|
| 1                  | 1   |
| 2                  | 2   |
| 5                  | 5   |
| 8                  | 8   |
| 10                 | 10  |
| 15                 | 15  |
| 30                 | 30  |
| 40                 | 40  |
| 55                 | 55  |
| 75                 | 75  |
| 100                | 100 |
| 125                | 125 |

| Connection sizes |             |
|------------------|-------------|
| M3               | M3 thread   |
| M5               | M5 thread   |
| 1/8              | G1/8 thread |
| 1/4              | G1/4 thread |
| 3/8              | G3/8 thread |

| Materials |                |
|-----------|----------------|
| NBR       | Nitrile rubber |
| PUR       | Polyurethane   |
| SI        | Silicone       |





Possible combinations can be found in the ordering data.

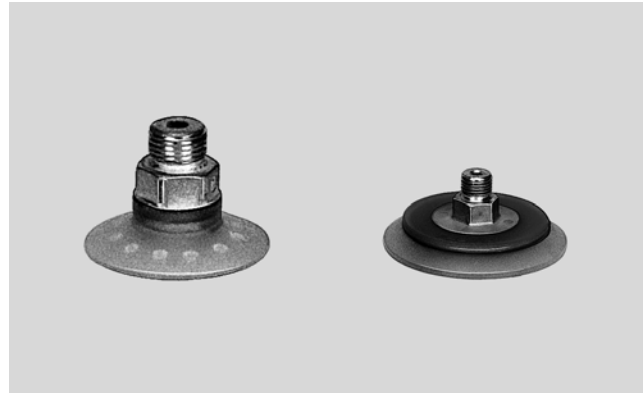
# Suction cups VAS

Technical data

FESTO

-  - Temperature range  
-20 ... +200 °C

-  - Diameter  
1 ... 125 mm



| General technical data   |                                     |                  |                  |                      |                                    |                |                                      |            |            |           |
|--------------------------|-------------------------------------|------------------|------------------|----------------------|------------------------------------|----------------|--------------------------------------|------------|------------|-----------|
| Suction cup<br>Ø<br>[mm] | Design                              | Vacuum port      | Type of mounting | Nominal size<br>[mm] | Effective suction cup<br>Ø<br>[mm] | Shore hardness | Breakaway force at 70% vacuum<br>[N] | Weight     |            |           |
|                          |                                     |                  |                  |                      |                                    |                |                                      | NBR<br>[g] | PUR<br>[g] | SI<br>[g] |
| 1                        | Vacuum port on top, round, standard | M3               | Screw-in thread  | 0.4                  | 0.8                                | 55±5           | 0.035                                | 1          | -          | -         |
| 2                        |                                     | M3               |                  | 1                    | 1.6                                | 55±5           | 0.14                                 | 11         | -          | -         |
| 5                        |                                     | M5               |                  | 1.5                  | 4                                  | 55±5           | 0.9                                  | 2          | -          | -         |
| 8                        |                                     | M5 <sup>1)</sup> |                  | 2                    | 5.5                                | 73             | 1.6                                  | 4          | 4          | 2         |
| 10                       |                                     | M5               |                  | 2                    | 8                                  | 73             | 4.5                                  | 3          | 3          | 3         |
| 15                       |                                     | G1/8             |                  | 3                    | 12                                 | 73             | 7.9                                  | 11         | 11         | 6         |
| 30                       |                                     | G1/8             |                  | 3                    | 25                                 | 73             | 34                                   | 13         | 13         | 7         |
| 40                       |                                     | G1/4             |                  | 4                    | 32                                 | 73             | 56                                   | 26         | 27         | 13        |
| 55                       |                                     | G1/4             |                  | 4                    | 44                                 | 73             | 106                                  | 32         | 32         | 16        |
| 75                       |                                     | G1/4             |                  | 4                    | 60                                 | 73             | 197                                  | 76         | 78         | 36        |
| 100                      |                                     | G1/4             |                  | 4                    | 85                                 | 73             | 397                                  | 138        | 142        | 67        |
| 125                      |                                     | G3/8             |                  | 7                    | 105                                | 73             | 606                                  | 152        | 148        | 148       |

