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MFG.
SUPER CUP™





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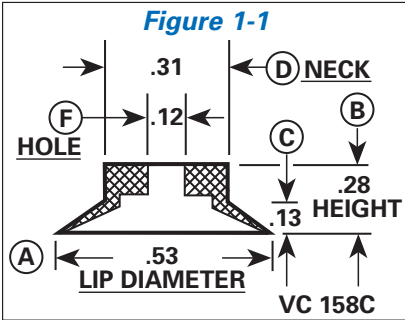


Guidelines

For Easy Vacuum Cup Selection

Proper vacuum cup selection can be divided into two categories:

A. Finding a suitable replacement to an already existing Vacuum Cup



Refer to cups by diameter (see Parts Index starting on page 48).

Step 1: Match your existing vacuum cup to one of the styles shown on pages 6 and 7.

Step 2: Turn to that page and match the lip diameter of your cup using the "A" column. Now select the part which closest represents the existing cup by comparing the rest of the dimensions. Example: If you have a cup which matches Figure 1-1, then you would turn to style "B". Next you would locate .53 in the "A" column and match the rest of the dimensions. In this case your final selection would be VC 158C.

B. Selecting a Vacuum Cup for a "new" application

Step 1: Determine the lip diameter required. (Below is a chart that will allow you to calculate the approximate lifting capacity based on the lip diameter.)

Step 2: Select style of vacuum cup preferred (pages 6 & 7).

Step 3: Find matching diameter in the "A" column.

Step 4: Cross-reference style and "A" dimension to select the proper vacuum cup.

Unless otherwise specified, parts ordered will be manufactured from our standard A50 blue vinyl material.

Note: If your selection cannot be found or you have a special application, please refer to our Technical Help Department at 513-791-7741.

| Vacuum in Inches | 1" | 1-1/4" | 1-1/2" | 1-3/4" | 2" | 2-1/4" | 3" | 3-1/8" | 3-1/2" | 4" | 4-1/2" | 5" | 5-1/4" | 5-3/4" | 6-1/2" | 7" | 8-1/2" |
|------------------|-----|--------|--------|--------|-----|--------|------|--------|--------|------|--------|------|--------|--------|--------|-------|--------|
| Mercury | | | | | | | | | | | | | | | | | |
| 5 | .5 | .8 | 1.1 | 1.5 | 2 | 2.5 | 4.5 | 5 | 6 | 8 | 10 | 12 | 13 | 16 | 20 | 24 | 35 |
| 10 | 1 | 1.6 | 2.2 | 3 | 4 | 5 | 9 | 10 | 12 | 16 | 20 | 24 | 26 | 32 | 40 | 48 | 70 |
| 15 | 1.5 | 2.4 | 3.3 | 4.5 | 6 | 7.5 | 13.5 | 15 | 18 | 24 | 30 | 36 | 39 | 48 | 60 | 72 | 105 |
| 20 | 2 | 3.2 | 4.4 | 6 | 8 | 10 | 18.0 | 20 | 24 | 32 | 40 | 48 | 52 | 64 | 80 | 96 | 140 |
| 21 | 2.1 | 3.4 | 4.6 | 6.3 | 8.4 | 10.5 | 18.9 | 21 | 25.2 | 33.6 | 42 | 50.4 | 54.6 | 67.2 | 84 | 100.8 | 147 |
| 25 | 2.5 | 4 | 5.5 | 7.5 | 10 | 12.5 | 22.5 | 25 | 30 | 40 | 50 | 60 | 65 | 80 | 100 | 120 | 175 |

Figures shown are approximate to 1/2 lb., have a 4 to 1 safety factor, and are based on the following formula:

$$\text{Lifting capacity} = \frac{.4912 \times \text{cup area} \times \text{inches vacuum}}{4}$$

Due to the variety of lip design the actual lifting capacity cannot be guaranteed.

Material Specifications



| Material | Working Temperature | Wear Resistance | Oil Resistance | Durometer |
|---------------------|---------------------|-----------------|----------------|-----------------|
| Vinyl | +32 – +125°F | Excellent | Fair | A20 – A75 Range |
| Urethane | +32 – +150°F | Good | Good | A20 – A70 Range |
| Silicone | -50 – +400°F | Good | Good | A30 – A60 Range |
| Oil Resistant Vinyl | +32 – +125°F | Good | Excellent | A40 – A60 Range |

Standard Durometer is A50 + or - 5 points.

Unless otherwise specified, parts ordered will be manufactured from our standard A50 blue vinyl material.

Other materials available:

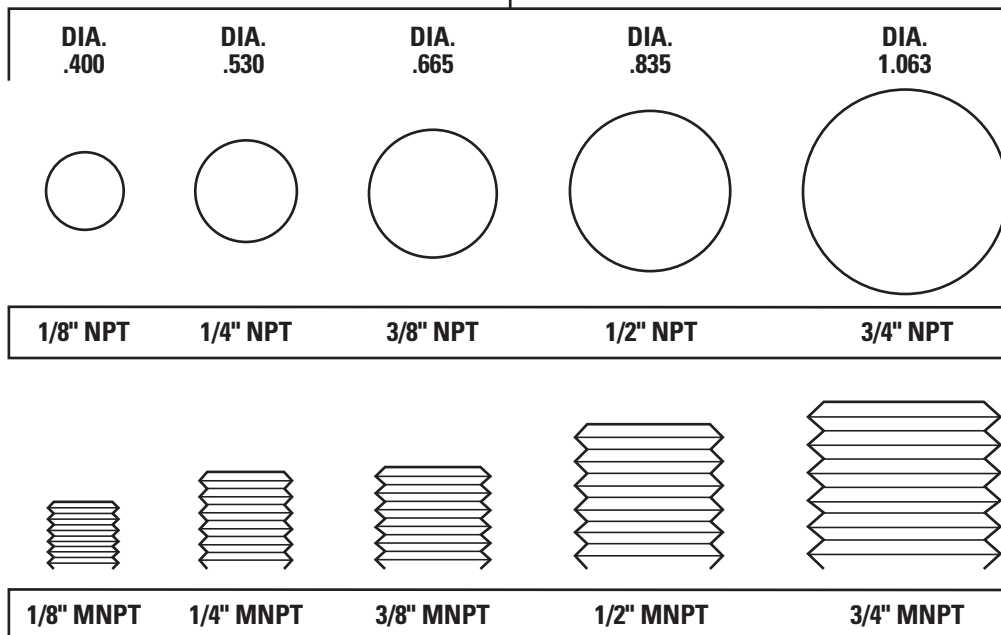
FDA Vinyl
Anti-Static Vinyl
FDA Silicone

Definitions

- Durometer:** Method by which the hardness of the material is gauged
- Cleats:** Bottom protrusions used for maintaining a larger vacuum area
- Bellows:** The fold or collapsible area that allows the cup to compress like an accordion
- Insert/Fitting:** Metallic piece bonded to the material to allow fastening by threads or bolts
- Convolution:** The folded area of a bellows cup that makes up 1 internal "V"
- Suction Cup:** Cup that does not require an external vacuum source to adhere to a surface
- Vacuum Cup:** Cup that does require the use of an external vacuum source to adhere to a surface

SIZE COMPARISONS ACTUAL OUTSIDE DIAMETERS OF PIPE THREADS

Actual Diameter Size



Most ordering problems occur by measuring the actual size of a fitting. This is the incorrect way of measuring. This sizing guide will help in determining the correct size that you need to order.

The most widely used pipe threads are National Pipe Threads (NPT). This thread has a taper that provides a leak resistant fit. NPT and FPT = Female Threads
MPT and MNPT = Male Threads

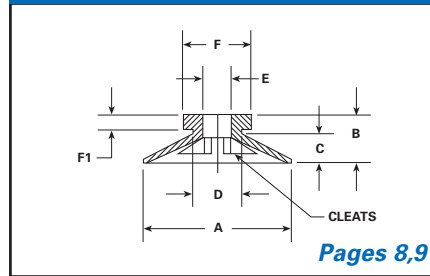
Need a custom vacuum cup made?

Vi-Cas can duplicate your existing part or work from a drawing without tooling or mold charges.

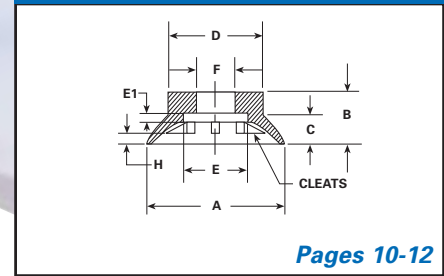
By only charging a small set-up fee and adding your part to our product line we can save you the expense of a mold.

Adapters are available. See page 30 for listing.

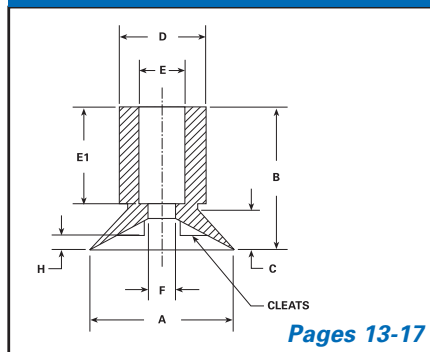
Style A



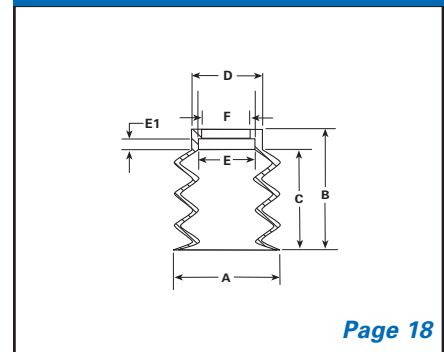
Style B



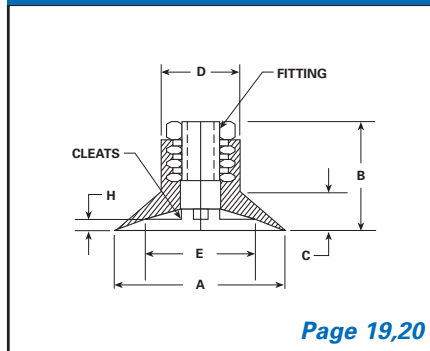
Style C



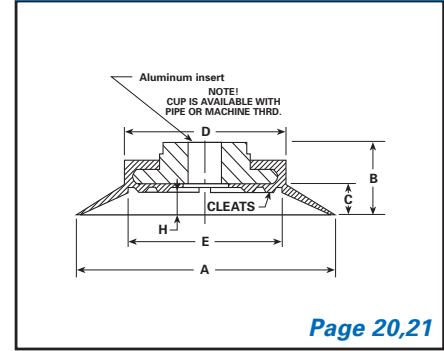
Style D



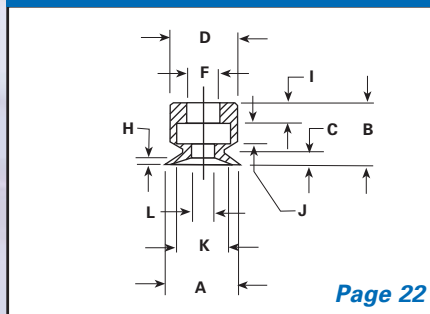
Style E



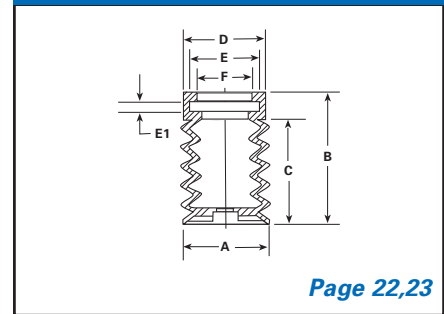
Style F



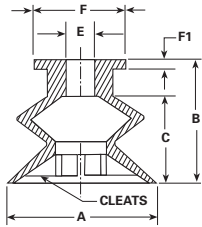
Style G



Style H

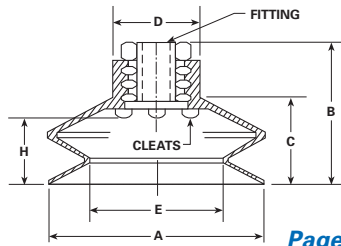


Style I



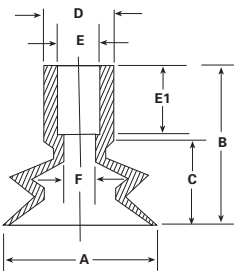
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Style J

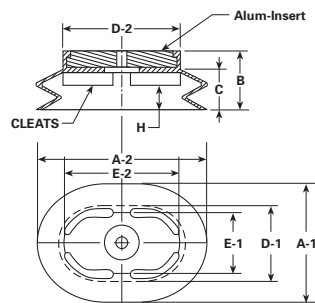


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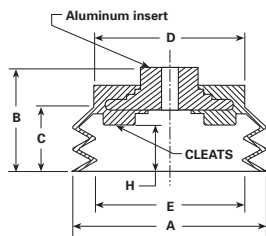
Style K



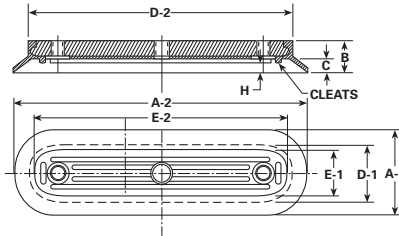
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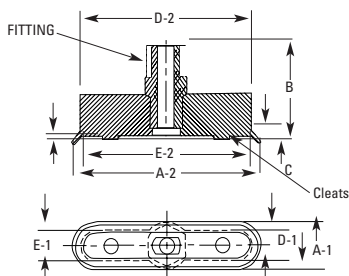
Style M



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Style O



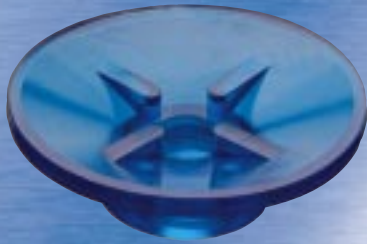
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Many cups can be provided with filters.
Please call for specific applications.



Vacuum Cups – Style A

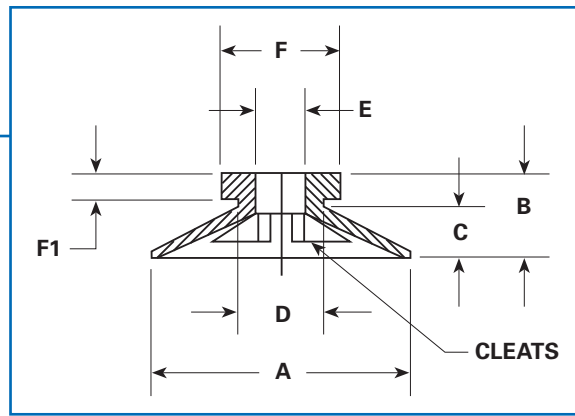
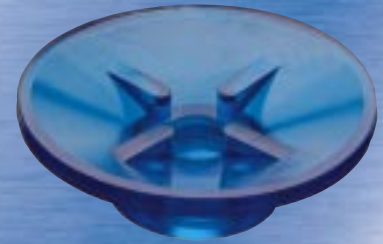
Style A



| VC No. | A | B | C | D | E | F x F1 | Cleats |
|--------|------|------|------|------|------|-------------|--------|
| 144 F | 2.46 | 0.76 | 0.51 | 0.71 | 0.37 | 0.95 x 0.18 | YES |
| 5B | 2.10 | 0.75 | 0.48 | 0.75 | 0.37 | 0.93 x 0.20 | YES |
| U50 | 2.06 | 0.69 | 0.40 | 0.75 | 0.49 | 1.05 x 0.14 | NO |
| D50P | 2.03 | 1.25 | 0.67 | 0.71 | 0.50 | 1.04 x 0.18 | NO |
| 142 | 1.85 | 0.64 | 0.40 | 0.82 | 0.25 | 1.00 x 0.17 | YES |
| 144B | 1.85 | 0.62 | 0.39 | 0.62 | 0.37 | 0.89 x 0.17 | YES |
| 144 | 1.85 | 0.62 | 0.37 | 0.75 | 0.37 | 0.95 x 0.15 | YES |
| 144A | 1.75 | 0.50 | 0.31 | 0.79 | 0.37 | 0.98 x 0.14 | NO |
| 100B | 1.67 | 0.50 | 0.39 | 0.43 | 0.25 | 0.65 x 0.09 | YES |
| 100B1 | 1.67 | 0.68 | 0.39 | 0.43 | 0.25 | 0.65 x 0.09 | YES |
| 100C1 | 1.67 | 0.54 | 0.37 | 0.42 | 0.25 | 0.60 x 0.10 | NO |
| 100A | 1.65 | 0.53 | 0.39 | 0.42 | 0.25 | 0.65 x 0.07 | YES |
| 100C | 1.65 | 0.57 | 0.42 | 0.42 | 0.25 | 0.60 x 0.09 | NO |
| 100E | 1.65 | 0.62 | 0.28 | 0.76 | 0.34 | 0.98 x 0.18 | NO |
| 100 | 1.65 | 0.50 | 0.40 | 0.43 | 0.25 | 0.60 x 0.04 | NO |
| 272 | 1.64 | 0.50 | 0.27 | 0.50 | 0.28 | 0.75 x 0.10 | YES |
| 144A1 | 1.62 | 0.64 | 0.34 | 0.75 | 0.39 | 0.95 x 0.14 | NO |
| 144D | 1.62 | 0.59 | 0.35 | 0.62 | 0.37 | 0.90 x 0.17 | YES |
| 121C | 1.62 | 0.43 | 0.33 | 0.50 | 0.18 | 0.60 x 0.07 | YES |
| U40 | 1.60 | 0.47 | 0.27 | 0.51 | 0.34 | 0.78 x 0.10 | NO |
| 50A | 1.57 | 0.89 | 0.50 | 0.42 | 0.23 | 0.60 x 0.06 | YES |
| 57 | 1.53 | 0.75 | 0.43 | 0.75 | 0.31 | 1.01 x 0.25 | NO |
| 100F | 1.51 | 0.53 | 0.51 | 0.43 | 0.25 | 0.62 x 0.09 | YES |
| 100D | 1.50 | 0.50 | 0.37 | 0.43 | 0.25 | 0.59 x 0.09 | YES |
| 105 | 1.49 | 0.76 | 0.52 | 0.43 | 0.25 | 0.62 x 0.09 | YES |
| R61 | 1.42 | 0.78 | 0.34 | 0.46 | 0.25 | 0.60 x 0.09 | YES |
| 299 | 1.40 | 0.38 | 0.21 | 0.43 | 0.25 | 0.68 x 0.07 | NO |
| 166 | 1.40 | 0.64 | 0.42 | 0.54 | 0.26 | 0.74 x 0.05 | NO |
| 2E2 | 1.35 | 0.54 | 0.31 | 0.43 | 0.31 | 0.60 x 0.09 | NO |
| 144C | 1.35 | 0.50 | 0.51 | 0.62 | 0.37 | 0.89 x 0.18 | YES |
| 57A | 1.32 | 0.62 | 0.31 | 0.75 | 0.37 | 0.95 x 0.21 | YES |
| 2A1 | 1.31 | 0.53 | 0.43 | 0.37 | 0.25 | 0.60 x 0.07 | YES |
| 57C | 1.31 | 0.62 | 0.39 | 0.75 | 0.39 | 0.93 x 0.18 | NO |
| 57B | 1.29 | 0.57 | 0.40 | 0.67 | 0.31 | 0.90 x 0.18 | NO |
| D30P | 1.26 | 0.73 | 0.33 | 0.37 | 0.20 | 0.57 x 0.08 | NO |
| R62 | 1.25 | 0.43 | 0.32 | 0.42 | 0.25 | 0.62 x 0.07 | NO |
| 2EF | 1.25 | 0.40 | 0.26 | 0.45 | 0.25 | 0.56 x 0.06 | YES |
| 57D | 1.25 | 0.43 | 0.25 | 0.62 | 0.31 | 0.87 x 0.18 | NO |
| 144C1 | 1.25 | 0.59 | 0.35 | 0.82 | 0.37 | 1.00 x 0.20 | NO |
| 9D | 1.19 | 0.25 | 0.17 | 0.47 | 0.28 | 0.57 x 0.05 | NO |
| 121 | 1.18 | 0.31 | 0.18 | 0.50 | 0.18 | 0.62 x 0.07 | YES |
| 105A | 1.17 | 0.71 | 0.33 | 0.41 | 0.22 | 0.61 x 0.09 | YES |
| 6A | 1.17 | 0.40 | 0.28 | 0.59 | 0.37 | 0.67 x 0.06 | NO |
| 317 | 1.16 | 0.30 | 0.19 | 0.47 | 0.23 | 0.90 x 0.06 | YES |
| 9A | 1.14 | 0.46 | 0.32 | 0.45 | 0.25 | 0.62 x 0.09 | YES |
| 9A1 | 1.14 | 0.54 | 0.39 | 0.43 | 0.25 | 0.62 x 0.09 | YES |
| 9B | 1.14 | 0.48 | 0.30 | 0.44 | 0.25 | 0.60 x 0.09 | NO |
| 9 | 1.14 | 0.50 | 0.34 | 0.43 | 0.25 | 0.62 x 0.09 | NO |
| 28 | 1.14 | 0.50 | 0.28 | 0.44 | 0.25 | 0.56 x 0.09 | YES |
| 381A | 1.13 | 0.64 | 0.19 | 0.53 | 0.31 | 0.67 x 0.08 | YES |
| 120 | 1.06 | 0.31 | 0.22 | 0.43 | 0.29 | 0.56 x 0.03 | NO |
| F25 | 1.06 | 0.35 | 0.15 | 0.37 | 0.20 | 0.55 x 0.07 | YES |
| 9C | 1.04 | 0.56 | 0.35 | 0.43 | 0.27 | 0.60 x 0.09 | YES |
| 20 | 1.04 | 0.26 | 0.18 | 0.45 | 0.25 | 0.57 x 0.04 | NO |
| 36J | 1.03 | 0.34 | 0.25 | 0.43 | 0.25 | 0.55 x 0.06 | YES |
| 141 | 1.01 | 0.60 | 0.34 | 0.90 | 0.31 | 0.87 x 0.18 | NO |



Style A



| VC No. | A | B | C | D | E | F x F1 | Cleats |
|-----------|------|------|------|------|------|-------------|--------|
| 36A | 1.00 | 0.35 | 0.25 | 0.43 | 0.25 | 0.65 x 0.09 | NO |
| 36B | 1.00 | 0.34 | 0.25 | 0.42 | 0.24 | 0.56 x 0.07 | YES |
| 36C | 1.00 | 0.29 | 0.25 | 0.46 | 0.26 | 0.56 x 0.06 | NO |
| 36D | 1.00 | 0.34 | 0.18 | 0.45 | 0.26 | 0.62 x 0.07 | YES |
| 36F | 1.00 | 0.39 | 0.21 | 0.43 | 0.25 | 0.61 x 0.75 | NO |
| 36G | 1.00 | 0.34 | 0.23 | 0.43 | 0.25 | 0.62 x 0.07 | YES |
| 36H | 1.00 | 0.34 | 0.21 | 0.45 | 0.25 | 0.62 x 0.07 | NO |
| 36 | 1.00 | 0.42 | 0.25 | 0.43 | 0.25 | 0.62 x 0.07 | NO |
| 184 | 1.00 | 1.06 | 0.21 | 0.37 | 0.21 | 0.50 x 0.18 | NO |
| 26 | 0.96 | 0.62 | 0.37 | 0.37 | 0.18 | 0.56 x 0.08 | NO |
| U20 | 0.87 | 0.31 | 0.08 | 0.38 | 0.19 | 0.53 x 0.10 | NO |
| D20P | 0.84 | 0.50 | 0.21 | 0.37 | 0.18 | 0.56 x 0.07 | NO |
| 41 | 0.82 | 0.29 | 0.19 | 0.40 | 0.19 | 0.59 x 0.06 | NO |
| 381 | 0.80 | 0.63 | 0.17 | 0.40 | 0.27 | 0.55 x 0.08 | YES |
| 41G | 0.80 | 0.39 | 0.22 | 0.42 | 0.13 | 0.63 x 0.10 | NO |
| 170 | 0.79 | 0.25 | 0.09 | 0.31 | 0.18 | 0.42 x 0.09 | NO |
| 48 | 0.78 | 0.29 | 0.62 | 0.34 | 0.25 | 0.37 x 0.06 | NO |
| 41E | 0.76 | 0.39 | 0.12 | 0.34 | 0.20 | 0.54 x 0.09 | NO |
| 41F | 0.76 | 0.20 | 0.14 | 0.43 | 0.26 | 0.75 x 0.04 | NO |
| 263 | 0.72 | 0.37 | 0.12 | 0.50 | 0.13 | 0.62 x 0.09 | YES |
| 41A | 0.71 | 0.43 | 0.25 | 0.40 | 0.18 | 0.56 x 0.12 | YES |
| 41B | 0.71 | 0.43 | 0.25 | 0.40 | 0.18 | 0.56 x 0.12 | NO |
| 41D | 0.71 | 0.42 | 0.23 | 0.39 | 0.21 | 0.54 x 0.12 | YES |
| 329 | 0.61 | 0.18 | 0.05 | 0.23 | 0.07 | 0.31 x 0.04 | NO |
| 41C | 0.60 | 0.32 | 0.14 | 0.29 | 0.18 | 0.46 x 0.09 | NO |
| 123A | 0.57 | 0.51 | 0.14 | 0.29 | 0.20 | 0.75 x 0.09 | NO |
| 123A1 | 0.57 | 0.54 | 0.18 | 0.31 | 0.18 | 0.75 x 0.09 | NO |
| 123B | 0.57 | 0.50 | 0.14 | 0.31 | 0.18 | 0.73 x 0.23 | NO |
| 167C1 | 0.56 | 0.37 | 0.78 | 0.15 | 0.06 | 0.18 x 0.09 | NO |
| 68 | 0.37 | 0.51 | 0.06 | 0.28 | 0.18 | 0.50 x 0.18 | YES |
| 1P | 0.35 | 0.54 | 0.35 | 0.35 | 0.18 | 0.50 x 0.07 | NO |
| MINI-.300 | 0.29 | 0.18 | 0.03 | 0.16 | 0.09 | 0.21 x 0.03 | NO |
| MINI-.250 | 0.23 | 0.20 | 0.04 | 0.15 | 0.09 | 0.21 x 0.03 | NO |
| MINI-.210 | 0.21 | 0.21 | 0.04 | 0.10 | 0.06 | 0.21 x 0.03 | NO |
| MINI-.200 | 0.20 | 0.21 | 0.02 | 0.15 | 0.06 | 0.22 x 0.04 | NO |

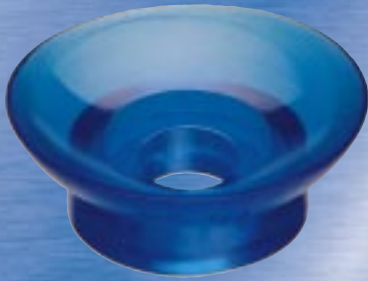
Style A Includes A-1 (oval cup)

| VC No. | A | A-1 | B | C | D | E | F x F1 | Cleats |
|-----------|------|------|------|------|------|------|-------------|--------|
| 100B2 | 1.18 | 2.00 | 0.48 | 0.35 | 0.42 | 0.25 | 0.25 x 0.63 | YES |
| 55F | 1.50 | 2.39 | 0.69 | 0.42 | 0.77 | 0.31 | 1.02 x 0.13 | NO |
| 199 | 0.69 | 1.00 | 0.59 | 0.31 | 0.50 | 0.31 | 0.62 x 0.20 | NO |
| 98 | 0.62 | 0.98 | 1.78 | 0.34 | 0.46 | 0.18 | 1.00 x 0.18 | NO |
| MINI-7x16 | 0.28 | 0.64 | 0.38 | 0.19 | 0.20 | 0.06 | 0.28 x 0.08 | YES |
| 69A | 0.19 | 0.74 | 0.60 | 0.08 | 0.38 | 0.09 | 0.50 x 0.09 | NO |
| 69B | 0.19 | 1.00 | 0.63 | 0.05 | 0.37 | 0.13 | 0.50 x 0.08 | NO |



Vacuum Cups – Style B

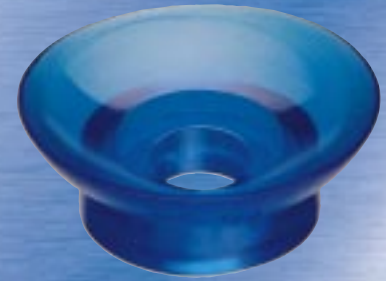
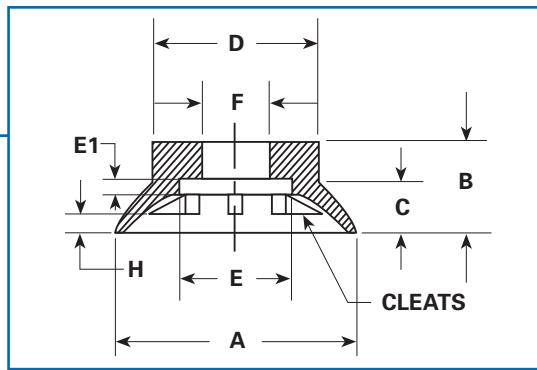
Style B



| VC No. | A | B | C | D | E x E1 | F | H | Cleats |
|--------|------|------|------|------|-------------|------|------|--------|
| 117 | 6.50 | 0.56 | 0.43 | 1.12 | 0.90 x 0.13 | 0.25 | 0.26 | NO |
| 109 | 5.18 | 1.31 | 1.00 | 3.50 | | 2.87 | 0.75 | NO |
| 112 | 5.03 | 1.39 | 1.00 | 3.50 | | 2.89 | 1.00 | NO |
| 198 | 4.00 | 0.96 | 1.04 | 1.84 | 1.14 x 0.11 | 0.70 | 0.50 | YES |
| 378 | 3.78 | 0.88 | 0.88 | 1.50 | | 0.78 | 0.47 | NO |
| 284 | 3.57 | 0.92 | 0.78 | 1.56 | 1.09 x 0.26 | 0.72 | 0.13 | YES |
| BH89 | 3.52 | 1.30 | 1.06 | 1.67 | 1.12 x 0.11 | 0.75 | 0.53 | YES |
| 115 | 3.40 | 0.82 | 0.82 | 0.93 | | 1.50 | 0.50 | NO |
| 114 | 3.37 | 0.95 | 0.85 | 1.43 | | 1.09 | 0.50 | NO |
| 155 | 3.35 | 1.13 | 1.01 | 1.25 | 1.51 x 0.21 | 0.78 | 0.28 | NO |
| 156 | 3.28 | 0.75 | 0.65 | 1.23 | 0.62 x 0.20 | 0.20 | 0.31 | NO |
| 29 | 3.25 | 0.73 | 0.73 | 1.65 | 1.23 x 0.18 | 0.75 | 0.31 | YES |
| 92A | 3.09 | 0.85 | 0.55 | 1.40 | 0.75 x 0.12 | 0.41 | 0.35 | NO |
| 92 | 3.07 | 0.96 | 0.78 | 1.07 | 0.56 x 0.23 | 0.26 | 0.37 | NO |
| 18 | 3.00 | 0.75 | 0.70 | 0.73 | | 0.50 | 0.37 | NO |
| 106C | 3.00 | 0.98 | 0.70 | 1.09 | 0.90 x 0.15 | 0.39 | 0.50 | NO |
| 153 | 2.90 | 1.00 | 1.00 | 1.39 | | 0.31 | 0.38 | NO |
| 153A | 2.90 | 1.01 | 1.01 | 1.42 | 0.70 x 0.13 | 0.40 | | NO |
| 194 | 2.87 | 0.96 | 0.37 | 1.75 | 1.35 x 0.14 | 0.56 | 0.18 | YES |
| 18D | 2.80 | 0.58 | 0.58 | 0.78 | | 0.50 | 0.41 | NO |
| 181 | 2.75 | 0.56 | 0.25 | 2.18 | | 1.60 | 0.25 | NO |
| 303 | 2.73 | 0.71 | 0.30 | 2.12 | 1.87 x 0.30 | 1.68 | 0.30 | NO |
| 106B | 2.73 | 0.87 | 0.60 | 1.09 | 0.90 x 0.25 | 0.25 | 0.43 | NO |
| 70B | 2.67 | 0.80 | 0.50 | 1.50 | 1.00 x 0.12 | 0.50 | 0.32 | NO |
| 62 | 2.65 | 1.10 | 1.10 | 0.76 | | 0.45 | 0.79 | YES |
| 116 | 2.62 | 0.82 | 0.82 | 1.20 | | 0.75 | 0.56 | NO |
| 385 | 2.58 | 0.44 | 0.14 | 1.99 | 1.80 x 0.19 | 0.39 | 0.17 | YES |
| 325 | 2.57 | 1.00 | 0.76 | 0.59 | 1.0 x 0.09 | 0.40 | 0.35 | NO |
| 59D | 2.50 | 0.81 | 0.30 | 1.25 | 0.63 x 0.14 | 0.31 | 0.11 | YES |
| 70A | 2.50 | 0.79 | 0.60 | 1.56 | | 0.56 | 0.38 | NO |
| 106 | 2.50 | 0.76 | 0.53 | 1.09 | 0.91 x 0.12 | 0.25 | 0.37 | NO |
| 106PG | 2.50 | 1.00 | 0.56 | 1.09 | 0.90 x 0.12 | 0.37 | 0.37 | NO |
| 185 | 2.46 | 1.48 | 0.67 | 1.15 | | 0.75 | 0.50 | NO |
| 171 | 2.43 | 0.75 | 0.46 | 1.06 | 1.00 x 0.12 | 0.50 | 0.37 | NO |
| 91B | 2.37 | 0.98 | 0.51 | 1.23 | 0.57 x 0.31 | 0.39 | 0.25 | NO |
| 91 | 2.32 | 0.93 | 0.63 | 0.89 | 0.56 x 0.28 | 0.25 | 0.28 | NO |
| BH60F | 2.31 | 1.42 | 0.56 | 1.58 | 1.20 x 0.22 | 0.75 | 0.57 | NO |
| 198A | 2.29 | 0.90 | 0.56 | 1.56 | 1.15 x 0.32 | 0.75 | 0.50 | YES |
| 91A | 2.20 | 0.92 | 0.53 | 0.89 | 0.56 x 0.25 | 0.25 | 0.50 | NO |
| 54HA | 2.15 | 0.85 | 0.45 | 1.37 | 0.70 x 0.13 | 0.40 | 0.35 | NO |
| 54H | 2.13 | 0.81 | 0.30 | 1.25 | 0.63 x 0.14 | 0.31 | 0.11 | YES |
| 5A | 2.10 | 0.71 | 0.45 | 1.37 | 0.75 x 0.12 | 0.56 | 0.12 | YES |
| 5 | 2.09 | 0.71 | 0.87 | 1.35 | 0.87 x 0.17 | 0.56 | 0.15 | YES |
| 54G | 2.09 | 0.81 | 0.40 | 1.35 | 1.00 x 0.25 | 0.31 | 0.37 | NO |
| 54E | 2.07 | 0.70 | 0.29 | 1.20 | 0.93 x 0.25 | 0.54 | 0.18 | NO |
| 54E1 | 2.07 | 0.70 | 0.34 | 1.20 | 0.93 x 0.25 | 0.43 | 0.25 | NO |
| 46 | 2.04 | 0.71 | 0.45 | 1.28 | 0.87 x 0.10 | 0.50 | 0.25 | NO |
| 106A | 2.03 | 0.56 | 0.43 | 1.12 | 0.90 x 0.13 | 0.25 | 0.26 | NO |
| 59 | 2.00 | 0.65 | 0.25 | 1.56 | 0.75 x 0.25 | 0.25 | 0.25 | YES |
| 99 | 2.00 | 1.14 | 0.35 | 0.98 | 0.50 x 0.42 | 0.25 | 0.37 | NO |
| 149 | 2.00 | 1.03 | 0.09 | 1.34 | 0.75 x 0.18 | 0.50 | 0.34 | YES |
| 168 | 2.00 | 0.67 | 0.45 | 1.09 | | 0.56 | 0.31 | NO |
| 195 | 2.00 | 0.71 | 0.21 | 1.50 | 0.38 x 0.03 | 0.25 | 0.59 | YES |
| BH50 | 2.00 | 1.00 | 0.50 | 1.00 | 0.68 x 0.43 | 0.39 | 0.25 | NO |
| 162B | 1.98 | 0.73 | 0.60 | 0.50 | | 0.50 | 0.18 | NO |
| 162 | 1.98 | 0.57 | 0.51 | 0.37 | | 0.31 | 0.37 | NO |
| 54E2 | 1.98 | 0.62 | 0.62 | 1.03 | 0.78 x 0.15 | 0.31 | 0.14 | NO |
| BH50-2 | 1.95 | 1.25 | 0.50 | 1.58 | 1.20 x 0.28 | 0.75 | 0.40 | NO |
| 54 | 1.93 | 0.75 | 0.42 | 1.37 | 0.92 x 0.25 | 0.56 | 0.31 | NO |
| 54-1 | 1.90 | 0.73 | 0.42 | 1.35 | 0.92 x 0.12 | 0.62 | 0.37 | NO |
| 45 | 1.84 | 0.84 | 0.48 | 0.87 | 0.57 x 0.20 | 0.23 | 0.28 | NO |
| 150 | 1.82 | 0.70 | 0.60 | 0.82 | | 0.31 | 0.25 | NO |



Style B



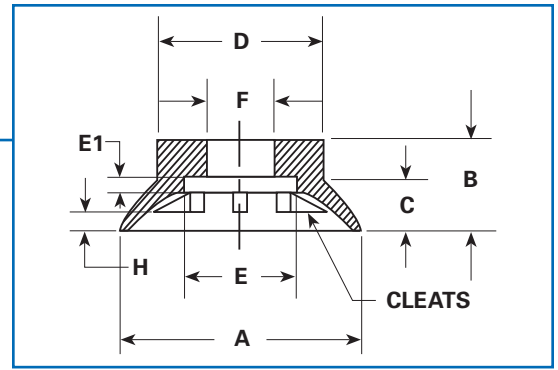
| VC No. | A | B | C | D | E x E1 | F | H | Cleats |
|--------|------|------|------|------|-------------|------|------|--------|
| 149A | 1.81 | 1.09 | 0.25 | 0.75 | 0.75 x 0.21 | 0.50 | 0.50 | YES |
| 54A | 1.78 | 0.79 | 0.39 | 1.26 | 0.93 x 0.12 | 0.56 | 0.25 | NO |
| 111 | 1.75 | 0.81 | 0.09 | 1.50 | | 0.40 | | NO |
| 162A | 1.75 | 0.42 | 0.26 | 0.54 | | 0.32 | 0.12 | YES |
| 54HD | 1.71 | 0.81 | 0.32 | 1.26 | 0.92 x 0.18 | 0.56 | 0.37 | YES |
| 54K | 1.63 | 0.81 | 0.30 | 0.88 | 0.92 x 0.14 | 0.31 | 0.31 | YES |
| 54F | 1.62 | 0.81 | 0.31 | 1.14 | 0.93 x 0.25 | 0.56 | 0.25 | NO |
| 100G | 1.62 | 0.53 | 0.43 | 0.60 | | 0.38 | 0.31 | NO |
| 163 | 1.62 | 0.48 | 0.48 | 0.37 | | 0.31 | 0.32 | NO |
| 100H | 1.60 | 0.53 | 0.34 | 0.70 | 0.40 x 0.07 | 0.15 | 0.29 | NO |
| 307 | 1.58 | 0.50 | 0.11 | 0.47 | 0.31 x 0.24 | 0.25 | 0.11 | NO |
| 54B | 1.57 | 0.81 | 0.44 | 1.14 | 0.93 x 0.12 | 0.56 | 0.31 | NO |
| 100J | 1.57 | 0.48 | 0.38 | 0.63 | 0.43 x 0.09 | 0.22 | 0.14 | YES |
| BH40 | 1.57 | 1.00 | 0.45 | 0.96 | 0.70 x 0.15 | 0.39 | 0.31 | NO |
| 37 | 1.53 | 0.75 | 0.37 | 0.85 | 0.56 x 0.21 | 0.37 | 0.25 | YES |
| 210 | 1.53 | 0.45 | 0.37 | 0.73 | | 0.56 | 0.20 | NO |
| 8 | 1.51 | 0.56 | 0.35 | 0.56 | | 0.23 | 0.21 | NO |
| 54J | 1.51 | 0.65 | 0.20 | 1.48 | 0.85 x 0.15 | 0.56 | 0.12 | NO |
| 37A | 1.50 | 0.81 | 0.31 | 0.87 | 0.58 x 0.25 | 0.25 | 0.25 | NO |
| 37B | 1.50 | 0.70 | 0.40 | 0.85 | | 0.25 | 0.26 | YES |
| 87 | 1.50 | 0.43 | 0.37 | 0.56 | | 0.18 | 0.18 | NO |
| 257 | 1.43 | 0.42 | 0.23 | 0.76 | 0.54 x 0.12 | 0.31 | 0.12 | YES |
| 51A | 1.42 | 0.43 | 0.28 | 0.68 | | 0.32 | 0.18 | NO |
| 146A | 1.42 | 0.75 | 0.40 | 0.92 | 0.68 x 0.12 | 0.40 | 0.37 | NO |
| 12 | 1.40 | 0.50 | 0.50 | 0.75 | | 0.31 | 0.12 | NO |
| 146 | 1.40 | 0.70 | 0.35 | 0.87 | 0.62 x 0.25 | 0.39 | 0.50 | NO |
| 205 | 1.37 | 1.04 | 0.37 | 1.03 | 0.70 x 0.37 | 0.45 | 0.50 | NO |
| 59H | 1.37 | 0.82 | 0.41 | 0.69 | 0.53 x 0.40 | 0.31 | 0.17 | YES |
| 60A | 1.37 | 1.04 | 0.25 | 0.67 | 0.39 x 0.62 | 0.31 | 0.04 | YES |
| 132 | 1.35 | 0.48 | 0.48 | 0.54 | | 0.25 | 0.26 | NO |
| 292 | 1.33 | 0.45 | 0.23 | 0.62 | | 0.31 | 0.01 | YES |
| 67 | 1.32 | 0.90 | 0.43 | 0.62 | | 0.25 | 0.25 | NO |
| 225B | 1.32 | 0.76 | 0.43 | 0.62 | 0.62 x 0.15 | 0.32 | 0.10 | YES |
| 23A | 1.29 | 0.62 | 0.35 | 0.62 | | 0.18 | 0.04 | YES |
| 23B | 1.29 | 0.65 | 0.22 | 0.87 | | 0.31 | 0.18 | YES |
| 23 | 1.29 | 0.62 | 0.34 | 0.60 | | 0.22 | 0.26 | NO |
| 2C1 | 1.26 | 0.32 | 0.23 | 0.60 | 0.35 x 0.09 | 0.25 | 0.06 | YES |
| 54C | 1.25 | 0.75 | 0.46 | 1.04 | 0.93 x 0.12 | 0.56 | 0.31 | NO |
| R24H | 1.25 | 0.25 | 0.23 | 0.79 | | 0.60 | 0.13 | NO |
| 270 | 1.21 | 0.45 | 0.13 | 0.46 | 0.35 x 0.09 | 0.15 | 0.01 | NO |
| 88 | 1.21 | 0.75 | 0.34 | 0.78 | | 0.56 | 0.25 | NO |
| 11 | 1.18 | 0.50 | 0.26 | 0.75 | | 0.31 | 0.23 | NO |
| 121A | 1.18 | 0.29 | 0.21 | 0.60 | 0.39 x 0.04 | 0.28 | 0.01 | YES |
| 121B | 1.18 | 0.35 | 0.25 | 0.59 | 0.39 x 0.09 | 0.18 | 0.12 | NO |
| 133A | 1.18 | 0.48 | 0.40 | 0.60 | | 0.18 | 0.25 | NO |
| 138A | 1.18 | 0.53 | 0.20 | 0.59 | 0.39 x 0.10 | 0.31 | 0.18 | NO |
| 177 | 1.17 | 0.37 | 0.26 | 0.48 | | 0.26 | 0.18 | NO |
| BH30 | 1.17 | 0.87 | 0.25 | 0.78 | 0.62 x 0.18 | 0.39 | 0.25 | NO |
| 6 | 1.12 | 0.54 | 0.50 | 0.39 | | 0.21 | 0.31 | NO |
| 186 | 1.12 | 0.31 | 0.31 | 0.50 | | 0.31 | 0.25 | NO |
| 207A | 1.12 | 0.48 | 0.48 | 0.53 | 0.43 x 0.09 | 0.23 | 0.07 | NO |
| 107 | 1.11 | 0.75 | 0.75 | 0.78 | 0.56 x 0.25 | 0.25 | 0.26 | NO |
| 323 | 1.10 | 0.40 | 0.40 | 0.58 | | 0.40 | 0.23 | NO |
| 193 | 1.09 | 0.48 | 0.20 | 0.75 | 0.56 x 0.09 | 0.37 | 0.17 | NO |
| 36E | 1.07 | 0.26 | 0.21 | 0.46 | | 0.40 | 0.09 | NO |
| 279D | 1.06 | 0.18 | 0.14 | 0.57 | | 0.20 | 0.04 | YES |

