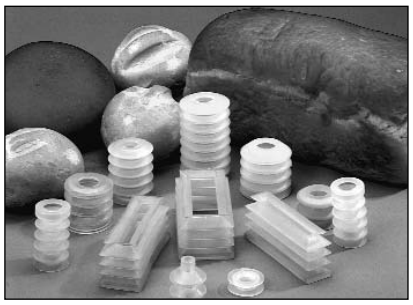
# The Vacuum Resource© Book

From ANVER



# 1

## Section

# Vacuum Cups and Accessories

# Vacuum Cups and Suction Cups

## *Suction Cup Selection Guide*

### The Best Solution for Material Handling.

Vacuum suction cups can hold, lift or turn virtually any kind of material in the production process. The contact between a suction cup and the object to be handled is soft and light, and the technique is simple and safe.

### Choosing the Right Suction Cup.

It is very important to choose the most appropriate type of vacuum suction cup, to obtain optimal results. ANVER has cups suitable for round, inclined, curved and irregular surfaces, and with our range of products you can find the best solution for every task.

The selection of a suction cup depends on particular conditions such as surface quality and structural stability of the work piece to be lifted and the desired material, shape, etc. of the suction cup. However, a simplified formula can be used to generate a theoretical estimate based on a few known values.

**The diameter of the suction cup can be determined using the following formula:**

### *How to Calculate the Diameter of Suction Cup Needed*

***U.S. Units***

$$\mathbf{D} = 0.44 \times \sqrt{\frac{\mathbf{a}/2.2 \times \mathbf{s}}{\mathbf{v}/29.5 \times \mathbf{c}}}$$

**D** = Diameter - inches
**a** = Mass lbs.
**c** = Number of Cups
**v** = Vacuum - in. of Hg
**s** = Safety Factor (at least 2)

***Metric Units***

$$\mathbf{D} = 11.2 \times \sqrt{\frac{\mathbf{m} \times \mathbf{s}}{\mathbf{b} \times \mathbf{c}}}$$

**D** = Diameter - mm
**m** = Mass - Kg
**c** = Number of Cups
**b** = Vacuum - bar
**s** = Safety Factor (at least 2)

**NOTE:** A safety factor of at least 2 for horizontal lifts should always be used to compensate for numerous variables surrounding lifting applications while a safety factor of at least 4 should be used for vertical or tilting applications. A pull-off test should be performed at our factory to determine the absolute suction cup for your particular application. Contact one of our application engineers for more information.

**The Widest Range of Cups.**

You can find many types of vacuum suction cups, with different dimensions and forms, on our web site. Our technical department is at your disposal to consult in choosing the most suitable solution for your particular needs.

## *Lifting Capacity:*

The lifting capacity of a vacuum cup can be theoretically determined at sea level by using the following formula:

$$C = \frac{.393 \; X \; D^2 \; X \; V}{N}$$

*C = Lifting Capacity (lbs.)*
*D = Cup Diameter (in.)*
*V = Vacuum Level (in. Hg)*
*N = Desired Safety Factor*

Safety factor for horizontal lifting applications should be at least (2). Vertical lifting applications should have a safety factor of at least (4).

***NOTE: This formula will give theoretical lifting capacity only. Actual lifting capacity should always be verified by user.***

**Advantages of ANVER Vacuum Suction Cups:**

- The widest selection
- Different materials for various kinds of use
- Various temperature resistance levels
- Perfect adherence even in the presence of edges and angles

➡ This spec sheet was adapted for print from our website. Additional information and photos are available at www.anver.com. 4072401

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# Vacuum Cups and Suction Cups