1) VAS-8-M5-S: Barbed fittings for 3 mm plastic tubing, lateral connection

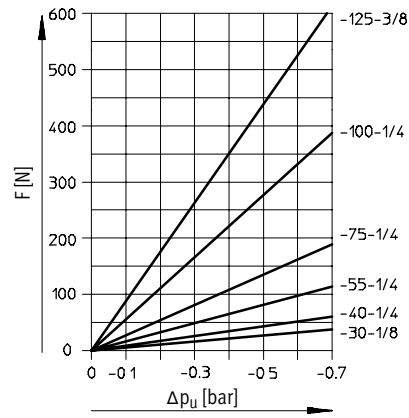
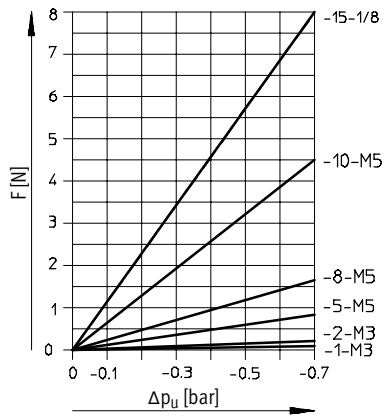
| Ambient conditions                     |                 |             |              |
|--|-----------------|-------------|--------------|
| Variant                                | VAS-...-NBR     | VAS-...-PUR | VAS-...-SI   |
| Operating medium                       | Atmospheric air |             |              |
| Ambient temperature [°C]               | -20 ... +80     | -20 ... +60 | -40 ... +200 |
| Corrosion resistance CRC <sup>1)</sup> | 2               |             |              |

1) Corrosion resistance class 2 according to Festo standard 940 070  
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

# Suction cups VAS

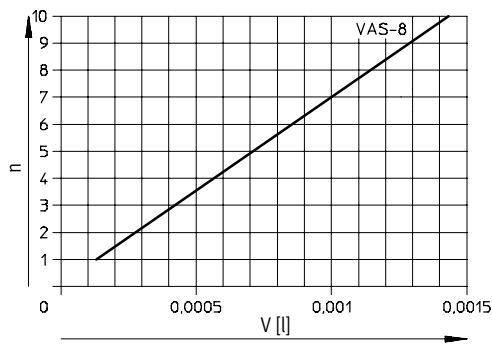
Technical data

## Theoretical suction force F as a function of vacuum $p_u$

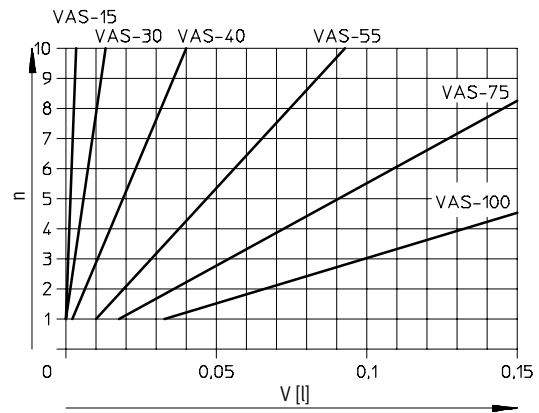


## Suction cup volume

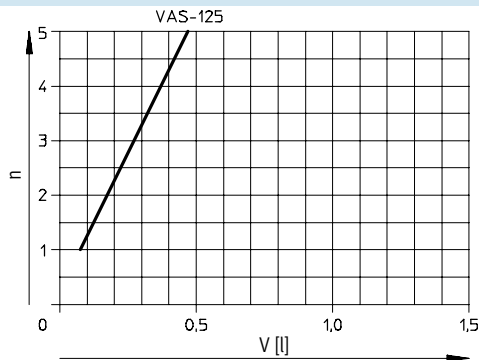
VAS-8



VAS-15 ... 100



VAS-125



# Suction cups VAS

Technical data

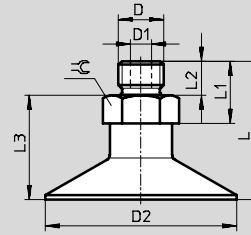
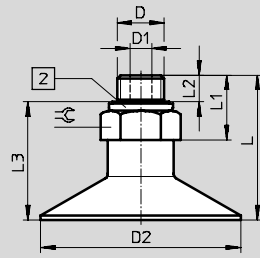
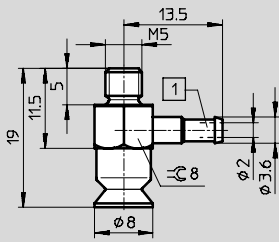
FESTO