(continued on next page)

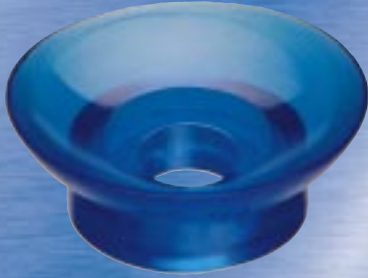


Vacuum Cups

Style B (continued)



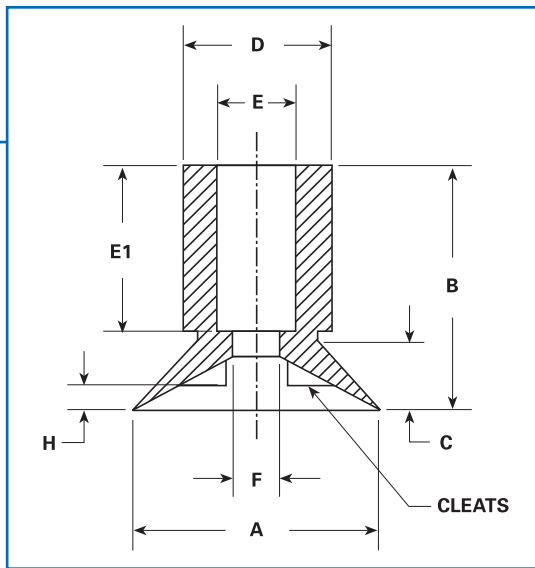
Style B



| VC No. | A | B | C | D | E x E1 | F | H | Cleats |
|-----------|------|------|------|------|--------------|------|------|--------|
| 10A | 1.04 | 0.59 | 0.25 | 0.72 | | 0.28 | 0.25 | NO |
| 10 | 1.04 | 0.51 | 0.28 | 0.62 | | 0.31 | 0.35 | NO |
| 59G | 1.01 | 0.72 | 0.18 | 0.70 | 0.47 x 0.27 | 0.28 | 0.10 | YES |
| 177A | 1.00 | 0.31 | 0.23 | 0.48 | | 0.25 | 0.15 | NO |
| 148 | 1.00 | 0.42 | 0.14 | 0.54 | | 0.37 | 0.14 | NO |
| 159 | 1.00 | 0.62 | 0.28 | 0.48 | | 0.18 | 0.07 | YES |
| 207D1 | 1.00 | 0.56 | 0.26 | 0.62 | 0.45 x 0.12 | 0.25 | 0.09 | NO |
| 230 | 0.93 | 0.31 | 0.18 | 0.48 | | 0.26 | 0.31 | NO |
| 165 | 0.87 | 0.37 | 0.12 | 0.66 | | 0.50 | 0.08 | NO |
| 279 | 0.85 | 0.16 | 0.12 | 0.47 | 0.50 x 0.03 | 0.25 | 0.06 | NO |
| 197 | 0.85 | 0.48 | 0.17 | 0.50 | 0.45 x 0.21 | 0.26 | 0.10 | NO |
| 257A | 0.85 | 0.32 | 0.20 | 0.46 | 0.35 x 0.07 | 0.23 | 0.09 | NO |
| 84 | 0.84 | 0.50 | 0.23 | 0.50 | | 0.18 | 0.29 | NO |
| 279A | 0.83 | 0.15 | 0.12 | 0.42 | 0.46 x 0.03 | 0.19 | 0.04 | NO |
| 151 | 0.81 | 0.60 | 0.73 | 0.54 | | 0.25 | 0.23 | NO |
| 207B | 0.81 | 0.40 | 0.17 | 0.57 | 0.43 x 0.12 | 0.18 | 0.07 | NO |
| 45A | 0.79 | 0.45 | 0.18 | 0.42 | 0.35 x 0.14 | 0.15 | 0.12 | NO |
| 228 | 0.79 | 0.60 | 0.15 | 0.46 | 0.75 x 0.31 | 0.18 | 0.09 | NO |
| 279C | 0.79 | 0.16 | 0.10 | 0.59 | | 0.35 | 0.09 | NO |
| 108 | 0.78 | 0.39 | 0.21 | 0.46 | | 0.25 | 0.04 | NO |
| 66B | 0.75 | 0.92 | 0.12 | 0.45 | | 0.25 | 0.14 | NO |
| 158A | 0.75 | 0.37 | 0.18 | 0.44 | | 0.17 | 0.09 | YES |
| 230A | 0.75 | 0.17 | 0.09 | 0.42 | | 0.26 | 0.17 | NO |
| 279B | 0.72 | 0.18 | 0.13 | 0.31 | | 0.15 | 0.06 | NO |
| 158 | 0.71 | 0.43 | 0.04 | 0.45 | | 0.18 | 0.06 | YES |
| 286 | 0.71 | 0.30 | 0.30 | 0.22 | | 0.06 | 0.04 | YES |
| 133 | 0.67 | 0.25 | 0.21 | 0.37 | | 0.18 | 0.15 | NO |
| 248 | 0.67 | 0.46 | 0.10 | 0.35 | 0.17 x 0.25 | 0.15 | 0.09 | NO |
| 43 | 0.65 | 0.32 | 0.12 | 0.37 | | 0.15 | 0.06 | NO |
| 207 | 0.62 | 0.34 | 0.12 | 0.46 | 0.31 x 0.12 | 0.18 | 0.09 | NO |
| 158F | 0.54 | 0.28 | 0.12 | 0.31 | 0.17 x 0.14 | 0.12 | 0.07 | YES |
| 158C | 0.53 | 0.28 | 0.13 | 0.31 | 0.25 x 0.10 | 0.15 | 0.10 | YES |
| 172 | 0.53 | 0.70 | 0.09 | 0.35 | | 0.18 | 0.09 | NO |
| 207C | 0.50 | 0.34 | 0.12 | 0.42 | 0.23 x 0.12 | 0.18 | 0.07 | NO |
| 206 | 0.42 | 0.48 | 0.07 | 0.35 | 0.25 x 0.12 | 0.20 | 0.03 | NO |
| 207D | 0.40 | 0.34 | 0.08 | 0.43 | 0.21 x 0.12 | 0.18 | 0.06 | NO |
| MINI-.400 | 0.40 | 0.30 | 0.05 | 0.21 | | 0.08 | 0.02 | NO |
| 158D | 0.38 | 0.29 | 0.12 | 0.29 | 0.23 x 0.06 | 0.17 | 0.06 | YES |
| 164A | 0.37 | 0.31 | 0.06 | 0.31 | 0.23 x 0.20 | 0.18 | 0.06 | NO |
| 165A | 0.37 | 0.25 | 0.25 | 0.37 | 0.31 x 0.109 | 0.21 | 0.03 | NO |
| 164 | 0.37 | 0.34 | 0.07 | 0.28 | 0.25 x 0.09 | 0.21 | 0.07 | NO |
| MINI-.224 | 0.32 | 0.19 | 0.07 | 0.31 | | 0.15 | 0.04 | NO |
| MINI-.299 | 0.31 | 0.25 | 0.07 | 0.34 | | 0.20 | | NO |
| MINI-.310 | 0.31 | 0.26 | 0.04 | 0.20 | 0.09 x 0.09 | 0.04 | 0.03 | NO |
| MINI-.312 | 0.29 | 0.46 | 0.04 | 0.26 | | 0.18 | | YES |
| MINI-.260 | 0.26 | 0.09 | 0.03 | 0.18 | | 0.12 | | NO |
| MINI-.255 | 0.25 | 0.39 | 0.04 | 0.18 | | 0.09 | 0.06 | NO |

Vacuum Cups

Style C



Style C



| VC No. | A | B | C | D | E x E1 | F | H | Cleats |
|--------|------|------|------|------|-------------|------|------|--------|
| 244 | 3.84 | 2.20 | 0.67 | 1.50 | | 0.78 | 0.25 | NO |
| 204 | 3.50 | 0.94 | 0.64 | 0.98 | | 0.38 | 0.37 | NO |
| 15 | 3.45 | 1.39 | 0.70 | 1.14 | | 0.62 | 0.43 | NO |
| 30A | 3.09 | 1.84 | 0.59 | 1.09 | 0.67 x 0.84 | 0.58 | 0.25 | NO |
| 30B | 3.09 | 2.23 | 0.69 | 1.12 | 0.53 x 1.17 | 0.50 | 0.50 | NO |
| 31A | 3.09 | 1.31 | 0.61 | 1.16 | | 0.48 | 0.50 | YES |
| 30 | 3.06 | 1.39 | 0.64 | 1.14 | | 0.50 | 0.37 | NO |
| 18A | 2.93 | 0.86 | 0.72 | 1.21 | 0.45 x 0.35 | 0.31 | 0.32 | YES |
| 237 | 2.77 | 1.22 | 0.52 | 0.98 | 0.45 x 0.65 | 0.31 | 0.51 | YES |
| 355 | 2.69 | 0.63 | 0.63 | 0.88 | | 0.75 | 0.57 | NO |
| 47N | 2.65 | 0.23 | 0.80 | 0.06 | 0.41 x 0.57 | 0.23 | 0.46 | NO |
| 1 | 2.62 | 2.23 | 1.08 | 1.03 | 0.63 x 0.89 | 0.33 | 0.25 | YES |
| 49C | 2.55 | 2.03 | 0.64 | 0.98 | 0.62 x 1.15 | 0.31 | 0.62 | YES |
| 49D | 2.55 | 2.00 | 0.71 | 1.00 | 0.63 x 1.44 | 0.31 | 0.17 | YES |
| 204A | 2.51 | 1.06 | 0.67 | 0.98 | | 0.38 | 0.42 | NO |
| 254 | 2.50 | 1.50 | 0.50 | 1.25 | 0.94 x 0.93 | 0.56 | 0.45 | NO |
| 4 | 2.50 | 2.02 | 0.33 | 1.00 | | 0.38 | 0.62 | YES |
| 13A | 2.48 | 1.36 | 0.64 | 1.17 | 0.50 x 0.50 | 0.63 | 0.37 | YES |
| 49 | 2.47 | 1.91 | 0.81 | 1.03 | 0.62 x 0.90 | 0.38 | 0.56 | YES |
| 13 | 2.45 | 1.35 | 0.69 | 1.17 | 0.64 x 0.51 | 0.63 | 0.40 | NO |
| 101 | 2.40 | 1.25 | 0.56 | 0.73 | | 0.38 | 0.31 | YES |
| 242 | 2.34 | 2.48 | 0.88 | 1.50 | 0.95 x 1.59 | 0.38 | 0.48 | NO |
| 204B | 2.03 | 0.70 | 0.44 | 0.81 | 0.38 x 0.29 | 0.50 | 0.46 | NO |
| 365 | 2.00 | 1.92 | 0.46 | 0.97 | 0.67 x 0.99 | 0.25 | 0.32 | NO |
| 58 | 1.98 | 1.05 | 0.44 | 0.73 | | 0.38 | 0.18 | YES |
| 58A | 1.98 | 1.00 | 0.45 | 0.75 | 0.31 x 0.45 | 0.18 | 0.25 | NO |
| 52 | 1.97 | 1.34 | 0.84 | 0.73 | | 0.25 | 0.75 | NO |
| 47N1 | 1.91 | 1.14 | 0.59 | 0.88 | 0.39 x 0.56 | 0.19 | 0.34 | NO |
| 3A | 1.86 | 0.97 | 0.30 | 0.97 | 0.63 x 0.36 | 0.25 | 0.31 | YES |
| 3 | 1.86 | 1.92 | 0.30 | 0.97 | 0.63 x 0.93 | 0.27 | 0.31 | YES |
| 316A | 1.75 | 0.66 | 0.36 | 0.61 | | 0.39 | 0.13 | NO |
| 204C | 1.75 | 0.92 | 0.47 | 0.81 | 0.38 x 0.50 | 0.50 | 0.31 | NO |
| 100S | 1.70 | 0.72 | 0.34 | 0.72 | 0.38 x 0.43 | 0.52 | 0.20 | NO |
| 100S1 | 1.67 | 0.77 | 0.33 | 0.73 | | 0.38 | 0.29 | YES |
| 127A | 1.66 | 1.11 | 0.33 | 0.98 | | 0.45 | 0.25 | NO |
| 51 | 1.64 | 1.95 | 0.30 | 0.94 | 0.64 x 0.85 | 0.25 | 0.20 | NO |
| 7 | 1.64 | 1.47 | 0.28 | 0.91 | | 0.33 | 0.17 | NO |
| 7A | 1.64 | 1.47 | 0.23 | 0.91 | 0.63 x 0.93 | 0.25 | 0.15 | NO |
| 7-1 | 1.63 | 1.50 | 0.27 | 0.92 | | 0.38 | 0.18 | NO |
| 133B | 1.62 | 0.66 | 0.61 | 0.63 | | 0.19 | 0.39 | NO |
| 7C | 1.60 | 1.50 | 0.28 | 0.90 | 0.50 x 0.96 | 0.25 | 0.16 | NO |
| 373 | 1.59 | 0.78 | 0.22 | 0.63 | 0.31 x 0.59 | 0.19 | 0.07 | YES |

(continued on next page)

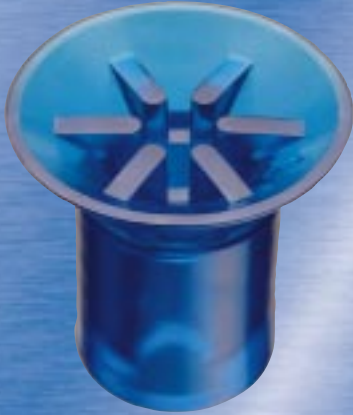
NOTE:
Style C cups
WITH
E and E1
dimensions
have a counter-bore
mounting hole.

Style C cups
WITHOUT
E and E1
dimensions
(F only)
have a thru
mounting hole.



Vacuum Cups – Style C *(continued)*

Style C



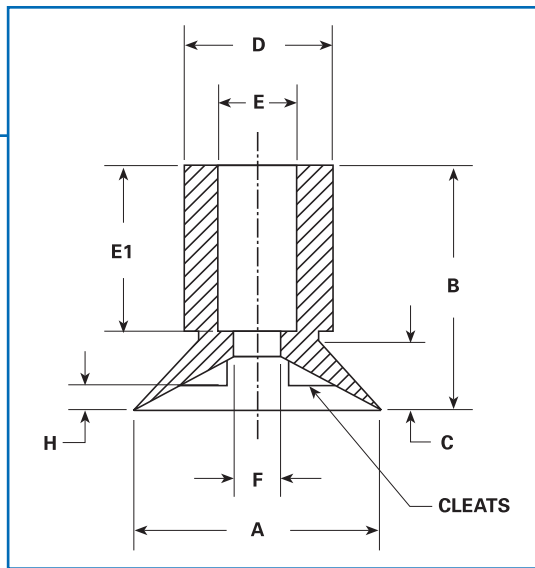
| VC No. | A | B | C | D | E x E1 | F | H | Cleats |
|--------|------|------|------|------|-------------|------|------|--------|
| 233 | 1.59 | 0.61 | 0.31 | 0.98 | | 0.44 | 0.18 | NO |
| 47L | 1.58 | 1.19 | 0.72 | 0.73 | 0.41 x 0.62 | 0.14 | 0.40 | NO |
| 49A | 1.56 | 1.55 | 0.38 | 0.97 | 0.38 x 0.89 | 0.31 | 0.37 | YES |
| 49A1 | 1.56 | 1.02 | 0.37 | 0.96 | | 0.38 | 0.09 | NO |
| 49B | 1.56 | 1.81 | 0.38 | 0.97 | 0.61 x 0.75 | 0.33 | 0.37 | YES |
| 50 | 1.56 | 0.94 | 0.47 | 0.48 | | 0.23 | 0.26 | YES |
| 7B | 1.52 | 1.03 | 0.34 | 0.78 | 0.38 x 0.67 | 0.19 | 0.17 | YES |
| 127 | 1.50 | 1.17 | 0.33 | 0.98 | | 0.45 | 0.32 | NO |
| 143 | 1.50 | 2.52 | 0.30 | 0.84 | 0.63 x 0.89 | 0.31 | 0.15 | NO |
| 204D | 1.50 | 0.88 | 0.42 | 0.80 | | 0.50 | 0.29 | NO |
| 97 | 1.43 | 0.58 | 0.20 | 0.69 | 0.47 x 0.42 | 0.56 | 0.06 | YES |
| 126 | 1.39 | 0.92 | 0.20 | 0.98 | | 0.44 | 0.15 | NO |
| 177B | 1.39 | 0.35 | 0.30 | 0.47 | | 0.24 | 0.15 | NO |
| 177C | 1.39 | 0.71 | 0.31 | 0.59 | | 0.38 | 0.20 | NO |
| 131 | 1.38 | 1.54 | 0.45 | 0.61 | 0.39 x 1.06 | 0.27 | 0.28 | YES |
| 360 | 1.38 | 0.56 | 0.18 | 0.75 | | 0.28 | 0.18 | NO |
| 2E1 | 1.37 | 1.00 | 0.27 | 0.61 | | 0.31 | 0.09 | YES |
| 2E | 1.36 | 1.09 | 0.28 | 0.63 | | 0.38 | 0.14 | YES |
| 60 | 1.32 | 1.06 | 0.41 | 0.73 | 0.50 x 0.75 | 0.25 | 0.23 | NO |
| 65 | 1.32 | 1.05 | 0.27 | 0.69 | 0.42 x 0.57 | 0.25 | 0.12 | YES |
| 2A | 1.31 | 0.77 | 0.23 | 0.63 | | 0.25 | 0.11 | YES |
| 2EB | 1.31 | 0.95 | 0.30 | 0.64 | | 0.19 | 0.10 | YES |
| 2EH | 1.31 | 1.04 | 0.27 | 0.63 | | 0.38 | 0.12 | YES |
| 2C | 1.29 | 0.80 | 0.25 | 0.61 | | 0.25 | 0.11 | NO |
| 2 | 1.28 | 1.00 | 0.23 | 0.63 | 0.41 x 0.54 | 0.25 | 0.15 | YES |
| 64 | 1.28 | 1.07 | 0.28 | 0.67 | 0.42 x 0.62 | 0.28 | 0.11 | NO |
| 2D | 1.25 | 1.00 | 0.23 | 0.61 | 0.41 x 0.58 | 0.25 | 0.11 | YES |
| 42 | 1.25 | 1.11 | 0.25 | 0.61 | 0.42 x 0.62 | 0.25 | 0.05 | YES |
| 127B | 1.25 | 1.00 | 0.25 | 0.75 | | 0.56 | 0.48 | NO |
| 327 | 1.24 | 0.90 | 0.20 | 0.80 | 0.44 x 0.66 | 0.36 | 0.03 | YES |
| 110 | 1.23 | 1.00 | 0.35 | 0.53 | 0.25 x 0.60 | 0.14 | 0.23 | NO |
| 59J | 1.22 | 0.59 | 0.19 | 0.59 | 0.43 x 0.41 | 0.26 | 0.12 | YES |
| 236 | 1.21 | 1.19 | 0.38 | 0.80 | 0.39 x 0.48 | 0.23 | 0.32 | NO |
| 152 | 1.20 | 1.09 | 0.27 | 0.66 | 0.42 x 0.62 | 0.27 | 0.26 | NO |
| 2D2 | 1.19 | 0.59 | 0.18 | 0.59 | 0.44 x 0.39 | 0.23 | 0.10 | YES |
| 313B | 1.19 | 0.61 | 0.21 | 0.59 | 0.39 x 0.25 | 0.31 | 0.18 | NO |
| 127C | 1.18 | 0.93 | 0.25 | 0.61 | | 0.32 | 0.17 | NO |
| 140 | 1.18 | 0.83 | 0.36 | 0.55 | | 0.28 | 0.32 | NO |
| 301B | 1.18 | 1.38 | 0.40 | 0.83 | 0.63 x 0.98 | 0.47 | 0.25 | NO |
| 342 | 1.18 | 0.85 | 0.13 | 0.63 | 0.44 x 0.48 | 0.12 | 0.06 | YES |
| 258 | 1.17 | 0.25 | 0.08 | 0.50 | | 0.36 | 0.04 | NO |
| 110B | 1.16 | 0.48 | 0.25 | 0.31 | 0.15 x 0.23 | 0.15 | 0.16 | NO |
| 316B | 1.16 | 0.94 | 0.25 | 0.62 | | 0.32 | 0.20 | NO |
| 224 | 1.13 | 0.52 | 0.27 | 0.32 | | 0.16 | 0.16 | NO |
| 209 | 1.12 | 1.14 | 0.48 | 0.56 | | 0.38 | 0.45 | NO |
| 19 | 1.11 | 0.72 | 0.41 | 0.47 | 0.23 x 0.32 | 0.31 | 0.31 | NO |
| 118 | 1.11 | 0.66 | 0.16 | 0.48 | | 0.31 | 0.11 | NO |
| 136B | 1.10 | 0.63 | 0.16 | 0.87 | 0.47 x 0.39 | 0.47 | 0.11 | YES |
| 136C | 1.10 | 0.66 | 0.17 | 0.87 | 0.56 x 0.39 | 0.23 | 0.08 | YES |
| 354 | 1.09 | 0.38 | 0.36 | 0.58 | | 0.39 | 0.20 | NO |
| 369 | 1.09 | 0.66 | 0.18 | 0.84 | 0.43 x 0.45 | 0.25 | 0.05 | YES |
| 250 | 1.08 | 0.97 | 0.16 | 0.77 | | 0.42 | 0.06 | NO |
| 53 | 1.06 | 0.73 | 0.23 | 0.56 | | 0.23 | 0.18 | NO |
| 145 | 1.06 | 1.88 | 0.25 | 1.00 | 0.75 x 0.09 | 0.44 | 0.25 | YES |
| 160 | 1.06 | 0.77 | 0.20 | 0.50 | | 0.23 | 0.09 | YES |
| 160C | 1.06 | 0.83 | 0.20 | 0.58 | 0.28 x 0.50 | 0.23 | 0.09 | YES |
| 19A | 1.05 | 0.58 | 0.22 | 0.47 | | 0.27 | 0.18 | NO |
| 147 | 1.04 | 1.00 | 0.25 | 0.67 | 0.38 x 0.59 | 0.27 | 0.20 | NO |

NOTE:
Style C cups WITH E and E1 dimensions have a counter-bore mounting hole.

Style C cups WITHOUT E and E1 dimensions (F only) have a thru mounting hole.



Style C



| VC No. | A | B | C | D | E x E1 | F | H | Cleats |
|--------|------|------|------|------|-------------|------|------|--------|
| 14 | 1.03 | 1.01 | 0.17 | 0.69 | | 0.28 | 0.12 | NO |
| 147B | 1.03 | 0.69 | 0.25 | 0.47 | | 0.23 | 0.19 | YES |
| R10 | 1.03 | 0.52 | 0.23 | 0.34 | | 0.22 | 0.14 | NO |
| 2F | 1.02 | 1.06 | 0.19 | 0.63 | 0.41 x 0.60 | 0.25 | 0.08 | YES |
| 59G1 | 1.01 | 0.59 | 0.18 | 0.70 | | 0.28 | 0.13 | YES |
| 66 | 1.01 | 0.84 | 0.25 | 0.53 | | 0.27 | 0.37 | NO |
| 113 | 1.01 | 0.72 | 0.11 | 0.36 | | 0.22 | 0.31 | NO |
| 147A | 1.01 | 0.98 | 0.22 | 0.69 | 0.38 x 0.65 | 0.25 | 0.18 | YES |
| 159A | 1.01 | 0.61 | 0.20 | 0.50 | | 0.19 | 0.06 | YES |
| 2E3 | 1.00 | 0.98 | 0.20 | 0.63 | 0.37 x 0.62 | 0.25 | 0.09 | NO |
| 110A | 1.00 | 0.83 | 0.35 | 0.54 | 0.23 x 0.45 | 0.12 | 0.23 | NO |
| 147E | 1.00 | 0.85 | 0.29 | 0.63 | 0.43 x 0.50 | 0.12 | 0.05 | YES |
| 204F | 1.00 | 0.86 | 0.25 | 0.80 | 0.38 x 0.43 | 0.45 | 0.14 | NO |
| 218 | 1.00 | 0.56 | 0.28 | 0.28 | | 0.13 | 0.23 | YES |
| 147C | 0.98 | 1.02 | 0.23 | 0.50 | | 0.31 | 0.22 | NO |
| 276B | 0.98 | 0.57 | 0.29 | 0.25 | 0.16 x 0.28 | 0.12 | 0.15 | NO |
| 2D1 | 0.97 | 0.86 | 0.20 | 0.54 | 0.23 x 0.53 | 0.12 | 0.09 | YES |
| 361 | 0.93 | 1.00 | 0.22 | 0.51 | 0.32 x 0.71 | 0.19 | 0.20 | NO |
| 311 | 0.93 | 1.10 | 0.33 | 0.40 | | 0.20 | 0.28 | NO |
| R23A | 0.86 | 0.53 | 0.33 | 0.28 | | 0.09 | 0.31 | NO |
| 17 | 0.85 | 1.03 | 0.20 | 0.63 | | 0.33 | 0.23 | NO |
| R23 | 0.85 | 0.80 | 0.44 | 0.38 | | 0.14 | 0.42 | NO |
| 79 | 0.84 | 0.66 | 0.19 | 0.48 | | 0.14 | 0.11 | NO |
| 178 | 0.84 | 0.75 | 0.27 | 0.42 | | 0.19 | 0.21 | NO |
| 246 | 0.84 | 1.03 | 0.20 | 0.63 | | 0.42 | 0.21 | NO |
| 372 | 0.84 | 0.53 | 0.32 | 0.38 | | 0.13 | 0.02 | YES |
| 21A | 0.83 | 0.56 | 0.53 | 0.36 | | 0.14 | 0.32 | NO |
| 66A | 0.83 | 0.92 | 0.14 | 0.48 | | 0.25 | 0.15 | NO |
| R22 | 0.82 | 0.25 | 0.23 | 0.38 | | 0.25 | 0.14 | NO |
| 136A | 0.81 | 0.94 | 0.19 | 0.63 | 0.45 x 0.48 | 0.22 | 0.25 | YES |
| 21 | 0.79 | 0.58 | 0.41 | 0.34 | | 0.22 | 0.25 | NO |
| 158B | 0.79 | 0.47 | 0.11 | 0.44 | | 0.20 | 0.08 | YES |
| 276C | 0.79 | 0.45 | 0.17 | 0.25 | | 0.17 | 0.08 | NO |
| 293 | 0.79 | 0.76 | 0.17 | 0.66 | 0.45 x 0.53 | 0.25 | 0.14 | NO |
| 119B | 0.78 | 0.59 | 0.19 | 0.45 | 0.28 x 0.35 | 0.14 | 0.14 | YES |
| 135A | 0.78 | 1.12 | 0.27 | 0.39 | 0.26 x 0.50 | 0.16 | 0.28 | NO |
| 275 | 0.78 | 0.61 | 0.16 | 0.43 | 0.18 x 0.24 | 0.10 | 0.07 | NO |
| 2E5 | 0.77 | 1.17 | 0.16 | 0.63 | 0.38 x 0.71 | 0.20 | 0.15 | YES |
| 16 | 0.77 | 0.69 | 0.13 | 0.50 | | 0.27 | 0.08 | NO |
| 119A | 0.77 | 0.67 | 0.13 | 0.41 | 0.22 x 0.31 | 0.16 | 0.08 | YES |
| 2E4 | 0.75 | 1.19 | 0.16 | 0.63 | 0.38 x 0.75 | 0.20 | 0.15 | YES |
| 139 | 0.75 | 0.23 | 0.09 | 0.38 | | 0.26 | 0.03 | YES |
| 140A | 0.75 | 0.67 | 0.19 | 0.47 | | 0.30 | 0.15 | NO |
| 313A | 0.75 | 0.70 | 0.10 | 0.58 | 0.50 x 0.75 | 0.32 | 0.05 | NO |
| 79A | 0.73 | 0.77 | 0.19 | 0.50 | 0.13 x 0.39 | 0.25 | 0.18 | NO |
| 158G | 0.73 | 0.36 | 0.05 | 0.33 | | 0.16 | 0.04 | YES |

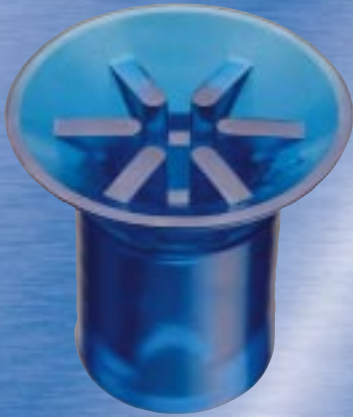
(continued on next page)

NOTE:
Style C cups WITH E and E1 dimensions have a counter-bore mounting hole.
Style C cups WITHOUT E and E1 dimensions (F only) have a thru mounting hole.



Vacuum Cups – Style C *(continued)*

Style C

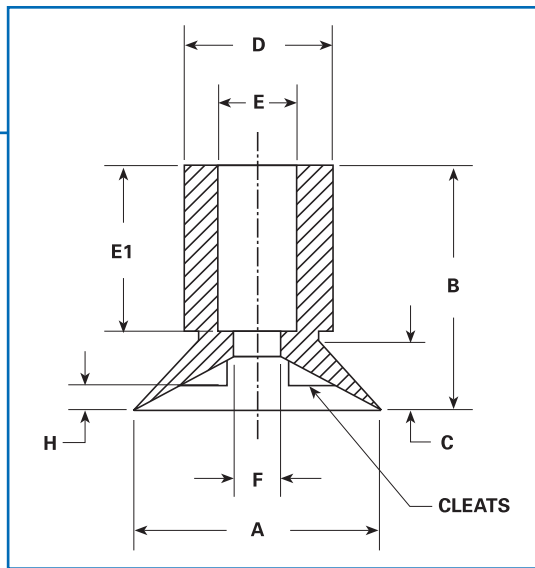


| VC No. | A | B | C | D | E x E1 | F | H | Cleats |
|-----------|------|------|------|------|-------------|------|------|--------|
| 249 | 0.70 | 1.19 | 0.15 | 0.72 | 0.57 x 0.62 | 0.31 | 0.11 | NO |
| 316D | 0.70 | 0.70 | 0.20 | 0.31 | 0.16 x 0.50 | 0.31 | 0.11 | NO |
| 312 | 0.69 | 0.67 | 0.32 | 0.35 | | 0.15 | 0.25 | NO |
| 136 | 0.68 | 0.92 | 0.13 | 0.63 | 0.42 x 0.53 | 0.16 | 0.11 | YES |
| 24A | 0.67 | 0.50 | 0.38 | 0.25 | | 0.11 | 0.20 | NO |
| 179A | 0.66 | 0.55 | 0.19 | 0.38 | | 0.19 | 0.05 | YES |
| 24 | 0.65 | 0.59 | 0.34 | 0.30 | | 0.11 | 0.14 | NO |
| 179 | 0.64 | 0.58 | 0.19 | 0.38 | | 0.19 | 0.35 | NO |
| D15 | 0.64 | 0.63 | 0.28 | 0.35 | 0.15 x 0.11 | 0.14 | 0.27 | NO |
| 351 | 0.63 | 0.81 | 0.13 | 0.44 | 0.25 x 0.56 | 0.15 | 0.06 | NO |
| 24B | 0.62 | 0.56 | 0.27 | 0.31 | | 0.20 | 0.21 | NO |
| 66C | 0.62 | 0.92 | 0.14 | 0.46 | | 0.25 | 0.17 | NO |
| 122 | 0.62 | 0.63 | 0.16 | 0.39 | | 0.13 | 0.25 | NO |
| 135 | 0.62 | 0.82 | 0.16 | 0.31 | 0.19 x 0.67 | 0.13 | 0.10 | NO |
| 157B | 0.62 | 0.56 | 0.25 | 0.38 | | 0.19 | 0.20 | NO |
| 61 | 0.60 | 0.77 | 0.13 | 0.75 | | 0.25 | 0.08 | YES |
| 122A | 0.60 | 0.89 | 0.17 | 0.41 | 0.19 x 0.37 | 0.14 | 0.14 | NO |
| 316C | 0.60 | 0.47 | 0.17 | 0.32 | | 0.15 | 0.07 | NO |
| 276A | 0.59 | 0.48 | 0.10 | 0.33 | | 0.11 | 0.10 | NO |
| 306 | 0.59 | 1.50 | 0.12 | 0.04 | 0.29 x 1.08 | 0.18 | 0.11 | NO |
| 379 | 0.59 | 0.44 | 0.15 | 0.35 | 0.20 x 0.29 | 0.08 | | NO |
| 123 | 0.56 | 0.82 | 0.16 | 0.56 | 0.31 x 0.48 | 0.19 | 0.12 | NO |
| 167B | 0.56 | 0.19 | 0.11 | 0.16 | | 0.06 | 0.08 | NO |
| 167C | 0.56 | 0.31 | 0.11 | 0.16 | | 0.05 | 0.09 | NO |
| 190 | 0.56 | 0.43 | 0.11 | 0.33 | | 0.16 | 0.08 | NO |
| 190A | 0.56 | 0.50 | 0.13 | 0.33 | | 0.16 | 0.09 | YES |
| 122B | 0.53 | 1.50 | 0.12 | 0.26 | | 0.18 | 0.12 | NO |
| 287 | 0.53 | 0.41 | 0.14 | 0.32 | | 0.17 | 0.09 | NO |
| 157 | 0.50 | 0.53 | 0.25 | 0.28 | | 0.13 | 0.28 | NO |
| 157A | 0.50 | 0.54 | 0.23 | 0.28 | | 0.19 | 0.32 | NO |
| 191A | 0.50 | 0.63 | 0.07 | 0.33 | | 0.15 | 0.10 | NO |
| 191B | 0.50 | 0.63 | 0.07 | 0.33 | 0.20 x 0.25 | 0.13 | 0.31 | NO |
| 220 | 0.50 | 0.35 | 0.06 | 0.42 | 0.28 x 0.14 | 0.14 | 0.07 | NO |
| 251 | 0.50 | 1.01 | 0.08 | 0.61 | 0.42 x 0.67 | 0.14 | 0.06 | NO |
| 191 | 0.46 | 0.37 | 0.06 | 0.33 | | 0.16 | 0.28 | NO |
| 211 | 0.45 | 0.45 | 0.11 | 0.33 | | 0.16 | 0.05 | NO |
| 157C | 0.43 | 0.51 | 0.11 | 0.23 | | 0.12 | 0.08 | NO |
| 265 | 0.41 | 0.23 | 0.09 | 0.28 | | 0.16 | 0.06 | NO |
| 167 | 0.40 | 0.25 | 0.05 | 0.14 | | 0.06 | 0.06 | NO |
| 173 | 0.40 | 0.75 | 0.20 | 0.31 | | 0.16 | 0.13 | NO |
| 135B | 0.39 | 0.48 | 0.14 | 0.20 | 0.13 x 0.31 | 0.06 | 0.09 | NO |
| 276 | 0.39 | 0.48 | 0.15 | 0.33 | 0.15 x 0.24 | 0.09 | 0.09 | NO |
| MINI-U9.5 | 0.37 | 0.29 | 0.07 | 0.20 | 0.08 x 0.14 | 0.05 | 0.07 | NO |
| 161 | 0.36 | 0.53 | 0.63 | 0.23 | | 0.13 | 0.03 | NO |
| 161C | 0.36 | 0.50 | 0.06 | 0.23 | | 0.13 | 0.05 | YES |
| 234 | 0.35 | 0.34 | 0.13 | 0.33 | | 0.22 | 0.09 | NO |
| 169 | 0.34 | 0.36 | 0.12 | 0.22 | | 0.13 | 0.08 | NO |
| 169D | 0.33 | 1.00 | 0.13 | 0.16 | | 0.06 | 0.13 | NO |
| MINI-.335 | 0.33 | 0.30 | 0.08 | 0.23 | 0.13 x 0.23 | 0.19 | 0.06 | NO |
| 169A | 0.32 | 1.50 | 0.12 | 0.20 | | 0.10 | 0.12 | NO |

NOTE:
Style C cups WITH E and E1 dimensions have a counter-bore mounting hole.
Style C cups WITHOUT E and E1 dimensions (F only) have a thru mounting hole.