## *Material Selection Guide*

| ANVER Material Blend Code | Common Material Name | Shore A Hardness* (Durometer) + / - 5 | Temperature Range ** °F (°C) | Abrasion Wear Resistance | Oil, Grease Resistance | UV Weather Aging Resistance | Typical Color (Depends on Cup Style) |
|---|---|---|---|---|---|---|---|
| **For most General Purpose Industrial Applications** | | | | | | | |
| **NBR** | **Nitrile (Buna-N)** | 40 - 60 | -40° to +230° F (-40° to +110° C) | ● ● ● ● | ● ● ● ● | ● ● ● | Black, Blue |
| | NBR is an excellent all around material for general industry. High overall value due to its top performance in many categories. Our proprietary blend which features the latest name brand ingredients have greatly increased the performance of this proven material. | | | | | | |
| **CR, NEO, NE, N50** | **Neoprene (Chloroprene)** | 40 - 60 | -40° to +230° F (-40° to +110° C) | ● ● ● ● | ● ● ● ● | ● ● ● | Blue, Red or Black |
| | N50 is an excellent hard wearing all around material for general industry with a nice rubber feel and memory. | | | | | | |
| **PUR** | **Polyurethane Anverflex™** | 30 - 65 | -13° to +176° F (-25° to +80° C) | ● ● ● ● | ● ● ● ● | ● ● ● | Blue, Green, White, all colors |
| | PUR is a tough, long wearing material. Suitable for many applications where heat is not a factor. Shiny gloss finish. | | | | | | |
| **For High Heat, Non-Marring Packaging and Food Use** | | | | | | | |
| **SIT** | **Silicone** | 40 - 60 | -94° to +600° F (-70° to +316° C) | ● ● | ● ● ● ● | ● ● ● ● | Translucent Clear |
| | SIT is excellent for high heat or food packaging. Soft and pliable, meets FDA Title 21 and German spec. BGVV (BGA) Part XV for contaminant-free load handling. Contains no dyes that can leach out when handling baked goods, drugs, glassware, hot products from molds, etc. | | | | | | |
| **SI** | **Silicone** | 40 - 60 | -94° to +392° F (-70° to +200° C) | ● ● | ● ● ● ● | ● ● ● ● | Solid White, Orange, Red |
| | SI is excellent for high heat applications such as mold part removal or where heat resistance is required for large cups/seals. | | | | | | |
| **S45, S60** | **Silicone** | 40 - 60 | -58° to +401° F (-50° to +205° C) | ● ● | ● ● ● ● | ● ● ● ● | Orange, Red |
| | S45 and S60 are excellent for EOAT high heat applications such as mold part removal from plastic injection machines requiring a soft touch. Higher durometer for bellows cups. | | | | | | |
| **For the Printing, Paper and Wood Industries** | | | | | | | |
| **NR** | **Natural (Gum) Rubber** | 35 - 50 | -40° to +176° F (-40° to +80° C) | ● ● ● ● | ● | ● | Tan, Grey, Green, Orange or Black |
| | NR is widely used in the printing/paper/wood industries. Low cost, wears well and does not gum up with ink or cut paper dust. Not for general use. | | | | | | |
| **Specialty Elastomers** | | | | | | | |
| **SSD** | **Static Dissipative Silicone** | 50 - 60 | -76° to +401° F (-60° to +205° C) | ● ● | ● ● | ● ● | Black, Grey (Carbon Filled) |
| | SSD is a specialized silicone with carbon that can handle heat and is static dissipative for high tech industries. It actually bleeds any static build-up out through a ground of the machine or other ground designed into the system. | | | | | | |
| **TPU** | **Thermal Polyurethane** | 75 | -13° to +176° F (-25° to +80° C) | ● ● ● ● | ● ● ● ● | ● ● ● ● | Translucent Brown (Darkens w/ Age) |
| | TPU is an extremely tough material which darkens with UV exposure. Long wearing but usually too expensive to justify its use. While initially promising a few years ago, TPU's expense premium has proven to far outweigh its increased performance over other recently improved materials. | | | | | | |
| **FPM** | **Viton® Fluorocarbon** | 60 - 65 | -4° to +482° F (-20° to +250° C) | ● | ● ● ● ● | ● ● ● ● | Usually Black, Blue |
| | FPM is specialized for high heat jobs. It has a stiff, somewhat dead feel for vacuum cups, and is relatively expensive which limits its vacuum cup use. High Heat Silicone has replaced Viton for most applications. | | | | | | |
| **VYL** | **Vinyl*** ** | 30 - 70 | +32° to +158° F (0° to +70° C) | ● ● ● ● | ● ● | ● ● | Clear Base Blue / other colors |
| | VYL is soft, low cost, and readily available in many grades for general light-duty use. The injection molded vinyl ANVER uses in its industrial vacuum cups is high quality, but you loose a key advantage of low cost to other materials. | | | | | | |
| **NM** | **ANVER Nomathane™** | 50 - 70 | -32° to +356° F (-0° to +180° C) | ● ● ● ● | ● ● ● ● | ● ● ● | Blue, Purple others |
| | NM is a new ANVER proprietary blend which is high wearing even in hot conditions. It is a silicone-free hybrid material which is non marking and will not leave any residue, mold release agent or ghost-mark on products which need to be painted after handling. This material also handles high temperature and is extremely long wearing making it ideal for the plastic injection molding industry. This material is priced similar to other top quality urethanes but it offers high overall value due to its excellent performance in many categories. | | | | | | |

**CODE:** Poor ● Good ● ● Very Good ● ● ● Excellent ● ● ● ●

Notes: * Various cup designs have different Durometers. Also note that a variance of +/- 5 in Shore Hardness or Durometer is the industry standard for all rubber products.
** The maximum temperature given is always for a momentary pick and place lift and not for a constant attach situation.
*** Some materials such as Urethane or Vinyl have more general names which is like saying Rubber or Plastic. Within that name there are dozens of types and grades and it is difficult to make comparisons. For example, Vinyl is used for children's toys, wall hanging cups, soap dish mounts, but also high end products. It is often difficult to determine the quality you are receiving. We have found that only injection molded, pressurized and vulcanized vinyl is suitable for industrial-duty vacuum cups.

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# Vacuum Cups and Suction Cups

## *Material Selection Guide*

### ANVER® Proprietary Designed Elastomer Materials for Vacuum Cups and Suction Cups

Our success as a leader and innovator in Vacuum Technology is due to the many important advances that we have made and continue to make in the selection of the elastomers used in our Vacuum Cups.