## Dimensions

VAS-8-M5-S

VAS-...-NBR/-PUR

VAS-...-SI



1 Barbed fitting for 3 mm plastic tubing

2 Sealing ring

| Type                       | D    | D1<br>Ø | D2<br>Ø | L    | L1   | L2  | L3   | ⊕   |
|----------------------------|------|---------|---------|------|------|-----|------|-----|
| <b>VAS-...-NBR</b>         |      |         |         |      |      |     |      |     |
| VAS-1-M3-NBR <sup>1)</sup> | M3   | 0.9     | 1       | 6.6  | 5    | 3   | 3.6  | 4.5 |
| VAS-2-M3-NBR <sup>1)</sup> | M3   | 1       | 2       | 9    | 5    | 3   | 6    | 4.5 |
| VAS-5-M5-NBR               | M5   | 1.5     | 5       | 16.5 | 11.5 | 3.5 | 13   | 8   |
| VAS-8-M5-NBR               | M5   | 2       | 8       | 18.7 | 11.5 | 3   | 15.7 | 8   |
| VAS-10-M5-NBR              | M5   | 2       | 10      | 19.2 | 11.5 | 3.5 | 15.7 | 8   |
| VAS-15-1/8-NBR             | G1/8 | 3       | 15      | 20   | 12   | 4.7 | 15.3 | 13  |
| VAS-30-1/8-NBR             | G1/8 | 3       | 30      | 21.5 | 12   | 4.7 | 16.8 | 13  |
| VAS-40-1/4-NBR             | G1/4 | 4       | 40      | 30.5 | 19   | 5.8 | 24.7 | 17  |
| VAS-55-1/4-NBR             | G1/4 | 4       | 55      | 33.5 | 19   | 5.8 | 27.7 | 17  |
| VAS-75-1/4-NBR             | G1/4 | 4       | 75      | 27   | 18   | 5.8 | 21.2 | 17  |
| VAS-100-1/4-NBR            | G1/4 | 4       | 100     | 27   | 18   | 5.8 | 21.2 | 17  |
| VAS-125-3/8-NBR            | G3/8 | 7       | 125     | 36   | 20   | 6   | 30   | 19  |
| <b>VAS-...-PUR</b>         |      |         |         |      |      |     |      |     |
| VAS-8-M5-PUR               | M5   | 2       | 8       | 18.7 | 11.5 | 3   | 15.7 | 8   |
| VAS-10-M5-PUR              | M5   | 2       | 10      | 19.2 | 11.5 | 3.5 | 15.7 | 8   |
| VAS-15-1/8-PUR             | G1/8 | 3       | 15      | 20   | 12   | 4.7 | 15.3 | 13  |
| VAS-30-1/8-PUR             | G1/8 | 3       | 30      | 21.5 | 12   | 4.7 | 16.8 | 13  |
| VAS-40-1/4-PUR             | G1/4 | 4       | 40      | 29.5 | 19   | 5.8 | 23.7 | 17  |
| VAS-55-1/4-PUR             | G1/4 | 4       | 55      | 32.5 | 19   | 5.8 | 26.7 | 17  |
| VAS-75-1/4-PUR             | G1/4 | 4       | 75      | 27   | 18   | 5.8 | 21.2 | 17  |
| VAS-100-1/4-PUR            | G1/4 | 4       | 100     | 27   | 18   | 5.8 | 21.2 | 17  |
| VAS-125-3/8-PUR            | G3/8 | 7       | 125     | 36   | 20   | 6   | 30   | 19  |
| <b>VAS-...-SI</b>          |      |         |         |      |      |     |      |     |
| VAS-8-M5-SI                | M5   | 2       | 8       | 19.2 | 11.5 | 5   | 14.2 | 8   |
| VAS-10-M5-SI               | M5   | 2       | 10      | 19.2 | 11.5 | 5   | 14.2 | 8   |
| VAS-15-1/8-SI              | G1/8 | 3       | 15      | 20   | 12   | 6.5 | 13.5 | 13  |
| VAS-30-1/8-SI              | G1/8 | 3       | 30      | 21.5 | 12   | 6.5 | 15   | 13  |
| VAS-40-1/4-SI              | G1/4 | 4       | 40      | 30.5 | 17   | 8   | 22.5 | 17  |
| VAS-55-1/4-SI              | G1/4 | 4       | 55      | 33.5 | 17   | 8   | 25.5 | 17  |
| VAS-75-1/4-SI              | G1/4 | 4       | 75      | 28   | 14   | 8   | 20   | 17  |
| VAS-100-1/4-SI             | G1/4 | 4       | 100     | 28.5 | 14.5 | 8   | 20.5 | 17  |
| VAS-125-3/8-SI             | G3/8 | 7       | 125     | 36   | 16.5 | 9   | 27   | 19  |