Style C



| VC No. | A | B | C | D | E x E1 | F | H | Cleats |
|-----------|------|------|------|------|--------|------|------|--------|
| 169C | 0.32 | 0.90 | 0.13 | 0.15 | | 0.06 | 0.13 | NO |
| MINI-7.9 | 0.31 | 0.35 | 0.06 | 0.20 | | 0.11 | 0.04 | NO |
| 161A | 0.29 | 1.00 | 0.11 | 0.22 | | 0.09 | 0.09 | NO |
| MINI-U6 | 0.28 | 0.26 | 0.20 | 0.20 | | 0.08 | 0.03 | NO |
| 167A | 0.25 | 0.19 | 0.03 | 0.11 | | 0.06 | 0.03 | NO |
| MINI-.246 | 0.25 | 0.48 | 0.08 | 0.16 | | 0.06 | 0.06 | NO |
| MINI-.199 | 0.19 | 0.47 | 0.05 | 0.16 | | 0.06 | 0.03 | NO |
| MINI-.160 | 0.15 | 0.50 | 0.03 | 0.11 | | 0.05 | 0.03 | NO |
| MINI-.148 | 0.14 | 0.28 | 0.05 | 0.23 | | 0.05 | 0.03 | NO |
| MINI-.125 | 0.12 | 0.46 | 0.03 | 0.11 | | 0.05 | 0.02 | NO |

Style C Includes A-1 (oval cup)

| VC No. | A | A-1 | B | C | D | E x E1 | F | H | Cleats |
|--------|------|------|------|------|------|-------------|------|------|--------|
| 239 | 1.20 | 1.89 | 0.89 | 0.36 | 0.63 | | 0.31 | 0.21 | YES |
| 98A | 0.65 | 0.98 | 1.01 | 0.34 | 0.46 | 0.18 x 0.76 | 0.46 | 0.23 | NO |
| 69 | 0.52 | 0.39 | 0.75 | 0.46 | 0.43 | 0.25 x 0.56 | 0.06 | 0.11 | YES |

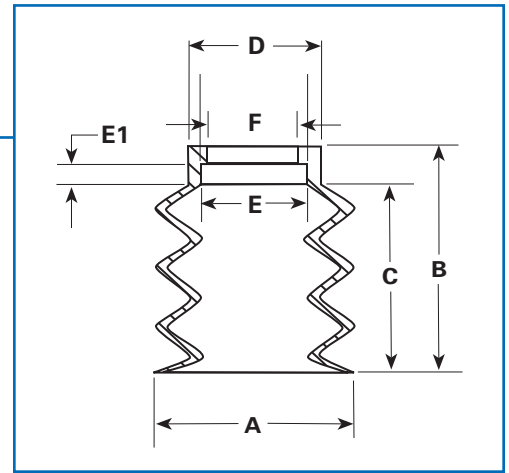
NOTE:
 Style C cups
 WITH
 E and E1
 dimensions
 have a counter-bore
 mounting hole.

Style C cups
 WITHOUT
 E and E1
 dimensions
 (F only)
 have a thru
 mounting hole.



Vacuum Cups

Style D

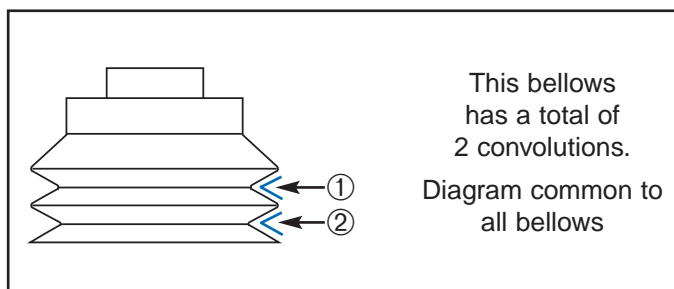


Style D



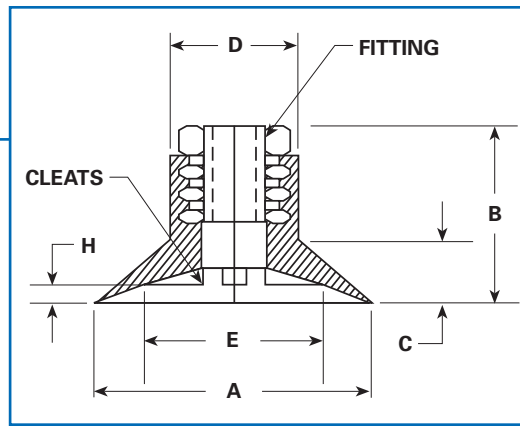
| VC No. | A | B | C | D | E x E1 | F | Style |
|--------|------|------|------|------|-------------|------|-------|
| 104A | 3.97 | 4.14 | 3.88 | 1.47 | 1.40 x 0.28 | 0.86 | D4 |
| 321 | 2.87 | 1.62 | 1.50 | 1.15 | 0.86 x 0.13 | 0.68 | D3 |
| 32E | 2.77 | 1.78 | 1.41 | 0.44 | 0.70 x 0.35 | 0.50 | D1 |
| 298 | 2.75 | 1.78 | 1.53 | 1.25 | 1.00 x 0.25 | 0.88 | D3 |
| 32E1 | 2.50 | 1.69 | 1.06 | 0.97 | 0.78 x 0.09 | 0.63 | D1 |
| 32G | 2.25 | 1.75 | 1.19 | 1.00 | 0.79 x 0.14 | 0.56 | D2 |
| 32W2 | 2.25 | 1.19 | 0.94 | 0.94 | 0.75 x 0.22 | 0.69 | D1 |
| 201D | 2.20 | 1.35 | 1.01 | 1.82 | 1.67 x 0.26 | 1.47 | D2 |
| 33D2 | 2.19 | 1.84 | 1.58 | 0.98 | 0.78 x 0.17 | 0.66 | D3 |
| 321B4 | 2.00 | 1.68 | 1.46 | 1.15 | 0.85 x 0.13 | 0.67 | D4 |
| 32W1 | 1.95 | 1.16 | 0.91 | 0.97 | 0.73 x 0.25 | 0.67 | D1 |
| 32A | 1.94 | 1.98 | 1.64 | 0.97 | 0.75 x 0.20 | 0.69 | D3 |
| 32ABC | 1.94 | 1.45 | 1.17 | 0.98 | 0.75 x 0.20 | 0.69 | D2 |
| 32TC | 1.88 | 1.63 | 1.42 | 0.89 | 0.76 x 0.12 | 0.70 | D2 |
| 32UJ | 1.88 | 1.11 | 0.84 | 0.92 | 0.78 x 0.23 | 0.70 | D1 |
| 320 | 1.81 | 1.22 | 0.95 | 1.15 | 0.86 x 0.13 | 0.68 | D2 |
| 32W | 1.79 | 1.20 | 0.94 | 0.97 | 0.73 x 0.23 | 0.67 | D1 |
| 32 | 1.75 | 1.69 | 1.33 | 1.02 | 0.76 x 0.28 | 0.67 | D2 |
| B1PA1 | 1.75 | 0.82 | 0.63 | 0.99 | 0.87 x 0.04 | 0.68 | D1 |
| 33L | 1.62 | 1.60 | 1.44 | 1.20 | 0.93 x 0.03 | 0.68 | D5 |
| 33M | 1.59 | 1.66 | 1.41 | 0.72 | | 0.46 | D2 |
| 33B | 1.52 | 1.73 | 1.50 | 0.91 | | 0.69 | D3 |
| 33J | 1.50 | 2.55 | 2.28 | 0.94 | 0.78 x 0.12 | 0.69 | D5 |
| 32H3 | 1.50 | 1.69 | 1.47 | 1.00 | 0.79 x 0.09 | 0.69 | D3 |
| 33D | 1.50 | 1.34 | 1.09 | 0.98 | 0.78 x 0.14 | 0.67 | D2 |
| 33 | 1.48 | 1.72 | 1.45 | 0.97 | 0.82 x 0.12 | 0.70 | D3 |
| 33C | 1.41 | 1.67 | 1.38 | 0.94 | 0.76 x 0.12 | 0.64 | D3 |
| 32H6 | 1.37 | 1.13 | 0.88 | 1.00 | 0.78 x 0.12 | 0.66 | D2 |
| B1PA | 1.27 | 0.82 | 0.63 | 0.99 | 0.87 x 0.04 | 0.68 | D1 |
| B1P | 1.25 | 1.00 | 0.64 | 0.97 | 0.60 x 0.18 | 0.67 | D1 |
| 32H | 1.19 | 0.84 | 0.61 | 1.00 | | 0.67 | D1 |
| 32H2 | 1.06 | 2.48 | 2.23 | 1.00 | 0.78 x 0.10 | 0.66 | D5 |
| 364 | 1.00 | 1.19 | 0.88 | 1.00 | 0.88 x 0.05 | 0.70 | D3 |
| 33G2 | 1.00 | 1.58 | 1.27 | 0.73 | 0.62 x 0.21 | 0.50 | D3 |
| 182 | 0.97 | 1.58 | 1.20 | 0.73 | 0.62 x 0.23 | 0.44 | D3 |
| B25 | 0.94 | 1.13 | 0.91 | 0.59 | 0.37 x 0.12 | 0.13 | D1 |
| 33A5-3 | 0.87 | 0.88 | 0.74 | 0.79 | 0.44 x 0.08 | 0.25 | D3 |
| 33A5-4 | 0.87 | 1.08 | 0.96 | 0.79 | 0.44 x 0.06 | 0.25 | D4 |

STYLE = Number of Convolutions

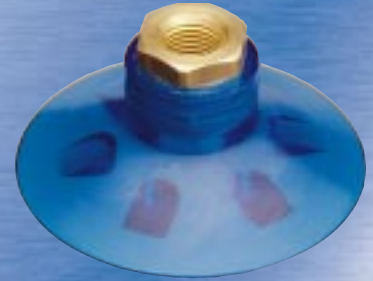


Vacuum Cups

Style E



Style E



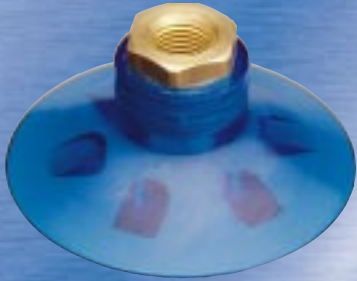
| VC No. | A | B | C | D | E | H | Cleats | Remarks | NPT Thrd. |
|--------|------|------|------|------|------|------|--------|---------------|-----------|
| 204 | 3.50 | 1.10 | 0.56 | 0.98 | 0.51 | 0.37 | NO | LOW PROFILE | 1/4 |
| 204-1 | 3.50 | 1.06 | 0.61 | 0.98 | 0.56 | 0.20 | NO | | 1/4 |
| 15 | 3.45 | 1.60 | 0.62 | 1.14 | 0.68 | 0.37 | NO | | 3/8 |
| 15A | 3.42 | 2.58 | 1.00 | 1.15 | 0.66 | 0.08 | YES | 3/8M | |
| 72 | 3.18 | 2.00 | 1.35 | 1.39 | 1.14 | 1.00 | NO | DEEP DISH | 3/8 |
| 31A | 3.09 | 1.48 | 0.59 | 1.14 | 0.43 | 0.12 | YES | 1/4 | |
| 31A | 3.09 | 1.73 | 0.59 | 1.14 | 0.43 | 0.12 | YES | 3/8 | |
| 212 | 3.08 | 1.06 | 0.84 | 1.06 | 0.63 | 0.36 | YES | 1/4M | |
| 30 | 3.06 | 1.67 | 0.59 | 1.14 | 0.60 | 0.37 | NO | | 3/8 |
| 30 | 3.06 | 1.48 | 0.59 | 1.14 | 0.60 | 0.37 | NO | | 1/4 |
| 92 | 3.07 | 1.37 | 0.75 | 1.06 | 0.56 | 0.44 | NO | | 1/4 |
| 328 | 3.00 | 1.40 | 1.05 | 1.50 | 0.75 | 0.29 | YES | 3/8 | |
| 106C | 3.00 | 1.28 | 0.72 | 1.13 | 0.94 | 0.53 | NO | | 1/4 |
| 103C | 3.00 | 1.88 | 0.46 | 1.18 | | 0.22 | NO | | 5/8-18M |
| 153 | 2.90 | 1.38 | 0.99 | 1.43 | 1.65 | 0.42 | NO | | 1/8 |
| 70 | 2.51 | 1.00 | 0.60 | 1.50 | 1.50 | 0.18 | YES | 3/8 | |
| 70 | 2.51 | 1.15 | 0.60 | 1.50 | 1.50 | 0.18 | YES | 1/4 | |
| 70 | 2.51 | 1.01 | 0.60 | 1.50 | 1.50 | 0.18 | YES | 1/8 | |
| 204A | 2.51 | 1.07 | 0.62 | 1.00 | 0.51 | 0.37 | NO | LOW PROFILE | 1/4 |
| 204A1 | 2.51 | 1.12 | 0.56 | 1.00 | 0.43 | 0.43 | NO | LOW PROFILE | 1/4 |
| 72A | 2.50 | 1.80 | 0.72 | 1.35 | 0.95 | 0.62 | YES | 1/2,3/8,1/4 | |
| 353A | 2.50 | 1.62 | 0.77 | 0.77 | | 0.66 | NO | | 1/4 |
| 106 | 2.50 | 1.09 | 0.54 | 1.09 | 0.92 | 0.37 | NO | | 1/8 |
| 4 | 2.50 | 2.65 | 0.36 | 1.00 | 0.36 | 0.11 | YES | 5/8-18M | |
| 13A | 2.48 | 1.67 | 0.65 | 1.17 | 0.63 | 0.12 | NO | | 3/8 |
| 49 | 2.47 | 2.23 | 0.76 | 1.05 | 0.43 | 0.15 | YES | 1/4 | |
| 13 | 2.45 | 1.75 | 0.70 | 1.18 | 0.65 | 0.43 | NO | | 1/4,3/8 |
| 59L | 2.32 | 1.88 | 0.38 | 1.56 | 1.28 | 0.31 | YES | 7/16-14M | |
| 91 | 2.32 | 1.16 | 0.69 | 0.88 | 1.20 | 0.31 | NO | | 3/8 |
| 91A | 2.20 | 2.01 | 0.51 | 0.89 | 0.57 | 0.37 | NO | | 1/4M |
| 5A | 2.10 | 1.20 | 0.40 | 1.37 | 0.89 | 0.12 | YES | THICK LIP | 1/4 |
| 5A1 | 2.10 | 0.88 | 0.41 | 1.37 | 1.26 | 0.27 | YES | 1/8 | |
| 368 | 2.09 | 0.99 | 0.35 | 0.89 | | 0.24 | NO | | 3/8-24M |
| 86 | 2.09 | 1.39 | 0.50 | 1.17 | 1.07 | 0.31 | YES | 3/8M | |
| 86 | 2.09 | 0.98 | 0.50 | 1.17 | 1.07 | 0.31 | YES | 1/8 | |
| 46 | 2.04 | 0.99 | 0.44 | 1.28 | 0.92 | 0.27 | NO | | 3/8 |
| 106A | 2.03 | 1.25 | 0.41 | 1.09 | 0.90 | 0.25 | NO | | 3/8 |
| 204B | 2.03 | 1.12 | 0.42 | 0.81 | 0.51 | 0.31 | NO | LOW PROFILE | 1/4 |
| 59 | 2.00 | 1.00 | 0.25 | 1.56 | 1.31 | 0.18 | YES | RADIAL CLEATS | 1/4 |
| 59 | 2.00 | 0.85 | 0.25 | 1.56 | 1.31 | 0.18 | YES | RADIAL CLEATS | 1/8 |
| 59A | 2.00 | 1.76 | 0.24 | 1.56 | 1.33 | 0.19 | YES | 3/8 | |
| 59B | 2.00 | 1.92 | 0.41 | 1.28 | 1.12 | 0.36 | YES | 1/8 | |
| 99 | 2.00 | 1.67 | 0.34 | 1.00 | 0.50 | 0.31 | NO | | 1/4M |
| 168 | 2.00 | 1.02 | 0.47 | 1.10 | 0.83 | 0.34 | NO | | 1/4 |
| 59C | 1.83 | 0.82 | 0.46 | 0.88 | 0.63 | 0.11 | YES | 1/8 | |
| 204C | 1.75 | 1.14 | 0.43 | 0.45 | 0.53 | 0.31 | NO | LOW PROFILE | 1/4 |
| 100S | 1.70 | 0.89 | 0.34 | 0.73 | 0.52 | 0.20 | NO | | 1/8 |
| 353 | 1.66 | 1.63 | 0.50 | 0.78 | | 0.44 | NO | | 1/4 |
| 272A | 1.65 | 0.90 | 0.26 | 0.75 | 1.32 | 0.07 | YES | 1/8 | |
| 214C | 1.60 | 1.16 | 0.21 | 1.00 | | 0.13 | NO | | M10x1.25M |
| 37C | 1.53 | 1.17 | 0.34 | 0.90 | 0.66 | 0.08 | YES | 3/8 | |

When ordering, please specify thread size.

(continued on next page)

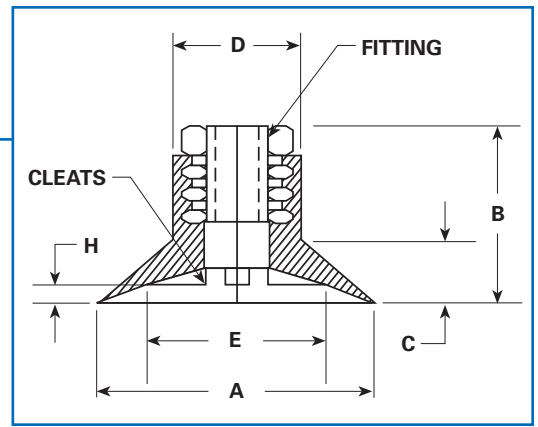


Styles E & F



Vacuum Cups

Style E (continued)



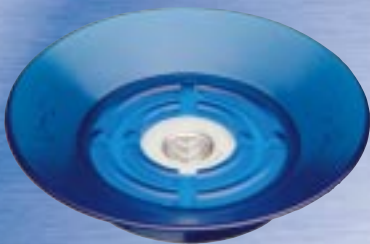
| VC No. | A | B | C | D | E | Cleats | H | Remarks | NPT Thrd. |
|--------|------|------|------|-------------|------|--------|-----|-------------|-----------|
| 37A | 1.50 | 0.78 | 0.32 | 0.89 | 0.57 | 0.37 | NO | | 1/8 |
| 37B | 1.50 | 1.09 | 0.40 | 0.87 | 0.56 | 0.18 | YES | 1/8M | |
| 204D | 1.50 | 1.04 | 0.43 | 0.79 | 0.51 | 0.29 | NO | LOW PROFILE | 1/4 |
| 59E | 1.50 | 1.62 | 0.28 | 1.25 | 1.06 | 0.12 | YES | 1/8 | |
| 59F | 1.50 | 1.68 | 0.36 | 1.00 | 0.81 | 0.18 | YES | 1/8 | |
| 368A | 1.48 | 0.85 | 0.25 | 0.89 | 0.31 | 0.15 | NO | | 3/8-24M |
| 2EA | 1.34 | 0.90 | 0.31 | 0.62 | 0.89 | 0.03 | YES | THIN LIP | 1/8M |
| 204E | 1.25 | 1.10 | 0.23 | 0.81 | 0.51 | 0.25 | NO | LOW PROFILE | 1/4 |
| 214D | 1.22 | 1.14 | 0.14 | 0.80 - 0.84 | | 0.11 | NO | | M10x1.25M |
| 88 | 1.21 | 1.15 | 0.34 | 0.75 | 0.71 | 0.21 | NO | | 1/8 |
| 107 | 1.11 | 1.14 | 0.20 | 0.77 | 0.55 | 0.25 | NO | | 1/8 |
| 10 | 1.04 | 0.90 | 0.25 | 0.62 | 0.32 | 0.28 | NO | | 1/8 |
| 10A | 1.04 | 0.85 | 0.32 | 0.71 | 0.32 | 0.21 | NO | | 1/8M |
| 214E | 1.02 | 1.10 | 0.14 | 0.59-0.66 | | 0.14 | NO | | M10x1.25M |
| 204F | 1.00 | 1.12 | 0.25 | 0.81 | 0.45 | 0.17 | NO | LOW PROFILE | 1/4 |

When ordering, please specify thread size.

M = Male thrd.

Vacuum Cups

Style F

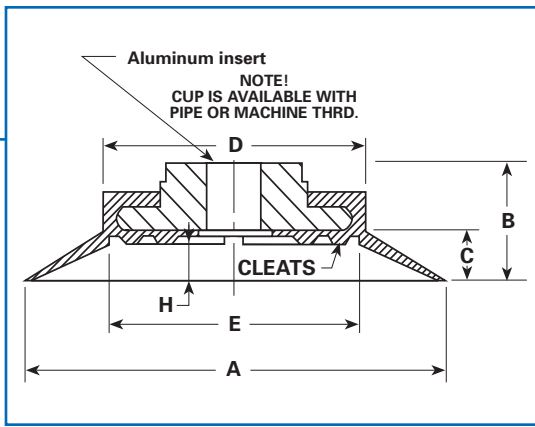


| VC No. | A | B | C | D | E | F | H | Cleats |
|--------|-------|------|------|-------|-------|---|------|--------|
| 95E | 14.68 | 2.31 | 1.40 | 14.00 | 11.25 | | 1.37 | YES |
| 95B | 14.00 | 1.87 | 1.00 | 14.00 | 11.25 | | 0.87 | YES |
| 95C | 12.00 | 1.39 | 0.92 | 12.00 | 10.65 | | 0.48 | YES |
| 95F | 11.80 | 1.75 | 1.75 | 7.83 | 7.86 | | 0.55 | YES |
| 95 | 11.00 | 2.00 | 1.50 | 8.50 | 8.25 | | 1.00 | YES |
| 95A | 10.50 | 1.39 | 0.92 | 10.37 | 8.75 | | 0.48 | YES |
| 95D | 10.50 | 1.87 | 1.05 | 8.54 | 8.10 | | 0.76 | YES |
| 96B | 8.50 | 1.62 | 1.18 | 6.12 | 6.62 | | 0.75 | YES |
| 96 | 8.50 | 1.25 | 0.87 | 7.00 | 7.06 | | 0.38 | YES |
| 96A | 8.12 | 2.00 | 1.18 | 5.50 | 4.14 | | 1.00 | YES |
| 340 | 8.00 | 1.60 | 0.67 | 4.25 | 5.08 | | 0.92 | YES |
| 96C | 7.20 | 0.97 | 0.42 | 6.38 | 6.45 | | 0.12 | YES |
| 94 | 7.00 | 1.62 | 0.78 | 5.00 | 5.21 | | 0.50 | YES |
| 295 | 6.31 | 0.68 | 0.50 | 4.64 | 4.45 | | 0.25 | YES |
| 34A | 6.25 | 1.50 | 0.75 | 4.50 | 3.50 | | 0.50 | YES |
| 34 | 6.25 | 1.37 | 0.81 | 5.00 | 3.50 | | 0.50 | YES |

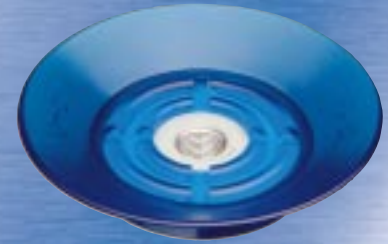
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Vacuum Cups

Style F (continued)



Style F



| VC No. | A | B | C | D | E | F | H | Cleats |
|--------|------|------|-------|------|------|-----------|------|--------|
| 39 | 6.00 | 1.31 | 0.50 | 4.75 | 4.90 | | 0.12 | YES |
| 93 | 5.87 | 1.25 | 0.78 | 5.06 | 4.81 | | 0.25 | YES |
| 35 | 5.50 | 2.30 | 2.06 | 2.31 | 2.00 | | 1.50 | YES |
| 71 | 5.31 | 2.34 | 1.97 | 2.25 | 2.06 | | 1.44 | YES |
| 76 | 5.00 | 1.75 | 1.12 | 3.25 | 2.65 | | 0.62 | YES |
| 103D | 5.00 | 2.06 | 1.26 | 1.34 | 3.37 | 5/8-18 | 0.50 | YES |
| 38 | 4.75 | 1.50 | 1.12 | 2.00 | 3.25 | | 0.37 | YES |
| 63 | 4.75 | 1.25 | 1.00 | 1.67 | 3.25 | | 0.25 | YES |
| BH115 | 4.62 | 1.18 | 0.97 | 1.31 | 2.75 | | 0.50 | YES |
| 241 | 4.50 | 1.35 | 0.75 | 2.90 | 2.50 | | 0.37 | YES |
| 73 | 4.31 | 2.00 | 12.69 | 2.25 | 1.80 | | 1.12 | YES |
| 27 | 4.25 | 1.18 | 0.50 | 2.75 | 2.43 | | 0.37 | YES |
| 77 | 4.12 | 1.20 | 0.76 | 2.81 | 2.60 | | 0.43 | YES |
| 103 | 4.00 | 1.37 | 1.00 | 1.50 | 0.75 | | 0.37 | NO |
| 208 | 4.00 | 1.37 | 0.43 | 2.80 | 2.60 | | 0.25 | YES |
| 203 | 3.93 | 1.12 | 0.45 | 3.00 | 2.75 | | 0.25 | YES |
| 203A | 3.90 | 1.20 | 0.37 | 2.75 | 2.65 | | 0.25 | YES |
| TC100 | 3.90 | 1.43 | 1.00 | 1.56 | 1.37 | 0.75 | 0.62 | NO |
| 245D | 3.87 | 0.59 | 0.59 | 3.13 | 2.20 | | 0.13 | YES |
| 219 | 3.56 | 1.30 | 0.50 | 2.48 | 1.70 | | 0.37 | YES |
| 80 | 3.50 | 1.31 | 1.06 | 1.62 | 2.00 | | 0.50 | YES |
| 27A | 3.25 | 1.15 | 0.50 | 2.23 | 1.87 | | 0.37 | YES |
| 27A1 | 3.25 | 1.15 | 0.50 | 2.25 | 1.82 | | 0.31 | YES |
| 27B | 3.25 | 1.25 | 1.00 | 2.75 | 2.25 | | 0.18 | YES |
| 29 | 3.25 | 1.37 | 0.69 | 1.67 | 2.32 | | 0.12 | YES |
| 245 | 3.21 | 0.71 | 0.41 | 2.00 | 2.28 | | 0.18 | YES |
| 72 | 3.18 | 2.00 | 1.40 | 1.37 | 1.14 | | 1.06 | YES |
| 214A | 3.17 | 1.17 | 0.23 | 1.98 | 2.60 | M10x1.25M | 0.13 | NO |
| 216C | 3.13 | 0.90 | 0.23 | 2.76 | 2.67 | | 0.06 | NO |
| 73A2 | 3.12 | 1.98 | 1.69 | 1.43 | 1.34 | | 0.93 | NO |
| 216 | 3.12 | 0.89 | 0.21 | 2.73 | 2.65 | | 0.06 | YES |
| 103A | 3.09 | 1.56 | 1.39 | 1.48 | 0.75 | | 0.31 | NO |
| 78 | 3.06 | 1.65 | 0.68 | 1.85 | 1.43 | | 0.31 | YES |
| 31B | 3.05 | 1.21 | 0.35 | 2.26 | 0.64 | | 0.17 | YES |
| TC75 | 2.95 | 1.37 | 0.87 | 1.56 | 1.59 | 0.75 | 0.56 | NO |
| 245B | 2.90 | 0.45 | 0.35 | 2.20 | 2.13 | | 0.19 | YES |
| 70 | 2.51 | 1.37 | 0.62 | 1.50 | 1.93 | | 0.25 | YES |
| 262 | 2.42 | 0.70 | 0.37 | 1.50 | 1.56 | | 0.18 | YES |
| 214 | 2.37 | 1.12 | 0.21 | 1.00 | 1.25 | | 0.18 | NO |
| 27A1A | 2.25 | 1.00 | 0.37 | 1.56 | 1.25 | | 0.25 | YES |
| 232 | 2.12 | 0.97 | 0.50 | 1.56 | 1.43 | | 0.25 | YES |
| 245C | 2.10 | 0.45 | 0.35 | 1.40 | 1.33 | | 0.19 | YES |
| 86 | 2.09 | 1.21 | 0.50 | 1.12 | 1.14 | | 0.31 | YES |
| 216A | 2.00 | 0.89 | 0.21 | 1.38 | 1.60 | | 0.06 | YES |
| 27A1B | 2.00 | 1.00 | 0.37 | 1.56 | 1.25 | | 0.20 | YES |
| 216B | 2.00 | 0.90 | 0.21 | 1.62 | 1.60 | | 0.06 | NO |
| 380 | 1.95 | 0.73 | 0.43 | 1.24 | 1.33 | 1/8 | 0.18 | YES |
| 259 | 1.61 | 0.51 | 0.31 | 0.98 | | | 0.16 | YES |

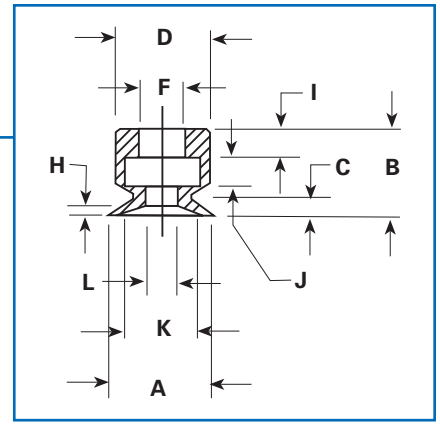
When ordering, please specify thread size.

M = Male thrd.



Vacuum Cups

Style G



Style G & H



| VC No. | A | B | C | D | F | H | I | J | K | L |
|-----------|------|------|------|------|------|------|------|------|-----------|------|
| 18B | 3.05 | 0.95 | 0.95 | 1.18 | 0.81 | 0.35 | 0.32 | 0.17 | 1.43 | 0.31 |
| 266 | 2.07 | 0.75 | 0.43 | 0.55 | 0.36 | 0.12 | 0.28 | 0.05 | 0.50 | 0.28 |
| 387 | 1.64 | 0.82 | 0.29 | 0.76 | 0.31 | 0.06 | 0.17 | 0.40 | 0.44 | 0.13 |
| RM40 | 1.56 | 0.46 | 0.31 | 0.59 | 0.34 | 0.09 | 0.09 | 0.09 | 0.46 | 0.12 |
| 337 | 1.19 | 0.37 | 0.23 | 0.48 | 0.20 | 0.13 | 0.10 | 0.08 | 0.28 | 0.13 |
| 313 | 1.18 | 1.03 | 0.33 | 0.60 | 0.39 | 0.48 | 0.09 | 0.09 | 0.39 | 0.23 |
| 313E | 1.18 | 0.75 | 0.10 | 0.59 | 0.39 | 0.05 | 0.09 | 0.15 | 0.31 | 0.51 |
| RM30 | 1.17 | 0.46 | 0.15 | 0.59 | 0.35 | 0.09 | 0.07 | 0.09 | 0.46 | 0.12 |
| 138 | 1.15 | 0.62 | 0.22 | 0.50 | 0.28 | 0.11 | 0.20 | 0.13 | 0.36 | 0.13 |
| 297 | 0.91 | 0.55 | 0.15 | 0.51 | 0.24 | 0.08 | 0.27 | 0.07 | 0.31 | 0.17 |
| 231 | 0.89 | 0.59 | 0.25 | 0.53 | 0.23 | 0.22 | 0.13 | 0.13 | 0.31 | 0.28 |
| 22 | 0.81 | 0.56 | 0.19 | 0.49 | 0.25 | 0.06 | 0.12 | 0.12 | 0.31 | 0.19 |
| 22A | 0.78 | 0.54 | 0.15 | 0.54 | 0.24 | 0.13 | 0.10 | 0.12 | 0.36 | 0.20 |
| 313D | 0.78 | 0.87 | 0.27 | 0.59 | 0.39 | 0.43 | 0.09 | 0.15 | 0.31 | 0.19 |
| 119 | 0.77 | 0.50 | 0.23 | 0.36 | 0.13 | 0.03 | 0.10 | 0.08 | 0.19 | 0.13 |
| 349 | 0.77 | 0.50 | 0.26 | 0.50 | 0.22 | 0.21 | 0.10 | 0.07 | 0.30 | 0.19 |
| RM14 | 0.65 | 0.46 | 0.11 | 0.59 | 0.35 | 0.09 | 0.07 | 0.09 | 0.46 | 0.12 |
| 25 | 0.63 | 0.63 | 0.32 | 0.50 | 0.25 | 0.00 | 0.13 | 0.12 | 0.33 | 0.19 |
| NJ7 | 0.59 | 0.56 | 0.14 | 0.50 | 0.20 | 0.18 | 0.11 | 0.09 | 0.37 | 0.14 |
| NJ2 | 0.51 | 0.50 | 0.14 | 0.34 | 0.14 | 0.07 | 0.12 | 0.12 | 0.20 | 0.10 |
| NJ10.5 | 0.44 | 0.30 | 0.06 | 0.31 | 0.16 | 0.05 | 0.10 | 0.08 | 0.16x0.25 | 0.11 |
| NJ1 | 0.42 | 0.48 | 0.10 | 0.35 | 0.14 | 0.04 | 0.07 | 0.10 | 0.42 | 0.12 |
| NJ14 | 0.42 | 0.30 | 0.10 | 0.33 | 0.14 | 0.06 | 0.08 | 0.08 | 0.22 | 0.09 |
| RM10.5 | 0.40 | 0.45 | 0.06 | 0.59 | 0.36 | 0.04 | 0.08 | 0.08 | 0.47 | 0.15 |
| 389 | 0.39 | 0.44 | 0.06 | 0.39 | 0.28 | 0.38 | 0.05 | 0.09 | 0.20 | 0.28 |
| NJ6 | 0.39 | 0.56 | 0.09 | 0.48 | 0.20 | 0.14 | 0.11 | 0.09 | 0.35 | 0.14 |
| NJ10 | 0.39 | 0.29 | 0.06 | 0.29 | 0.17 | 0.04 | 0.10 | 0.09 | 0.25 | 0.12 |
| MINI-.350 | 0.35 | 0.30 | 0.09 | 0.27 | 0.14 | 0.10 | 0.09 | 0.06 | 0.08 | 0.07 |
| NJ13 | 0.35 | 0.23 | 0.06 | 0.35 | 0.19 | 0.05 | 0.06 | 0.06 | 0.28 | 0.11 |
| NJ3 | 0.32 | 0.53 | 0.04 | 0.40 | 0.21 | 0.03 | 0.17 | 0.06 | 0.28 | 0.14 |
| NJ5 | 0.32 | 0.50 | 0.07 | 0.45 | 0.21 | 0.04 | 0.12 | 0.07 | 0.34 | 0.07 |
| NJ9 | 0.32 | 0.28 | 0.06 | 0.31 | 0.15 | 0.03 | 0.09 | 0.09 | 0.25 | 0.11 |
| NJ11 | 0.28 | 0.50 | 0.04 | 0.40 | 0.21 | 0.03 | 0.15 | 0.07 | 0.31 | 0.12 |
| NJ12 | 0.26 | 0.28 | 0.09 | 0.29 | 0.12 | 0.07 | 0.10 | 0.03 | 0.18 | 0.07 |
| NJ4 | 0.23 | 0.50 | 0.04 | 0.39 | 0.20 | 0.04 | 0.09 | 0.07 | 0.28 | 0.09 |
| NJ8 | 0.23 | 0.26 | 0.03 | 0.31 | 0.17 | 0.03 | 0.08 | 0.09 | 0.25 | 0.09 |
| MINI-.138 | 0.15 | 0.15 | 0.03 | 0.15 | 0.07 | 0.03 | 0.06 | 0.03 | 0.12 | 0.04 |
| MINI-.080 | 0.09 | 0.15 | 0.02 | 0.15 | 0.07 | 0.02 | 0.06 | 0.03 | 0.12 | 0.04 |

Vacuum Cups

Style H



| VC No. | Style | A | B | C | D | E x E1 | F |
|--------|-------|------|------|------|------|-------------|------|
| 202 | D3 | 1.47 | 1.34 | 1.05 | 0.73 | 0.64 x 0.09 | 0.38 |
| 134 | D5 | 1.38 | 2.14 | 1.72 | 1.31 | 1.14 x 0.19 | 0.91 |
| 134A | D3 | 1.34 | 1.72 | 1.38 | 1.31 | 1.14 x 0.19 | 0.91 |
| B20P1 | D1 | 0.88 | 0.76 | 0.48 | 0.57 | 0.40 x 0.08 | 0.20 |
| 267 | D1 | 0.87 | 0.89 | 0.64 | 0.64 | 0.50 x 0.10 | 0.37 |
| 304C | D1 | 0.72 | 0.66 | 0.39 | 0.48 | 0.27 x 0.05 | 0.20 |



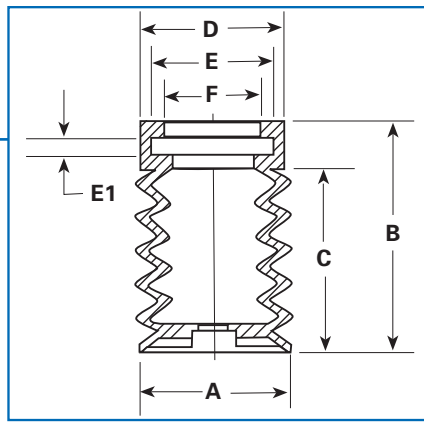
Styles H & I



This bellows has a total of 2 convolutions. Diagram common to all bellows

Vacuum Cups

Style H (continued)

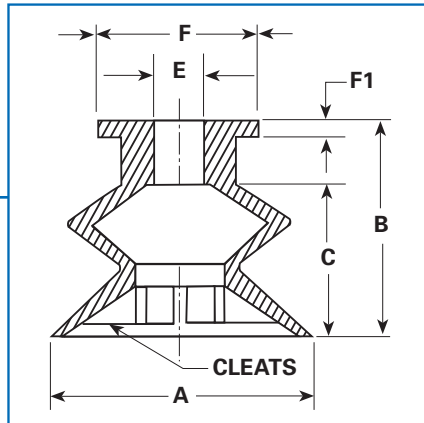


| VC No. | Style | A | B | C | D | E x E1 | F |
|--------|-------|------|------|------|------|-------------|------|
| RM16 | D2 | 0.67 | 0.84 | 0.64 | 0.59 | 0.47 x 0.08 | 0.38 |
| 33A6-3 | D1 | 0.66 | 0.69 | 0.35 | 0.52 | 0.43 x 0.06 | 0.35 |
| 304 | D1 | 0.65 | 0.46 | 0.24 | 0.64 | 0.48 x 0.07 | 0.37 |
| 176 | D1 | 0.64 | 0.83 | 0.38 | 0.52 | 0.45 x 0.08 | 0.34 |
| RM15.8 | D2 | 0.63 | 0.55 | 0.33 | 0.80 | 0.64 x 0.09 | 0.50 |
| 33A6 | D2 | 0.61 | 0.98 | 0.64 | 0.73 | 0.56 x 0.06 | 0.42 |
| B14.5 | D1 | 0.60 | 0.71 | 0.38 | 0.38 | 0.28 x 0.06 | 0.20 |
| 304A | D1 | 0.56 | 0.69 | 0.45 | 0.47 | 0.29 x 0.12 | 0.21 |
| B3-1A | D3 | 0.52 | 1.08 | 0.82 | 0.30 | 0.20 x 0.08 | 0.15 |
| 33A61 | D2 | 0.39 | 0.91 | 0.64 | 0.59 | 0.50 x 0.08 | 0.38 |
| B9.5 | D2 | 0.39 | 0.59 | 0.31 | 0.39 | 0.09 x 0.20 | 0.20 |
| NJ7.5 | D2 | 0.30 | 0.77 | 0.57 | 0.59 | 0.47 x 0.08 | 0.36 |

STYLE = Number of Convolutions

Vacuum Cups

Style I



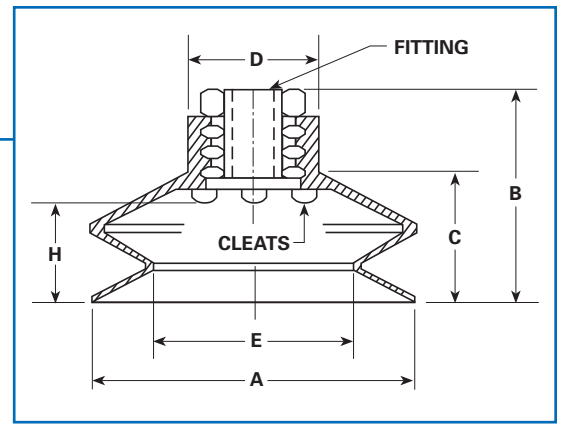
STYLE = Number of Convolutions

| VC No. | Style | A | B | C | E | F x F1 |
|--------|-------|------|------|------|------|-------------|
| B50P | D1 | 2.10 | 1.42 | 0.95 | 0.40 | 1.04 x 0.12 |
| B50P1 | D2 | 2.10 | 2.00 | 1.45 | 0.42 | 1.06 x 0.13 |
| 32CS | D1 | 2.02 | 1.28 | 0.83 | 0.37 | 0.57 x 0.18 |
| B40P | D1 | 1.70 | 1.13 | 0.89 | 0.29 | 0.75 x 0.10 |
| B30-2 | D1 | 1.37 | 1.04 | 0.71 | 0.29 | 0.78 x 0.09 |
| B30-1 | D1 | 1.34 | 1.13 | 0.76 | 0.31 | 0.90 x 0.22 |
| B30P | D1 | 1.30 | 1.00 | 0.73 | 0.20 | 0.56 x 0.06 |
| B1D | D1 | 1.21 | 1.03 | 0.79 | 0.29 | 0.54 x 0.10 |
| BL30 | D4 | 1.21 | 1.21 | 0.95 | 0.29 | 0.80 x 0.10 |
| B1F | D1 | 1.20 | 0.85 | 0.73 | 0.25 | 0.64 x 0.09 |
| 124A | D1 | 1.00 | 0.84 | 0.59 | 0.18 | 0.62 x 0.06 |
| 192 | D2 | 1.00 | 1.00 | 0.56 | 0.06 | 0.50 x 0.09 |
| 33F | D2 | 0.98 | 1.17 | 1.00 | 0.18 | 0.54 x 0.10 |
| B20P | D1 | 0.87 | 0.75 | 0.48 | 0.28 | 0.56 x 0.07 |
| 324B | D1 | 0.82 | 0.62 | 0.44 | 0.31 | 0.60 x 0.10 |
| BL20 | D4 | 0.79 | 0.88 | 0.73 | 0.20 | 0.56 x 0.07 |
| B2F | D1 | 0.75 | 0.68 | 0.45 | 0.18 | 0.64 x 0.10 |
| 314 | D1 | 0.67 | 0.44 | 0.30 | 0.21 | 0.43 x 0.13 |
| B3A | D1 | 0.57 | 0.56 | 0.31 | 0.31 | 0.54 x 0.07 |
| B3F | D1 | 0.51 | 0.51 | 0.37 | 0.15 | 0.50 x 0.10 |
| B3F1 | D1 | 0.50 | 0.59 | 0.31 | 0.33 | 0.52 x 0.09 |
| BL11 | D3 | 0.43 | 0.87 | 0.71 | 0.24 | 0.55 x 0.09 |