### What is an Elastomer Vacuum Cup?

An elastomer is any type of polymer that has rubber-like properties of which there are dozens of material names. An elastomeric compound, consisting of a blend of a base polymer and other ingredients, is a material that has been designed to meet specific functional requirements.

A Vacuum Cup is only as good as its specific recipe or mixture of elastomeric compounds. The more expensive materials, available from the chemical product market leaders, usually result in the highest quality product consistency, which is why we stick with only ingredients from these suppliers. Each compound listed below is a specific blend of approx. a dozen line items, not a single ingredient as many people have come to believe. The following ingredients make up a typical Vacuum Cup formulation:

**Polymers** . . . . . the basic gum-like component of a compound, provide certain chemical and mechanical properties in the final product.

**Fillers** . . . . . reinforcing agents that enhance chemical and mechanical properties; adding carbon for example

**Vulcanization agents** . . . . to cross-link the polymers.

**Accelerators** . . . . . to modify the rate of vulcanization.

**Activators** . . . . . to initiate the vulcanization.

**Plasticizers** . . . . . to soften or improve processing.

**Processing aids** . . . . . to ease handling during mixing, extrusion, calendaring, or molding; and various mold release agents, sprays etc.

**Age-resistors** . . . . . to reduce or retard aging. Keep in mind that all rubber products have a defined working shelf life.

**Miscellaneous ingredients** such as blowing agents, pigments, retarders and odorants, all have specific purposes but are not necessarily required.

### Consistent Quality Control

At ANVER, we take measures to control quality throughout every phase of the development process. By specifying the highest quality ingredients, auditing incoming raw materials, establishing good relationships with our suppliers, and insisting on quality and uniformity in the goods we purchase, we can ensure the consistency of our elastomeric Vacuum Cups, from initial development to final production. You will find that all of our vacuum cups offer high quality and top value in every market segment.

We mold with many other specialty materials, including Ethylene Propylene Diene Methylene (EPDM) and Electro Static Limiting ESD, (this is a plastic blend material which acts to limit the build-up of static charge by virtue of a more slippery surface, which reduces surface friction). Contact the factory for details.
Viton® is a registered trademark of DuPont Dow Elastomers.

➨ This spec sheet was adapted for print from our website. Additional information and photos are available at www.anver.com. 5050301

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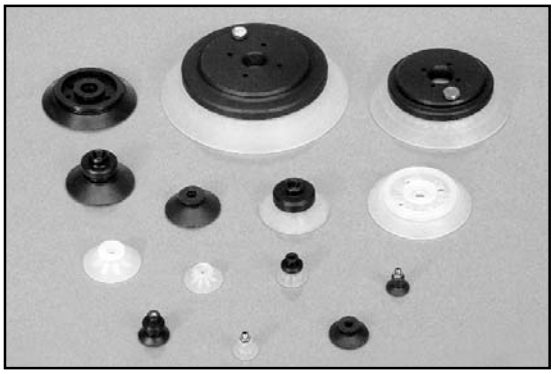
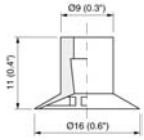
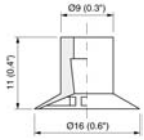
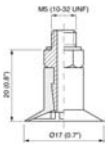
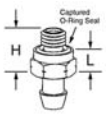
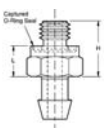
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*



**ANVER-Made Generic Replacements of P-Style Vacuum Cups and Suction Cups**

Ideal for use on plane surfaces, where minimum movement is required to maintain the pick-up area, and for support of pliable materials. Available in sizes from 0.65 to 6.13 inches (16.6 to 155.6mm).

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **F15 Cups** | | | | | | |
| F15-NEO<br>A-3150125 |  | 0.65<br>(16.6) | 0.40<br>(11.0) | 1.11<br>(0.50) | 2.50<br>(1.13) | SLSA-1<br>Suspensions |
| F15-SIT<br>A-3150125S |  | 0.65<br>(16.6) | 0.40<br>(11.0) | 1.11<br>(0.50) | 2.50<br>(1.13) | SLSA-1<br>Suspensions |
| **F15 Cups with 10-15 Fitting** | | | | | | |
| F15-NEO/<br>FITTING<br>A-3150014 |  | 0.65<br>(16.5) | 0.8<br>(20.0) | 1.11<br>(0.50) | 2.50<br>(1.13) | SLSA-1<br>Suspensions |
| F15-SIT/<br>FITTING<br>A-3150014S |  | 0.65<br>(16.5) | 0.8<br>(20.0) | 1.11<br>(0.50) | 2.50<br>(1.13) | SLSA-1<br>Suspensions |
| **Fittings for F15 Cups** | | | | | | |
| BM5 FITTING M5<br>MALE<br>Replaces<br>10-15 FITTING<br>A-3107030 |  | The BM5 FITTING M5 MALE is an improved 5 mm male fitting with captured O-ring which replaces the older 10-15 FITTING M5 MALE. It allows you to screw directly into any of the SLSA-1 Suspensions. | | | | SLSA-1<br>Suspensions |
| 10-32 FITTING<br>UNF MALE<br><br>BM10-32 |  | The 10-32 Fitting UNF Male is a 10-32 UNF Male fitting. It allows you to screw directly into any of the SLSA-1 Suspensions. Fits all the same cups as the 10-15 Fitting above, but in a 10-32 UNF version. Comes with captured O-ring for a vacuum tight seal. Popular alternate fitting for the North American market. | | | | SLSA-1<br>Suspensions |