1) Sealing rings are not included in the scope of delivery.

# Suction cups VAS

Technical data

| Ordering data                     |                 |                |                               |              |                               |          |                            |
|-----------------------------------|-----------------|----------------|-------------------------------|--------------|-------------------------------|----------|----------------------------|
| Suction cup Ø<br>[mm]             | Screw-in thread | Nitrile rubber |                               | Polyurethane |                               | Silicone |                            |
|                                   |                 | Part No.       | Type                          | Part No.     | Type                          | Part No. | Type                       |
| 1                                 | M3              | 173 437        | VAS-1-M3-NBR                  | –            |                               | –        |                            |
| 2                                 | M3              | 173 438        | VAS-2-M3-NBR                  | –            |                               | –        |                            |
| 5                                 | M5              | 173 439        | VAS-5-M5-NBR                  | –            |                               | –        |                            |
| 8                                 | M5              | 34 588         | VAS-8-M5-NBR                  | 36 135       | VAS-8-M5-PUR                  | 160 988  | VAS-8-M5-SI                |
| 10                                | M5              | 173 440        | VAS-10-M5-NBR                 | 173 441      | VAS-10-M5-PUR                 | 173 442  | VAS-10-M5-SI               |
| 15                                | G $\frac{1}{8}$ | 36 142         | VAS-15- $\frac{1}{8}$ -NBR    | 36 136       | VAS-15- $\frac{1}{8}$ -PUR    | 158 973  | VAS-15- $\frac{1}{8}$ -SI  |
| 30                                | G $\frac{1}{8}$ | 34 587         | VAS-30- $\frac{1}{8}$ -NBR    | 36 137       | VAS-30- $\frac{1}{8}$ -PUR    | 158 974  | VAS-30- $\frac{1}{8}$ -SI  |
| 40                                | G $\frac{1}{4}$ | 36 143         | VAS-40- $\frac{1}{4}$ -NBR    | 36 138       | VAS-40- $\frac{1}{4}$ -PUR    | 158 975  | VAS-40- $\frac{1}{4}$ -SI  |
| 55                                | G $\frac{1}{4}$ | 36 144         | VAS-55- $\frac{1}{4}$ -NBR    | 36 139       | VAS-55- $\frac{1}{4}$ -PUR    | 158 976  | VAS-55- $\frac{1}{4}$ -SI  |
| 75                                | G $\frac{1}{4}$ | 36 145         | VAS-75- $\frac{1}{4}$ -NBR    | 36 140       | VAS-75- $\frac{1}{4}$ -PUR    | 160 989  | VAS-75- $\frac{1}{4}$ -SI  |
| 100                               | G $\frac{1}{4}$ | 34 586         | VAS-100- $\frac{1}{4}$ -NBR   | 36 141       | VAS-100- $\frac{1}{4}$ -PUR   | 160 990  | VAS-100- $\frac{1}{4}$ -SI |
| 125                               | G $\frac{3}{8}$ | 152 605        | VAS-125- $\frac{3}{8}$ -NBR   | 152 606      | VAS-125- $\frac{3}{8}$ -PUR   | 160 991  | VAS-125- $\frac{3}{8}$ -SI |
| Lateral outlet                    |                 |                |                               |              |                               |          |                            |
| 8                                 | M5              | –              |                               | 12 612       | VAS-8-M5-S                    | –        |                            |
| Free of copper, PTFE and silicone |                 |                |                               |              |                               |          |                            |
| 8                                 | M5              | 183 508        | VAS-8-M5-NBR-CT               | 183 511      | VAS-8-M5-PUR-CT               | –        |                            |
| 15                                | G $\frac{1}{8}$ | 183 509        | VAS-15- $\frac{1}{8}$ -NBR-CT | 183 512      | VAS-15- $\frac{1}{8}$ -PUR-CT | –        |                            |
| 30                                | G $\frac{1}{8}$ | 183 510        | VAS-30- $\frac{1}{8}$ -NBR-CT | 183 513      | VAS-30- $\frac{1}{8}$ -PUR-CT | –        |                            |