Vacuum Cups

Style J



Style J

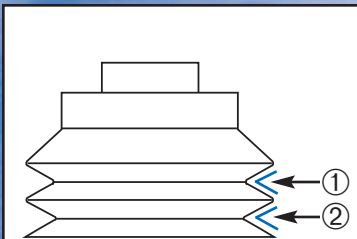


STYLE = Number of Convolutions

| VC No. | Style | A | B | C | D | E | H | Cleats | NPT THRD. |
|--------|-------|------|------|------|------|------|------|--------|----------------------|
| B111 | D1 | 4.45 | 1.66 | 1.40 | 2.12 | 1.65 | 1.33 | YES | 3/8 |
| 175B | D2 | 3.38 | 3.86 | 2.91 | 0.82 | 1.29 | 2.36 | YES | 1/4 |
| B85 | D1 | 3.37 | 1.28 | 0.98 | 1.58 | 1.23 | 1.08 | YES | 3/8 |
| 175 | D2 | 3.25 | 3.00 | 2.20 | 1.00 | 1.53 | 2.00 | NO | 3/8 |
| 32B1 | D1 | 2.82 | 2.00 | 1.37 | 1.00 | 1.81 | 0.62 | YES | 3/8 |
| 32B | D1 | 2.80 | 2.06 | 1.35 | 1.00 | 1.71 | 0.93 | YES | 1/4, 3/8 |
| 32E | D1 | 2.77 | 2.03 | 1.42 | 1.31 | 1.46 | 0.18 | YES | 1/4, 3/8 |
| 32ABC1 | D2 | 2.50 | 2.40 | 1.75 | 1.00 | 1.12 | 1.80 | NO | 1/4 |
| 32E1 | D1 | 2.50 | 1.65 | 1.07 | 0.98 | 1.48 | 0.75 | YES | 1/4, 3/8 |
| 32FB | D1 | 2.42 | 1.87 | 1.23 | 1.14 | 1.26 | 0.75 | YES | 3/8 |
| 137C | D2 | 2.42 | 3.00 | 1.95 | 0.77 | 0.92 | 1.60 | NO | 1/4 |
| 32F | D1 | 2.38 | 1.85 | 1.23 | 1.00 | 1.31 | 0.87 | YES | 1/4, 3/8 |
| 32F1 | D1 | 2.37 | 1.72 | 1.30 | 1.00 | 1.03 | 0.96 | YES | 1/4 |
| 32G1 | D4 | 2.26 | 3.11 | 2.10 | 1.00 | 1.30 | | NO | 3/8 |
| 137 | D2 | 2.36 | 1.84 | 1.43 | 1.03 | 1.03 | 1.18 | YES | 1/4, 3/8 |
| 217A | D2 | 2.21 | 2.86 | 1.95 | 1.37 | 0.99 | | NO | 5/8-18 |
| B50 | D1 | 2.10 | 1.87 | 0.92 | 1.31 | 1.25 | 0.78 | YES | 1/8, 1/4 |
| 32C | D1 | 2.00 | 2.04 | 0.84 | 0.75 | 1.18 | 0.56 | YES | 1/4 |
| 32C1F | D1 | 2.00 | 1.54 | 0.89 | 1.00 | 1.17 | 0.68 | YES | 1/4, 3/8 |
| 32D | D2 | 2.00 | 1.65 | 1.26 | 0.75 | 1.10 | 1.00 | NO | 1/4 |
| 322D | D1 | 2.00 | 1.13 | 0.73 | 1.00 | 1.37 | 0.33 | YES | |
| 32W | D1 | 1.79 | 1.46 | 0.87 | 0.98 | 1.00 | 0.81 | NO | 1/8 |
| 322C | D1 | 1.75 | 1.13 | 0.64 | 1.00 | 1.18 | 0.33 | YES | |
| B40 | D1 | 1.65 | 1.37 | 0.71 | 0.95 | 0.89 | 0.43 | YES | 1/8, 3/8, 1/8M |
| 32W3 | D1 | 1.64 | 1.51 | 0.90 | 0.98 | 0.87 | 0.85 | NO | 1/8, 1/4 |
| BL40 | D4 | 1.56 | 2.13 | 1.50 | 0.80 | 1.11 | | YES | 1/4 |
| 290 | D2 | 1.56 | 2.64 | 1.70 | 0.75 | 1.03 | | YES | 1/4M |
| 33N | D2 | 1.53 | 2.04 | 1.05 | 0.96 | 0.97 | 0.92 | YES | 1/4 |
| 33D | D2 | 1.50 | 2.00 | 1.09 | 1.00 | 0.65 | 1.32 | NO | 1/4 |
| 322A | D1 | 1.50 | 1.12 | 0.71 | 1.06 | 1.00 | 0.31 | YES | 1/4 |
| 33A | D3 | 1.42 | 1.93 | 1.32 | 0.68 | 0.71 | 1.28 | NO | 1/8, 1/4, 1/8M |
| 33A1 | D2 | 1.40 | 1.87 | 0.92 | 0.70 | 0.76 | 0.85 | NO | 1/8, 1/4 |
| B1A | D1 | 1.38 | 1.26 | 0.75 | 0.54 | 0.60 | 0.62 | NO | 1/8 |
| 32H6-1 | D2 | 1.38 | 1.88 | 0.88 | 1.00 | 0.63 | 0.65 | NO | 3/8 |
| 33AR | D1 | 1.37 | 1.30 | 0.85 | 0.70 | 0.73 | 0.74 | NO | 1/8M |
| 294A | D3 | 1.37 | 2.03 | 1.37 | 0.66 | 1.12 | 0.25 | YES | 1/8 |
| 294 | D3 | 1.37 | 1.12 | 1.12 | 0.66 | 1.18 | 0.26 | YES | 1/8 |
| B30 | D1 | 1.35 | 1.43 | 0.76 | 0.73 | 0.67 | 0.64 | YES | 1/8, 1/4 |
| B32 | D1 | 1.26 | 1.60 | 0.82 | 0.63 | 0.80 | 0.50 | YES | 1/8 |
| 33A2 | D2 | 1.25 | 1.43 | 0.82 | 0.68 | 0.70 | 0.81 | NO | 1/8 |
| B1 | D1 | 1.20 | 1.15 | 0.76 | 0.56 | 0.59 | 0.60 | NO | 1/8 |
| 289 | D2 | 1.18 | 1.95 | 1.00 | 0.87 | 0.46 | | NO | 1/4 BSPP |
| 33A4 | D3 | 1.14 | 2.00 | 1.32 | 0.70 | 0.51 | 1.37 | NO | 1/8, 1/4, 1/8M, 1/4M |
| 33A4A | D1 | 1.12 | 1.12 | 0.55 | 0.71 | 0.54 | 0.50 | NO | 1/8M |
| 294C | D4 | 1.00 | 1.48 | 0.85 | 0.56 | 0.44 | 0.85 | NO | 1/8 |
| 33A3 | D2 | 0.90 | 1.21 | 0.60 | 0.68 | 0.54 | 0.55 | NO | 1/8, 1/4 |
| 33A5L | D5 | 0.87 | 2.43 | 1.76 | 0.79 | 0.48 | 1.75 | NO | 1/8, 1/4 |
| B20F | D1 | 0.87 | 1.07 | 0.46 | 0.62 | 0.46 | 0.45 | YES | 1/8, 1/8M |
| 33A5 | D3 | 0.73 | 1.43 | 0.75 | 0.67 | 0.45 | 0.79 | NO | 1/8, 1/8M |

When ordering, please specify thread size.

M = Male thrd.

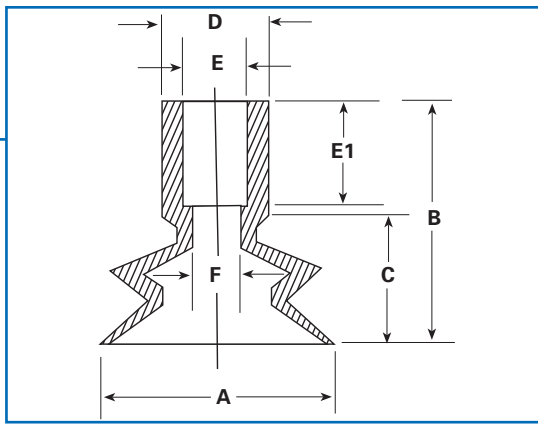


This bellows has a total of 2 convolutions.

Diagram common to all bellows

Vacuum Cups

Style K



STYLE = Number of Convolutions

| VC No. | Style | A | B | C | D | E x E1 | F |
|----------|-------|------|------|------|-----------|-------------|-----------|
| 175 | D2 | 3.25 | 2.67 | 2.22 | 1.00 | 0.73 x 0.12 | 0.55 |
| 175A | D2 | 3.37 | 4.00 | 3.20 | 1.00 | | 0.36 |
| B1A4 | D1 | 3.00 | 1.15 | 1.01 | 0.55 | | 0.29 |
| 32B | D1 | 2.80 | 1.97 | 1.36 | 0.98 | | 0.38 |
| 32BM | D1 | 2.77 | 1.95 | 1.33 | 1.00 | | 1.36 |
| B30A | D1 | 2.73 | 0.97 | 0.72 | 0.75 | | 0.25 |
| 130C | D4 | 2.63 | 2.75 | 2.12 | 1.19 | 0.87 x 0.82 | 0.72 |
| 32C4 | D1 | 2.50 | 1.59 | 0.87 | 0.75 | | 0.50 |
| 32F | D1 | 2.38 | 1.98 | 1.23 | 1.00 | | 0.38 |
| 137 | D2 | 2.36 | 1.64 | 1.42 | 1.00 | | 0.38 |
| 137B | D2 | 2.26 | 2.10 | 1.61 | 0.81-0.77 | | 0.38 |
| B53 | D1 | 2.13 | 1.43 | 0.94 | 0.72 | | 0.33 |
| B50 | D1 | 2.12 | 1.44 | 0.92 | 1.30 | | 0.25 |
| 32C2 | D1 | 2.02 | 1.42 | 0.78 | 1.31 | | 0.75 |
| 32J | D1 | 2.02 | 1.07 | 0.88 | 0.76 | | 0.38 |
| 32C | D1 | 2.00 | 1.61 | 0.81 | 0.73 | | 0.38 |
| 32C1 | D1 | 2.00 | 1.59 | 0.80 | 0.75 | | 0.50 |
| 32D | D2 | 2.00 | 1.96 | 1.21 | 0.75 | 0.44 x 0.84 | 0.28 |
| 32DS | D2 | 2.00 | 1.30 | 1.20 | 0.75 | 0.44 x 0.09 | 0.28 |
| 32MW | D2 | 1.99 | 1.75 | 1.34 | 0.75 | | 0.43 |
| 32D1 | D2 | 1.98 | 1.97 | 1.23 | 0.73 | 0.44 x 0.83 | 0.31 |
| 274 | D1 | 1.75 | 0.89 | 0.37 | 0.50 | | 0.15 |
| 32C5 | D1 | 1.75 | 1.47 | 0.71 | 0.75 | | 0.38 |
| 32MP | D2 | 1.75 | 1.84 | 1.19 | 1.00 | | 0.42 |
| 32EP | D2 | 1.74 | 1.90 | 1.26 | 0.67 | | 0.43 |
| 274A | D2 | 1.73 | 0.91 | 0.59 | 0.50 | | 0.14 BARB |
| 32W3 | D1 | 1.64 | 1.44 | 0.91 | 0.98 | 0.56 x 0.07 | 0.31 |
| BL40 | D4 | 1.59 | 1.59 | 1.38 | 0.80 | 0.42 x 0.09 | 0.28 |
| 370 | D2 | 1.56 | 1.68 | 1.25 | 0.63 | | 0.36 |
| 32MP1 | D2 | 1.52 | 1.84 | 1.19 | 0.98 | | 0.42 |
| 261 | | 1.50 | 0.57 | 0.50 | 0.57 | | 0.34 |
| 33A8 | D6 | 1.47 | 2.94 | 2.28 | 0.70 | | 0.44 |
| 33A | D3 | 1.42 | 1.69 | 1.41 | 0.69 | | 0.25 |
| 174 | D2 | 1.42 | 1.20 | 0.98 | 0.50 | | 0.28 |
| 33A1 | D2 | 1.40 | 1.66 | 0.95 | 0.69 | | 0.44 |
| 33E9 | D4 | 1.39 | 1.19 | 1.05 | 0.66 | | 0.45 |
| B1A | D1 | 1.38 | 0.91 | 0.77 | 0.53 | | 0.28 |
| 40 | D1 | 1.33 | 1.05 | 0.80 | 0.81 | | 0.28 |
| 300 | D2 | 1.33 | 1.11 | 0.87 | 0.73 | | 0.34 |
| B30 | D1 | 1.33 | 1.20 | 0.73 | 0.73 | | 0.25 |
| 180 | D2 | 1.31 | 0.91 | 0.91 | 0.77 | | 0.64 |
| 294A | D3 | 1.31 | 1.87 | 1.25 | 0.50 | | 0.18 |
| 33A2 | D2 | 1.25 | 0.98 | 0.83 | 0.67 | | 0.44 |
| 33A2S | D2 | 1.25 | 1.50 | 0.88 | 0.69 | | 0.44 |
| 33A7 | D2 | 1.25 | 0.89 | 0.77 | 0.55 | | 0.27 |
| 32MP1.25 | D2 | 1.25 | 1.92 | 1.08 | 0.98 | 0.75 x 0.18 | 0.44 |
| 264 | D1 | 1.25 | 0.95 | 0.50 | 0.67 | | 0.44 |
| B1Q | D1 | 1.25 | 1.00 | 0.56 | 0.75 | | 0.56 |
| 33AD1 | D1 | 1.20 | 1.12 | 0.59 | 0.67 | | 0.23 |
| 33K | D2 | 1.20 | 1.38 | 0.89 | 0.64 | 0.42 x 0.48 | 0.23 |
| 376 | D1 | 1.20 | 0.50 | 0.36 | 0.80 | | 0.62 |
| B1 | D1 | 1.20 | 0.88 | 0.77 | 0.55 | | 0.27 |
| B1C | D1 | 1.20 | 0.88 | 0.78 | 0.53 | | 0.27 |
| B4AC | D2 | 1.20 | 1.23 | 1.06 | 0.50 | | 0.28 |

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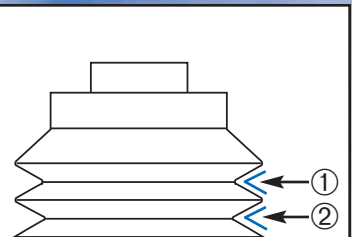


Style K



NOTE:
Style K cups
WITH
E and E1
dimensions
have a counter-bore
mounting hole.

Style K cups
WITHOUT
E and E1
dimensions
(F only)
have a thru
mounting hole.



This bellows
has a total of
2 convolutions.
Diagram common to
all bellows



Vacuum Cups – Style K *(continued)*

Style K



STYLE = Number of Convolutions

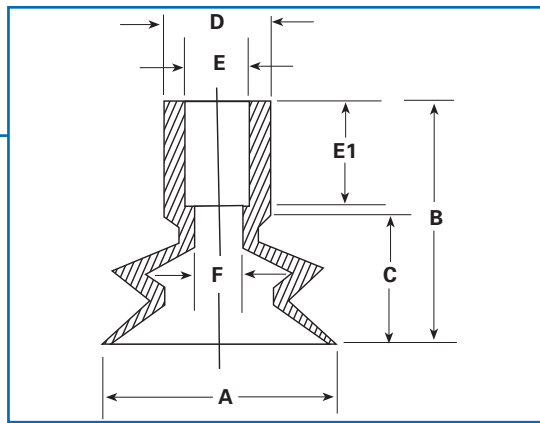
| VC No. | Style | A | B | C | D | E x E1 | F |
|---------|-------|------|------|------|------|-------------|-----------|
| 32C3 | D1 | 1.19 | 1.25 | 0.67 | 0.64 | | 0.31 |
| 33H | D2 | 1.19 | 1.25 | 0.94 | 0.78 | | 0.36 |
| B4A | D2 | 1.19 | 1.25 | 1.09 | 0.48 | | 0.27 |
| 196A | D1 | 1.17 | 0.89 | 0.66 | 0.48 | | 0.27 |
| 33E2 | D2 | 1.16 | 1.54 | 0.99 | 0.63 | 0.31 x 0.50 | 0.31 |
| B1A2 | D1 | 1.15 | 0.94 | 0.94 | 0.55 | | 0.28 |
| 33A4 | D3 | 1.14 | 1.64 | 1.34 | 0.69 | | 0.25 |
| 33E | D2 | 1.14 | 1.52 | 0.89 | 0.61 | 0.31 x 0.54 | 0.28 |
| 209A | D1 | 1.13 | 1.14 | 0.78 | 0.56 | | 0.39 |
| 196 | D1 | 1.11 | 0.66 | 1.03 | 0.48 | 0.43 x 0.01 | 0.25 |
| 134B2 | D1 | 1.10 | 0.98 | 0.68 | 0.52 | | 0.25 |
| 33E1 | D2 | 1.09 | 1.20 | 0.76 | 0.66 | | 0.34 |
| B28 | D1 | 1.09 | 0.80 | 0.47 | 0.50 | | 0.14 |
| 196D | D1 | 1.08 | 0.64 | 0.52 | 0.50 | | 0.25 |
| 124A3 | D1 | 1.03 | 0.90 | 0.65 | 0.43 | | 0.18 |
| 124F1 | D2 | 1.03 | 1.45 | 0.75 | 0.75 | 0.42 x 0.70 | 0.38 |
| 388 | D2 | 1.03 | 1.63 | 1.00 | 0.75 | 0.44 x 0.60 | 0.25 |
| 124 | D1 | 1.02 | 1.45 | 0.77 | 0.64 | 0.35 x 0.62 | 0.31 |
| 333 | D1 | 1.02 | 1.13 | 0.46 | 0.73 | 0.44 x 0.56 | 0.28 |
| 32MP1A | D2 | 1.00 | 1.86 | 1.05 | 0.75 | 0.50 x 0.17 | 0.43 |
| 124B | D1 | 1.00 | 1.38 | 0.74 | 0.64 | 0.37 x 0.64 | 0.28 |
| 128A | D3 | 1.00 | 1.75 | 1.09 | 0.48 | | 0.23 |
| 128 | D3 | 0.98 | 1.80 | 1.11 | 1.00 | | 0.25 |
| 134B | D1 | 0.98 | 0.91 | 0.63 | 0.50 | 0.25 x 0.31 | 0.25 |
| 359 | D2 | 0.98 | 1.49 | 1.11 | 0.40 | | 0.16 BARB |
| 356 | D1 | 0.94 | 0.91 | 0.67 | 0.39 | 0.18 x 0.16 | 0.17 BARB |
| 196B | D1 | 0.92 | 0.63 | 0.53 | 0.48 | | 0.28 |
| 33A3 | D2 | 0.90 | 1.02 | 0.59 | 0.67 | | 0.39 |
| 33A5EL | D8 | 0.88 | 2.75 | 2.31 | 0.80 | | 0.37 |
| 33A5L3 | D3 | 0.88 | 1.23 | 0.89 | 0.80 | | 0.25 |
| 33G1 | D2 | 0.88 | 1.29 | 0.94 | 0.78 | | 0.34 |
| 33G | D2 | 0.86 | 1.30 | 0.97 | 0.78 | | 0.34 |
| 273 | D2 | 0.85 | 1.69 | 0.89 | 0.59 | | 0.27 |
| B20-2 | D1 | 0.84 | 0.75 | 0.47 | 0.38 | 0.19 x 0.28 | 0.19 |
| B18-1 | D1 | 0.80 | 0.86 | 0.33 | 0.48 | | 0.26 |
| B20 | D1 | 0.80 | 0.81 | 0.39 | 0.38 | | 0.16 |
| B21 | D3 | 0.80 | 1.03 | 0.89 | 0.47 | 0.31 x 0.12 | 0.25 |
| 315 | D2 | 0.79 | 0.87 | 0.59 | 0.56 | | 0.20 |
| B20.5 | D2 | 0.79 | 1.06 | 0.65 | 0.46 | 0.31 x 0.37 | 0.25 |
| 33A9 | D2 | 0.78 | 0.72 | 0.66 | 0.39 | 0.28 x 0.06 | 0.13 |
| 124C | D1 | 0.78 | 1.47 | 0.75 | 0.63 | 0.43 x 0.65 | 0.30 |
| B19 | D1 | 0.78 | 0.58 | 0.39 | 0.39 | | 0.19 |
| 33A5 | D3 | 0.77 | 1.27 | 0.75 | 0.66 | | 0.25 |
| 33A5S | D3 | 0.77 | 0.91 | 0.66 | 0.68 | | 0.25 |
| B2 0.64 | D1 | 0.76 | 0.64 | 0.47 | 0.52 | | 0.27 |
| B2A1 | D1 | 0.76 | 0.72 | 0.40 | 0.64 | | 0.28 |
| B2 | D1 | 0.75 | 0.71 | 0.43 | 0.51 | | 0.26 |
| 124D | D1 | 0.75 | 0.65 | 0.40 | 0.43 | | 0.18 |
| 124D3 | D1 | 0.75 | 0.92 | 0.41 | 0.44 | | 0.19 |
| 310 | D1 | 0.72 | 0.89 | 0.38 | 0.39 | | 0.25 |
| B18 | D2 | 0.72 | 0.94 | 0.64 | 0.39 | | 0.20 |
| 196C | D1 | 0.67 | 0.44 | 0.36 | 0.34 | | 0.23 |
| 176A | D1 | 0.64 | 1.19 | 0.38 | 0.63 | 0.38 x 0.81 | 0.30 |
| 33A10 | D1 | 0.63 | 0.62 | 0.42 | 0.75 | | 0.35 |
| B15-1 | D1 | 0.63 | 0.80 | 0.41 | 0.34 | | 0.14 |
| B15-2 | D1 | 0.63 | 0.97 | 0.39 | 0.38 | | 0.16 |
| B15 | D1 | 0.61 | 0.81 | 0.25 | 0.36 | | 0.16 |
| B19A | D2 | 0.60 | 0.60 | 0.41 | 0.40 | 0.28 x 0.08 | 0.22 |

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NOTE:
Style K cups WITH E and E1 dimensions have a counter-bore mounting hole.
Style K cups WITHOUT E and E1 dimensions (F only) have a thru mounting hole.



Style K



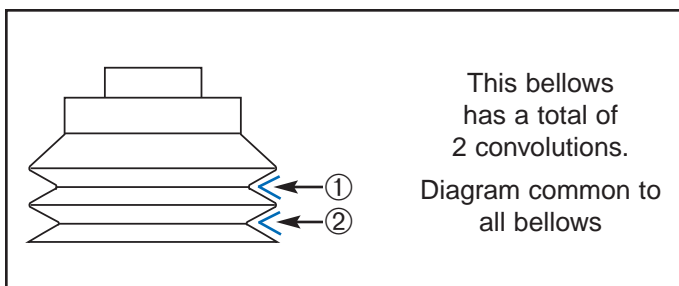
| VC No. | Style | A | B | C | D | E x E1 | F |
|--------|-------|------|------|------|------|-------------|-----------|
| B3 | D1 | 0.52 | 0.59 | 0.38 | 0.40 | | 0.15 |
| B3-1 | D3 | 0.52 | 1.06 | 0.81 | 0.31 | | 0.15 |
| B3-2 | D5 | 0.51 | 1.53 | 1.25 | 0.31 | | 0.15 |
| B10-3 | D1 | 0.44 | 0.65 | 0.25 | 0.36 | | 0.15 BARB |
| B10-5 | D1 | 0.44 | 0.70 | 0.20 | 0.31 | | 0.16 |
| 277 | D1 | 0.43 | 0.50 | 0.33 | 0.22 | | 0.72 |
| B10-4 | D1 | 0.43 | 1.03 | 0.24 | 0.35 | 0.15 x 0.78 | 0.15 |
| B10.5 | D1 | 0.43 | 0.65 | 0.21 | 0.32 | | 0.16 BARB |
| B10 | D1 | 0.41 | 0.55 | 0.23 | 0.20 | | 0.06 |
| B10-1 | D1 | 0.41 | 0.53 | 0.23 | 0.19 | | 0.11 |
| B9.5A | D2 | 0.40 | 0.51 | 0.27 | 0.40 | 0.28 x 0.20 | 0.20 |
| B9 | D2 | 0.39 | 0.89 | 0.53 | 0.41 | | 0.20 |
| B10-6 | D1 | 0.39 | 1.06 | 0.28 | 0.18 | | 0.06 |
| B10-2 | D2 | 0.38 | 0.75 | 0.41 | 0.19 | | 0.06 |
| B8.1 | D1 | 0.35 | 0.47 | 0.21 | 0.22 | 0.09 x 0.10 | 0.08 |
| B8 | D1 | 0.31 | 0.50 | 0.14 | 0.19 | | 0.08 |
| B7 | D1 | 0.28 | 0.66 | 0.25 | 0.27 | | 0.15 |
| B7-1 | D3 | 0.27 | 0.63 | 0.30 | 0.27 | | 0.16 |
| B6 | D1 | 0.25 | 0.45 | 0.17 | 0.14 | | 0.06 |
| B6-2 | D2 | 0.25 | 0.60 | 0.26 | 0.15 | | 0.06 |
| B6.4 | D1 | 0.25 | 1.62 | 0.14 | 0.14 | | 0.06 |
| B6.5 | D2 | 0.25 | 0.57 | 0.33 | 0.34 | | 0.08 |
| B3.4 | D3 | 0.19 | 0.56 | 0.23 | 0.27 | | 0.08 |
| B5-2 | D2 | 0.19 | 0.50 | 0.17 | 0.12 | | 0.06 |
| B5-3 | D3 | 0.19 | 0.50 | 0.20 | 0.12 | | 0.06 |
| B5 | D1 | 0.18 | 0.46 | 0.10 | 0.12 | | 0.06 |
| B3.5 | D3 | 0.13 | 0.56 | 0.26 | 0.29 | 0.15 x 0.33 | 0.06 |

STYLE = Number of Convolutions

Style K Includes A-1 (oval cup)

| VC No. | Style | A | A-1* | B | C | D | E x E1 | F |
|--------|-------|------|------|------|------|------|-------------|-------------|
| 33I | D2 | 1.18 | 2.34 | 1.29 | 0.90 | 0.79 | | 0.32 |
| 33H1 | D2 | 1.14 | 1.34 | 1.34 | 1.02 | 0.75 | | 0.34 |
| 33I-1 | D2 | 1.12 | 1.37 | 0.98 | 0.59 | 0.78 | | 0.40 |
| 33I-3 | D2 | 1.10 | 1.76 | 1.00 | 0.60 | 0.76 | | 0.39 |
| 33I-4 | D2 | 1.00 | 1.00 | 1.03 | 0.60 | 0.78 | 0.56 x 0.07 | 0.40 |
| 252 | D1 | 0.98 | 0.75 | 0.70 | 0.42 | 0.51 | | 0.26 |
| 33I-2 | D2 | 0.78 | 0.96 | 0.98 | 0.57 | 0.76 | | 0.40 |
| 33I-5 | D2 | 0.74 | 1.37 | 0.98 | 0.75 | 0.78 | 0.56 x 0.07 | 0.40 |
| B4 | D1 | 0.61 | 1.67 | 0.88 | 0.50 | 0.50 | | 0.19 x 2.00 |

*Denotes oval cup.



NOTE:
Style K cups WITH E and E1 dimensions have a counter-bore mounting hole.

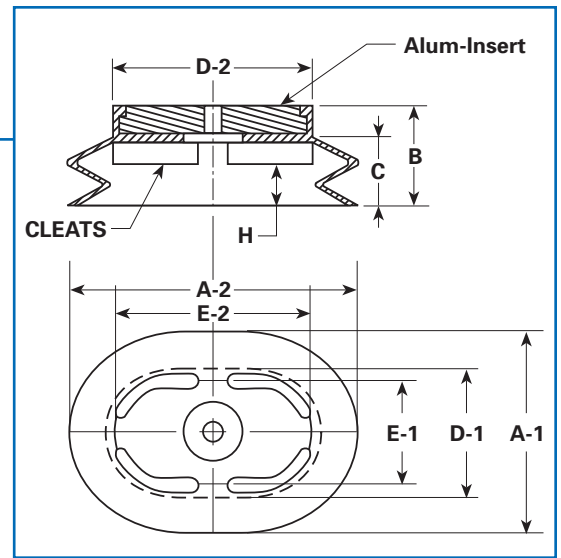
Style K cups WITHOUT E and E1 dimensions (F only) have a thru mounting hole.



Vacuum Cups

Style L

Style L



Style L Includes A-1 (oval cup)

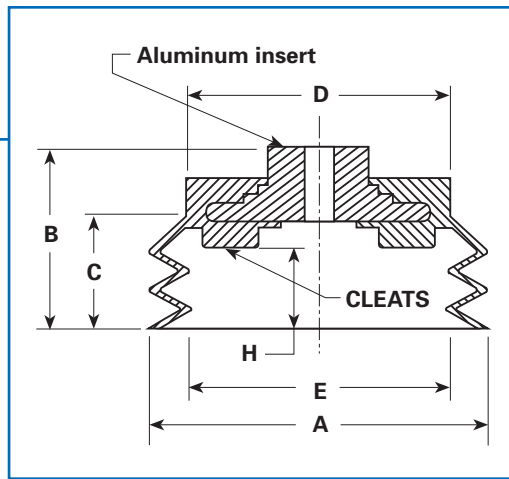
STYLE = Number of Convolutions

| VC No. | Style | A-1 | A-2 | B | C | D-1 | D-2 | E-1 | E-2 | H | Cleats |
|-----------------|-------|------|-------|------|------|------|-------|------|-------|------|--------|
| 32 3.5 x 10 | D1 | 3.50 | 10.00 | 1.77 | 1.25 | 2.00 | 8.50 | 1.81 | 8.31 | 0.75 | YES |
| 32 3.5 x 5 | D1 | 3.45 | 4.93 | 1.75 | 1.25 | 1.40 | 2.45 | 1.82 | 3.35 | 0.68 | YES |
| 129 | D2 | 3.25 | 7.87 | 2.00 | 1.56 | 2.20 | 6.87 | 2.28 | 6.93 | 1.18 | YES |
| 32 3 x 3.25 | D4 | 3.00 | 3.25 | 2.75 | 2.25 | 2.50 | 2.75 | 1.75 | 1.94 | 2.03 | YES |
| 32 3 x 7 | D4 | 3.00 | 7.00 | 2.50 | 1.94 | 1.88 | 5.88 | 2.09 | 6.09 | 1.81 | YES |
| 32 2.75 x 6.5 | D2 | 2.75 | 6.50 | 2.50 | 1.98 | 1.61 | 5.36 | 1.24 | 4.99 | 1.69 | YES |
| 32 2.5 x 6DP | D4 | 2.50 | 6.00 | 3.84 | 1.12 | 1.37 | 4.87 | 1.00 | 4.50 | 2.00 | YES |
| 32 2.5 x 6 | D1 | 2.46 | 5.95 | 1.79 | 1.21 | 1.37 | 4.87 | 0.98 | 4.51 | 0.81 | YES |
| 32 2.25 x 3.87 | D1 | 2.18 | 3.84 | 1.50 | 0.95 | 1.34 | 2.98 | 1.14 | 2.73 | 0.43 | YES |
| 32 2 x 3.25L | D5 | 2.00 | 3.25 | 3.38 | 2.81 | 1.50 | 2.75 | 0.53 | 2.07 | 2.46 | YES |
| 32 2 x 3.5 | D1 | 2.00 | 3.50 | 1.38 | 0.61 | 1.50 | 3.25 | 0.75 | 2.25 | 0.50 | YES |
| 32 1.5 x 3.87 | D1 | 1.50 | 3.84 | 1.48 | 0.79 | 1.50 | 3.62 | 0.84 | 3.18 | 0.31 | YES |
| 32 1.5 x 2.75D2 | D2 | 1.50 | 2.75 | 1.70 | 1.08 | 0.86 | 2.11 | 2.11 | 0.86 | 0.84 | YES |
| 32 1.5 x 2.75 | D1 | 1.46 | 2.73 | 1.39 | 0.64 | 0.85 | 2.12 | 0.85 | 2.12 | 0.50 | YES |
| 32 1.3 x 3.05 | D1 | 1.25 | 3.00 | 0.87 | 0.71 | 0.75 | 2.50 | 0.90 | 2.62 | 0.37 | NO |
| 32 1.25 x 2.5 | D1 | 1.25 | 2.46 | 1.28 | 0.64 | 0.75 | 2.00 | 0.64 | 1.87 | 0.39 | YES |
| 32 1.25 x 2.5D2 | D2 | 1.25 | 2.50 | 1.71 | 1.04 | 0.75 | 2.00 | 0.47 | 1.72 | 0.14 | YES |
| 32 1 x 13 | D2 | 1.00 | 13.00 | 1.07 | 0.57 | 1.00 | 13.00 | 0.73 | 12.75 | 0.43 | YES |
| 188B1 | D2 | 1.00 | 4.50 | 1.31 | 0.94 | 1.00 | 4.50 | 0.41 | 3.91 | 0.70 | YES |
| 32 .75 x 5 | D2 | 0.75 | 5.00 | 0.94 | 0.43 | 0.75 | 5.00 | 0.59 | 4.25 | 0.34 | YES |
| 188C1 | D1 | 0.75 | 2.87 | 0.70 | 0.56 | 0.75 | 2.89 | 0.35 | 2.50 | 0.39 | NO |
| 32 .62 x 1.87 | D1 | 0.62 | 1.87 | 0.55 | 0.32 | 0.43 | 1.68 | 0.26 | 1.50 | 0.46 | NO |

When ordering, please specify thread size.

Vacuum Cups

Style M



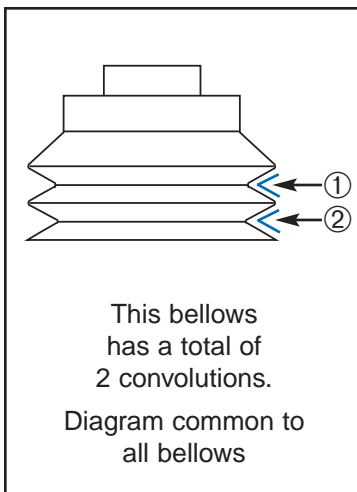
Style M



STYLE = Number of Convolutions

| VC No. | Style | A | B | C | D | E | H | Cleats |
|-----------|-------|-------|------|------|------|------|------|--------|
| 104 12.5 | D1 | 12.50 | 4.25 | 4.12 | 9.25 | 9.00 | 3.10 | YES |
| 104 10 | D1 | 10.00 | 3.12 | 3.00 | 7.25 | 8.00 | 1.13 | YES |
| 104 9.5 | D1 | 9.50 | 2.85 | 2.85 | 8.38 | 8.20 | 1.00 | YES |
| 104 8.5 | D1 | 8.50 | 3.81 | 3.17 | 5.71 | 6.50 | 1.62 | YES |
| 104 8.5-2 | D2 | 8.50 | 2.75 | 1.62 | 7.50 | 7.50 | 1.12 | YES |
| 104 7.94 | D2 | 7.94 | 2.81 | 1.96 | 6.04 | 6.00 | 1.50 | YES |
| 104 7.5 | D1 | 7.37 | 2.25 | 1.75 | 5.46 | 5.46 | 1.12 | YES |
| 104 7.0-1 | D6 | 7.00 | 5.50 | 4.00 | 6.06 | 5.96 | 2.75 | YES |
| 104 7.0 | D2 | 7.00 | 2.62 | 1.51 | 6.00 | 5.87 | 1.06 | YES |
| 104 6.43 | D1 | 6.43 | 2.75 | 2.43 | 4.18 | 4.54 | 1.62 | YES |
| 104 6.0 | D2 | 6.00 | 2.38 | 1.62 | 5.12 | 5.12 | 0.87 | YES |
| 104 5.6 | D1 | 5.60 | 2.00 | 1.62 | 3.00 | 4.00 | 0.87 | YES |
| B110 | D1 | 4.62 | 2.50 | 1.68 | 3.50 | 3.03 | 1.12 | YES |
| 104 4.5 | D2 | 4.50 | 2.50 | 1.56 | 3.50 | 3.68 | 1.12 | YES |
| 104 4.33 | D2 | 4.33 | 1.42 | 1.30 | 2.75 | 3.50 | 0.88 | YES |
| 104 3.75 | D2 | 3.75 | 2.00 | 1.43 | 2.75 | 2.78 | 1.00 | YES |
| 322F | D1 | 3.50 | 1.13 | 0.77 | 2.50 | 2.60 | 0.31 | YES |
| 130D2 | D2 | 3.36 | 1.78 | 1.45 | 2.43 | 2.48 | 0.76 | YES |
| 130 | D4 | 3.31 | 2.75 | 2.18 | 2.42 | 2.50 | 1.68 | YES |
| 130G | D4 | 3.31 | 2.75 | 2.38 | 2.38 | 2.50 | 1.25 | YES |
| 130SB | D1 | 3.31 | 1.37 | 0.81 | 2.40 | 2.50 | 0.31 | YES |
| B75 | D1 | 3.09 | 1.82 | 0.18 | 2.29 | 2.21 | 0.73 | YES |
| 322E | D1 | 3.00 | 1.13 | 0.78 | 1.64 | 2.10 | 0.31 | YES |
| 130A5 | D5 | 2.75 | 3.21 | 2.56 | 2.26 | 1.90 | 2.18 | YES |
| 130A | D4 | 2.75 | 2.84 | 2.18 | 2.26 | 0.92 | 1.81 | YES |
| 130D | D4 | 2.36 | 2.36 | 2.13 | 1.41 | 1.61 | 1.97 | YES |
| 130F | D2 | 2.25 | 1.89 | 1.01 | 2.25 | 1.31 | 0.52 | YES |
| 130B | D4 | 2.21 | 3.46 | 2.46 | 2.21 | 1.37 | 2.37 | YES |
| 130E | D4 | 1.97 | 1.97 | 1.73 | 1.18 | 1.34 | 1.61 | YES |

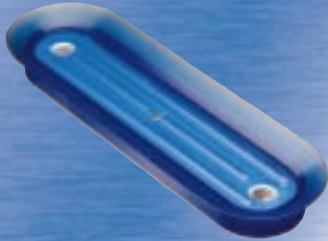
When ordering, please specify thread size.