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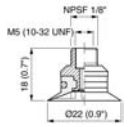
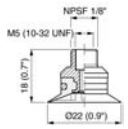
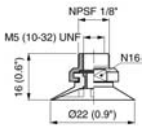
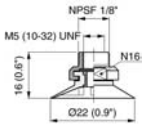
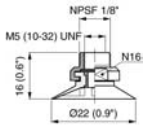
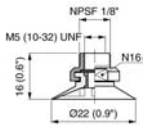
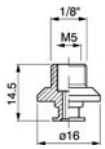
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

ANVER® CORPORATION

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **F20 Cups** | | | | | | |
| F20-NEO<br>A-3150126 |  | 0.87<br>(22.1) | 0.30<br>(8.0) | 1.87<br>(0.85) | 4.20<br>(1.91) | SLSA-1 or 2<br>Suspensions |
| F20-SIT<br>A-3150126S |  | 0.87<br>(22.1) | 0.30<br>(8.0) | 1.87<br>(0.85) | 4.20<br>(1.91) | SLSA-1 or 2<br>Suspensions |
| **F20 Cups with 20-30 Fitting** | | | | | | |
| F20-NEO/1PC FITTING<br>A-3150015A |  | 0.87<br>(22.1) | 0.70<br>(18.0) | 1.87<br>(0.85) | 4.20<br>(1.91) | SLSA-1 or 2<br>Suspensions |
| F20-SIT/1PC FITTING<br>A-3150015SA |  | 0.87<br>(22.1) | 0.70<br>(18.0) | 1.87<br>(0.85) | 4.20<br>(1.91) | SLSA-1 or 2<br>Suspensions |
| **F20 Cups with 20-30 Connection Plate** | | | | | | |
| F20-NEO/FIT/ SCREEN<br>A-3150015 |  | 0.87<br>(22.1) | 0.60<br>(16.0) | 1.87<br>(0.85) | 4.20<br>(1.91) | SLSA-1 or 2<br>Suspensions |
| F20-SIT/FIT/ SCREEN<br>A-3150015S |  | 0.87<br>(22.1) | 0.60<br>(16.0) | 1.87<br>(0.85) | 4.20<br>(1.91) | SLSA-1 or 2<br>Suspensions |
| **Fittings for F20 Cups** | | | | | | |
| 20-30 FITTING<br>A-3150196 |  | For SLSA-1 Suspensions, use the HSHN5 Double Male 5 mm adapter.<br>For SLSA-2 Suspensions, use the HS18-18F-G Double Female G 1/8" adapter. | | | | SLSA-1 or 2<br>Suspensions |
| 20-30 STRENGTHENING RING SILICONE<br>A-0101084 |  | The 20-30 Strengthening Ring is used with the above 20-30 Fitting. It simply stretches on and snaps in place. Included with cups which use the one-piece fitting. | | | | SLSA-1 or 2<br>Suspensions |

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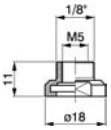
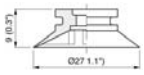
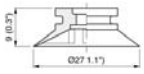
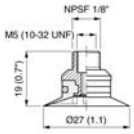
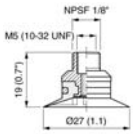
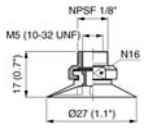
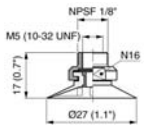
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **Fittings for F20 Cups** | | | | | | |
| 20-30 CONNECTION PLATE A-3150141 |  | For SLSA-1 Suspensions, use the HSHN5 Double Male 5 mm adapter.<br>For SLSA-2 Suspensions, use the HS18-18F-G Double Female G 1/8" adapter. | | | | SLSA-1 or 2 Suspensions |
| 20-30 LOCKING SPACER A-3150140 |  | The 20-30 Locking Spacer is used with the above 20-30 Connection Plate. It presses in from the bottom. | | | | SLSA-1 or 2 Suspensions |
| **F25 Cups** | | | | | | |
| F25-NEO A-3150127 |  | 1.08 (27.5) | 0.30 (9.0) | 2.49 (1.13) | 5.60 (2.54) | SLSA-1 or 2 Suspensions |
| F25-SIT A-3150127S |  | 1.08 (27.5) | 0.30 (9.0) | 2.49 (1.13) | 5.60 (2.54) | SLSA-1 or 2 Suspensions |
| **F25 Cups with 20-30 Fitting** | | | | | | |
| F25-NEO/1PC FITTING A-3150016A |  | 1.08 (27.5) | 0.70 (19.0) | 2.49 (1.13) | 5.60 (2.54) | SLSA-1 or 2 Suspensions |
| F25-SIT/1PC FITTING A-3150016SA |  | 1.08 (27.5) | 0.70 (19.0) | 2.49 (1.13) | 5.60 (2.54) | SLSA-1 or 2 Suspensions |
| **F25 Cups with 20-30 Connection Plate** | | | | | | |
| F25-NEO/FIT/ SCREEN A-3150016 |  | 1.08 (27.5) | 0.70 (17.0) | 2.49 (1.13) | 5.60 (2.54) | SLSA-1 or 2 Suspensions |
| F25-SIT/FIT/ SCREEN A-3150016S |  | 1.08 (27.5) | 0.70 (17.0) | 2.49 (1.13) | 5.60 (2.54) | SLSA-1 or 2 Suspensions |