# Bellows suction cups VASB

Type code


VASB - 30 - 1/8 - NBR

| Type |                     |
|------|---------------------|
| VASB | Bellows suction cup |

| Suction cup Ø [mm] |     |
|--------------------|-----|
| 8                  | 8   |
| 15                 | 15  |
| 30                 | 30  |
| 40                 | 40  |
| 55                 | 55  |
| 75                 | 75  |
| 100                | 100 |
| 125                | 125 |



| Connection sizes |             |
|------------------|-------------|
| M5               | M5 thread   |
| 1/8              | G1/8 thread |
| 1/4              | G1/4 thread |
| 3/8              | G3/8 thread |

| Materials |                |
|-----------|----------------|
| NBR       | Nitrile rubber |
| PUR       | Polyurethane   |
| SI        | Silicone       |

 Note  
Possible combinations can be found in the ordering data.

# Bellows suction cups VASB

Technical data

-  - Temperature range  
-20 ... +200 °C
-  - Diameter  
8 ... 125 mm



| General technical data   |  |             |                    |                      |                                    |                |                                      |            |            |           |
|--------------------------|--|-------------|--------------------|----------------------|------------------------------------|----------------|--------------------------------------|------------|------------|-----------|
| Suction cup<br>Ø<br>[mm] | Design   | Vacuum port | Type of mounting   | Nominal size<br>[mm] | Effective suction cup<br>Ø<br>[mm] | Shore hardness | Breakaway force at 70% vacuum<br>[N] | Weight     |            |           |
|                          |  |             |                    |                      |                                    |                |                                      | NBR<br>[g] | PUR<br>[g] | SI<br>[g] |
| 8                        | Vacuum port<br>on top,<br>round,<br>bellows, 1.5<br>convolutions | M5          | Screw-in<br>thread | 2                    | 5.5                                | 73             | 1.6                                  | 4          | 4          | 2         |
| 15                       |  | G1/8        |                    | 3                    | 12                                 | 73             | 7.9                                  | 11         | 11         | 6         |
| 30                       |  | G1/8        |                    | 3                    | 25                                 | 73             | 34                                   | 15         | 15         | 9         |
| 40                       |  | G1/4        |                    | 4                    | 32                                 | 73             | 56                                   | 30         | 30         | 16        |
| 55                       |  | G1/4        |                    | 4                    | 44                                 | 73             | 106                                  | 42         | 42         | 26        |
| 75                       |  | G1/4        |                    | 4                    | 60                                 | 73             | 197                                  | 95         | 95         | 53        |
| 100                      |  | G1/4        |                    | 4                    | 85                                 | 73             | 397                                  | 170        | 170        | 95        |
| 125                      |  | G3/8        |                    | 7                    | 105                                | 73             | 606                                  | 207        | 194        | 194       |

| Ambient conditions                     |                 |             |              |
|--|-----------------|-------------|--------------|
| Variant                                | VAS-...-NBR     | VAS-...-PUR | VAS-...-SI   |
| Operating medium                       | Atmospheric air |             |              |
| Ambient temperature [°C]               | -20 ... +80     | -20 ... +60 | -40 ... +200 |
| Corrosion resistance CRC <sup>1)</sup> | 2               |             |              |