Vacuum Cups – Style N

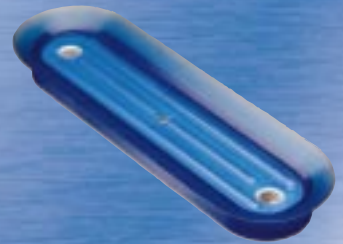
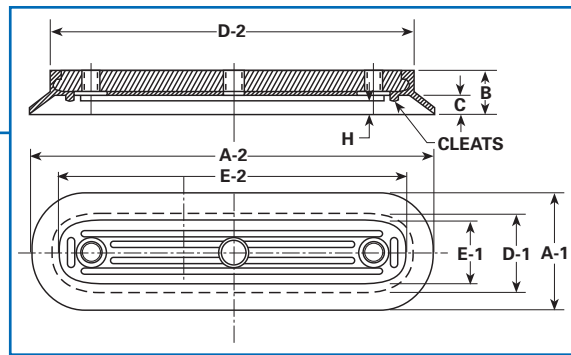
Style N



NOTE:
*Style N cups
 DO NOT have
 3 Threaded Ports*

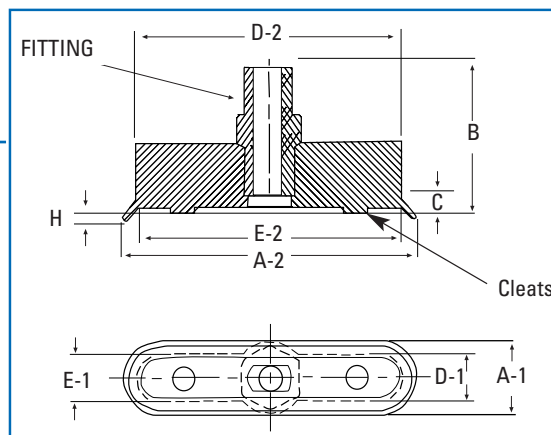
| VC No. | A-1 | A-2 | B | C | D-1 | D-2 | E-1 | E-2 | H | Cleats |
|------------------|-------|-------|------|------|------|-------|------|-------|------|--------|
| 90 12 x 12 | 12.00 | 12.00 | 2.00 | 1.95 | 9.93 | 9.93 | 9.40 | 9.40 | 1.05 | YES |
| 90 10.75 x 13 | 10.75 | 13.00 | 1.50 | 0.91 | 9.37 | 11.62 | 9.12 | 11.37 | 0.50 | YES |
| 90 9.5 x 10.5 | 9.50 | 10.50 | 1.50 | 0.91 | 8.12 | 9.12 | 7.87 | 8.87 | 0.50 | YES |
| 90 8.5 x 10DP | 8.50 | 10.00 | 2.00 | 1.45 | 6.87 | 8.37 | 6.38 | 7.88 | 0.12 | YES |
| 90 8 x 15 | 8.00 | 15.00 | 2.75 | 2.28 | 5.50 | 12.50 | 4.31 | 11.25 | 2.12 | YES |
| 90 8 x 20 | 8.00 | 20.00 | 2.68 | 2.03 | 5.75 | 17.75 | 4.75 | 16.75 | 1.00 | YES |
| 90 7 x 12 | 7.00 | 12.00 | 1.88 | 1.10 | 4.92 | 9.92 | 4.32 | 9.32 | 0.90 | YES |
| 90 6 x 14 DP | 6.00 | 14.00 | 1.90 | 1.34 | 4.50 | 12.37 | 3.92 | 11.92 | 1.12 | NO |
| 90 6 x 12DP | 6.00 | 12.00 | 2.37 | 1.56 | 4.50 | 10.50 | 3.81 | 9.82 | 0.88 | YES |
| 90 6 x 10 | 6.00 | 10.00 | 1.12 | 0.45 | 5.00 | 9.00 | 4.12 | 8.37 | 0.36 | NO |
| 90 6 x 10 DP | 6.00 | 10.00 | 1.87 | 1.25 | 4.50 | 8.50 | 3.75 | 6.81 | 1.18 | YES |
| 90 6 x 9 BRD | 6.00 | 9.00 | 1.06 | 0.71 | 4.62 | 7.62 | 4.29 | 7.29 | 0.44 | NO |
| 90 6 x 8.5DP | 6.00 | 8.50 | 1.87 | 1.37 | 4.37 | 7.03 | 0.40 | 6.50 | 0.80 | YES |
| 90 6 x 8.5 | 6.00 | 8.50 | 1.44 | 0.68 | 4.62 | 7.18 | 4.37 | 5.81 | 0.43 | YES |
| 90 6 x 6 | 6.00 | 6.00 | 1.75 | 1.37 | 4.50 | 4.50 | 3.95 | 3.95 | 1.00 | YES |
| 90 5 x 14 | 5.00 | 14.00 | 1.50 | 0.89 | 3.75 | 12.75 | 3.67 | 12.39 | 0.50 | YES |
| 90 5 x 12 | 4.96 | 12.00 | 1.53 | 0.76 | 3.99 | 10.98 | 3.79 | 10.78 | 0.47 | YES |
| 90 4 x 14 | 4.00 | 14.00 | 1.50 | 0.75 | 3.00 | 13.00 | 2.79 | 12.75 | 0.45 | YES |
| 73A | 4.00 | 9.00 | 1.84 | 1.60 | 2.25 | 7.37 | 1.64 | 6.75 | 1.00 | NO |
| 90 4 x 8 | 4.00 | 8.00 | 1.62 | 0.75 | 2.75 | 6.62 | 2.25 | 6.25 | 0.50 | YES |
| 75 | 3.90 | 8.75 | 1.50 | 1.38 | 2.38 | 7.25 | 1.63 | 6.75 | 1.00 | YES |
| 90 3.625 x 5.375 | 3.63 | 5.38 | 1.25 | 0.75 | 2.38 | 4.13 | 2.13 | 3.88 | 0.44 | YES |
| 90 3.5 x 14 | 3.50 | 14.00 | 1.12 | 0.50 | 2.50 | 13.00 | 1.89 | 12.37 | 0.43 | YES |
| 90 3.5 x 11 | 3.50 | 11.00 | 1.25 | 0.46 | 2.50 | 10.00 | 1.93 | 9.37 | 0.37 | YES |
| 90 3.5 x 7.5 | 3.50 | 7.50 | 1.33 | 0.56 | 2.25 | 6.25 | 1.90 | 5.90 | 0.37 | YES |
| 74 | 3.50 | 7.50 | 1.60 | 0.75 | 2.34 | 6.18 | 1.89 | 5.90 | 0.56 | NO |
| 74A | 3.50 | 7.50 | 1.60 | 0.78 | 2.34 | 6.34 | 1.89 | 5.90 | 0.40 | YES |
| 213 | 3.44 | 7.68 | 0.92 | 0.51 | 2.00 | 3.23 | 2.68 | 3.92 | 0.06 | YES |
| 90 3.25 x 15.5 | 3.25 | 15.50 | 1.33 | 0.55 | 2.25 | 14.50 | 2.16 | 14.41 | 0.15 | YES |
| 90 3.25 x 5 | 3.25 | 5.00 | 1.25 | 0.75 | 2.00 | 3.75 | 1.75 | 3.50 | 0.43 | YES |
| 82 | 3.12 | 6.00 | 1.75 | 1.50 | 1.43 | 4.32 | 1.20 | 4.12 | 0.87 | YES |
| 90 3 x 10 | 3.00 | 10.00 | 1.12 | 0.53 | 2.00 | 9.00 | 1.71 | 8.75 | 0.37 | YES |
| 90 3 x 8 | 3.00 | 8.00 | 1.25 | 0.45 | 2.25 | 7.12 | 1.68 | 6.68 | 0.37 | YES |
| 90 3 x 12 | 3.00 | 12.00 | 1.29 | 0.94 | 1.26 | 10.26 | 1.50 | 10.50 | 0.63 | YES |
| 90 3 x 13 | 3.00 | 13.00 | 1.43 | 0.53 | 2.06 | 12.06 | 1.46 | 11.43 | 0.46 | YES |
| 288 | 2.75 | 5.85 | 0.70 | 0.40 | 1.75 | 4.85 | 1.86 | 4.06 | 0.20 | YES |
| 90 2.75 x 4.75 | 2.75 | 4.75 | 1.00 | 0.50 | 2.00 | 4.00 | 2.00 | 4.00 | 0.25 | YES |
| 90 2.75 x 3.5 | 2.73 | 3.48 | 1.18 | 0.70 | 2.03 | 2.78 | 1.75 | 2.48 | 0.25 | NO |
| 338 2.718 x 6 | 2.72 | 6.00 | 0.88 | 0.52 | 1.38 | 4.63 | 0.75 | 4.00 | 0.13 | YES |
| 90 2.68 x 3.5 | 2.68 | 3.50 | 0.47 | 0.30 | 1.80 | 2.62 | 1.80 | 2.62 | 0.08 | YES |
| 90 2.68 x 6.62 | 2.68 | 6.62 | 0.50 | 0.34 | 1.81 | 5.74 | 1.80 | 5.75 | 0.28 | YES |
| 90 2.68 x 5.75 | 2.68 | 5.75 | 0.51 | 0.30 | 1.81 | 4.87 | 1.81 | 4.87 | 0.12 | YES |
| 90 2.50 x 3.75 | 2.50 | 3.75 | 1.00 | 0.33 | 1.62 | 2.87 | 1.50 | 2.75 | 0.20 | YES |
| 90 2.5 x 5.0 | 2.50 | 5.00 | 1.00 | 0.33 | 1.62 | 4.12 | 1.50 | 4.00 | 0.20 | NO |
| 125 | 2.50 | 5.50 | 1.25 | 0.62 | 1.37 | 4.34 | 0.88 | 2.56 | 0.37 | NO |
| 90 2.375 x 4.25 | 2.38 | 4.25 | 0.66 | 0.33 | 1.50 | 3.38 | 1.38 | 3.25 | 0.23 | YES |
| 90 2.25 x 5.25 | 2.29 | 5.26 | 1.25 | 0.55 | 1.54 | 4.51 | 1.54 | 4.51 | 0.38 | YES |
| 90 2.25 x 3.0 | 2.25 | 3.00 | 1.14 | 0.37 | 2.00 | 2.75 | 1.58 | 2.33 | 0.26 | NO |
| 90 2.2 x 7.5 | 2.20 | 7.50 | 1.33 | 0.44 | 1.38 | 6.69 | 1.18 | 6.50 | 0.16 | YES |
| 81 | 2.06 | 4.00 | 0.73 | 0.56 | 1.40 | 3.37 | 0.85 | 2.78 | 0.37 | NO |
| 90 2 x 10 | 2.00 | 10.00 | 0.89 | 0.42 | 1.00 | 9.00 | 0.85 | 0.75 | 0.43 | NO |
| 183 2 x 7 | 2.00 | 7.00 | 1.00 | 0.45 | 1.25 | 6.25 | 6.18 | 1.20 | 0.25 | NO |
| 183 2 x 6 | 2.00 | 6.00 | 0.93 | 0.39 | 1.25 | 5.23 | 2.00 | 5.21 | 0.25 | NO |
| 183 2 x 6 R | 2.00 | 5.59 | 1.00 | 0.50 | 1.25 | 5.23 | 1.17 | 5.15 | 0.12 | NO |
| 183 2 x 5 | 2.00 | 5.00 | 1.17 | 0.48 | 1.25 | 4.25 | 1.18 | 4.18 | 0.25 | YES |
| 183 2 x 4 | 2.00 | 4.00 | 1.00 | 0.50 | 1.23 | 3.23 | 1.15 | 3.12 | 0.37 | YES |
| 183 2 x 4 R | 2.00 | 3.54 | 1.00 | 0.46 | 1.23 | 3.23 | 1.15 | 3.15 | 0.31 | NO |
| 81A | 1.89 | 4.12 | 1.20 | 0.51 | 1.50 | 3.73 | 0.87 | 3.06 | 0.37 | YES |
| 90 1.87 x 16 | 1.88 | 16.00 | 1.63 | 0.86 | 1.38 | 15.50 | 1.23 | 15.38 | 0.19 | YES |
| 90 1.75 x 16 | 1.75 | 16.00 | 1.62 | 0.73 | 1.35 | 15.50 | 1.23 | 15.31 | 0.18 | NO |
| 90 1.62 x 4.0 | 1.62 | 4.00 | 1.04 | 0.31 | 1.25 | 3.60 | 0.96 | 3.34 | 0.18 | YES |
| 83 | 1.56 | 4.09 | 1.23 | 0.50 | 1.18 | 3.37 | 0.73 | 3.31 | 0.31 | NO |

Styles N & O



| VC No. | A-1 | A-2 | B | C | D-1 | D-2 | E-1 | E-2 | H | Cleats |
|-----------------|------|-------|------|------|-------|------|------|-------|------|--------|
| 183 1.56 x 4 | 1.56 | 4.00 | 1.00 | 0.50 | 0.79 | 3.25 | 0.69 | 3.15 | 0.31 | YES |
| 90 1.5 x 10 | 1.50 | 10.00 | 1.25 | 0.40 | 1.00 | 9.50 | 0.87 | 9.37 | 0.25 | YES |
| 90 1.5 x 8 | 1.50 | 8.00 | 1.26 | 0.39 | 1.00 | 7.37 | 0.74 | 7.15 | 0.23 | YES |
| 188A TALL | 1.50 | 2.87 | 2.00 | 0.37 | 1.25 | 2.62 | 0.73 | 3.31 | 0.18 | YES |
| 188A | 1.50 | 2.87 | 1.14 | 0.37 | 1.25 | 2.62 | 0.82 | 2.18 | 0.18 | YES |
| 125A | 1.43 | 3.71 | 0.78 | 0.56 | 0.62 | 2.87 | 0.78 | 3.04 | 0.28 | NO |
| 90 1.25 x 11.64 | 1.25 | 11.64 | 1.05 | 0.55 | 11.64 | 1.25 | 0.67 | 11.07 | 0.20 | NO |
| 188 | 1.00 | 4.50 | 0.78 | 0.17 | 1.00 | 4.50 | 0.51 | 4.00 | 0.15 | NO |
| 188B | 1.00 | 4.50 | 0.73 | 0.20 | 1.00 | 4.50 | 0.54 | 4.04 | 0.12 | YES |
| 188B2 | 1.00 | 5.00 | 0.75 | 0.25 | 1.00 | 5.00 | 0.55 | 4.54 | 0.17 | NO |
| 188D | 1.00 | 2.50 | 0.75 | 0.28 | 1.00 | 2.50 | 0.37 | 1.86 | 0.25 | NO |
| 188JC | 1.00 | 5.00 | 0.63 | 0.13 | 1.00 | 5.00 | 0.54 | 4.50 | 0.06 | YES |
| 188E | 0.87 | 4.50 | 0.70 | 0.19 | 0.87 | 4.50 | 0.42 | 4.02 | 0.16 | NO |
| 188F | 0.87 | 3.87 | 0.50 | 0.13 | 0.87 | 3.87 | 0.39 | 3.39 | 0.12 | NO |
| 189D1 | 0.86 | 1.75 | 0.50 | 0.21 | 0.75 | 1.63 | 0.41 | 1.30 | 0.20 | NO |
| 188H | 0.75 | 1.63 | 0.50 | 0.13 | 0.75 | 1.62 | 0.26 | 1.20 | 0.12 | NO |
| 188G | 0.75 | 2.38 | 0.50 | 0.13 | 0.75 | 2.37 | 0.25 | 1.95 | 0.12 | NO |
| 188G1 | 0.75 | 6.00 | 0.75 | 0.14 | 0.47 | 5.73 | 2.86 | 5.54 | 0.65 | NO |
| 189D | 0.75 | 1.75 | 0.50 | 0.14 | 0.75 | 1.75 | 0.37 | 1.35 | 0.12 | NO |
| 391 | 0.71 | 1.63 | 0.41 | 0.15 | 0.41 | 1.33 | 0.30 | 0.93 | 0.09 | NO |

Vacuum Cups Style O



| VC No. | A-1 | A-2 | B | C | D-1 | D-2 | E-1 | E-2 | H | Cleats | THRD. | REMARKS |
|--------|------|------|------|------|------|------|------|------|------|--------|---------------|-------------|
| 55 | 1.50 | 2.39 | 0.94 | 0.42 | 0.66 | 1.55 | 0.23 | 1.12 | 0.31 | NO | 1/8, 1/4 | OVAL |
| 89A | 1.47 | 2.96 | 0.93 | 0.19 | 0.92 | 0.87 | 0.88 | 2.34 | 0.20 | NO | 1/4 | SQUARE |
| 89 | 1.15 | 2.78 | 1.10 | 0.20 | 0.96 | 0.38 | 0.48 | 2.13 | 0.18 | NO | 1/4 | SQUARE |
| 189 | 0.87 | 1.73 | 1.03 | 0.21 | 1.35 | 0.50 | 0.40 | 1.21 | 0.09 | YES | 1/8M, 1/8MBSP | |
| 189 | 0.87 | 1.73 | 0.74 | 0.21 | 1.35 | 0.50 | 0.40 | 1.21 | 0.09 | YES | 1/8M | LOW PROFILE |
| 87 | 0.75 | 1.48 | 1.06 | 0.37 | 0.62 | 0.62 | 0.35 | 1.12 | 0.18 | NO | 1/8M | |
| 189H | 0.71 | 1.38 | 0.63 | 0.18 | 0.44 | 1.10 | 0.22 | 0.84 | 0.12 | NO | M6x1.0 | OVAL |
| 189A | 0.50 | 2.00 | 1.06 | 0.12 | 1.81 | 0.31 | 0.29 | 1.76 | 0.09 | NO | 1/8M | |
| 189B | 0.50 | 1.50 | 1.06 | 0.12 | 1.31 | 0.31 | 0.29 | 1.28 | 0.09 | NO | 1/8M | |
| 189C | 0.50 | 1.00 | 1.06 | 0.12 | 0.81 | 0.31 | 0.29 | 0.76 | 0.09 | NO | 1/8M | |

M = Male thrd.

Plastic Suction Cups and Grabbers



Plastic Suction Cups

| Part No. | Description |
|----------|-------------------------|
| 2010 | 1.5" OD with .25" Hole |
| 2020 | 1.5" OD with Screw Hole |
| 2030 | 1.5" OD with Metal Hook |
| 2040 | .75" OD with Knob |

| Part No. | Description |
|----------|-------------------------------|
| 2050 | .75" OD with Arrow |
| 2060 | .75" OD with Plastic Hook |
| 3062 | .75" OD with Metal Hook |
| 3032 | 1.5" OD with Mushroom Head |
| | 1.5" OD with .125" Cross Hole |



Grabbers

Grabber cups can help protect your fingers from cuts and scrapes when handling glass or sheet metal. They also can be used to install ceramic tiles. The uses are unlimited. They can be used on almost any non-porous surface. Four sizes available, up to 4.75 inches in diameter. FREE sample is offered.

| Model | Lifting Capacity* | Diameter |
|-------|-------------------|----------|
| Miss | 5 lbs. | 2.12" |
| Mrs. | 8 lbs. | 2.62" |

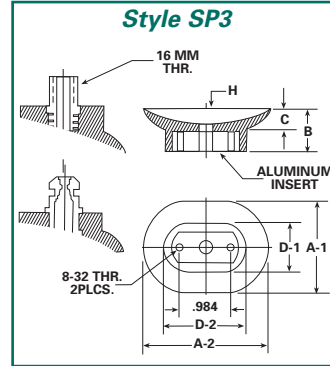
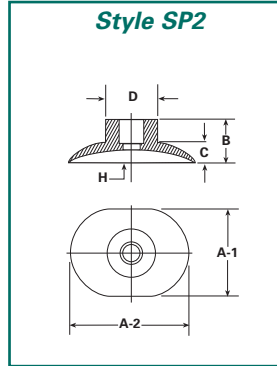
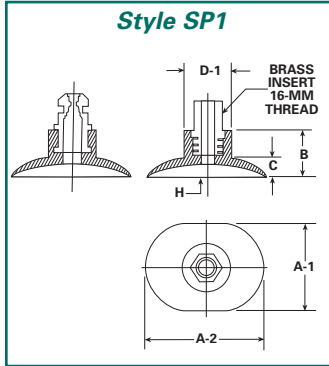
| Model | Lifting Capacity* | Diameter |
|-------|-------------------|----------|
| Mr. | 10 lbs. | 3.25" |
| Super | 25 lbs. | 4.75" |

* Based on a vertical lift, surface must be non-porous and clean for best performance.

Soap Cups



Styles SP1, SP2, SP3



Style SP1

| VC No. | A-1 | A-2* | B | C | D | H | NOTE |
|--------|------|------|------|------|------|------|--------|
| 47-14 | 2.46 | 1.51 | 1.12 | 0.41 | 1.00 | 0.21 | OVAL |
| 47T | 1.91 | 3.32 | 1.23 | 0.67 | 0.75 | 0.73 | OVAL |
| 47-31 | 1.87 | 3.12 | 1.20 | 0.70 | 1.01 | 0.35 | SQUARE |
| 47Y | 1.87 | 2.81 | 1.09 | 0.51 | 1.01 | 0.26 | OVAL |
| 47Y1 | 1.73 | 2.78 | 1.06 | 0.43 | 1.00 | 0.37 | OVAL |
| #2 | 1.70 | 2.50 | 0.91 | 0.54 | 0.75 | 0.37 | OVAL |
| DD2 | 1.68 | 2.71 | 1.15 | 0.75 | 1.29 | 0.37 | SQUARE |
| 47PG1 | 1.53 | | 0.75 | 0.35 | 1.50 | 0.56 | ROUND |
| 47Y2 | 0.93 | 1.75 | 1.14 | 0.15 | 0.95 | 0.07 | OVAL |

Style SP2

| VC No. | A-1 | A-2* | B | C | D | E | E1 | H | NOTE |
|--------|------|------|------|------|------|------|------|------|--------|
| 47N | 2.65 | | 1.45 | 0.71 | 0.87 | 0.39 | 0.59 | 0.43 | ROUND |
| 47I | 2.29 | 3.31 | 1.78 | 0.67 | 0.75 | 0.18 | | 0.39 | OVAL |
| 47AV1 | 2.18 | | 1.03 | 0.61 | 0.75 | 0.18 | | 0.34 | ROUND |
| 47PG | 2.01 | | 1.00 | 0.34 | 1.98 | 0.25 | | 0.62 | ROUND |
| 47B | 1.95 | | 1.04 | 0.65 | 0.71 | 0.23 | | 0.57 | ROUND |
| #1A | 1.93 | 2.81 | 0.89 | 0.54 | 0.73 | 0.14 | | 0.37 | OVAL |
| 47N1 | 1.91 | | 1.12 | 0.62 | 0.85 | 0.35 | 0.56 | 0.37 | ROUND |
| 47S | 1.73 | 2.41 | 1.25 | 0.73 | 0.84 | 0.39 | 0.56 | 0.43 | SQUARE |
| 47L | 1.58 | | 1.21 | 0.70 | 0.73 | 0.25 | 0.67 | 0.14 | ROUND |
| 47H | 1.29 | 2.29 | 0.87 | 0.48 | 0.71 | 0.25 | | 0.29 | OVAL |
| 47 | 0.92 | | 0.85 | 0.37 | 0.75 | 0.25 | | 0.31 | ROUND |
| #1 | 0.92 | 2.85 | 0.87 | 0.62 | 1.23 | 0.21 | | 0.43 | OVAL |


















Style SP3

| VC No. | A-1 | A-2* | B | C | D-1 | D-2 | H | NOTE |
|--------|------|------|------|------|------|------|------|---------|
| 47C | 2.12 | 2.79 | 0.89 | 0.46 | 1.09 | 1.76 | 0.31 | SQUARE |
| 47E | 2.12 | 3.26 | 0.87 | 0.65 | 1.06 | 1.64 | 0.31 | SQUARE |
| 47W | 2.07 | 3.06 | 0.96 | 0.50 | 0.85 | 1.57 | 0.41 | OVAL |
| 47-01 | 2.01 | 2.68 | 0.89 | 0.37 | 0.87 | 1.54 | 0.29 | OVAL |
| 47U | 2.00 | | 1.14 | 0.84 | 0.89 | 1.54 | 0.62 | ROUND |
| 47SG | 1.98 | 3.37 | 1.11 | 0.57 | 0.61 | 1.00 | 0.50 | SQUARE |
| 47-0 | 1.95 | 2.65 | 0.92 | 0.57 | 1.59 | 1.00 | 0.35 | OVAL |
| 47-03 | 1.92 | 3.09 | 0.82 | 0.41 | 0.85 | 1.54 | 0.25 | OVAL |
| 47F | 1.88 | 2.50 | 0.88 | 0.44 | 1.00 | 1.63 | 0.31 | OVAL |
| 47-02 | 1.87 | 2.73 | 0.91 | 0.41 | 0.87 | 1.56 | 2.81 | SQUARE |
| 47-04 | 1.82 | 3.03 | 0.85 | 0.31 | 0.89 | 1.56 | 0.26 | SQUARE |
| 47F1 | 1.70 | 2.42 | 0.84 | 0.35 | 0.87 | 1.54 | 0.44 | SQUARE |
| 47Z1 | 1.70 | 2.70 | 0.88 | 0.59 | 0.87 | 1.78 | 0.37 | ELLIPSE |
| 47F2 | 1.68 | 2.42 | 0.85 | 0.34 | 0.87 | 2.43 | 0.25 | SQUARE |
| 47Y3 | 1.54 | 2.50 | 0.82 | 0.34 | 0.79 | 1.48 | 0.18 | OVAL |
| #10A | 1.53 | 2.12 | 0.81 | 0.26 | 0.91 | 1.45 | 0.21 | OVAL |
| 55AU | 1.48 | 2.37 | 0.92 | 0.46 | 0.96 | 1.15 | 0.31 | SQUARE |
| 47Z2 | 1.39 | 2.53 | 0.81 | 0.33 | 0.79 | 1.49 | 0.29 | ELLIPSE |
| #10 | 1.21 | 2.04 | 0.85 | 0.31 | 0.93 | 1.48 | 0.25 | OVAL |

* Denotes oval cup



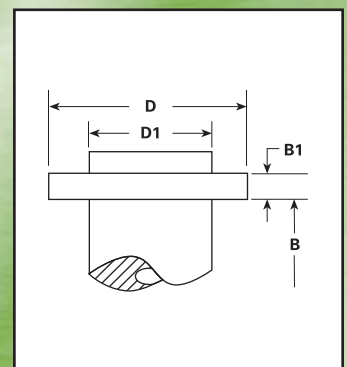
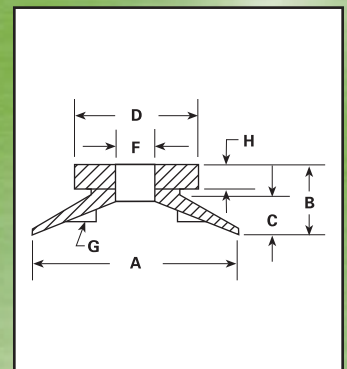
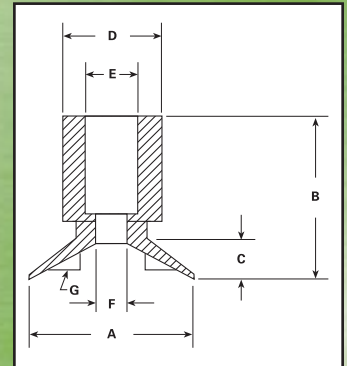
Rubber Cups

| | | | | | |
|---|--|---|--|---|--|
|  | 1 KLUGE , paper suckers. Red or gum rubber. 1P - PLASTIC SUCKER Longer Life. |  | 56 MF MIEHLE FEEDERS MF 3336 and packaging machines. Fits 1/2" tube. For light stock. Gum rubber or Neo. |  | 90 TOKO DYY-9-R1 MULTI 1218 CJ-11 IMPERIAL CJ-11 Bourg Modulen Collator |
|  | 1a KLUGE Narrow Margin Sucker, very handy in tight places. Red or gum rubber. |  | 57 HARRIS 1108 Fits 5/8" tube, for heavy stock. |  | 92 HEIDELBERG 22.016.008 For T-Press TOK-TOM. |
|  | 2 KLUGE card suckers. Red or gum rubber. |  | 58 MIEHLE STREAM FEEDERS CS 11398, packaging machines. Occasionally replaces 3122, 3123, 3124. Fits 1/2" tube - 1-3/8" across. Gum rubber or Poly. |  | 93 MULLER 020.1913 Collating and gathering machines. |
|  | 3 KLUGE carton suckers. Red or gum rubber. |  | 59 HARRIS 956-ELB Fits 5/16" tube - 1-3/8" across. |  | 94 PHILLIPSBURG Inserters, bellows type. |
|  | 4 UNIVERSAL TIPS light duty C&P, Giant, Web, Chief and Kluge. |  | 60 MF MIEHLE FEEDERS MF 3558 packaging machines, Superchief, tissue suckers. Fits 1/2" tube - 1" across. For light stock. Gum rubber or Neo. |  | 95 McCAIN Bellows type. |
|  | 5 UNIVERSAL TIPS heavy duty C&P, Giant, Web, Chief. |  | 61 HARRIS 391-ELB Fits 5/16" tube - 1-3/8" across. For heavy stock. |  | 96 HARRIS/AURELIA bellows type. 1-1/4 across, 1" high. |
|  | 6a MACEY COLLATOR HARRIS pickup sucker for cardboard. |  | 62 CS MIEHLE FEEDERS CS-357, 1-1/4" across. |  | 97 RYOBI, 5640-35-531 |
|  | 7 HARRIS old style, Giant, Web, Chief, Harris, for cardboard. Gum rubber or black. |  | 63 SHERIDAN & other collators with 1/8" tube. |  | 99 HEIDELBERG 42.016.073 for GTO. |
|  | 8 HARRIS old style, Giant, Web, Chief, Harris, for paper. |  | 64 MIEHLE FEEDERS K-1196. |  | 100 NORFIN COLLATOR |
|  | 9 MILLER Simplex, Major, Southworth envelope press suction feed. Fits 1/4" tube. For paper. |  | 66 A.B. DICK molded sucker. For all presses with 1/4" bottom tube. |  | 101 UHLMANN PACKAGING MACHINES |
|  | 10 MILLER Simplex, Major, for cardboard. Gum rubber or black. |  | 67 HARRIS , polyurethane, 3361-LTY. Occasionally replaces 59 & 61. Fits 5/16" tube - 1-3/4" across. For heavy stock. |  | 102 HORIZON COLLATOR, 3013 Small dark grey sucker. |
|  | 11 HARRIS 90 ELB fits most presses. Mann, Macey Collator & Sütcher, 6E7 - paper, 6E8 - cardboard. HTB Miehle feeders. |  | 68 HEIDELBERG cylinders. Cup shape prevents snap-back. |  | 103 HORIZON COLLATOR, 3015 Large blue sucker. |
|  | 12 HARRIS 1361 LTN fits most presses, for paper. Gum rubber or silicone. |  | 76 MULLER collating and gathering machines. Red or Black. |  | 104 DUPLO COLLATOR Bellows type sucker. |
|  | 13 a - MIEHLE CS3122 FEEDER Superchief light forwarder, Miller, Didde Glaser Collator, for paper. b - MIEHLE CS3124 FEEDER Superchief heavy forwarder, Dexter, Giant, for cardboard. Both fit Ebco presses. |  | 77 MULLER collating & gathering machines. Green. |  | RVC BOURG MODULEN 147B COLLATOR Vinyl. |
|  | 14 MIEHLE CS427 FEEDER Farrington Collator, Giant, Web, Chief, for paper. |  | 78 HAMADASTAR printing press. |  | RVC A.B. DICK CENTURY 3000 176 Bellows type sucker. |
|  | 15 MIEHLE CS1026 FEEDER Giant, Web, Chief, for cardboard. |  | 79 ASTRO AND SANDMAR envelope & sheet feeders. Specify medium or heavy. |  | RU CUMMINGTON 125 collator, Miehle Vertical for cardboard. |
|  | 15a MACEY COLLATOR Harris pickup sucker, for paper. |  | 80 ATF Commander 29 Speiss feeders. Heidelberg. For thin stock. |  | CHIEF 24 Light. for light stock. |
|  | 16 C&P, RICE Kluge "D" delivery, for paper and light cardboard. |  | 81 KLOCKNER 18092-1 packaging machines. 1-1/8" across, 1/2" high. Black, Red, Blue, or Tan. |  | CHIEF 24 Heavy. for heavy stock. |
|  | 22 HEIDELBERG SUCKER, KLUGE new style. Delivery gripper will not tear this. |  | 82 RYOBI Ryobi-item, |  | RCS MIEHLE CS, feeders. For 3121 heavy stock or sheet metal. 1-7/8" high, 1-1/4" across. Fits 1/2" OD tube or 1/2" pipe. |
|  | 23 RUBBER SUCTION TIP 5/8" across - fits inserting and gathering machines. Sheridan, McCain, Phillipsburg. Various compounds available. Submit sample. |  | 83 HEIDELBERG GTO offset presses. |  | RCS MIEHLE CS 3123 and other feeders. For cardboard 1" high, 1-1/4" across. Fits 1/2" OD tube. |
|  | 23a DEXTER RGA 717 raised inside pattern for light stock. Submit sample. |  | 86 KLOCKNER 18092 packaging machines. 1-1/2" across, 3/4" high. Black, Red, Blue or Tan. |  | RTF MIEHLE TF 1999 and other feeders. For cardboard or sheet metal. 1-7/16" high, 1-9/16" across. Fits 3/4" OD tube or 1/2" pipe. |
|  | 55 MF MIEHLE FEEDERS MF 3968 and ATF Superchief pickup suckers. |  | 88 HAMADA CK 02-77 printing presses |  | RTF MIEHLE TF 1648 and other feeders. For heavy cardboard or sheet metal. 2-1/8" high, 2-1/2" across. Fits 3/4" OD tube or 1/2" pipe. Gum rubber or Neo. |

Dimensions

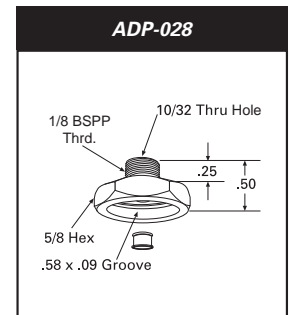
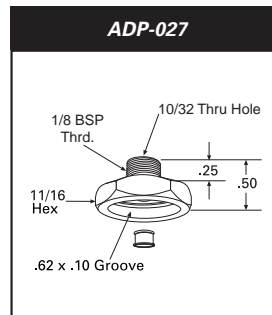
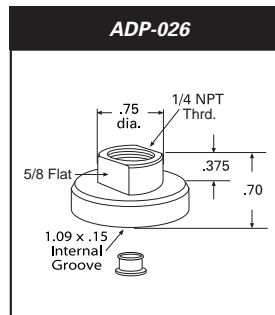
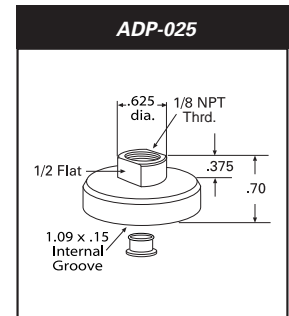
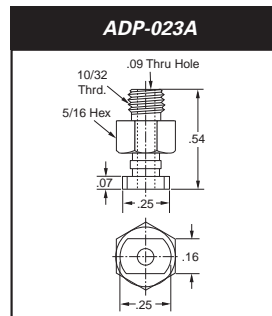
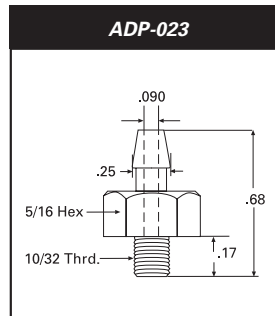
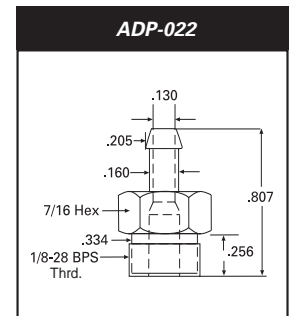
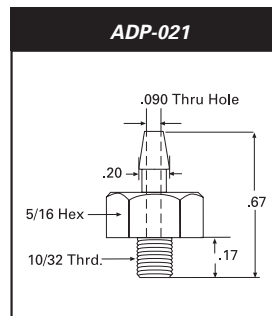
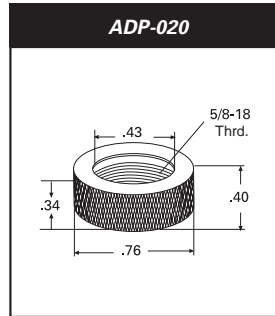
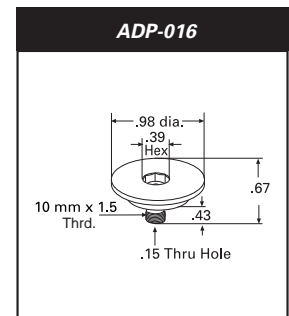
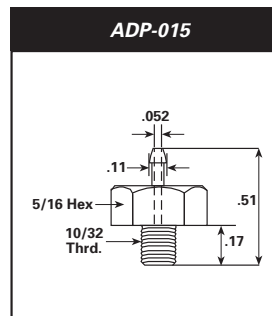
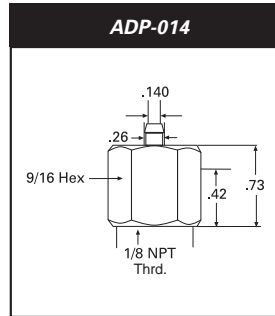
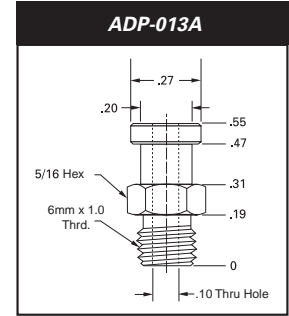
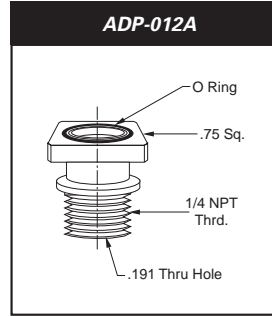
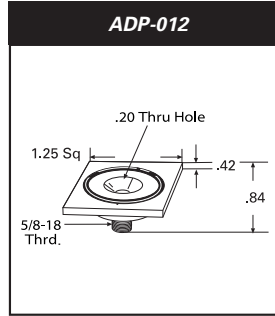
| Part No. | A | B | B1 | C | D | D1 | E C'Bore | F Hole | G Cleats | H Flange |
|---------------|-------------|-------|------|-------|-----------|------|-------------|-----------|-------------|-------------|
| 1 | 0.20 | 0.59 | 0.09 | | 0.53 | 0.31 | | 0.16 | NO | 0.08 |
| 1a | 0.26 x 0.62 | 0.60 | 0.11 | | 0.55 | 0.37 | | 0.14 | NO | 0.11 |
| 2 | 0.59 | 0.62 | 0.09 | 0.25 | 0.56 | 0.37 | | 0.17 | NO | 0.11 |
| 3 | 1.00 | 0.62 | 0.12 | 0.37 | 0.56 | 0.36 | | 0.27 | NO | 0.08 |
| 4 | 1.00 | 0.31 | | 0.19 | 0.56 | | | 0.30 | NO | 0.07 |
| 5 | 1.00 | 0.31 | | 0.21 | 0.53 | | | 0.29 | NO | 0.05 |
| 6a | 1.00 | 0.37 | | 0.18 | 0.44 | | | 0.24 | YES | |
| 7 | 1.00 | 0.37 | | 0.23 | 0.62 | | | 0.24 | YES | 0.10 |
| 8 | 1.00 | 0.31 | | 0.21 | 0.58 | | | 0.29 | NO | 0.06 |
| 9 | 0.62 | 0.56 | | 0.16 | 0.30 | | | 0.19 | NO | |
| 10 | 1.00 | 0.52 | | 0.23 | 0.34 | | | 0.20 | NO | |
| 11 | 1.06 | 0.81 | | 0.19 | 0.44 | | | 0.25 | YES | |
| 12 | 1.06 | 0.75 | | 0.19 | 0.56 | | | 0.22 | NO | 0.12 |
| 13a | 1.00 | 1.00 | | 0.25 | 0.65 | | 0.39 | 0.27 | NO | |
| 14 | 1.00 | 0.38 | | 0.24 | 0.62 | | | 0.27 | NO | 0.08 |
| 15 | 1.00 | 0.38 | | 0.24 | 0.62 | | | 0.27 | NO | 0.08 |
| 15a | 1.00 | 0.38 | | 0.19 | 0.43 | | | 0.24 | NO | |
| 16 | 0.62 | 0.20 | | 0.06 | 0.50 | | 0.28 | 0.18 | NO | |
| 22 | 0.87 | 0.20 | | 0.20 | 0.37 | | | 0.25 | NO | |
| 23 | 0.62 | 0.56 | | 0.25 | 0.25 | | | 0.09 | NO | |
| 23a | 0.65 | 0.62 | | 0.31 | 0.28 | | | 0.09 | YES | |
| 55 | 1.31 | 1.00 | | 0.31 | 1.25-2.00 | | | 0.25 | YES | |
| 56 | 1.31 | 1.00 | | 0.25 | 0.62 | | 0.37 | 0.23 | YES | |
| 57 | 1.50 | 1.12 | | 0.25 | 1.00 | | 0.53 | 0.25 | NO | 0.10 |
| 58 | 1.37 | 1.00 | | 0.25 | 0.62 | | 0.38 | 0.26 | YES | |
| 59 | 1.37 | 0.81 | | 0.25 | 0.62 | | | 0.24 | YES | |
| 60 | 1.00 | 0.95 | | 0.20 | 0.62 | | 0.40 | 0.24 | YES | |
| 61 | 1.37 | 0.75 | | 0.31 | 0.60 | | | 0.24 | YES | 0.09 |
| 62 | 1.25 | 0.37 | | 0.25 | 0.64 | | | 0.24 | NO | 0.06 |
| 63 | 0.62 | 0.75 | 0.25 | | 0.62 | 0.37 | | 0.12 | NO | 0.12 |
| 64 | 0.62 | 0.56 | | 0.25 | 0.31 | | | 0.10 | NO | |
| 66 | 0.75 | 0.26 | | 0.12 | 0.37 | | | 0.27 | NO | 0.03 |
| 67 | 1.50 | 1.06 | | 0.50 | 0.50 | | | 0.23 | YES | |
| 68 | 1.12 | 0.25 | | 0.22 | 0.50 | | | 0.25 | NO | |
| 76 | 0.81 | 0.56 | | 0.18 | 0.56 | | 0.25 | 0.18 | NO | |
| 77 | 1.00 | 0.56 | | 0.25 | 0.56 | | 0.31 | 0.23 | NO | |
| 78 | 0.75 | 0.37 | | 0.18 | 0.44 | | | 0.22 | NO | |
| 79 | 0.75 | 0.25 | | 0.09 | 0.44 | | | 0.24 | NO | 0.03 |
| 80 | 1.12 | 0.25 | | 0.12 | 0.69 | | | | NO | |
| 81 | 1.23 | 0.71 | | 0.37 | 0.60 | | | 0.22 | YES | 0.09 |
| 82 | 0.62 | 0.17 | | 0.11 | 0.36 | | | 0.16 | NO | |
| 83 | 0.75 | 0.15 | | 0.12 | 0.50 | | | 0.28 | NO | |
| 86 | 1.50 | 0.81 | | 0.62 | 0.62 | | | 0.22 | NO | 0.09 |
| 88 | 0.625 | 0.375 | | 0.125 | 0.390 | | | 0.25 | NO | |
| 89 | 0.875 | 0.562 | | 0.484 | 0.281 | | | 0.093 | NO | |
| 90 | 0.875 | 0.890 | | 0.125 | 0.484 | | | 0.25 | YES | |
| 92 | 0.609 | 0.234 | | 0.140 | 0.484 | | 0.218 | 0.171 | NO | |
| 93 | 0.625 | 0.390 | | 0.140 | 0.484 | | | 0.187 | NO | |
| 94 | 0.687 | 0.531 | | 0.171 | 0.312 | | | 0.125 | NO | |
| 95 | 0.687 | 0.718 | | 0.171 | 0.312 | | | 0.125 | NO | |
| 96 | 1.25 | 1.00 | | 0.218 | 0.734 | | | 0.625 | NO | |
| 97 | 0.906 | 0.812 | | 0.125 | 0.515 | | | 0.25 | NO | |
| 99 | 0.656 | 0.343 | | 0.093 | 0.343 | | | 0.312 | NO | |
| 101 | 0.828 | 0.406 | | 0.281 | 0.593 | | | 0.125 | NO | 0.093 |
| 102 | 0.671 | 0.312 | | 0.062 | 0.406 | | 0.25 | 0.078 | NO | |
| 103 | 0.875 | 0.312 | | 0.062 | 0.406 | | 0.234 | 0.312 | NO | |
| 104 | 0.781 | 0.406 | | 0.234 | 0.421 | | 0.140 | 0.296 | NO | |
| RVC 147B | 1.031 | 0.687 | | 0.234 | 0.484 | | | 0.234 | YES | |
| RVC 176 | 0.625 | 0.843 | | 0.109 | 0.531 | | 0.2031 | 0.359 | NO | |
| RU-125 | 0.81 | 0.18 | | 0.04 | 0.44 | | | 0.17 | NO | 0.06 |
| Chief 24 Lt. | 1.44 | 0.31 | | 0.31 | 1.00 | | | 0.69 | NO | |
| Chief 24 Hvy. | 1.25 | 0.23 | | 0.23 | 0.75 | | | 0.59 | NO | |
| RCS 3121 | 1.62 | 1.87 | | 0.31 | 0.94 | | 0.59 | 0.25 | NO | |
| RCS 3123 | 1.25 | 1.00 | | 0.24 | 0.66 | | 0.40 | 0.25 | NO | |
| RTF 1999 | 1.56 | 1.44 | | 0.30 | 0.94 | | 0.62 | 0.24 | NO | |
| RTF 1648 | 2.50 | 2.06 | | 0.87 | 1.00 | | 0.62 | 0.31 | NO | |