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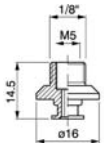
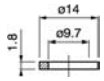
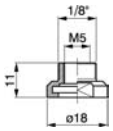
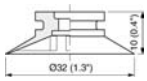
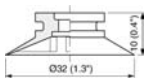
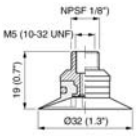
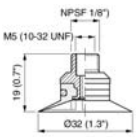
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

ANVER® CORPORATION

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **Fittings for F25 Cups** | | | | | | |
| 20-30 FITTING<br>A-3150196 |  | For SLSA-1 Suspensions, use the HSHN5 Double Male 5 mm adapter.<br>For SLSA-2 Suspensions, use the HS18-18F-G Double Female G 1/8" adapter. | | | | SLSA-1 or 2 Suspensions |
| 20-30 STRENGTHENING RING SILICONE<br>A-0101084 |  | The 20-30 Strengthening Ring is used with the above 20-30 Fitting. It simply stretches on and snaps in place. Included with cups which use the one-piece fitting. | | | | SLSA-1 or 2 Suspensions |
| 20-30 CONNECTION PLATE<br>A-3150141 |  | For SLSA-1 Suspensions, use the HSHN5 Double Male 5 mm adapter.<br>For SLSA-2 Suspensions, use the HS18-18F-G Double Female G 1/8" adapter. | | | | SLSA-1 or 2 Suspensions |
| 20-30 LOCKING SPACER<br>A-3150140 |  | The 20-30 Locking Spacer is used with the above 20-30 Connection Plate. It presses in from the bottom. | | | | SLSA-1 or 2 Suspensions |
| **F30 Cups** | | | | | | |
| F30-NEO<br>A-3150239 |  | 1.25 (31.6) | 0.40 (10.0) | 3.11 (1.41) | 7.00 (3.18) | SLSA-1 or 2 Suspensions |
| F30-SIT<br>A-3150239S |  | 1.25 (31.6) | 0.40 (10.0) | 3.11 (1.41) | 7.00 (3.18) | SLSA-1 or 2 Suspensions |
| **F30 Cups with 20-30 Fitting** | | | | | | |
| F30-NEO/1 PC FITTING<br>A-3250036A |  | 1.25 (31.6) | 0.70 (17.0) | 3.11 (1.41) | 7.00 (3.18) | SLSA-1 or 2 Suspensions |
| F30-SIT/1PC FITTING<br>A-3250036SA |  | 1.25 (31.6) | 0.70 (17.0) | 3.11 (1.41) | 7.00 (3.18) | SLSA-1 or 2 Suspensions |

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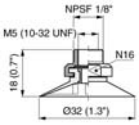
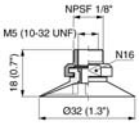
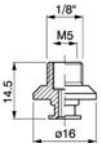
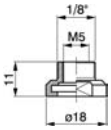
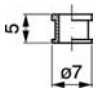
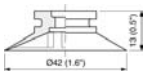
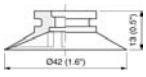
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **F30 Cups with 20-30 Connection Plate** | | | | | | |
| F30-NEO/FIT/ SCREEN<br>A-3250036 |  | 1.25 (31.6) | 0.70 (18.0) | 3.11 (1.41) | 7.00 (3.18) | SLSA-1 or 2 Suspensions |
| F30-SIT/FIT/ SCREEN<br>A-3250036S |  | 1.25 (31.6) | 0.70 (18.0) | 3.11 (1.41) | 7.00 (3.18) | SLSA-1 or 2 Suspensions |
| **Fittings for F30 Cups** | | | | | | |
| 20-30 FITTING<br>A-3150196 |  | For SLSA-1 Suspensions, use the HSHN5 Double Male 5 mm adapter.<br>For SLSA-2 Suspensions, use the HS18-18F-G Double Female G 1/8" adapter. | | | | SLSA-1 or 2 Suspensions |
| 20-30 STRENGTHENING RING SILICONE<br>A-0101084 |  | The 20-30 Strengthening Ring is used with the above 20-30 Fitting. It simply stretches on and snaps in place. Included with cups which use the one-piece fitting. | | | | SLSA-1 or 2 Suspensions |
| 20-30 CONNECTION PLATE<br>A-3150141 |  | For SLSA-1 Suspensions, use the HSHN5 Double Male 5 mm adapter.<br>For SLSA-2 Suspensions, use the HS18-18F-G Double Female G 1/8" adapter. | | | | SLSA-1 or 2 Suspensions |
| 20-30 LOCKING SPACER<br>A-3150140 |  | The 20-30 Locking Spacer is used with the above 20-30 Connection Plate. It presses in from the bottom. | | | | SLSA-1 or 2 Suspensions |
| **F40 Cups** | | | | | | |
| F40-NEO<br>A-3150129P |  | 1.66 (42.1) | 0.50 (13.0) | 4.89 (2.22) | 11.00 (4.99) | SLSA-2 Suspensions |
| F40-SIT<br>A-3150129S |  | 1.66 (42.1) | 0.50 (13.0) | 4.89 (2.22) | 11.00 (4.99) | SLSA-2 Suspensions |