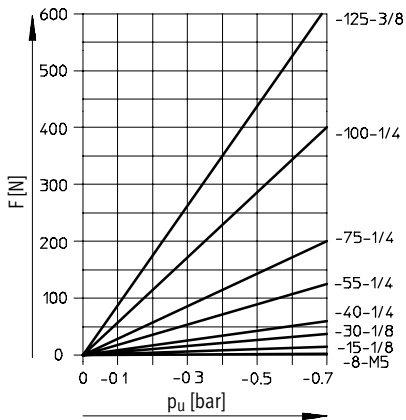
1) Corrosion resistance class 2 according to Festo standard 940 070  
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

# Bellows suction cups VASB

Technical data

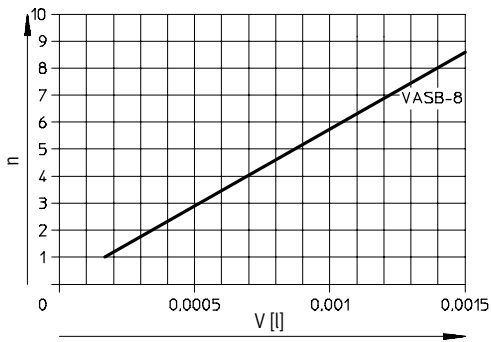
FESTO

## Theoretical suction force F as a function of vacuum $p_u$

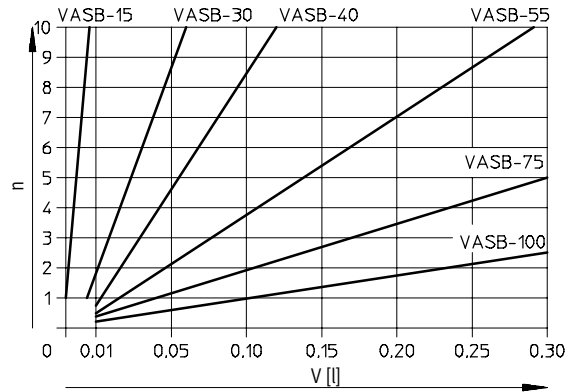


## Suction cup volume

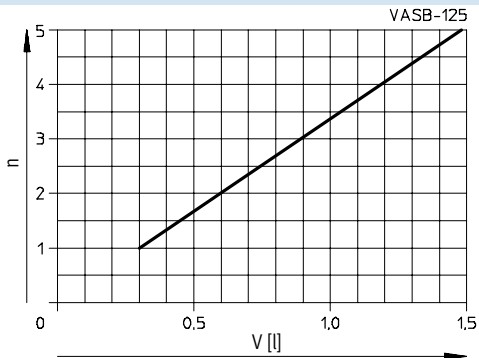
VASB-8



VASB-15 ... 100

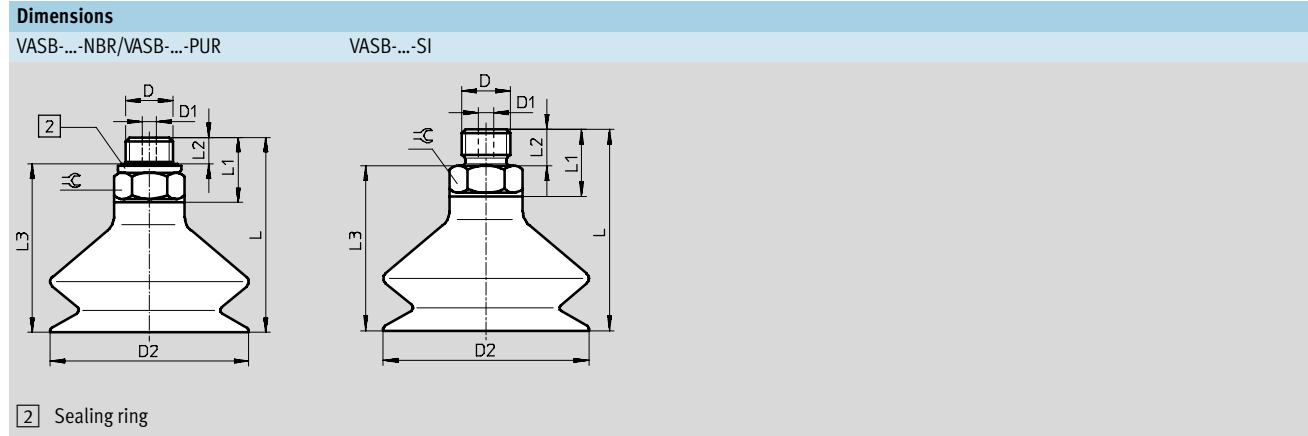


VASB-125



# Bellows suction cups VASB

Technical data



| Type                | D    | D1<br>Ø | D2<br>Ø | L    | L1   | L2  | L3   | ≈C |
|---------------------|------|---------|---------|------|------|-----|------|----|
| <b>VASB-...-NBR</b> |      |         |         |      |      |     |      |    |
| VASB-8-M5-NBR       | M5   | 0.5     | 8       | 22.5 | 11.5 | 3.5 | 19   | 8  |
| VASB-15-1/8-NBR     | G1/8 | 3       | 15      | 25.5 | 12   | 4.7 | 20.8 | 13 |
| VASB-30-1/8-NBR     | G1/8 | 3       | 30      | 34   | 12   | 4.7 | 29.3 | 13 |
| VASB-40-1/4-NBR     | G1/4 | 4       | 40      | 43   | 17   | 5.8 | 37.2 | 17 |
| VASB-55-1/4-NBR     | G1/4 | 4       | 55      | 52   | 17   | 5.8 | 46.2 | 17 |
| VASB-75-1/4-NBR     | G1/4 | 4       | 75      | 43.5 | 17   | 5.8 | 37.7 | 17 |
| VASB-100-1/4-NBR    | G1/4 | 4       | 100     | 43.5 | 17   | 5.8 | 37.7 | 17 |
| VASB-125-3/8-NBR    | G3/8 | 7       | 125     | 60   | 20   | 6   | 54   | 19 |