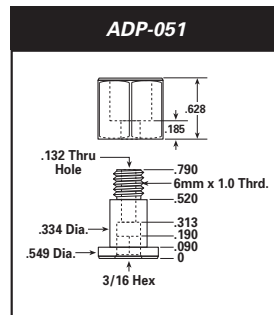
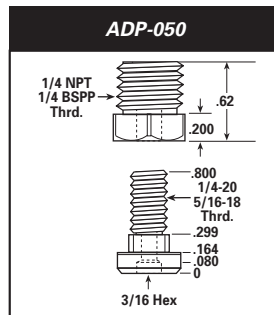
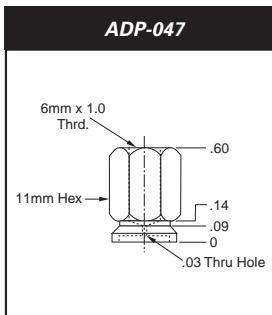
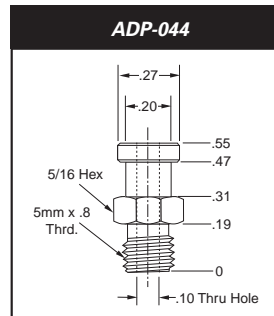
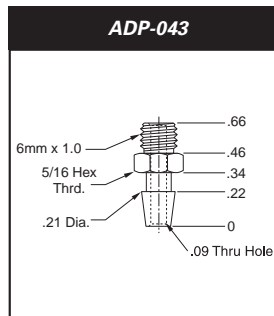
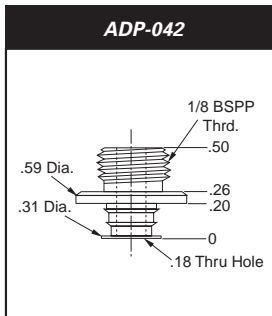
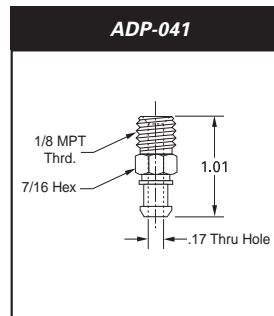
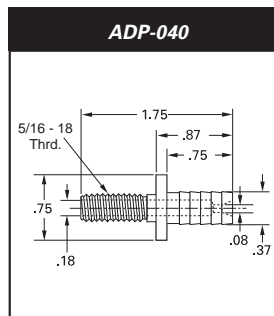
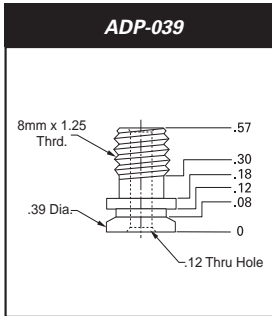
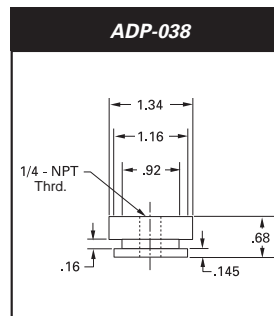
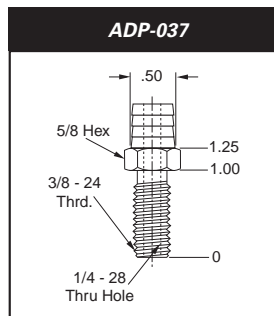
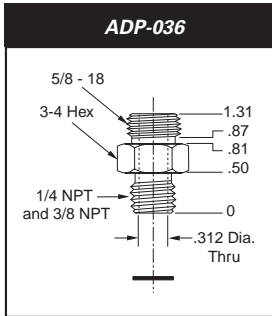
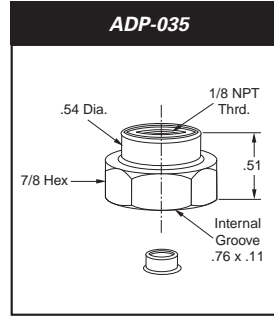
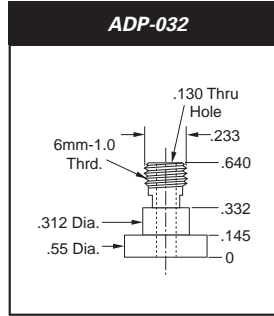
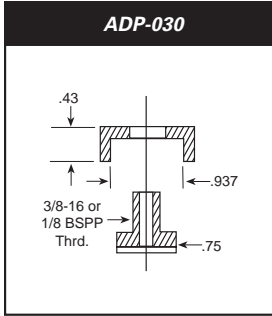
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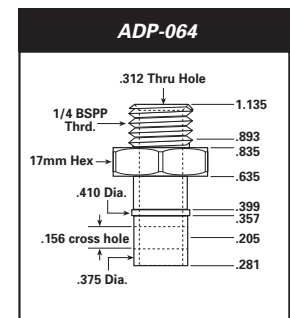
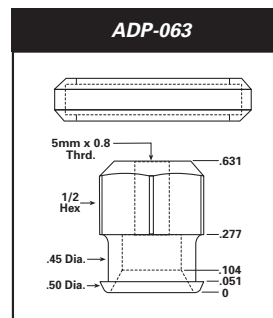
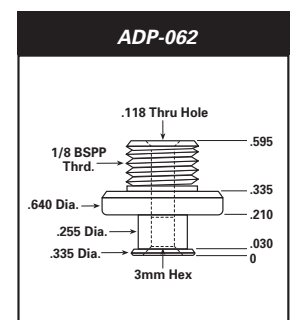
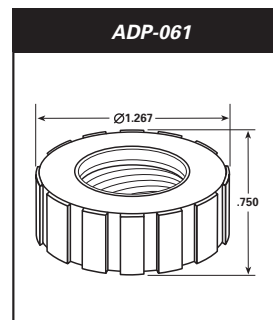
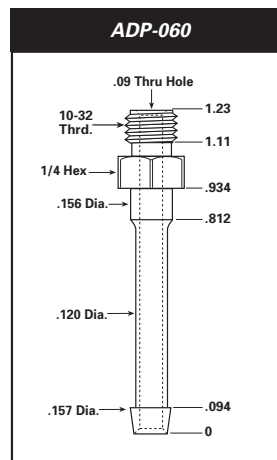
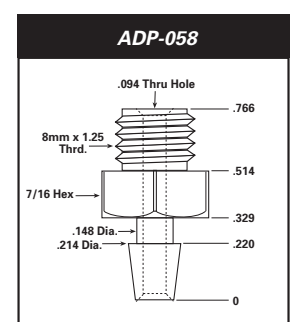
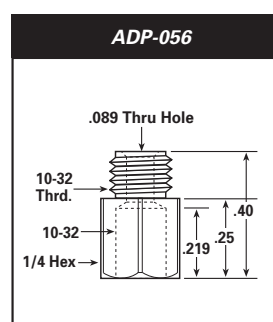
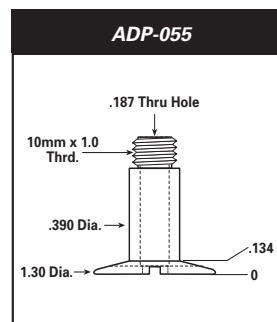
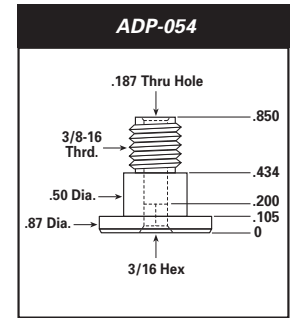
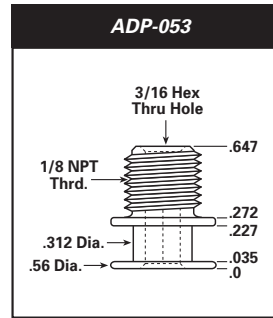
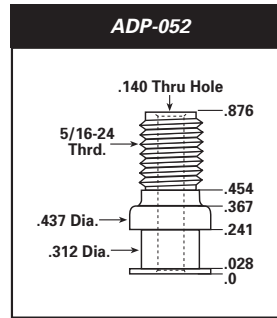
CLEATS are bottom protrusions used for maintaining larger vacuum area.

Cup Adapters/Filters





Cup Adapters/Filters (continued)





Valves

Many cups can be fitted with a vacuum valve. The valve stops the creation of a vacuum until the workpiece is contacted.



Fittings & Adaptors

Barbed Fittings & Adaptors allow easy connection to your vacuum system.



Swivel Joints

Swivel Joints provide up to a 30° pivot in any direction. This feature allows the vacuum cup to compensate for application on uneven surfaces.



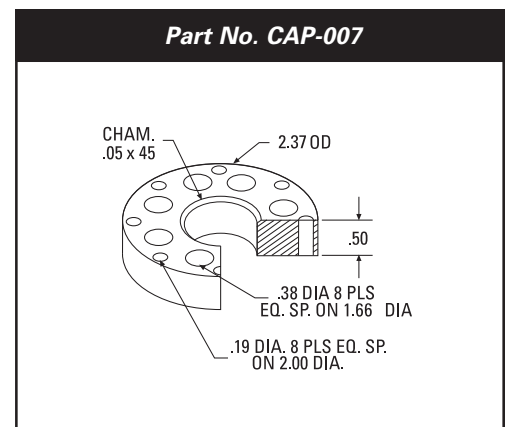
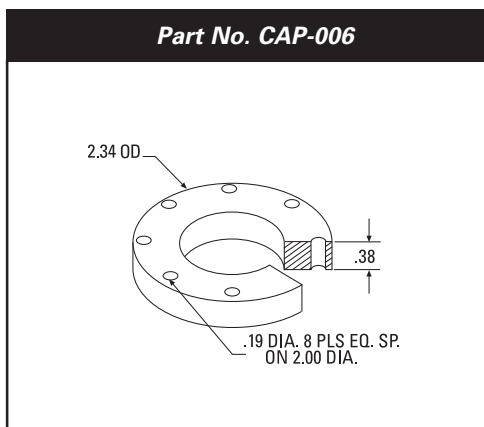
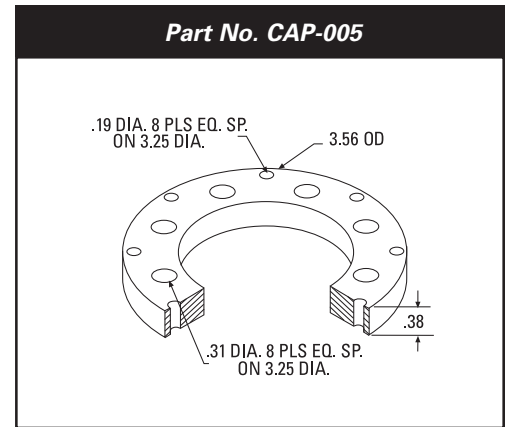
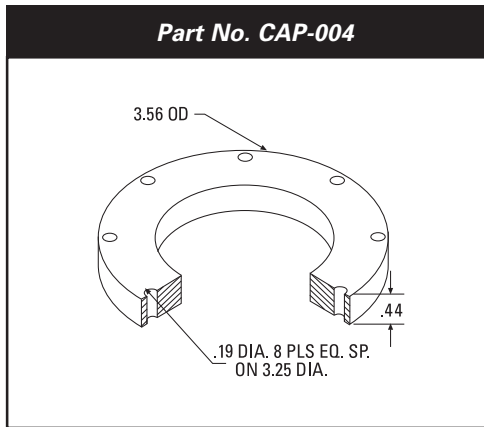
Level Compensators

Level Compensators come in a variety of stock sizes and can also be custom made to your specifications. A variety of screw adaptors are available to custom fit most any application.

- Compensate for an uneven load.
- Reduce shock to the workpiece.

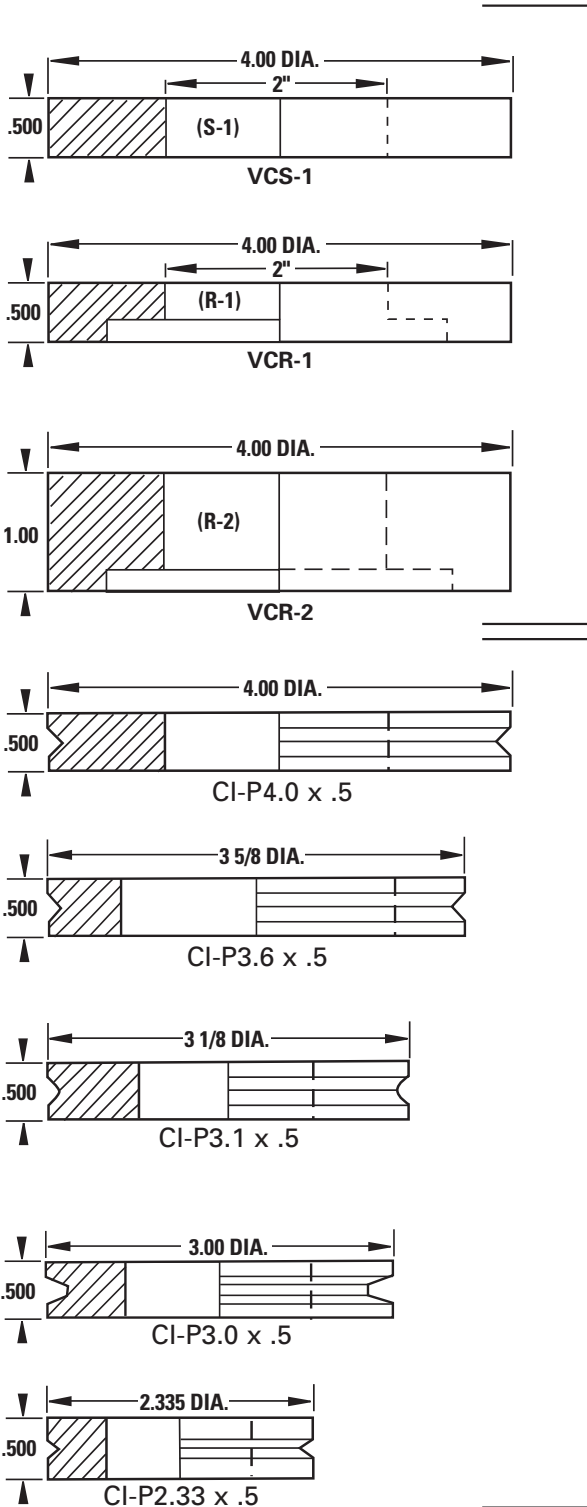
Tightening Discs – Copper Discs and Rings

Material and inside diameter to be specified.



A full line of Tightening Discs to be used on:
 • Haskin Strand • National Instruments • Pneumatic Scale • Resina • Swanmatic.
 Available in long-wearing polyurethane and vinyl.

Resina and Pneumatic



Can be used on Resina equipment

(See Gripper Blocks listed on page 35)

Pneumatic type Tightening Disc

Note:
Material and inside diameter to be specified.

Resina



Available in Vinyl or Polyurethane A30 through A80 Durometer.

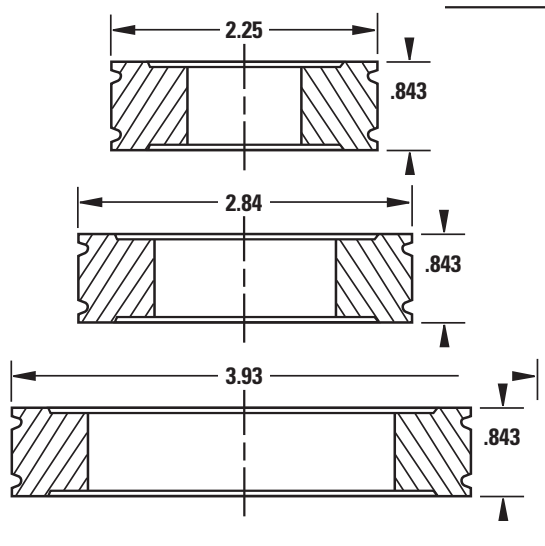
Pneumatic



Tightening Discs –

Horix and National Instrument Discs

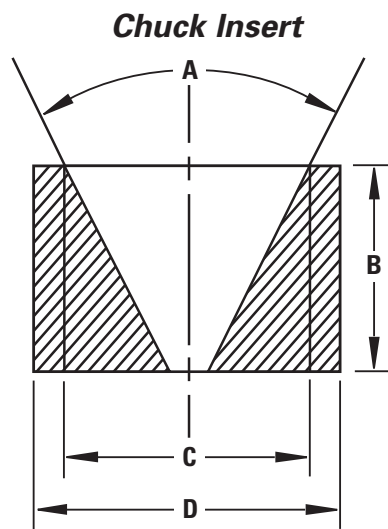
Horix



Horix type Tightening Disc

Note:
Material and inside diameter to be specified.

National Instrument



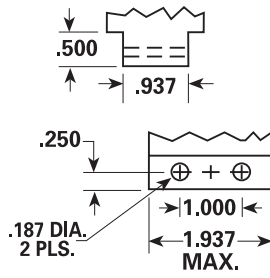
National Instrument type Tightening Disc

| Part No. | A | B | C | D |
|----------|------|------|------|------|
| N1 | 66° | 0.68 | 0.86 | 0.93 |
| N2 | 64° | 0.75 | 1.05 | 1.24 |
| N2 1/2 | 62° | 0.87 | 1.25 | 1.48 |
| N3 | 56° | 1.00 | 1.46 | 1.67 |
| N4 | 70° | 1.00 | 1.73 | 1.98 |
| N5 | 80° | 0.93 | 2.11 | 2.33 |
| N6 | 64° | 1.00 | 2.45 | 2.70 |
| N70 | 123° | 1.25 | 2.97 | 3.12 |
| N75 | 124° | 1.25 | 3.50 | 3.79 |
| 1N90 | 118° | 1.25 | 4.06 | 4.31 |
| 1N100 | 124° | 1.25 | 5.31 | 5.56 |
| 1N110 | 123° | 1.25 | 6.00 | 6.25 |

A dimension is degrees

Gripper Rubbers

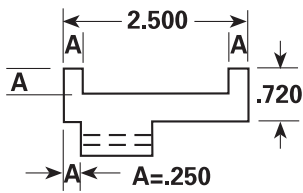
NOTE:
DIMENSIONS SHOWN ARE
COMMON TO ALL GRIPPERS



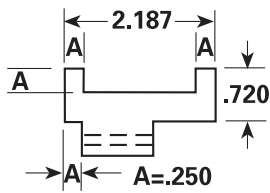
Available in Polyurethane
or Vinyl. All sizes not
available in vinyl.



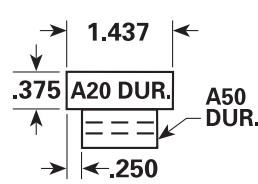
Part No. VCGR-1



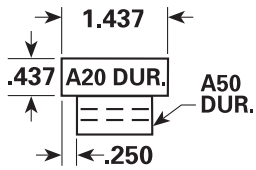
Part No. VCGR-2



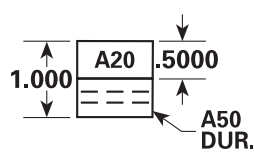
Part No. VCGR-2T



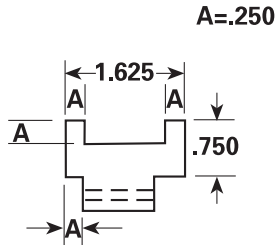
Part No. VCGR-2TA



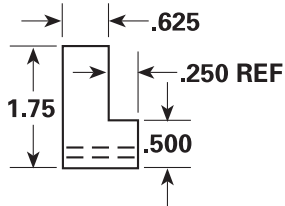
Part No. VCGR-A1



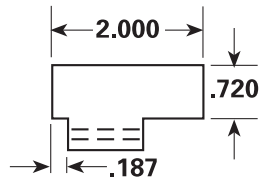
Part No. VCGR-3



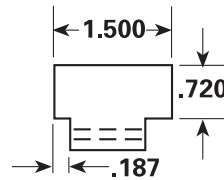
Part No. VCGR-4



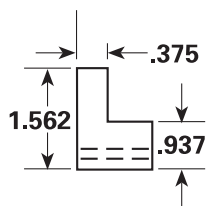
Part No. VCGR-5



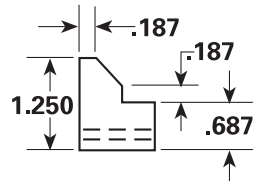
Part No. VCGR-5-1.500



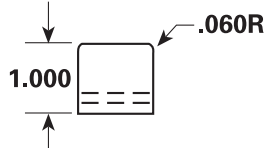
Part No. VCGR-6



Part No. VCGR-7

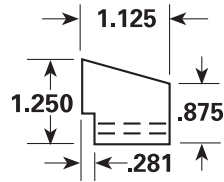


Part No. VCGR-8

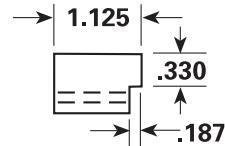


Gripper Rubbers *(continued)*

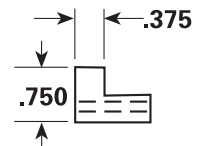
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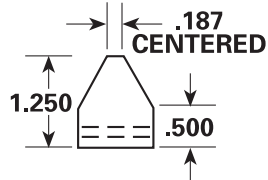
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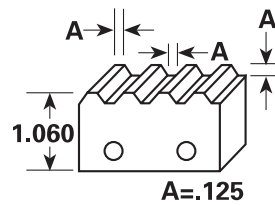
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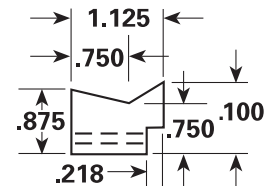
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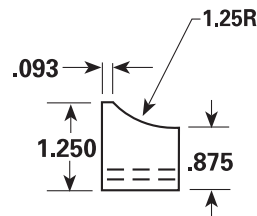
Part No. VCGR-13



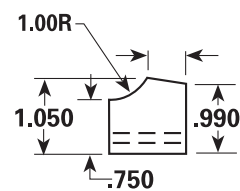
Part No. VCGR-14



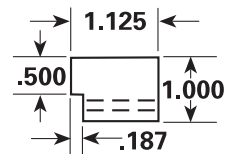
Part No. VCGR-15



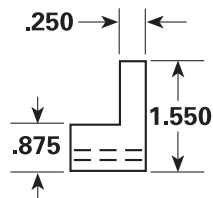
Part No. VCGR-16



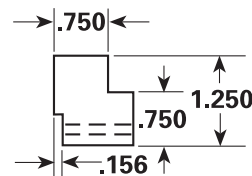
Part No. VCGR-17



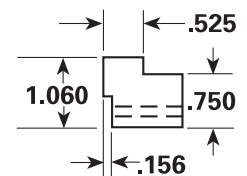
Part No. VCGR-17A



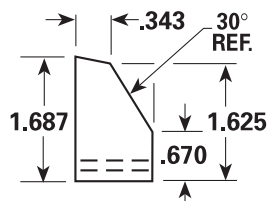
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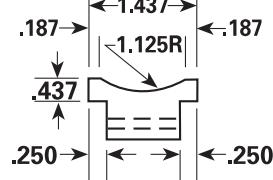
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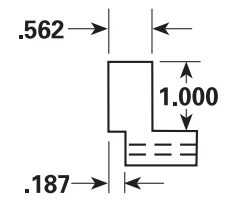
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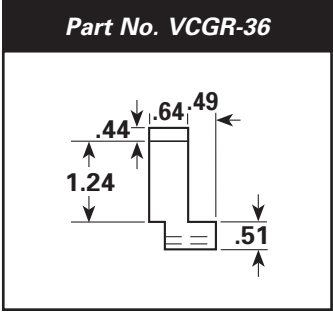
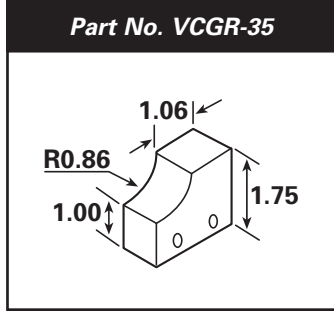
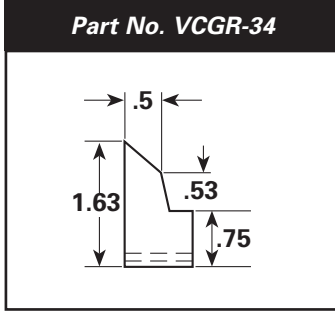
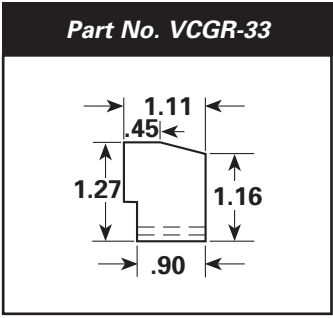
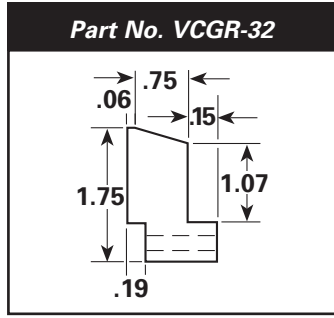
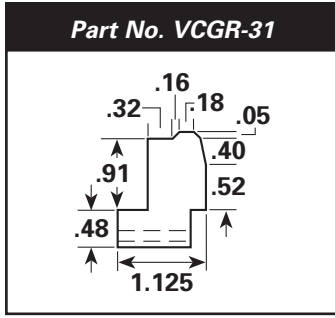
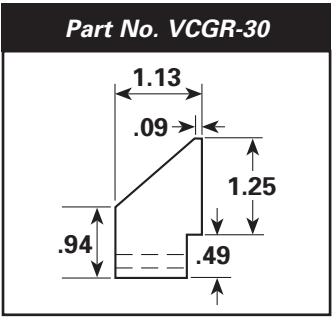
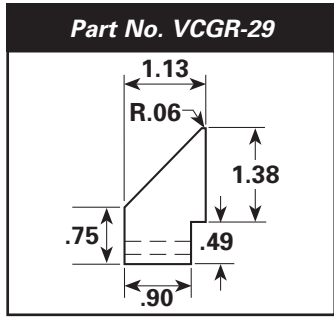
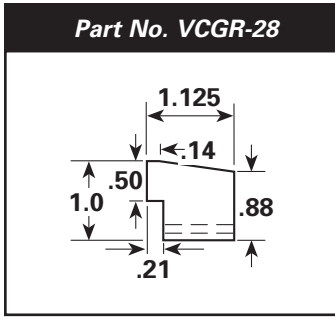
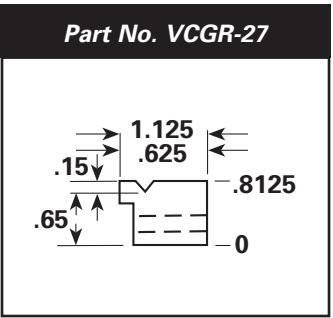
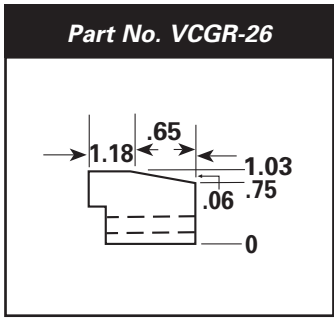
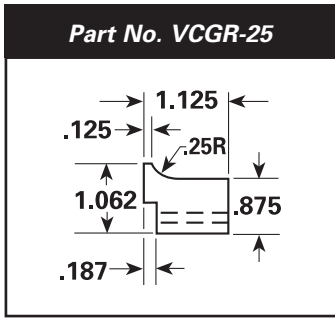
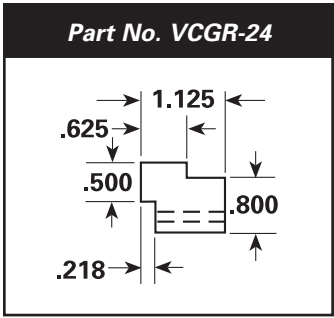
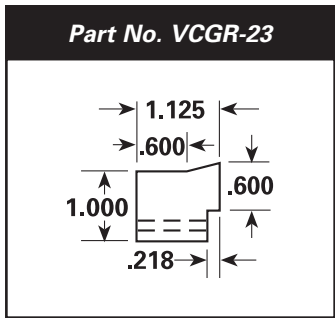
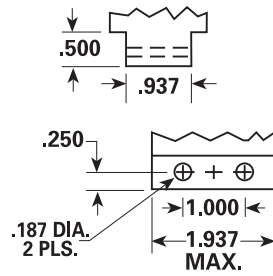
Part No. VCGR-21



Part No. VCGR-22



NOTE:
DIMENSIONS SHOWN ARE
COMMON TO ALL GRIPPERS

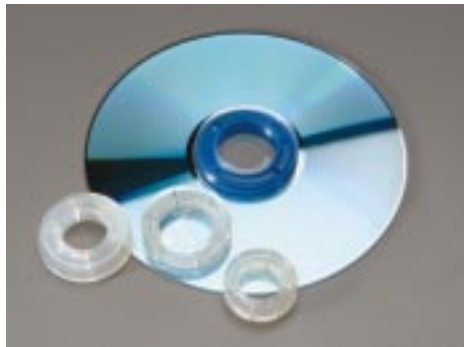


Custom Molded Vacuum Cups

Egg / Golf Ball Cups



CD Cups



Bakery Cups



Windshield Cups



Vi-Cas can custom produce vacuum cups to your specifications. Unique shapes are not a problem. Low volume (prototypes) or high volume. Call with your requirements.

Rollers

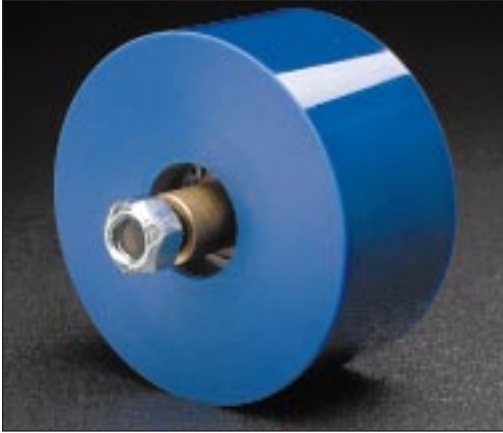


Vi-Cas can recoat your worn rollers with long-lasting polyurethane for a fraction of the cost of new.

- Quick turn-around
- Silicone for high temperature applications
- A-20 thru D-60 Durometers
- New rollers to your specs

Rollers *(continued)*

Solid Rollers - Stud Mount



| Diameter (Inches) | Width (Inches) | Bearings (2) | Part Number |
|-------------------|----------------|--------------|-------------|
| 8 | 2 | 1/2" ID | 8x2SRB |
| 6 | 2 | 1/2" ID | 6x2SRB |
| 4 | 2 | 1/2" ID | 4x2SRB |
| 4 | 1 | 1/2" ID | 4x1SRB |
| 3 | 2 | 1/2" ID | 3x2SRB |
| 2.5 | 2 | 1/2" ID | 2.5x2SRB |
| 2 | 2 | 1/2" ID | 2x2SRB |
| 1.5 | 1.25 | 1/2" ID | 1.5x1.25SRB |

Finned Rollers - Stud Mount



| Diameter (Inches) | Width (Inches) | Bearings (2) | Part Number |
|-------------------|----------------|--------------|-------------|
| 6 | 2 | 1/2" ID | 6x2FRB |
| 4 | 2 | 1/2" ID | 4x2FRB |
| 2.5 | 2 | 1/2" ID | 2.5x2FRB |
| 2.5 | 1 | 1/2" ID | 2.5x1FRB |
| 1.5 | 1.12 | 1/2" ID | 1.5x1.12FRB |
| 2 | 2 | 1/2" ID | 2x2FRB |

- Mounting stud with spacer is also offered.

- Rollers are made from long-lasting polyurethane, 20A thru 90A Durometers.

- Vi-Cas offers a complete line of Vacuum Cups, Cup Adapters, Level Compensators and Swivel Joints.

- Vi-Cas can recoat your worn rollers with long-lasting Polyurethane.

- Specials can be quoted to your specifications.

- Quick Turn-Around.

- Silicone for high temperature applications.

- Vi-Cas also manufactures accessories for material handling, package machinery and printing equipment.

Custom Rollers - Stud Mount



| Diameter (Inches) | Width (Inches) | Bearings (2) | Part Number |
|-------------------|----------------|--------------|---------------|
| 4 | 2 | 1/2" ID | 4x2CRB |
| 4 | 2 | 1/2" ID | 4x2HRB |
| 2.5 | 2 | 1/2" ID | 2.5x2CRB |
| 2.5 | 1.125 | 1/2" ID | 2.5x1 1/4 CRB |
| 2 | 1.125 | 1/2" ID | 2x1 1/4 CRB |

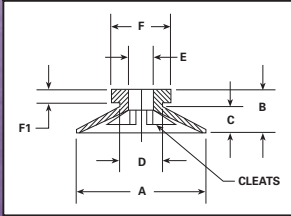
Drive Rollers - Shaft Mount



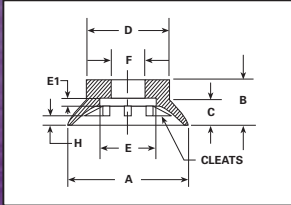
| Diameter (Inches) | Width (Inches) | Bore | Part Number |
|-------------------|----------------|------|-------------|
| 6 | 2 | 1 | 6x2DR |
| 4 | 1 | 1 | 4x1DR |

Parts Index – cups by number

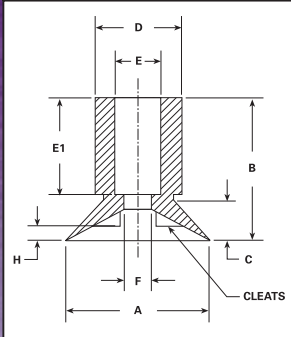
Style A page 8,9



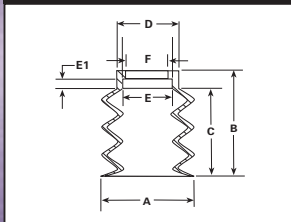
Style B page 10-12



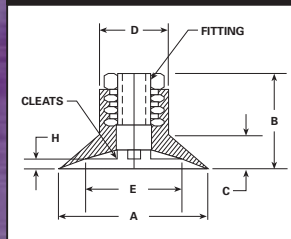
Style C page 13-17



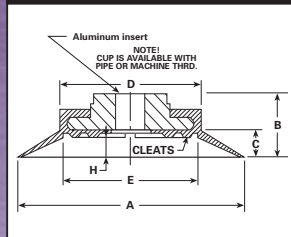
Style D page 18



Style E page 19,20



Style F page 20,21



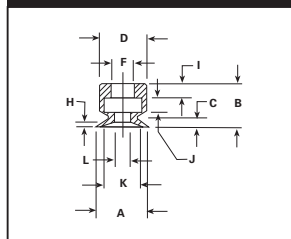
| VC No. | Style | A(1) | A-2 |
|---------|-------|------|------|
| 1 | C | 2.62 | |
| 1P | A | 0.35 | |
| 2 | C | 1.28 | |
| 2A | C | 1.31 | |
| 2A1 | A | 1.31 | |
| 2C | C | 1.29 | |
| 2C1 | B | 1.26 | |
| 2D | C | 1.25 | |
| 2D1 | C | 0.97 | |
| 2D2 | C | 1.19 | |
| 2E | C | 1.36 | |
| 2E1 | C | 1.37 | |
| 2E2 | A | 1.35 | |
| 2E3 | C | 1.00 | |
| 2E4 | C | 0.75 | |
| 2E5 | C | 0.77 | |
| 2EA | E | 1.34 | |
| 2EB | C | 1.31 | |
| 2EF | A | 1.25 | |
| 2EH | C | 1.31 | |
| 2F | C | 1.02 | |
| 3 | C | 1.86 | |
| 3A | C | 1.86 | |
| 4 | C,E | 2.50 | |
| 4.1x3.5 | SPCL* | 3.51 | 4.06 |
| 5 | B | 2.09 | |
| 5A | B,E | 2.10 | |
| 5A1 | E | 2.10 | |
| 5B | A | 2.10 | |
| 6 | B | 1.12 | |
| 6A | A | 1.17 | |
| 7 | C | 1.64 | |
| 7-1 | C | 1.63 | |
| 7A | C | 1.64 | |
| 7B | C | 1.52 | |
| 7C | C | 1.60 | |
| 8 | B | 1.51 | |
| 9 | A | 1.14 | |
| 9A | A | 1.14 | |
| 9A1 | A | 1.14 | |
| 9B | A | 1.14 | |
| 9C | A | 1.04 | |
| 9D | A | 1.19 | |
| 10 | B,E | 1.04 | |
| 10A | B,E | 1.04 | |
| 11 | B | 1.18 | |
| 12 | B | 1.40 | |
| 13 | C,E | 2.45 | |
| 13A | C,E | 2.48 | |
| 14 | C | 1.03 | |
| 15 | C,E | 3.45 | |
| 15A | E | 3.42 | |
| 16 | C | 0.77 | |
| 16A | SPCL* | 0.75 | |
| 17 | C | 0.85 | |
| 18 | B | 3.00 | |
| 18A | C | 2.93 | |
| 18B | G | 3.05 | |
| 18C | SPCL* | 2.52 | |
| 18D | A | 2.80 | |
| 19 | C | 1.11 | |
| 19A | C | 1.05 | |
| 20 | A | 1.04 | |
| 21 | C | 0.79 | |
| 21A | C | 0.83 | |

| VC No. | Style | A(1) | A-2 |
|----------------|-------|------|-------|
| 22 | G | 0.81 | |
| 22A | G | 0.78 | |
| 23 | B | 1.29 | |
| 23A | B | 1.29 | |
| 23B | B | 1.29 | |
| 24 | C | 0.65 | |
| 24A | C | 0.67 | |
| 24B | C | 0.62 | |
| 24C | SPCL* | 0.65 | |
| 25 | G | 0.63 | |
| 26 | A | 0.96 | |
| 27 | F | 4.25 | |
| 27A | F | 3.25 | |
| 27A1 | F | 3.25 | |
| 27A1A | F | 2.25 | |
| 27A1B | F | 2.00 | |
| 27A2 | SPCL* | 3.28 | |
| 27B | F | 3.25 | |
| 28 | A | 1.14 | |
| 28-1 | A | 1.14 | |
| 29 | B,F | 3.25 | |
| 30 | C,E | 3.06 | |
| 30A | C | 3.09 | |
| 30B | C | 3.09 | |
| 31A | C,E | 3.09 | |
| 31B | F | 3.05 | |
| 32 | D | 1.75 | |
| 32 .62x1.87 | L | 0.62 | 1.87 |
| 32 .75x5 | L | 0.75 | 5.00 |
| 32 1x13 | L | 1.00 | 13.00 |
| 32 1.25x2.5 | L | 1.25 | 2.46 |
| 32 1.25x2.5D2 | L | 1.25 | 2.50 |
| 32 1.3x3.05 | L | 1.25 | 3.00 |
| 32 1.5x2.75 | L | 1.46 | 2.73 |
| 32 1.5x2.75D2 | L | 1.50 | 2.75 |
| 32 1.5x3.87 | L | 1.50 | 3.84 |
| 32 2x3.25L | L | 2.00 | 3.25 |
| 32 2x3.5 | L | 2.00 | 3.50 |
| 32 2.25x3.87 | L | 2.18 | 3.84 |
| 32 2.5x6 | L | 2.46 | 5.95 |
| 32 2.5x6DP | L | 2.50 | 6.00 |
| 32 2.75x6.5 | L | 2.75 | 6.50 |
| 32 3x1.25 | SPCL* | 1.25 | 3.00 |
| 32 3x3.25 | L | 3.00 | 3.25 |
| 32 3x7 | L | 3.00 | 7.00 |
| 32 4x5.38 | SPCL* | 4.00 | 5.38 |
| 32 4.25x5.63-1 | SPCL* | 4.25 | 5.63 |
| 32 3.5x5 | L | 3.45 | 4.93 |
| 32 3.5x10 | L | 3.50 | 10.00 |
| 32A | D | 1.94 | |
| 32ABC | D | 1.94 | |
| 32ABC1 | J | 2.50 | |
| 32B | J,K | 2.80 | |
| 32B1 | J | 2.82 | |
| 32BM | K | 2.77 | |
| 32C | J,K | 2.00 | |
| 32C1 | K | 2.00 | |
| 32C1F | J | 2.00 | |
| 32C2 | K | 2.02 | |
| 32C3 | K | 1.19 | |
| 32C4 | K | 2.50 | |
| 32C5 | K | 1.75 | |
| 32CS | I | 2.02 | |
| 32D | J,K | 2.00 | |
| 32D1 | K | 1.98 | |