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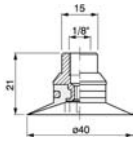
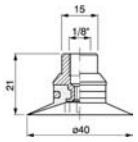
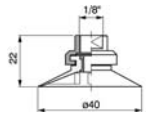
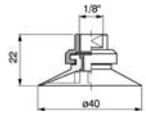
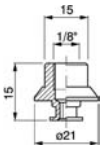
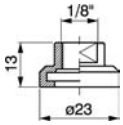
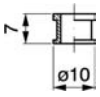
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

ANVER® CORPORATION

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **F40 Cups with 40/30-2/BL30 Fitting** | | | | | | |
| F40-NEO/1PC FITTING<br>A-3150018PA |  | 1.66<br>(42.1) | 0.80<br>(21.0) | 4.89<br>(2.22) | 11.00<br>(4.99) | SLSA-2<br>Suspensions |
| F40-SIT/1PC FITTING<br>A-3150018SA |  | 1.66<br>(42.1) | 0.80<br>(21.0) | 4.89<br>(2.22) | 11.00<br>(4.99) | SLSA-2<br>Suspensions |
| **F40 Cups with 40 Connection Plate** | | | | | | |
| F40-NEO/FIT/ SCREEN<br>A-3150018P |  | 1.66<br>(42.1) | 0.90<br>(22.0) | 4.89<br>(2.22) | 11.00<br>(4.99) | SLSA-2<br>Suspensions |
| F40-SIT/FIT/ SCREEN<br>A-3150018S |  | 1.66<br>(42.1) | 0.90<br>(22.0) | 4.89<br>(2.22) | 11.00<br>(4.99) | SLSA-2<br>Suspensions |
| **Fittings for F40 Cups** | | | | | | |
| 40/30-2/BL30 FITTING<br>A-3250001 |  | The 40/30-2/BL30 FITTING uses a Strengthening Ring 40.<br>It allows you to screw directly into any of the SLSA-2 Suspensions which have a male G 1/8" NPS Thread. | | | | SLSA-2<br>Suspensions |
| STRENGTHENING RING SILICONE 40<br>A-0101085 |  | The Strengthening Ring 40 is used with the above 40/30-2/BL30 Fitting.<br>It simply stretches on and snaps in place.<br>Included with cups which use the one-piece fitting. | | | | SLSA-2<br>Suspensions |
| 40 CONNECTION PLATE<br>A-3150143 |  | The 40 Connection Plate uses a 40 Locking Spacer.<br>It allows you to screw directly into any of the SLSA-2 Suspensions which have a male G 1/8" Thread. | | | | SLSA-2<br>Suspensions |
| 40 LOCKING SPACER<br>A-3150142 |  | The 40 Locking Spacer is used with the above 40 Connection Plate.<br>It presses in from the bottom. | | | | SLSA-2<br>Suspensions |