| <b>VASB-...-PUR</b> |      |         |         |      |      |     |      |    |
| VASB-8-M5-PUR       | M5   | 0.5     | 8       | 22.5 | 11.5 | 3.5 | 19   | 8  |
| VASB-15-1/8-PUR     | G1/8 | 3       | 15      | 25.5 | 12   | 4.7 | 20.8 | 13 |
| VASB-30-1/8-PUR     | G1/8 | 3       | 30      | 34   | 12   | 4.7 | 29.3 | 13 |
| VASB-40-1/4-PUR     | G1/4 | 4       | 40      | 43   | 17   | 5.8 | 37.2 | 17 |
| VASB-55-1/4-PUR     | G1/4 | 4       | 55      | 52   | 17   | 5.8 | 46.2 | 17 |
| VASB-75-1/4-PUR     | G1/4 | 4       | 75      | 43.5 | 17   | 5.8 | 37.7 | 17 |
| VASB-100-1/4-PUR    | G1/4 | 4       | 100     | 43.5 | 17   | 5.8 | 37.7 | 17 |
| VASB-125-3/8-PUR    | G3/8 | 7       | 125     | 60   | 20   | 6   | 54   | 19 |
| <b>VASB-...-SI</b>  |      |         |         |      |      |     |      |    |
| VASB-8-M5-SI        | M5   | 2       | 8       | 22.5 | 11.5 | 5   | 17.5 | 8  |
| VASB-15-1/8-SI      | G1/8 | 3       | 15      | 25.5 | 12   | 6.5 | 19   | 13 |
| VASB-30-1/8-SI      | G1/8 | 3       | 30      | 34   | 12   | 6.5 | 27.5 | 13 |
| VASB-40-1/4-SI      | G1/4 | 4       | 40      | 43   | 17   | 8   | 35   | 17 |
| VASB-55-1/4-SI      | G1/4 | 4       | 55      | 52   | 17   | 8   | 44   | 17 |
| VASB-75-1/4-SI      | G1/4 | 4       | 75      | 43.5 | 14   | 8   | 35.5 | 17 |
| VASB-100-1/4-SI     | G1/4 | 4       | 100     | 43.5 | 14   | 8   | 35.5 | 17 |
| VASB-125-3/8-SI     | G3/8 | 7       | 125     | 60   | 16.5 | 9   | 51   | 19 |