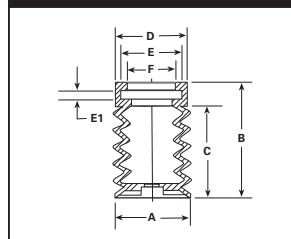
| VC No. | Style | A(1) | A-2 |
|----------|-------|------|------|
| 32DS | K | 2.00 | |
| 32E | D,J | 2.77 | |
| 32E1 | D,J | 2.50 | |
| 32EP | K | 1.74 | |
| 32F | J,K | 2.38 | |
| 32F1 | J | 2.37 | |
| 32FB | J | 2.42 | |
| 32G | D | 2.28 | |
| 32G1 | J | 2.26 | |
| 32H | D | 1.19 | |
| 32H2 | D | 1.06 | |
| 32H3 | D | 1.50 | |
| 32H6 | D | 1.37 | |
| 32H6-1 | J | 1.38 | |
| 32J | K | 2.02 | |
| 32MP | K | 1.75 | |
| 32MP1 | K | 1.52 | |
| 32MP1A | K | 1.00 | |
| 32MP1.25 | K | 1.25 | |
| 32MMW | K | 1.99 | |
| 32TC | D | 1.88 | |
| 32UJ | D | 1.88 | |
| 32W | D,J | 1.79 | |
| 32W1 | D | 1.95 | |
| 32W2 | D | 2.25 | |
| 32W3 | J,K | 1.64 | |
| 32W4 | SPCL* | 1.26 | |
| 33 | D | 1.48 | |
| 33A | J,K | 1.42 | |
| 33AD1 | K | 1.20 | |
| 33ATC | SPCL* | 1.37 | |
| 33A1 | J,K | 1.40 | |
| 33A2 | J,K | 1.25 | |
| 33A2S | K | 1.25 | |
| 33A3 | J,K | 0.90 | |
| 33A4 | J,K | 1.14 | |
| 33A4A | J | 1.12 | |
| 33A5 | D,J | 0.87 | |
| 33A5-3 | D | 0.87 | |
| 33A5-4 | K | 0.77 | |
| 33A5EL | K | 0.88 | |
| 33A5L | J | 0.87 | |
| 33A5L3 | K | 0.88 | |
| 33A5S | K | 0.77 | |
| 33A6 | H | 0.61 | |
| 33A6-1 | H | 0.39 | |
| 33A6-3 | H | 0.66 | |
| 33A7 | K | 1.25 | |
| 33A8 | K | 1.47 | |
| 33A9 | K | 0.78 | |
| 33A10 | K | 0.63 | |
| 33AR | J | 1.37 | |
| 33B | D | 1.52 | |
| 33C | D | 1.41 | |
| 33D | D,J | 1.50 | |
| 33D2 | D | 2.19 | |
| 33E1 | K | 1.09 | |
| 33E2 | K | 1.16 | |
| 33E9 | K | 1.39 | |
| 33F | I | 0.98 | |
| 33G | K | 0.86 | |
| 33G1 | K | 0.88 | |
| 33G2 | D | 1.00 | |
| 33H | K | 1.19 | |
| 33I | K | 1.18 | 2.34 |

*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

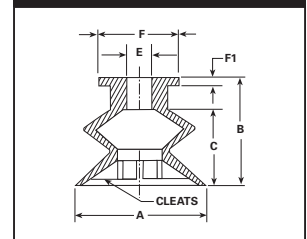
Style G page 22



Style H page 22,23



Style I page 23

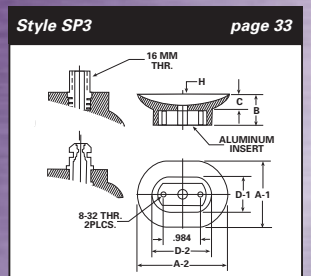
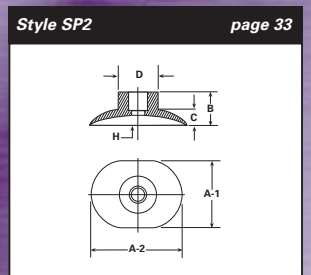
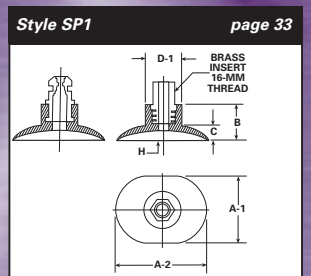
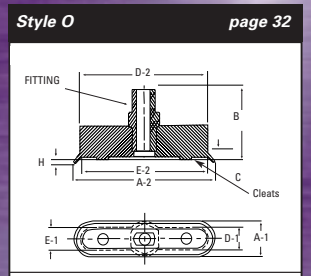
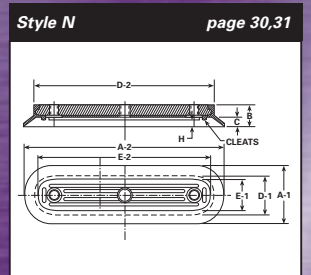
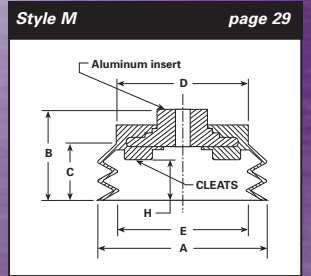
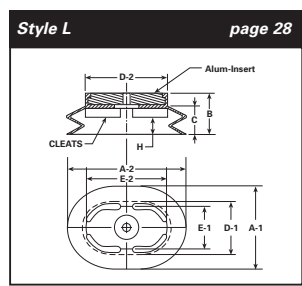
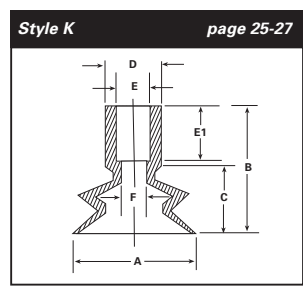
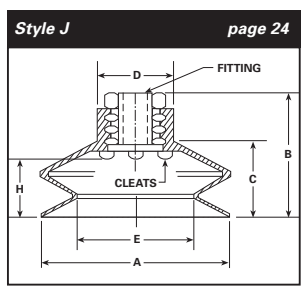


| VC No. | Style | A(1) | A-2 |
|--------|-------|------|------|
| 33I-1 | K | 1.12 | 1.37 |
| 33I-2 | K | 0.78 | 0.96 |
| 33I-3 | K | 1.10 | 1.76 |
| 33J | D | 1.50 | |
| 33K | K | 1.20 | |
| 33L | D | 1.62 | |
| 33M | D | 1.59 | |
| 33N | J | 1.53 | |
| 33P | SPCL* | 1.28 | |
| 34 | F | 6.25 | |
| 34A | F | 6.25 | |
| 35 | F | 5.50 | |
| 35J | SPCL* | 0.57 | 1.44 |
| 35J1 | SPCL* | 0.57 | 1.45 |
| 35J3 | SPCL* | 0.63 | 1.67 |
| 36 | A | 1.00 | |
| 36A | A | 1.00 | |
| 36B | A | 1.00 | |
| 36C | A | 1.00 | |
| 36D | A | 1.00 | |
| 36E | B | 1.07 | |
| 36F | A | 1.00 | |
| 36G | A | 1.00 | |
| 36H | A | 1.00 | |
| 36J | A | 1.03 | |
| 37 | B | 1.53 | |
| 37A | B,E | 1.50 | |
| 37B | B,E | 1.50 | |
| 37C | E | 1.53 | |
| 38 | F | 4.75 | |
| 39 | F | 6.00 | |
| 40 | K | 1.33 | |
| 41 | A | 0.82 | |
| 41A | A | 0.71 | |
| 41B | A | 0.71 | |
| 41C | A | 0.60 | |
| 41D | A | 0.71 | |
| 41E | A | 0.76 | |
| 41F | A | 0.76 | |
| 41G | A | 0.80 | |
| 42 | C | 1.25 | |
| 43 | B | 0.65 | |
| 44 | SPCL* | 0.69 | |
| 44A | SPCL* | 0.53 | |
| 45 | B | 1.84 | |
| 45A | B | 0.79 | |
| 46 | B,E | 2.04 | |
| 47 | SP2 | 0.92 | |
| 47-14 | SP1 | 2.46 | 1.51 |
| 47-31 | SP1 | 1.87 | 2.18 |
| 47AV1 | SP2 | 2.18 | |
| 47B | SP2 | 1.95 | |
| 47C | SP3 | 2.12 | 2.79 |
| 47E | SP3 | 2.12 | 3.26 |
| 47F | SP3 | 1.88 | 2.50 |
| 47F1 | SP3 | 1.70 | 2.42 |
| 47F2 | SP3 | 1.68 | 2.42 |
| 47H | SP2 | 1.29 | 2.29 |
| 47I | SP2 | 2.29 | 3.31 |
| 47L | C,SP2 | 1.58 | |
| 47N | C,SP2 | 2.65 | |
| 47N1 | C,SP2 | 1.94 | |
| 47-O | SP3 | 1.95 | 2.65 |
| 47-O1 | SP3 | 2.01 | 2.68 |
| 47-O2 | SP3 | 1.87 | 2.73 |

| VC No. | Style | A(1) | A-2 |
|--------|-----------|------|------|
| 47-O3 | SP3 | 1.92 | 3.09 |
| 47-O4 | SP3 | 1.82 | 3.03 |
| 47PG | SP2 | 2.01 | |
| 47PG1 | SP1,SPCL* | 1.53 | |
| 47PG2 | SPCL* | 3.00 | |
| 47PS | SPCL* | 1.44 | 2.25 |
| 47S | SP2 | 1.73 | 2.41 |
| 47SG | SP3 | 1.98 | 3.37 |
| 47T | SP1 | 1.91 | 3.32 |
| 47U | SP3 | 2.00 | |
| 47U1 | SPCL* | 2.02 | |
| 47W | SP3 | 2.07 | 3.06 |
| 47Y | SP1 | 1.87 | 2.81 |
| 47Y1 | SP1 | 1.73 | 2.78 |
| 47Y2 | SP1 | 0.93 | 1.75 |
| 47Y3 | SP3 | 1.54 | 2.50 |
| 47Z1 | SP3 | 1.70 | 2.70 |
| 47Z2 | SP3 | 1.39 | 2.53 |
| 48 | A | 0.78 | |
| 49 | C,E | 2.47 | |
| 49A | C | 1.56 | |
| 49A1 | C | 1.56 | |
| 49B | C | 1.56 | |
| 49C | C | 2.55 | |
| 49D | C | 2.55 | |
| 50 | C | 1.56 | |
| 50A | A | 1.57 | |
| 51 | C | 1.64 | |
| 51A | B | 1.42 | |
| 52 | C | 1.97 | |
| 53 | C | 1.06 | |
| 54 | B | 1.93 | |
| 54-1 | B | 1.90 | |
| 54A | B | 1.78 | |
| 54B | B | 1.57 | |
| 54C | B | 1.25 | |
| 54E | B | 2.07 | |
| 54E1 | B | 2.07 | |
| 54E2 | B | 2.01 | |
| 54F | B | 1.62 | |
| 54G | B | 2.09 | |
| 54H | A | 2.13 | |
| 54HA | B | 2.15 | |
| 54HD | B | 1.71 | |
| 54J | B | 1.51 | |
| 54K | B | 1.63 | |
| 55 | O | 1.50 | 2.39 |
| 55F | A | 1.50 | 2.39 |
| 55AU | SP3 | 1.48 | 2.37 |
| 57 | A | 1.53 | |
| 57A | A | 1.32 | |
| 57B | A | 1.29 | |
| 57C | A | 1.31 | |
| 57D | A | 1.25 | |
| 58 | C | 1.98 | |
| 58A | C | 1.98 | |
| 59 | B,E | 2.00 | |
| 59A | E | 2.00 | |
| 59B | E | 2.00 | |
| 59C | E | 1.83 | |
| 59D | A | 2.50 | |
| 59E | E | 1.50 | |
| 59F | E | 1.50 | |
| 59G | B | 1.01 | |
| 59G1 | C | 1.01 | |

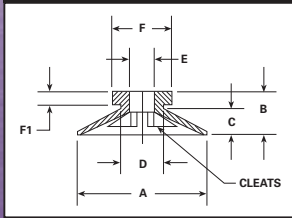
| VC No. | Style | A(1) | A-2 |
|---------------|-------------|------|-------|
| 59H | B | 1.37 | |
| 59J | C | 1.22 | |
| 59L | E | 2.32 | |
| 60 | C | 1.32 | |
| 60A | B | 1.37 | |
| 61 | C | 0.60 | |
| 62 | B | 2.65 | |
| 63 | F | 4.75 | |
| 64 | C | 1.28 | |
| 65 | C | 1.32 | |
| 66 | C | 1.01 | |
| 66A | C | 0.83 | |
| 66B | B | 0.75 | |
| 66C | C | 0.62 | |
| 67 | B | 1.32 | |
| 68 | A | 0.37 | |
| 69 | C | 0.52 | 0.39 |
| 69A | A | 0.19 | 0.74 |
| 69B | A | 0.19 | 1.00 |
| 70 | E, F, SPCL* | 2.51 | |
| 70A | B | 2.50 | |
| 70B | B | 2.67 | |
| 71 | F | 5.31 | |
| 72 | E, F | 3.18 | |
| 72A | E | 2.50 | |
| 73 | F | 4.31 | |
| 73A | N | 4.00 | 9.00 |
| 73A2 | F | 3.12 | |
| 74 | N | 3.50 | 7.50 |
| 74A | N | 3.50 | 7.50 |
| 75 | N | 3.90 | 8.75 |
| 76 | F | 5.00 | |
| 77 | F | 4.12 | |
| 78 | F | 3.06 | |
| 79 | C | 0.84 | |
| 79A | C | 0.73 | |
| 80 | F | 3.50 | |
| 81 | N | 2.06 | 4.00 |
| 81B | SPCL* | 1.29 | 4.38 |
| 81C | SPCL* | 0.84 | 3.13 |
| 82 | N | 3.12 | 6.00 |
| 83 | N | 1.56 | 4.09 |
| 84 | B | 0.84 | |
| 86 | E,F | 2.09 | |
| 87 | B | 1.50 | |
| 87 | O | 0.75 | 1.48 |
| 88 | B,E | 1.21 | |
| 89 | O | 1.15 | 2.78 |
| 89A | O | 1.47 | 2.96 |
| 90 1.25x11.64 | N | 1.25 | 11.64 |
| 90 1.5x2.12 | SPCL* | 1.50 | 2.13 |
| 90 1.5x8 | N | 1.50 | 8.00 |
| 90 1.5x10 | N | 1.50 | 10.00 |
| 90 1.62x4 | N | 1.62 | 4.00 |
| 90 1.87x16 | N | 1.88 | 16.00 |
| 90 1.75x16 | N | 1.75 | 16.00 |
| 90 2.2x7.5 | N | 2.20 | 7.50 |
| 90 2.25x3 | N | 2.25 | 3.00 |
| 90 2.25x5.25 | N | 2.29 | 5.26 |
| 90 2.375x4.25 | N | 2.38 | 4.25 |
| 90 2.5x5 | N | 2.50 | 5.00 |
| 90 2.5x3.75 | N | 2.50 | 3.75 |
| 90 2.36x5.12 | SPCL* | 2.36 | 5.12 |
| 90 2.68x3.5 | N | 2.68 | 3.50 |
| 90 2.68x5.75 | N | 2.68 | 5.75 |

*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

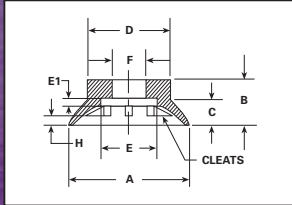


Parts Index – cups by number *(continued)*

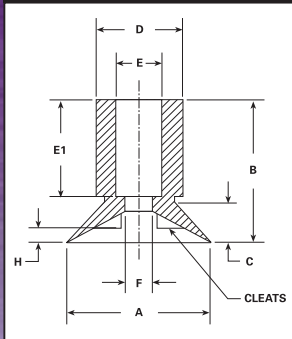
Style A page 8,9



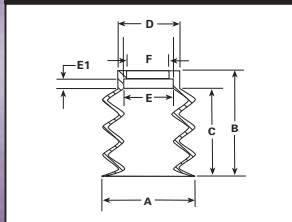
Style B page 10-12



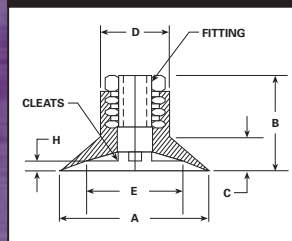
Style C page 13-17



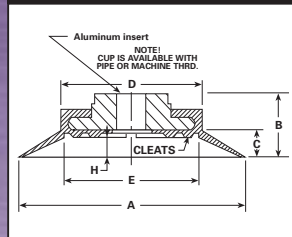
Style D page 18



Style E page 19,20



Style F page 20,21



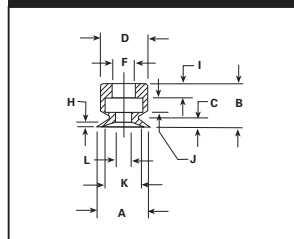
| VC No. | Style | A(1) | A-2 |
|----------------|-------|-------|-------|
| 90 2.68x6.62 | N | 2.68 | 6.62 |
| 90 2.75x3.5 | N | 2.21 | 3.48 |
| 90 2.75x4.75 | N | 2.75 | 4.75 |
| 90 3x8 | N | 3.00 | 8.00 |
| 90 3x10 | N | 3.00 | 10.00 |
| 90 3x12 | N | 3.00 | 12.00 |
| 90 3x13 | N | 3.00 | 13.00 |
| 90 3.25x15.5 | N | 3.25 | 15.50 |
| 90 3.5x7.5 | N | 3.25 | 7.50 |
| 90 3.5x11 | N | 3.50 | 11.00 |
| 90 3.5x14 | N | 3.50 | 14.00 |
| 90 4x8 | N | 4.00 | 8.00 |
| 90 4x14 | N | 4.00 | 14.00 |
| 90 5x3.25 | N | 3.25 | 5.00 |
| 90 5x12 | N | 4.96 | 12.00 |
| 90 5x14 | N | 5.00 | 14.00 |
| 90 5.375x3.625 | N | 3.63 | 5.38 |
| 90 6x6 | N | 6.00 | 6.00 |
| 90 6x8.5 | N | 6.00 | 8.50 |
| 90 6x10 | N | 6.00 | 10.00 |
| 90 6x10DP | N | 6.00 | 10.00 |
| 90 6x12DP | N | 6.00 | 12.00 |
| 90 6x14DP | N | 6.00 | 14.00 |
| 90 6x90BRD | N | 6.00 | 9.00 |
| 90 7x12 | N | 7.00 | 12.00 |
| 90 8x15 | N | 8.00 | 15.00 |
| 90 8x20DP | N | 8.00 | 20.00 |
| 90 8.5x10DP | N | 8.50 | 10.00 |
| 90 9.5x10.5 | N | 9.50 | 10.50 |
| 90 9.75x14 | SPCL* | 9.85 | 14.14 |
| 90 10.75x13 | N | 10.75 | 13.00 |
| 90 12x12 | N | 12.00 | 12.00 |
| 90 20x10 | N | 2.00 | 10.00 |
| 91 | B,E | 2.32 | |
| 91A | B,E | 2.20 | |
| 91B | B | 2.37 | |
| 92 | B,E | 3.07 | |
| 92A | B | 3.09 | |
| 93 | F | 5.87 | |
| 94 | F | 7.00 | |
| 95 | F | 11.00 | |
| 95A | F | 10.50 | |
| 95B | F | 14.0 | |
| 95C | F | 12.00 | |
| 95D | F | 10.50 | |
| 95E | F | 14.68 | |
| 95F | F | 11.80 | |
| 96 | F | 8.50 | |
| 96A | F | 8.12 | |
| 96B | F | 8.50 | |
| 96C | F | 7.20 | |
| 97 | C | 1.43 | |
| 98 | A | 0.62 | 0.98 |
| 98A | C | 0.65 | 0.98 |
| 99 | B,E,F | 2.00 | |
| 100 | A | 1.65 | |
| 100A | A | 1.65 | |
| 100B | A | 1.67 | |
| 100B1 | A | 1.67 | |
| 100B2 | A | 1.18 | 2.00 |
| 100C | A | 1.65 | |
| 100C1 | A | 1.67 | |
| 100E | A | 1.65 | |
| 100F | A | 1.51 | |
| 100G | B | 1.62 | |

| VC No. | Style | A(1) | A-2 |
|-----------|-------|-------|------|
| 100H | B | 1.60 | |
| 100J | B | 1.57 | |
| 100S | C,E | 1.70 | |
| 100S1 | C | 1.67 | |
| 101 | C | 2.40 | |
| 103 | F | 4.00 | |
| 103A | F | 3.09 | |
| 103C | E | 3.00 | |
| 103D | F | 5.00 | |
| 104 3.75 | M | 3.75 | |
| 104 4.33 | M | 4.33 | |
| 104 4.5 | M | 4.50 | |
| 104 5.5 | SPCL* | 4.53 | 4.25 |
| 104 5.6 | M | 5.60 | |
| 104 6.0 | M | 6.00 | |
| 104 6.4 | M | 6.43 | |
| 104 7.0 | M | 7.00 | |
| 104 7.0-1 | M | 7.00 | |
| 104 7.5 | M | 7.37 | |
| 104 7.94 | M | 7.94 | |
| 104 8.5 | M | 8.50 | |
| 104 8.5-2 | M | 8.50 | |
| 104 9.5 | M | 9.50 | |
| 104 10 | M | 10.00 | |
| 104 12.5 | M | 12.50 | |
| 104A | D | 3.97 | |
| 104PC | SPCL* | 4.49 | |
| 105 | A | 1.49 | |
| 105A | A | 1.17 | |
| 106 | B,E | 2.50 | |
| 106A | B,E | 2.03 | |
| 106B | B | 2.73 | |
| 106C | B,E | 3.00 | |
| 106PG | B | 2.50 | |
| 107 | B,E | 1.11 | |
| 108 | B | 0.78 | |
| 109 | B | 5.18 | |
| 110 | C | 1.23 | |
| 110A | C | 1.00 | |
| 110B | C | 1.16 | |
| 111 | B | 1.75 | |
| 112 | B | 5.03 | |
| 113 | C | 1.01 | |
| 114 | B | 3.37 | |
| 115 | B | 3.40 | |
| 116 | B | 2.62 | |
| 117 | B | 6.50 | |
| 118 | C | 1.11 | |
| 119 | G | 0.77 | |
| 119A | C | 0.77 | |
| 119B | C | 0.78 | |
| 120 | A | 1.06 | |
| 121 | A | 1.18 | |
| 121A | B | 1.18 | |
| 121B | B | 1.18 | |
| 121C | A | 1.62 | |
| 122 | C | 0.62 | |
| 122A | C | 0.60 | |
| 122B | C | 0.53 | |
| 123 | C | 0.56 | |
| 123A | A | 0.57 | |
| 123A1 | A | 0.57 | |
| 123B | A | 0.57 | |
| 124 | K | 1.02 | |
| 124A | I | 1.00 | |

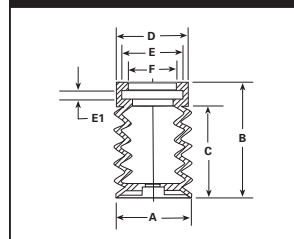
| VC No. | Style | A(1) | A-2 |
|--------|---------|------|------|
| 124A3 | K | 1.03 | |
| 124B | K | 1.00 | |
| 124C | K | 0.78 | |
| 124D | K | 0.75 | |
| 124D3 | K | 0.75 | |
| 124F1 | K | 1.03 | |
| 125 | N | 2.50 | 5.50 |
| 125A | N | 1.43 | |
| 126 | C | 1.39 | |
| 127 | C | 1.50 | |
| 127A | C | 1.66 | |
| 127B | C | 1.25 | |
| 127C | C | 1.18 | |
| 128 | K | 0.98 | |
| 128A | K | 1.00 | |
| 129 | L | 3.25 | 7.87 |
| 130 | M | 3.31 | |
| 130A | M | 2.73 | |
| 130A5 | M | 2.75 | |
| 130B | M | 2.21 | |
| 130C | K | 2.63 | |
| 130D | M | 2.36 | |
| 130D2 | M | 3.36 | |
| 130E | M | 1.97 | |
| 130F | M | 2.25 | |
| 130G | M | 3.31 | |
| 130H | SPCL* | 3.38 | |
| 130SB | M | 3.31 | |
| 130SQ | SPCL* | 3.05 | |
| 131 | C | 1.38 | |
| 132 | B | 1.35 | |
| 133 | B | 0.67 | |
| 133A | B | 1.18 | |
| 133B | C | 1.62 | |
| 133E | K | 1.14 | |
| 134 | H | 1.38 | |
| 134A | H | 1.34 | |
| 134B | K | 0.98 | |
| 134B2 | K | 1.10 | |
| 135A | C | 0.78 | |
| 135B | C | 0.39 | |
| 135C | C | 0.62 | |
| 136 | C | 0.68 | |
| 136A | C | 0.81 | |
| 136B | C | 1.10 | |
| 136C | C | 1.10 | |
| 137 | J,K | 2.36 | |
| 137B | K | 2.26 | |
| 137C | J | 2.42 | |
| 138 | G | 1.15 | |
| 138A | B | 1.18 | |
| 139 | C | 0.75 | |
| 140 | C | 1.18 | |
| 140A | C | 0.75 | |
| 141 | A | 1.01 | |
| 142 | A | 1.85 | |
| 143 | C | 1.50 | |
| 144 | A | 1.85 | |
| 144A | A | 1.75 | |
| 144A1 | A | 1.62 | |
| 144B | A | 1.85 | |
| 144C | A | 1.35 | |
| 144C1 | A | 1.25 | |
| 144F | A | 2.46 | |
| 145 | C,SPCL* | 1.06 | |

*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

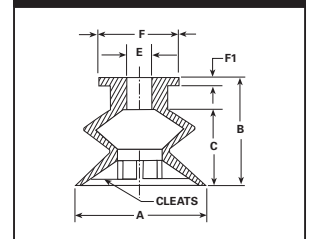
Style G page 22



Style H page 22,23



Style I page 23

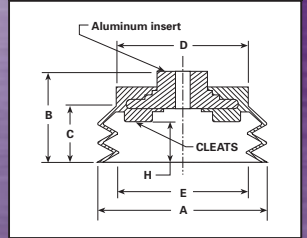


| VC No. | Style | A(1) | A-2 |
|--------|-------|------|-----|
| 146 | B | 1.40 | |
| 146A | B | 1.42 | |
| 147 | C | 1.04 | |
| 147A | C | 1.01 | |
| 147B | C | 1.03 | |
| 147C | C | 0.98 | |
| 147E | C | 1.00 | |
| 148 | B | 1.00 | |
| 149 | B | 2.00 | |
| 149A | B | 1.81 | |
| 150 | B | 1.82 | |
| 151 | B | 0.81 | |
| 152 | C | 1.20 | |
| 153 | B,E | 2.90 | |
| 153A | B | 2.90 | |
| 154 | SPCL* | 6.03 | |
| 155 | A | 3.35 | |
| 156 | B | 3.28 | |
| 157 | C | 0.50 | |
| 157A | C | 0.50 | |
| 157B | C | 0.62 | |
| 157C | C | 0.43 | |
| 158 | B | 0.71 | |
| 158A | B | 0.75 | |
| 158B | C | 0.79 | |
| 158C | B | 0.53 | |
| 158D | B | 0.38 | |
| 158F | B | 0.54 | |
| 158G | C | 0.73 | |
| 159 | B | 1.00 | |
| 159A | C | 1.01 | |
| 160 | C | 1.06 | |
| 160C | C | 1.06 | |
| 161 | C | 0.36 | |
| 161A | C | 0.29 | |
| 161C | C | 0.36 | |
| 162 | B | 1.98 | |
| 162A | B | 1.75 | |
| 162B | B | 1.98 | |
| 163 | B | 1.62 | |
| 164 | B | 0.35 | |
| 164A | B | 0.37 | |
| 165 | B | 0.87 | |
| 165A | B | 0.37 | |
| 166 | A | 1.40 | |
| 167 | C | 1.40 | |
| 167A | C | 0.25 | |
| 167B | C | 0.56 | |
| 167C | C | 0.56 | |
| 167C1 | A | 0.56 | |
| 168 | B,E | 2.00 | |
| 169 | C | 0.34 | |
| 169A | C | 0.32 | |
| 169C | C | 0.32 | |
| 169D | C | 0.33 | |
| 170 | A | 0.79 | |
| 171 | B | 2.43 | |
| 172 | B | 0.53 | |
| 173 | C | 0.40 | |
| 174 | K | 1.42 | |
| 175 | J,K | 3.25 | |
| 175A | K | 3.37 | |
| 175B | J | 3.38 | |
| 176 | H | 0.64 | |
| 176A | K | 0.64 | |

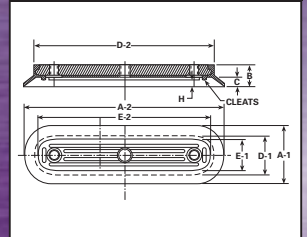
| VC No. | Style | A(1) | A-2 |
|------------|-------|------|------|
| 177 | B | 1.17 | |
| 177A | B | 1.00 | |
| 177B | C | 1.39 | |
| 177C | C | 1.39 | |
| 178 | C | 0.84 | |
| 179 | C | 0.64 | |
| 179A | C | 0.66 | |
| 180 | K | 1.31 | |
| 181 | B | 2.75 | |
| 181A | SPCL* | 2.57 | |
| 181B | SPCL* | 3.07 | |
| 182 | D | 0.97 | |
| 183 1.56x4 | N | 1.56 | 4.00 |
| 183 2x4 | N | 2.00 | 4.00 |
| 183 2x4R | N | 2.00 | 3.54 |
| 183 2x5 | N | 2.00 | 5.00 |
| 183 2x6 | N | 2.00 | 6.00 |
| 183 2x6R | N | 2.00 | 5.59 |
| 183 2x7 | N | 2.00 | 7.00 |
| 184 | A | 1.00 | |
| 185 | B | 2.46 | |
| 186 | B | 1.12 | |
| 187 | SPCL* | 1.38 | |
| 188 | N | 1.00 | 4.50 |
| 188A | N | 1.50 | 2.87 |
| 188A TALL | N | 1.50 | 2.87 |
| 188B | N | 1.00 | 4.50 |
| 188B1 | L | 1.00 | 4.50 |
| 188B2 | N | 1.00 | 5.00 |
| 188C1 | SPCL* | 0.75 | 2.88 |
| 188D | N | 1.00 | 2.50 |
| 188E | N | 0.87 | 4.50 |
| 188F | N | 0.87 | 3.87 |
| 188G | N | 0.75 | 2.38 |
| 188G1 | N | 0.75 | 6.00 |
| 188H | O | 0.75 | 1.63 |
| 188JC | N | 1.00 | 5.00 |
| 189 | O | 0.87 | 1.73 |
| 189A | O | 0.50 | 2.00 |
| 189B | O | 0.50 | 1.50 |
| 189C | O | 0.50 | 1.00 |
| 189D | N | 0.75 | 1.75 |
| 189D1 | N | 0.86 | 1.75 |
| 189F | SPCL* | 0.39 | 1.17 |
| 189H | O | 0.71 | |
| 190 | C | 0.56 | |
| 190A | C | 0.56 | |
| 191 | C | 0.46 | |
| 192 | I | 1.00 | |
| 193 | B | 1.09 | |
| 194 | B | 2.87 | |
| 195 | B | 2.00 | |
| 196 | K | 1.11 | |
| 196A | K | 0.92 | |
| 196B | K | 0.92 | |
| 196C | K | 0.67 | |
| 196D | K | 1.08 | |
| 197 | B | 0.85 | |
| 198 | B | 4.00 | |
| 198A | B | 2.29 | |
| 199 | A | 0.69 | 1.00 |
| 200 | SPCL* | 1.75 | 3.25 |
| 201A | SPCL* | 2.00 | |
| 201B | SPCL* | 3.88 | |
| 201C | SPCL* | 1.10 | |

| VC No. | Style | A(1) | A-2 |
|--------|-------|-------|-------|
| 202 | H | 1.47 | |
| 203 | F | 3.93 | |
| 203A | F | 3.90 | |
| 204 | C,E | 3.50 | |
| 204-1 | E | 3.50 | |
| 204A | C,E | 2.51 | |
| 204A1 | E | 2.51 | |
| 204B | C,E | 2.03 | |
| 204C | C,E | 1.75 | |
| 204D | C,E | 1.50 | |
| 204E | E | 1.25 | |
| 204F | C,E | 1.00 | |
| 205 | B | 1.37 | |
| 206 | B | 0.42 | |
| 207 | B | 0.62 | |
| 207A | B | 1.12 | |
| 207B | B | 0.81 | |
| 207C | B | 0.50 | |
| 207D | B | 0.40 | |
| 207D1 | B | 1.00 | |
| 208 | F | 4.00 | |
| 209 | C | 1.12 | |
| 209A | K | 1.13 | |
| 210 | B | 1.53 | |
| 211 | C | 0.45 | |
| 212 | E | 3.08 | |
| 212-5J | SPCL* | 0.76 | 1.01 |
| 213 | N | 3.44 | 7.68 |
| 214 | F | 2.37 | |
| 214A | F | 3.17 | |
| 214C | E | 1.60 | |
| 214D | E | 1.22 | |
| 214E | E | 1.02 | |
| 216 | F | 3.12 | |
| 216A | F | 2.00 | |
| 216B | F | 2.00 | |
| 216C | F | 3.13 | |
| 217A | J | 2.21 | |
| 218 | C | 1.00 | |
| 219 | F | 3.56 | |
| 220 | C | 0.50 | |
| 221 | SPCL* | 10.87 | 15.25 |
| 224 | C | 1.13 | |
| 225A | C | 1.44 | |
| 225B | B | 1.32 | |
| 225C | SPCL* | 0.95 | |
| 225D | SPCL* | 1.65 | |
| 225E | SPCL* | 1.63 | |
| 225F | SPCL* | 2.27 | |
| 225G | SPCL* | 0.81 | |
| 225-3 | SPCL* | 1.22 | |
| 226 | SPCL* | 2.64 | |
| 227 | SPCL* | 3.18 | |
| 228 | B | 0.79 | |
| 229 | SPCL* | 0.63 | |
| 230 | B | 0.93 | |
| 230A | B | 0.75 | |
| 231 | G | 0.89 | |
| 232 | F | 2.12 | |
| 233 | C | 1.59 | |
| 234 | C | 0.35 | |
| 235 | SPCL* | 4.50 | 5.56 |
| 236 | C | 1.21 | |
| 237 | C | 2.77 | |
| 238 | SPCL* | 0.84 | 1.31 |

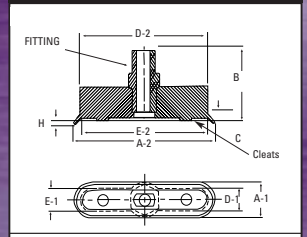
Style M page 29



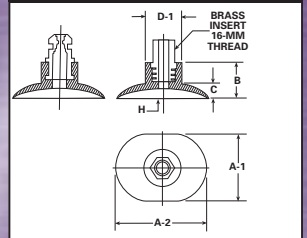
Style N page 30,31



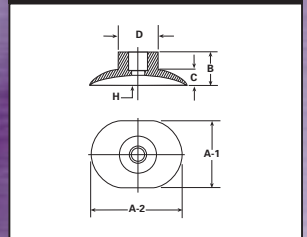
Style O page 32



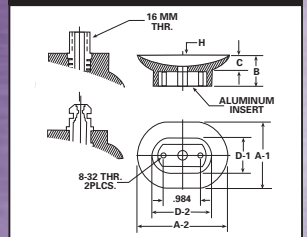
Style SP1 page 33



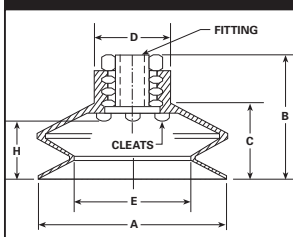
Style SP2 page 33



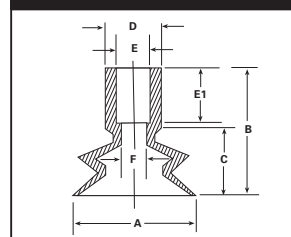
Style SP3 page 33



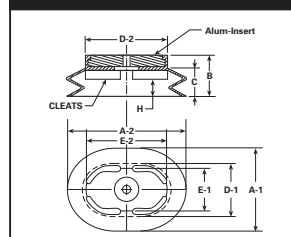
Style J page 24



Style K page 25-27



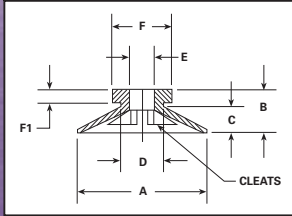
Style L page 28



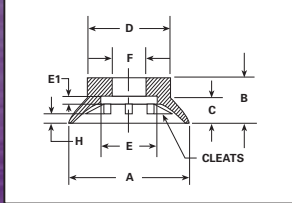
*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