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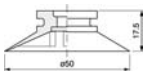
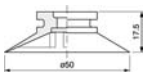
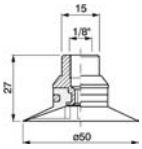
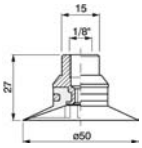
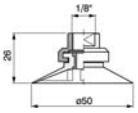
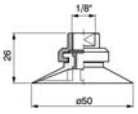
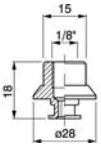
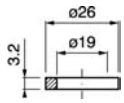
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **F50 Cups** | | | | | | |
| F50-NEO<br>A-3150130P |  | 2.10<br>(52.8) | 0.70<br>(17.5) | 9.33<br>(4.23) | 21.00<br>(9.53) | SLSA-2<br>Suspensions |
| F50-SIT<br>A-3150130S |  | 2.10<br>(52.8) | 0.70<br>(17.5) | 9.33<br>(4.23) | 21.00<br>(9.53) | SLSA-2<br>Suspensions |
| **F50 Cups with 50 Fitting** | | | | | | |
| F50-NEO/1PC FITTING<br>A-3150019PA |  | 2.10<br>(52.8) | 1.10<br>(27.0) | 9.33<br>(4.23) | 21.00<br>(9.53) | SLSA-2<br>Suspensions |
| F50-SIT/1PC FITTING<br>A-3150019SA |  | 2.10<br>(52.8) | 1.10<br>(27.0) | 9.33<br>(4.23) | 21.00<br>(9.53) | SLSA-2<br>Suspensions |
| **F50 Cups with 50 Connection Plate** | | | | | | |
| F50-NEO/FIT/ SCREEN<br>A-3150019P |  | 2.10<br>(52.8) | 1.00<br>(26.0) | 9.33<br>(4.23) | 21.00<br>(9.53) | SLSA-2<br>Suspensions |
| F50-SIT/FIT/ SCREEN<br>A-3150019S |  | 2.10<br>(52.8) | 1.00<br>(26.0) | 9.33<br>(4.23) | 21.00<br>(9.53) | SLSA-2<br>Suspensions |
| **Fittings for F50 Cups** | | | | | | |
| 50/50-2 FITTING<br>A-05AG |  | The 50/50-2 Fitting is utilized with a Strengthening Ring 50. It allows you to screw directly into any of the SLSA-2 Suspensions which have a male G 1/8" Thread. | | | | SLSA-2<br>Suspensions |
| STRENGTHENING RING SILICONE 50<br>A-0101086 |  | The Strengthening Ring 50 is used with the above 50/50-2 Fitting. It simply stretches on and snaps in place. Included with cups which use the one-piece fitting. | | | | SLSA-2<br>Suspensions |

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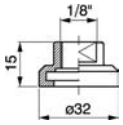
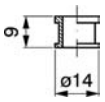
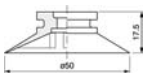
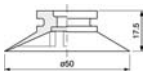
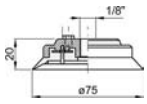
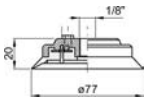
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **Fittings for F50 Cups** | | | | | | |
| 50 CONNECTION PLATE<br>A-3150145 |  | The 50 Connection Plate uses a 50 Locking Spacer. It allows you to screw directly into any of the SLSA-2 Suspensions which have a male G 1/8" Thread. | | | | SLSA-2 Suspensions |
| 50 LOCKING SPACER<br>A-3150144 |  | The 50 Locking Spacer is used with the above 50 Connection Plate. It presses in from the bottom. | | | | SLSA-2 Suspensions |
| **F75 Cups** | | | | | | |
| F75-NEO<br>A-3150131P |  | 3.02 (76.5) | 0.60 (14.0) | 26.67 (12.10) | 60.00 (27.22) | SLSA-2 Suspensions |
| F75-SIT<br>A-3150131S |  | 3.02 (76.5) | 0.60 (14.0) | 26.67 (12.10) | 60.00 (27.22) | SLSA-2 Suspensions |
| **F75 Cups with 75 Fitting** | | | | | | |
| F75-NEO/FIT/ SCREEN 1/8<br>A-3250032P |  | 3.02 (76.5) | 0.80 (20.0) | 26.67 (12.10) | 60.00 (27.22) | SLSA-2 Suspensions |
| F75-SIT/FIT/ SCREEN 1/8<br>A-3250032S |  | 3.03 (77.0) | 0.80 (20.0) | 26.67 (12.10) | 60.00 (27.22) | SLSA-2 Suspensions |



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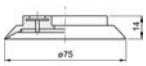
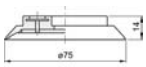
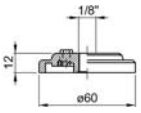
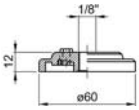
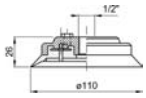
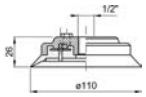
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **F75 Cups with 75 Connection Plate** | | | | | | |
| F75-NEO/CON PLATE A-3150037P |  | 3.02 (76.5) | 0.60 (14.0) | 26.67 (12.10) | 60.00 (27.22) | SLSA-2 Suspensions |
| F75-SIT/CON PLATE A-3150037S |  | 3.02 (76.5) | 0.60 (14.0) | 26.67 (12.10) | 60.00 (27.22) | SLSA-2 Suspensions |
| **Fittings for F75 Cups** | | | | | | |
| 75 CONNECTION PLATE 1/8 A-3150043 |  | The 75 Connection Plate 1/8 is to be imbedded in the 75 Series suction cup's rubber portion allowing the 75 Fitting 1/8" to be held in place. | | | | SLSA-2 Suspensions |
| 75 FITTING 1/8" A-3250006 |  | The 75 Fitting 1/8" with 1/8" female center port connection with optional M5 (10/32) female port often used as a blow-off port. | | | | SLSA-2 Suspensions |
| **F110 Cups** | | | | | | |
| F110-NEO A-3150132P |  | 4.30 (112.5) | 0.70 (19.0) | 56.00 (25.40) | 126.00 (57.15) | SLSA-2 Suspensions |
| F110-SIT A-3150132S |  | 4.30 (112.5) | 0.70 (19.0) | 56.00 (25.40) | 126.00 (57.15) | SLSA-2 Suspensions |
| **F110 Cups with 110 Fitting** | | | | | | |
| F110-NEO/FIT/ SCREEN A-3150021P |  | 4.30 (112.5) | 1.00 (26.0) | 56.00 (25.40) | 126.00 (57.15) | SLSA-2 Suspensions |
| F110-SIT/FIT/ SCREEN A-3150021S |  | 4.30 (112.5) | 1.00 (26.0) | 56.00 (25.40) | 126.00 (57.15) | SLSA-2 Suspensions |