1) Sealing rings are not included in the scope of delivery.

# Bellows suction cups VASB

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Technical data

| Ordering data                     |                 |                |                                |              |                                |          |                             |
|-----------------------------------|-----------------|----------------|--------------------------------|--------------|--------------------------------|----------|-----------------------------|
| Suction cup Ø<br>[mm]             | Screw-in thread | Nitrile rubber |                                | Polyurethane |                                | Silicone |                             |
|                                   |                 | Part No.       | Type                           | Part No.     | Type                           | Part No. | Type                        |
| 8                                 | M5              | 35 410         | VASB-8-M5-NBR                  | 35 417       | VASB-8-M5-PUR                  | 160 992  | VASB-8-M5-SI                |
| 15                                | G $\frac{1}{8}$ | 35 411         | VASB-15- $\frac{1}{8}$ -NBR    | 35 418       | VASB-15- $\frac{1}{8}$ -PUR    | 158 977  | VASB-15- $\frac{1}{8}$ -SI  |
| 30                                | G $\frac{1}{8}$ | 35 412         | VASB-30- $\frac{1}{8}$ -NBR    | 35 419       | VASB-30- $\frac{1}{8}$ -PUR    | 158 978  | VASB-30- $\frac{1}{8}$ -SI  |
| 40                                | G $\frac{1}{4}$ | 35 413         | VASB-40- $\frac{1}{4}$ -NBR    | 35 420       | VASB-40- $\frac{1}{4}$ -PUR    | 158 979  | VASB-40- $\frac{1}{4}$ -SI  |
| 55                                | G $\frac{1}{4}$ | 35 414         | VASB-55- $\frac{1}{4}$ -NBR    | 35 421       | VASB-55- $\frac{1}{4}$ -PUR    | 158 980  | VASB-55- $\frac{1}{4}$ -SI  |
| 75                                | G $\frac{1}{4}$ | 35 415         | VASB-75- $\frac{1}{4}$ -NBR    | 35 422       | VASB-75- $\frac{1}{4}$ -PUR    | 160 993  | VASB-75- $\frac{1}{4}$ -SI  |
| 100                               | G $\frac{1}{4}$ | 35 416         | VASB-100- $\frac{1}{4}$ -NBR   | 35 423       | VASB-100- $\frac{1}{4}$ -PUR   | 160 994  | VASB-100- $\frac{1}{4}$ -SI |
| 125                               | G $\frac{3}{8}$ | 152 609        | VASB-125- $\frac{3}{8}$ -NBR   | 152 610      | VASB-125- $\frac{3}{8}$ -PUR   | 160 995  | VASB-125- $\frac{3}{8}$ -SI |
| Free of copper, PTFE and silicone |                 |                |                                |              |                                |          |                             |
| 8                                 | M5              | 183 514        | VASB-8-M5-NBR-CT               | 183 517      | VASB-8-M5-PUR-CT               | –        | –                           |
| 15                                | G $\frac{1}{8}$ | 183 515        | VASB-15- $\frac{1}{8}$ -NBR-CT | 183 518      | VASB-15- $\frac{1}{8}$ -PUR-CT | –        | –                           |
| 30                                | G $\frac{1}{8}$ | 183 516        | VASB-30- $\frac{1}{8}$ -NBR-CT | 183 519      | VASB-30- $\frac{1}{8}$ -PUR-CT | –        | –                           |