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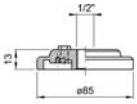
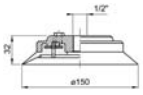
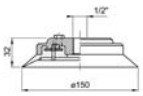
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

ANVER® CORPORATION

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **F110 Cups with 110 Connection Plate** | | | | | | |
| F110-NEO/CON PLATE A-3150038P |  | 4.30 (112.5) | 0.70 (19.0) | 56.00 (25.40) | 126.00 (57.15) | SLSA-2 Suspensions |
| F110-SIT/CON PLATE A-3150038S |  | 4.30 (112.5) | 0.60 (14.0) | 56.00 (25.40) | 126.00 (57.15) | SLSA-2 Suspensions |
| **Fittings for 110 Cups** | | | | | | |
| 110 FITTING 1/2" A-3250007 |  | The 110 Fitting 1/2" with 1/2" female center port connection with optional NPSF 1/8" female port often used as a blow-off port. | | | | SLSA-2 Suspensions |
| 110 CONNECTION PLATE A-3150044 |  | The 110 Connection Plate is to be imbedded in the 110 Series suction cup's rubber portion allowing the 110 Fitting 1/2" to be held in place. | | | | SLSA-2 Suspensions |
| **F150 Cups** | | | | | | |
| F150-NEO A-3150133P |  | 6.13 (155.6) | 1.00 (25.0) | 106.67 (48.38) | 240.00 (108.86) | SLSA-2 Suspensions |
| F150-SIT A-3150133S |  | 6.13 (155.6) | 1.00 (25.0) | 106.67 (48.38) | 240.00 (108.86) | SLSA-2 Suspensions |
| **F150 Cups with 150 Fitting** | | | | | | |
| F150-NEO/FIT/ SCREEN A-3150022P |  | 6.13 (155.6) | 1.00 (25.0) | 106.67 (48.38) | 240.00 (108.86) | SLSA-2 Suspensions |
| F150-SIT/FIT/ SCREEN A-3150022S |  | 6.13 (155.6) | 1.00 (25.0) | 106.67 (48.38) | 240.00 (108.86) | SLSA-2 Suspensions |



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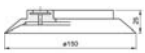
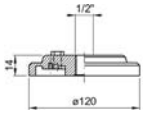
# Vacuum Cups and Suction Cups

## *Generic P-Style / F Series Flat Vacuum Cups*

| VacuumCup Description and Part Number | Dimensional Dwg. | Static* Dia. in. (mm) | Static* Height in. (mm) | Load Capacity at 24 in. Hg (609.6mm Hg) 2:1 safety factor lb (kg) | Pull-Off Capacity at 27 in. Hg (685.6mm Hg) 1:1 safety factor lb (kg) | Associated Level Compensator/ Suspension |
|---|---|---|---|---|---|---|
| **F150 Cups with 150 Connection Plate** | | | | | | |
| F150-NEO/CON PLATE A-3150039P |  | 6.13 (155.6) | 1.00 (25.0) | 106.67 (48.38) | 240.00 (108.86) | SLSA-2 Suspensions |
| F150-SIT/CON PLATE A-3150039S |  | 6.13 (155.6) | 1.00 (25.0) | 106.67 (48.38) | 240.00 (108.86) | SLSA-2 Suspensions |
| **Fittings for F150 Cups** | | | | | | |
| 150 CONNECTION PLATE A-3150045 |  | The 150 Connection Plate is to be imbedded in the 150 Series suction cup's rubber portion allowing the 150 Fitting 1/2" to be held in place. | | | | SLSA-2 Suspensions |
| 150 FITTING 1/2" A-3250008 |  | The 150 Fitting 1/2" with 1/2" female center port connection with optional NPSF 1/8" female port often used as a blow-off port. | | | | SLSA-2 Suspensions |

* All cups shown above are identical in size and shape to other manufacturers' cups. The 'static' columns represent the cup dimensions without a load as given by other manufacturers.

Note: The "G" thread is a straight pipe thread also known as BSPP, BSP, NPS or "G", commonly used in Europe, Asia and most of the world. For more information about the common pipe threads used by ANVER, please Click Here.



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