Parts Index – cups by number *(continued)*

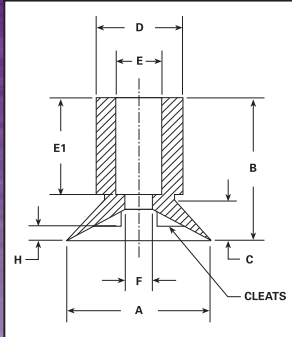
Style A page 8,9



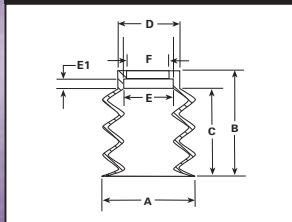
Style B page 10-12



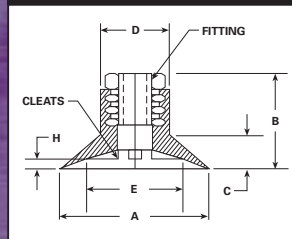
Style C page 13-17



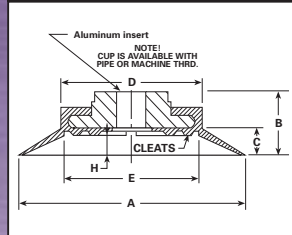
Style D page 18



Style E page 19,20



Style F page 20,21



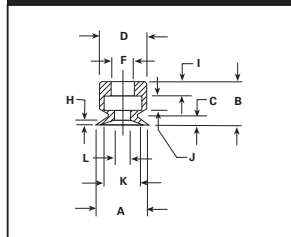
| VC No. | Style | A(1) | A-2 |
|--------|----------|------|------|
| 238A | SPCL* | 0.84 | 1.32 |
| 238A1 | SPCL* | 0.96 | |
| 238A2 | SPCL* | 0.95 | |
| 238A3 | SPCL* | 0.95 | |
| 239 | C | 1.20 | 1.89 |
| 239B | SPCL* | 1.00 | 1.75 |
| 240 | SPCL* | 6.80 | |
| 241 | F | 4.50 | |
| 242 | C | 2.34 | |
| 243 | SPCL* | 1.12 | |
| 244 | C | 3.84 | |
| 245 | F | 3.21 | |
| 245B | F | 2.90 | |
| 245C | F | 2.10 | |
| 245D | F | 3.87 | |
| 246 | C | 0.84 | |
| 248 | B | 0.67 | |
| 249 | C | 0.70 | |
| 250 | C | 1.08 | |
| 251 | C | 0.50 | |
| 252 | K | 0.98 | 0.75 |
| 254 | C | 2.50 | |
| 255 | SPCL* | 2.89 | |
| 255A | SPCL* | 1.83 | |
| 256 | SPCL* | 1.50 | |
| 257 | B | 1.43 | |
| 257A | B | 0.85 | |
| 258 | C | 1.17 | |
| 259 | F | 1.64 | |
| 260 | SPCL* | 3.43 | |
| 260A | SPCL* | 5.37 | |
| 261 | K | 1.50 | |
| 262 | F | 2.42 | |
| 263 | A | 0.72 | |
| 264 | K | 1.25 | |
| 265 | C | 0.41 | |
| 266 | G, SPCL* | 2.07 | |
| 267 | H | 0.87 | |
| 270 | B | 1.21 | |
| 271 | SPCL* | 2.61 | |
| 271A | SPCL* | 2.62 | |
| 271B | SPCL* | 3.33 | |
| 271C | SPCL* | 2.59 | |
| 271D | SPCL* | 2.59 | |
| 271E | SPCL* | 2.56 | |
| 271F | SPCL* | 1.96 | |
| 271G | SPCL* | 3.25 | |
| 271H | SPCL* | 1.97 | |
| 271I | SPCL* | 1.97 | |
| 271J | SPCL* | 1.90 | |
| 271K | SPCL* | 1.97 | |
| 272 | A | 1.64 | |
| 272A | E | 1.65 | |
| 273 | K | 0.85 | |
| 274 | K | 1.75 | |
| 274A | K | 1.73 | |
| 275 | C | 0.78 | |
| 276 | C | 0.39 | |
| 276A | C | 0.59 | |
| 276B | C | 0.98 | |
| 276C | C | 0.79 | |
| 277 | K | 0.43 | |
| 278 | SPCL* | 5.48 | |
| 279 | B | 0.85 | |
| 279A | B | 0.83 | |

| VC No. | Style | A(1) | A-2 |
|--------|----------|------|------|
| 279B | B | 0.72 | |
| 279C | B | 0.79 | |
| 279D | A | 1.06 | |
| 280 | SPCL* | 0.66 | 0.97 |
| 280A | SPCL* | 0.56 | 0.94 |
| 280B | SPCL* | 0.56 | 0.94 |
| 283 | SPCL* | 0.58 | |
| 283A | SPCL* | 0.31 | |
| 283A02 | SPCL* | 0.31 | |
| 283B | SPCL* | 0.58 | |
| 283C | SPCL* | 1.05 | |
| 283D | SPCL* | 0.42 | |
| 283E | SPCL* | 0.60 | |
| 283F | SPCL* | 0.54 | |
| 284 | B | 3.57 | |
| 286 | B | 0.71 | |
| 287 | C | 0.53 | |
| 288 | N | 2.75 | 5.85 |
| 289 | J | 1.18 | |
| 290 | J | 1.56 | |
| 291 | SPCL* | 4.68 | |
| 291A | SPCL* | 3.23 | |
| 291C | SPCL* | 6.40 | |
| 291D | SPCL* | 3.35 | |
| 292 | B | 1.33 | |
| 293 | C | 0.79 | |
| 294 | J | 1.37 | |
| 294A | K | 1.37 | |
| 294C | J | 1.00 | |
| 295 | F | 6.31 | |
| 297 | G | 0.91 | |
| 298 | D | 2.75 | |
| 299 | A | 1.40 | |
| 300 | K | 1.33 | |
| 301A | SPCL* | 0.80 | |
| 301B | C | 1.18 | |
| 303 | B | 2.73 | |
| 304 | H | 0.65 | |
| 304A | H | 0.56 | |
| 304B | SPCL* | 0.73 | |
| 304C | H, SPCL* | 0.72 | |
| 306 | C | 0.59 | |
| 307 | B | 1.58 | |
| 310 | K | 0.72 | |
| 311 | C | 0.93 | |
| 312 | C | 0.69 | |
| 312J | SPCL* | 1.19 | 1.63 |
| 313 | G | 1.18 | |
| 313A | C | 0.75 | |
| 313B | C | 1.19 | |
| 313C | SPCL* | 1.50 | |
| 313D | G | 0.78 | |
| 313E | G | 1.18 | |
| 313F | SPCL* | 1.26 | |
| 313G | SPCL* | 0.98 | |
| 314 | I | 0.67 | |
| 315 | K | 0.79 | |
| 316A | C | 1.75 | |
| 316B | C | 1.16 | |
| 316C | C | 0.60 | |
| 316D | C | 0.70 | |
| 317 | A | 1.16 | |
| 318 | SPCL* | 2.31 | |
| 319 | SPCL* | 0.75 | 1.25 |
| 320 | D | 1.81 | |

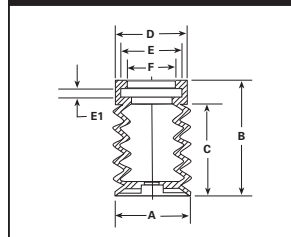
| VC No. | Style | A(1) | A-2 |
|------------------|-------|-------|-------|
| 321 | D | 2.87 | |
| 321B4 | D | 2.00 | |
| 322A | J | 1.50 | |
| 322C | J | 1.75 | |
| 322D | J | 2.00 | |
| 322E | M | 3.00 | |
| 322F | M | 3.50 | |
| 323 | B | 1.10 | |
| 324A | SPCL* | 0.61 | |
| 324B | I | 0.82 | |
| 325 | B | 2.57 | |
| 326-4.375x15.875 | SPCL* | 4.38 | 15.88 |
| 327 | C | 1.24 | |
| 328 | E | 3.00 | |
| 329 | A | 0.61 | |
| 329J | SPCL* | 1.02 | 1.27 |
| 330 | SPCL* | 0.89 | |
| 331 | SPCL* | 1.12 | |
| 331-4 | K | 1.00 | 1.00 |
| 331-5 | K | 0.74 | 1.37 |
| 332 | SPCL* | 3.50 | 10.50 |
| 333 | K | 1.02 | |
| 334 | SPCL* | 1.13 | |
| 334A | SPCL* | 1.03 | |
| 335 | SPCL* | 4.57 | |
| 335A | SPCL* | 2.77 | |
| 336A | SPCL* | 0.37 | |
| 336B | SPCL* | 0.42 | |
| 337 | G | 1.19 | |
| 338 2.718x6 | N | 2.72 | 6.00 |
| 339 | SPCL* | 0.43 | |
| 340 | F | 8.00 | |
| 340J | SPCL* | 1.02 | 1.03 |
| 341 | SPCL* | 1.56 | |
| 342 | C | 1.18 | |
| 344 | SPCL* | 0.92 | |
| 345 | SPCL* | 9.50 | |
| 346A | SPCL* | 3.85 | |
| 346C | SPCL* | 6.58 | |
| 347 | SPCL* | 0.26 | 0.54 |
| 349 | G | 0.77 | |
| 350 | SPCL* | 0.72 | |
| 351 | C | 0.63 | |
| 352 | SPCL* | 0.76 | |
| 353 | E | 1.66 | |
| 353A | E | 2.50 | |
| 354 | C | 1.09 | |
| 355 | C | 2.69 | |
| 356 | K | 0.94 | |
| 357 | SPCL* | 4.12 | |
| 358 | SPCL* | 1.19 | |
| 359 | K | 0.98 | |
| 360 | C | 1.38 | |
| 361 | C | 0.93 | |
| 363 | SPCL* | 3.47 | |
| 364 | D | 1.00 | |
| 365 | C | 2.00 | |
| 366 | SPCL* | 11.38 | |
| 367 | SPCL* | 0.78 | |
| 368 | E | 2.09 | |
| 368A | E | 1.48 | |
| 369 | C | 1.09 | |
| 370 | K | 1.56 | |
| 372 | C | 0.84 | |
| 373 | C | 1.69 | |

*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

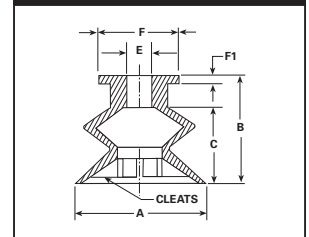
Style G page 22



Style H page 22,23



Style I page 23

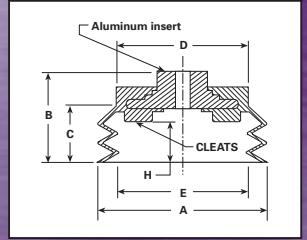


| VC No. | Style | A(1) | A-2 |
|---------|-------|------|------|
| 374A | SPCL* | 1.08 | |
| 374B | SPCL* | 1.42 | |
| 375 | SPCL* | 0.82 | |
| 376 | K | 1.20 | |
| 378 | A | 3.78 | |
| 379 | C | 0.59 | |
| 380 | F | 1.95 | |
| 381 | A | 0.80 | |
| 381A | A | 1.13 | |
| 382 | SPCL* | 0.98 | |
| 383A | SPCL* | 0.59 | 1.77 |
| 383B | SPCL* | 0.81 | 2.38 |
| 383C | SPCL* | 1.43 | 3.56 |
| 384 | SPCL* | 0.62 | |
| 385 | A | 2.58 | |
| 387 | G | 1.64 | |
| 388 | K | 1.03 | |
| 389 | G | 0.39 | |
| 390 | SPCL* | 2.05 | |
| 391 | N | 0.71 | 1.63 |
| 627-4 | SPCL* | 1.80 | |
| 830A | SPCL* | 2.74 | |
| #1 | SP2 | 0.92 | 2.85 |
| #1A | SP2 | 1.93 | 2.81 |
| #2 | SP1 | 1.70 | 2.50 |
| #10 | SP3 | 1.21 | 2.04 |
| #10A | SP3 | 1.53 | 2.12 |
| B1 | J,K | 1.20 | |
| B1A | J,K | 1.38 | |
| B1A2 | K | 1.15 | |
| B1A4 | K | 3.00 | |
| B1C | K | 1.20 | |
| B1D | I | 1.21 | |
| B1F | I | 1.20 | |
| B1P | D | 1.25 | |
| B1PA | D | 1.27 | |
| B1PA1 | D | 1.75 | |
| B1Q | K | 1.25 | |
| B2 | I,K | 0.75 | |
| B2 0.64 | K | 0.76 | |
| B2A1 | K | 0.76 | |
| B3 | K | 0.52 | |
| B3-1 | K | 0.52 | |
| B3-1A | H | 0.52 | |
| B3-2 | K | 0.51 | |
| B3.4 | K | 0.19 | |
| B3.5 | K | 0.13 | |
| B3A | I | 0.57 | |
| B3F | I | 0.51 | |
| B3F1 | I | 0.50 | |
| B4 | K | 0.61 | 1.67 |
| B4A | K | 1.19 | |
| B4AC | K | 1.20 | |
| B5-2 | K | 0.19 | |
| B5-3 | K | 0.19 | |
| B6 | K | 0.25 | |
| B6-2 | K | 0.25 | |
| B6.4 | K | 0.25 | |
| B6.5 | K | 0.25 | |
| B7 | K | 0.28 | |
| B7-1 | K | 0.27 | |
| B8 | K | 0.31 | |
| B8.1 | K | 0.35 | |
| B9 | K | 0.39 | |
| B9.5 | H | 0.39 | |

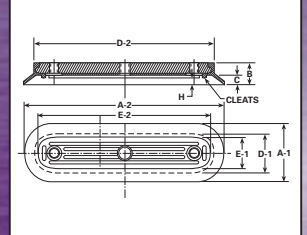
| VC No. | Style | A(1) | A-2 |
|-----------|-------|------|------|
| B9.5A | K | 0.40 | |
| B10 | K | 0.41 | |
| B10-1 | K | 0.41 | |
| B10-2 | K | 0.38 | |
| B10-3 | K | 0.44 | |
| B10-4 | K | 0.43 | |
| B10.5 | K | 0.43 | |
| B10-6 | K | 0.39 | |
| B14.5 | H | 0.60 | |
| B15 | K | 0.61 | |
| B15-1 | K | 0.63 | |
| B15-2 | K | 0.63 | |
| B18 | K | 0.78 | |
| B18-1 | K | 0.80 | |
| B19 | K | 0.78 | |
| B19A | K | 0.60 | |
| B20 | K | 0.80 | |
| B20.5 | K | 0.79 | |
| B20-1 | K | 0.72 | |
| B20-2 | K | 0.84 | |
| B20F | J | 0.87 | |
| B20P | I | 0.87 | |
| B20P1 | H | 0.88 | |
| B21 | K | 0.80 | |
| B25 | D | 0.94 | |
| B28 | K | 1.09 | |
| B30 | K | 1.33 | |
| B30 | J | 1.35 | |
| B30-1 | I | 1.34 | |
| B30-2 | I | 1.37 | |
| B30A | K | 2.73 | |
| B30P | I | 1.30 | |
| B32 | J | 1.26 | |
| B33H1 | K | 1.14 | 1.34 |
| B40 | J | 1.65 | |
| B40P | I | 1.70 | |
| B50 | K | 2.12 | |
| B50 | J | 2.10 | |
| B50P | I | 2.10 | |
| B50P1 | I | 2.10 | |
| B53 | K | 2.13 | |
| B75 | M | 3.09 | |
| B85 | J | 3.37 | |
| B110 | M | 4.62 | |
| B111 | J | 4.45 | |
| BH30 | B | 1.17 | |
| BH40 | B | 1.57 | |
| BH50 | B | 2.00 | |
| BH50-2 | B | 1.95 | |
| BH60F | B | 2.31 | |
| BH89 | B | 3.52 | |
| BH115 | F | 4.62 | |
| BL11 | I | 0.43 | |
| BL20 | I | 0.79 | |
| BL30 | I | 1.21 | |
| BL40 | J | 1.56 | |
| BL40 | K | 1.59 | |
| D15 | C | 0.64 | |
| D20P | A | 0.84 | |
| D30P | A | 1.26 | |
| D50P | A | 2.03 | |
| F25 | A | 1.06 | |
| MINI-.080 | G | 0.09 | |
| MINI-.125 | C | 0.12 | |
| MINI-.138 | G | 0.15 | |

| VC No. | Style | A(1) | A-2 |
|--------------|-------|------|------|
| MINI-.148 | C | 0.14 | |
| MINI-.160 | C | 0.15 | |
| MINI-.199 | C | 0.19 | |
| MINI-.200 | A | 0.20 | |
| MINI-.210 | A | 0.21 | |
| MINI-.224 | B | 0.32 | |
| MINI-.24x.81 | SPCL* | 0.24 | 0.81 |
| MINI-.246 | C | 0.23 | |
| MINI-.250 | A | 0.23 | |
| MINI-.255 | B | 0.25 | |
| MINI-.260 | B | 0.26 | |
| MINI-.299 | B | 0.31 | |
| MINI-.300 | A | 0.29 | |
| MINI-.310 | B | 0.31 | |
| MINI-.312 | B | 0.29 | |
| MINI-.330 | SPCL* | 0.33 | |
| MINI-.335 | C | 0.33 | |
| MINI-.350 | G | 0.35 | |
| MINI-.400 | B | 0.40 | |
| MINI-7x16 | A | 0.28 | 0.64 |
| MINI-7.9 | C | 0.31 | |
| MINI-U6 | C | 0.28 | |
| MINI-U9.5 | C | 0.37 | |
| NJ1 | G | 0.51 | |
| NJ2 | G | 0.42 | |
| NJ3 | G | 0.32 | |
| NJ4 | G | 0.23 | |
| NJ5 | G | 0.32 | |
| NJ6 | G | 0.39 | |
| NJ7 | G | 0.59 | |
| NJ7.5 | H | 0.30 | |
| NJ8 | G | 0.23 | |
| NJ9 | G | 0.32 | |
| NJ10 | G | 0.39 | |
| NJ10.5 | G | 0.44 | |
| NJ11 | G | 0.28 | |
| NJ12 | G | 0.26 | |
| NJ13 | G | 0.35 | |
| NJ14 | G | 0.42 | |
| R10 | C | 1.03 | |
| R22 | C | 0.82 | |
| R23 | C | 0.85 | |
| R23A | C | 0.86 | |
| R24H | B | 1.25 | |
| R61 | A | 1.42 | |
| R62 | A | 1.25 | |
| RM10.5 | G | 0.40 | |
| RM14 | G | 0.65 | |
| RM15.8 | H | 0.63 | |
| RM16 | H | 0.67 | |
| RM30 | G | 1.17 | |
| RM40 | G | 1.56 | |
| TC75 | F | 2.95 | |
| TC100 | F | 3.90 | |
| DD2 | SP1 | 1.68 | 2.71 |
| U20 | A | 0.87 | |
| U40 | A | 1.60 | |
| U50 | A | 2.06 | |

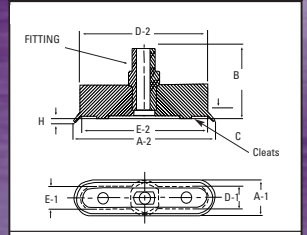
Style M page 29



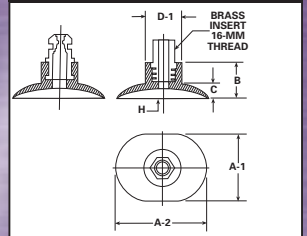
Style N page 30,31



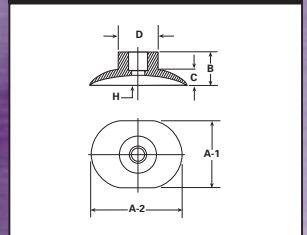
Style O page 32



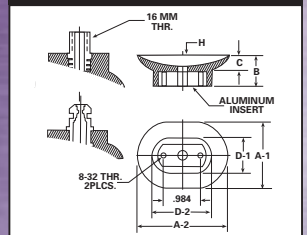
Style SP1 page 33



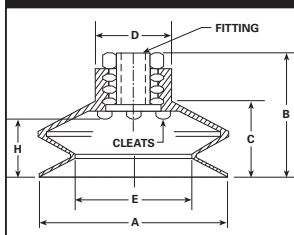
Style SP2 page 33



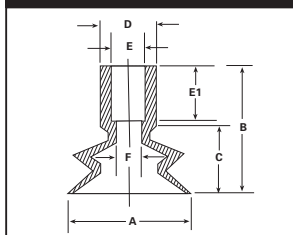
Style SP3 page 33



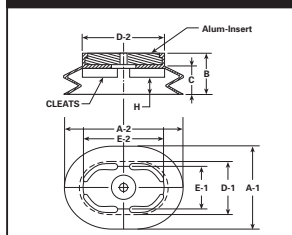
Style J page 24



Style K page 25-27



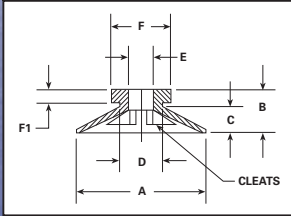
Style L page 28



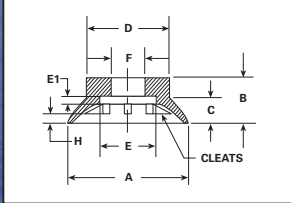
*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

Parts Index – cups by diameter

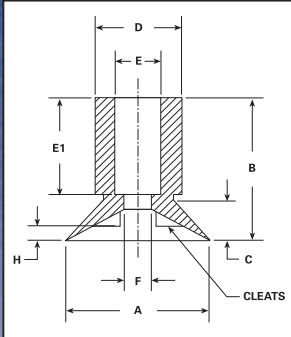
Style A page 8,9



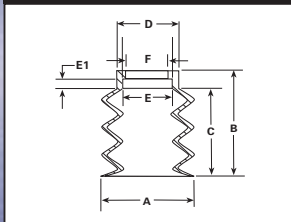
Style B page 10-12



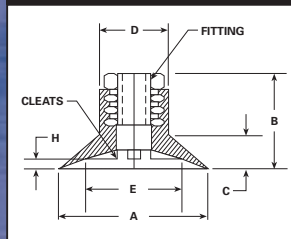
Style C page 13-17



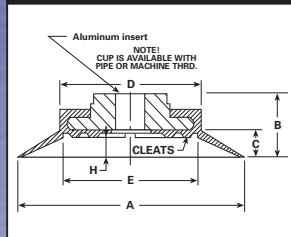
Style D page 18



Style E page 19,20



Style F page 20,21



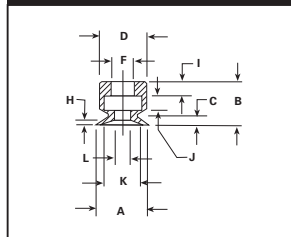
| VC No. | Style | A(1) | A-2 |
|--------------|-------|------|------|
| MINI-.080 | G | 0.09 | |
| MINI-.125 | C | 0.12 | |
| B3.5 | K | 0.13 | |
| MINI-.148 | C | 0.14 | |
| MINI-.138 | G | 0.15 | |
| MINI-.160 | C | 0.15 | |
| 69A | A | 0.19 | 0.74 |
| 69B | A | 0.19 | 1.00 |
| MINI-.199 | C | 0.19 | |
| B3.4 | K | 0.19 | |
| B5-2 | K | 0.19 | |
| B5-3 | K | 0.19 | |
| MINI-.200 | A | 0.20 | |
| MINI-.210 | A | 0.21 | |
| MINI-.250 | A | 0.23 | |
| NJ4 | G | 0.23 | |
| NJ8 | G | 0.23 | |
| MINI-.246 | C | 0.23 | |
| MINI-.24x.81 | SPCL* | 0.24 | 0.81 |
| 167A | C | 0.25 | |
| B6 | K | 0.25 | |
| B6-2 | K | 0.25 | |
| B6.4 | K | 0.25 | |
| B6.5 | K | 0.25 | |
| MINI-.255 | B | 0.25 | |
| 347 | SPCL* | 0.26 | 0.54 |
| MINI-.260 | B | 0.26 | |
| NJ12 | G | 0.26 | |
| B7 | K | 0.28 | |
| MINI-7x16 | A | 0.28 | |
| MINI-U6 | C | 0.28 | |
| NJ11 | G | 0.28 | |
| 161A | C | 0.29 | |
| MINI-.300 | A | 0.29 | |
| MINI-.312 | B | 0.29 | |
| NJ7.5 | H | 0.30 | |
| 283A | SPCL* | 0.31 | |
| 283A02 | SPCL* | 0.31 | |
| B8 | K | 0.31 | |
| MINI-.299 | B | 0.31 | |
| MINI-.310 | B | 0.31 | |
| MINI-7.9 | C | 0.31 | |
| 169A | C | 0.32 | |
| 169C | C | 0.32 | |
| MINI-.224 | B | 0.32 | |
| NJ3 | G | 0.32 | |
| NJ5 | G | 0.32 | |
| NJ9 | G | 0.32 | |
| 169D | C | 0.33 | |
| MINI-.330 | SPCL* | 0.33 | |
| MINI-.335 | C | 0.33 | |
| 169 | C | 0.34 | |
| 1P | A | 0.35 | |
| 164 | B | 0.35 | |
| 234 | C | 0.35 | |
| B8.1 | K | 0.35 | |
| NJ13 | G | 0.35 | |
| MINI-.350 | G | 0.35 | |
| 161 | C | 0.36 | |
| 161C | C | 0.36 | |
| 68 | A | 0.37 | |
| 164A | B | 0.37 | |
| 165A | B | 0.37 | |
| 336A | SPCL* | 0.37 | |
| MINI-U9.5 | C | 0.37 | |

| VC No. | Style | A(1) | A-2 |
|-----------|-------|------|------|
| 158D | B | 0.38 | |
| B10-2 | K | 0.38 | |
| 33A61 | H | 0.39 | |
| 135B | C | 0.39 | |
| 189F | SPCL* | 0.39 | 1.17 |
| 276 | C | 0.39 | |
| 389 | G | 0.39 | |
| B9 | K | 0.39 | |
| B9.5 | H | 0.39 | |
| B10-6 | K | 0.39 | |
| NJ6 | G | 0.39 | |
| NJ10 | G | 0.39 | |
| 167 | C | 0.40 | |
| 173 | C | 0.40 | |
| 207D | B | 0.40 | |
| B9.5A | K | 0.40 | |
| MINI-.400 | B | 0.40 | |
| RM-10.5 | G | 0.40 | |
| 265 | C | 0.41 | |
| B10 | K | 0.41 | |
| B10-1 | K | 0.41 | |
| 206 | B | 0.42 | |
| 283D | SPCL* | 0.42 | |
| 336B | SPCL* | 0.42 | |
| NJ1 | G | 0.42 | |
| NJ14 | G | 0.42 | |
| 157C | C | 0.43 | |
| 277 | K | 0.43 | |
| 339 | SPCL* | 0.43 | |
| B10-4 | K | 0.43 | |
| B10.5 | K | 0.43 | |
| BL11 | I | 0.43 | |
| B10-3 | K | 0.44 | |
| NJ10.5 | G | 0.44 | |
| 211 | C | 0.45 | |
| 191 | C | 0.46 | |
| 157 | C | 0.50 | |
| 157A | C | 0.50 | |
| 189A | O | 0.50 | 2.00 |
| 189B | O | 0.50 | 1.50 |
| 189C | O | 0.50 | 1.00 |
| 191A | C | 0.50 | |
| 191B | C | 0.50 | |
| 207C | B | 0.50 | |
| 220 | C | 0.50 | |
| 251 | C | 0.50 | |
| B3F1 | I | 0.50 | |
| B3F | I | 0.51 | |
| NJ2 | G | 0.51 | |
| 69 | C | 0.52 | 0.39 |
| B3 | K | 0.52 | |
| B3-1 | K | 0.52 | |
| B3-1A | H | 0.52 | |
| 44A | SPCL* | 0.53 | |
| 122B | C | 0.53 | |
| 158C | B | 0.53 | |
| 172 | B | 0.53 | |
| 287 | C | 0.53 | |
| 158F | B | 0.54 | |
| 283F | SPCL* | 0.54 | |
| 123 | C | 0.56 | |
| 167B | C | 0.56 | |
| 167C | C | 0.56 | |
| 167C1 | A | 0.56 | |
| 190 | C | 0.56 | |

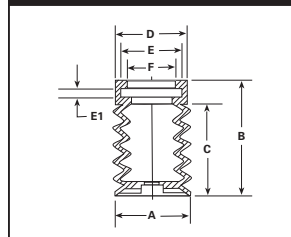
| VC No. | Style | A(1) | A-2 |
|------------|-------|------|------|
| 190A | C | 0.56 | |
| 280A | SPCL* | 0.56 | 0.94 |
| 280B | SPCL* | 0.56 | 0.94 |
| 304A | H | 0.56 | |
| 35J | SPCL* | 0.57 | 1.44 |
| 35J1 | SPCL* | 0.57 | 1.45 |
| 123A | A | 0.57 | |
| 123A1 | A | 0.57 | |
| 123B | A | 0.57 | |
| B3A | I | 0.57 | |
| 283 | SPCL* | 0.58 | |
| 283B | SPCL* | 0.58 | |
| 276A | C | 0.59 | |
| 306 | C | 0.59 | |
| 379 | C | 0.59 | |
| 383A | SPCL* | 0.59 | 1.77 |
| NJ7 | G | 0.59 | |
| 41C | A | 0.60 | |
| 61 | C | 0.60 | |
| 122A | C | 0.60 | |
| 283E | SPCL* | 0.60 | |
| 316C | C | 0.60 | |
| B14.5 | H | 0.60 | |
| B19-A | K | 0.60 | |
| 33A6 | H | 0.61 | |
| 324A | SPCL* | 0.61 | |
| 329 | A | 0.61 | |
| B4 | K | 0.61 | 1.67 |
| B15 | K | 0.61 | |
| 24B | C | 0.62 | |
| 32.62x1.87 | L | 0.62 | 1.87 |
| 66C | C | 0.62 | |
| 98 | A | 0.62 | 0.98 |
| 122 | C | 0.62 | |
| 135 | C | 0.62 | |
| 157B | C | 0.62 | |
| 207 | B | 0.62 | |
| 384 | SPCL* | 0.62 | |
| 25 | G | 0.63 | |
| 33A10 | K | 0.63 | |
| 35J3 | SPCL* | 0.63 | 1.67 |
| 229 | SPCL* | 0.63 | |
| 351 | C | 0.63 | |
| B151 | K | 0.63 | |
| B152 | K | 0.63 | |
| RM-15.8 | H | 0.63 | |
| 176 | H | 0.64 | |
| 176A | K | 0.64 | |
| 179 | C | 0.64 | |
| D15 | C | 0.64 | |
| 24 | C | 0.65 | |
| 24C | SPCL* | 0.65 | |
| 43 | B | 0.65 | |
| 98A | C | 0.65 | 0.98 |
| 304 | H | 0.65 | |
| RM-14 | G | 0.65 | |
| 33A6-3 | H | 0.66 | |
| 179A | C | 0.66 | |
| 280 | SPCL* | 0.66 | 0.97 |
| 24A | C | 0.67 | |
| 133 | B | 0.67 | |
| 196C | K | 0.67 | |
| 248 | B | 0.67 | |
| 314 | I | 0.67 | |
| RM-16 | H | 0.67 | |

*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

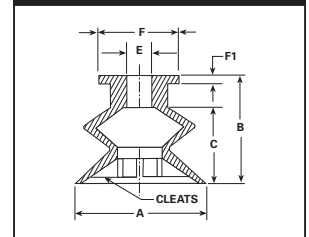
Style G page 22



Style H page 22,23



Style I page 23

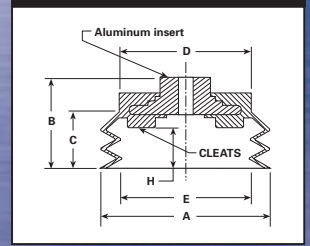


| VC No. | Style | A(1) | A-2 |
|---------|----------|------|------|
| 136 | C | 0.68 | |
| 44 | SPCL* | 0.69 | |
| 199 | A | 0.69 | 1.00 |
| 312 | C | 0.69 | |
| 249 | C | 0.70 | |
| 316D | C | 0.70 | |
| 41A | A | 0.71 | |
| 41B | A | 0.71 | |
| 41D | A | 0.71 | |
| 158 | B | 0.71 | |
| 189H | O | 0.71 | |
| 286 | B | 0.71 | |
| 391 | N | 0.71 | 1.63 |
| 263 | A | 0.72 | |
| 279B | B | 0.72 | |
| 304C | H, SPCL* | 0.72 | |
| 310 | K | 0.72 | |
| 350 | SPCL* | 0.72 | |
| B20-1 | K | 0.72 | |
| 33A5 | J | 0.73 | |
| 79A | C | 0.73 | |
| 158G | C | 0.73 | |
| 304B | SPCL* | 0.73 | |
| 331-5 | K | 0.74 | 1.37 |
| 2E4 | C | 0.75 | |
| 16A | SPCL* | 0.75 | |
| 32.75x5 | L | 0.75 | 5.00 |
| 66B | B | 0.75 | |
| 87 | O | 0.75 | 1.48 |
| 124D | K | 0.75 | |
| 124D-3 | K | 0.75 | |
| 139 | C | 0.75 | |
| 140A | C | 0.75 | |
| 158A | B | 0.75 | |
| 188C | SPCL* | 0.75 | 2.88 |
| 188C1 | L | 0.75 | 2.87 |
| 188G | N | 0.75 | 2.38 |
| 188G1 | N | 0.75 | 6.00 |
| 188H | N | 0.75 | 1.63 |
| 189D | N | 0.75 | 1.75 |
| 230A | B | 0.75 | |
| 313A | C | 0.75 | |
| 319 | SPCL* | 0.75 | 1.25 |
| B2 | I, K | 0.75 | |
| 41E | A | 0.76 | |
| 41F | A | 0.76 | |
| 212-5J | SPCL* | 0.76 | 1.01 |
| 352 | SPCL* | 0.76 | |
| B2.64 | K | 0.76 | |
| B2A1 | K | 0.76 | |
| 2E5 | C | 0.77 | |
| 16 | C | 0.77 | |
| 33A5 | K | 0.77 | |
| 33A5S | K | 0.77 | |
| 119 | G | 0.77 | |
| 119A | C | 0.77 | |
| 349 | G | 0.77 | |
| 22A | G | 0.78 | |
| 331-2 | K | 0.78 | 0.96 |
| 48 | A | 0.78 | |
| 108 | B | 0.78 | |
| 119B | C | 0.78 | |
| 124C | K | 0.78 | |
| 135A | C | 0.78 | |
| 275 | C | 0.78 | |

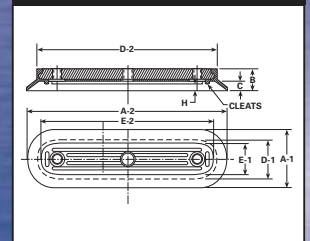
| VC No. | Style | A(1) | A-2 |
|--------|-------|------|------|
| 313D | G | 0.78 | |
| 339A | K | 0.78 | |
| 367 | SPCL* | 0.78 | |
| B18 | K | 0.78 | |
| B19 | K | 0.78 | |
| 21 | C | 0.79 | |
| 45A | B | 0.79 | |
| 158B | C | 0.79 | |
| 170 | A | 0.79 | |
| 228 | B | 0.79 | |
| 276C | C | 0.79 | |
| 279C | B | 0.79 | |
| 293 | C | 0.79 | |
| 315 | K | 0.79 | |
| B20.5 | K | 0.79 | |
| BL20 | I | 0.79 | |
| 41G | A | 0.80 | |
| 301A | SPCL* | 0.80 | |
| 381 | A | 0.80 | |
| B18-1 | K | 0.80 | |
| B20 | K | 0.80 | |
| B21 | K | 0.80 | |
| 22 | G | 0.81 | |
| 136A | C | 0.81 | |
| 151 | B | 0.81 | |
| 207B | B | 0.81 | |
| 225G | SPCL* | 0.81 | |
| 383B | SPCL* | 0.81 | 2.38 |
| 41 | A | 0.82 | |
| 375 | SPCL* | 0.82 | |
| 324B | I | 0.82 | |
| R22 | C | 0.82 | |
| 21A | C | 0.83 | |
| 66A | C | 0.83 | |
| 279A | B | 0.83 | |
| 79 | C | 0.84 | |
| 81C | SPCL* | 0.84 | 3.13 |
| 84 | B | 0.84 | |
| 178 | C | 0.84 | |
| 238 | SPCL* | 0.84 | 1.31 |
| 238A | SPCL* | 0.84 | 1.32 |
| 246 | C | 0.84 | |
| 372 | C | 0.84 | |
| B20 | K | 0.84 | |
| D20P | A | 0.84 | |
| 17 | C | 0.85 | |
| 197 | B | 0.85 | |
| 257A | B | 0.85 | |
| 273 | K | 0.85 | |
| 279 | B | 0.85 | |
| R23 | C | 0.85 | |
| 33G | K | 0.86 | |
| 189D1 | N | 0.86 | 1.75 |
| R23A | C | 0.86 | |
| 33A5-3 | D | 0.87 | |
| 33A5-4 | D | 0.87 | |
| 33AL5 | J | 0.87 | |
| 165 | B | 0.87 | |
| 188E | N | 0.87 | 4.50 |
| 188F | N | 0.87 | 3.87 |
| 189 | O | 0.87 | 1.73 |
| 267 | H | 0.87 | |
| B20F | J | 0.87 | |
| B20P | I | 0.87 | |
| U20 | A | 0.87 | |

| VC No. | Style | A(1) | A-2 |
|---------|-------|------|-------|
| 33A5EL | K | 0.88 | |
| 33A5L3 | K | 0.88 | |
| 33G1 | K | 0.88 | |
| B20P1 | H | 0.88 | |
| 231 | G | 0.89 | |
| 330 | SPCL* | 0.89 | |
| 33A3 | J, K | 0.90 | |
| 297 | G | 0.91 | |
| #1 | SP2 | 0.92 | 2.85 |
| 47 | SP2 | 0.92 | |
| 196B | K | 0.92 | |
| 344 | SPCL* | 0.92 | |
| 47-Y-2 | SP1 | 0.93 | 1.75 |
| 230 | B | 0.93 | |
| 311 | C | 0.93 | |
| 356 | K | 0.94 | |
| B25 | D | 0.94 | |
| 225C | SPCL* | 0.95 | |
| 238A2 | SPCL* | 0.95 | |
| 238A3 | SPCL* | 0.95 | |
| 26 | A | 0.96 | |
| 238A1 | SPCL* | 0.96 | |
| 2D1 | C | 0.97 | |
| 182 | D | 0.97 | |
| 33F | I | 0.98 | |
| 128 | K | 0.98 | |
| 134B | K | 0.98 | |
| 147C | C | 0.98 | |
| 252 | K | 0.98 | 0.75 |
| 276B | C | 0.98 | |
| 313G | SPCL* | 0.98 | |
| 359 | K | 0.98 | |
| 382 | SPCL* | 0.98 | |
| 2E3 | C | 1.00 | |
| 32 1x13 | L | 1.00 | 13.00 |
| 32MP1A | K | 1.00 | |
| 33G2 | D | 1.00 | |
| 36 | A | 1.00 | |
| 36A | A | 1.00 | |
| 36B | A | 1.00 | |
| 36C | A | 1.00 | |
| 36D | A | 1.00 | |
| 36F | A | 1.00 | |
| 36G | A | 1.00 | |
| 36H | A | 1.00 | |
| 110A | C | 1.00 | |
| 124A | I | 1.00 | |
| 124B | K | 1.00 | |
| 128A | K | 1.00 | |
| 147E | C | 1.00 | |
| 148 | B | 1.00 | |
| 159 | B | 1.00 | |
| 177A | B | 1.00 | |
| 184 | A | 1.00 | |
| 188 | N | 1.00 | 4.50 |
| 188B | N | 1.00 | 4.50 |
| 188B1 | L | 1.00 | 4.50 |
| 188B2 | N | 1.00 | 5.00 |
| 188D | N | 1.00 | 2.50 |
| 188JC | N | 1.00 | 4.25 |
| 192 | I | 1.00 | |
| 204F | C, E | 1.00 | |
| 207D1 | B | 1.00 | |
| 218 | C | 1.00 | |
| 239B | SPCL* | 1.00 | |

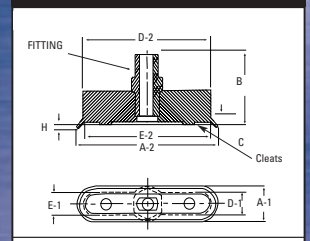
Style M page 29



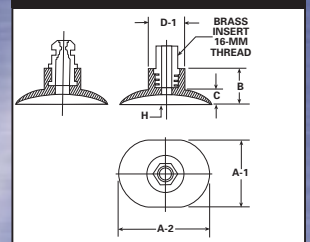
Style N page 30, 31



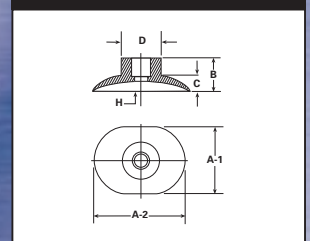
Style O page 32



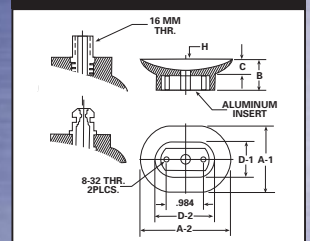
Style SP1 page 33



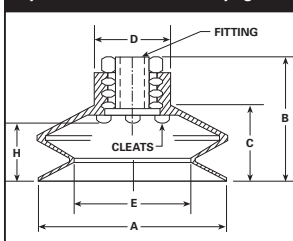
Style SP2 page 33



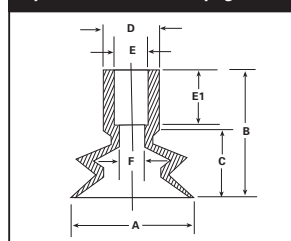
Style SP3 page 33



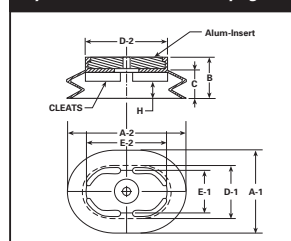
Style J page 24



Style K page 25-27

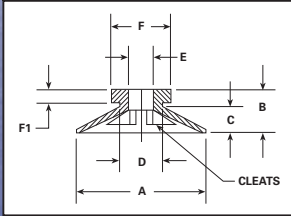


Style L page 28

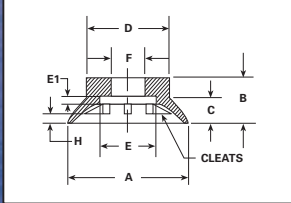


*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

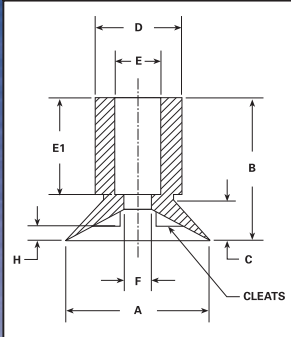
Style A page 8,9



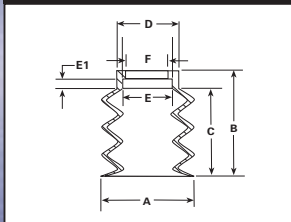
Style B page 10-12



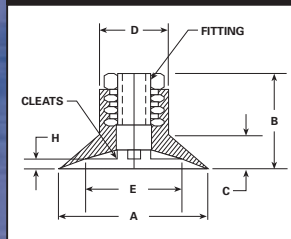
Style C page 13-17



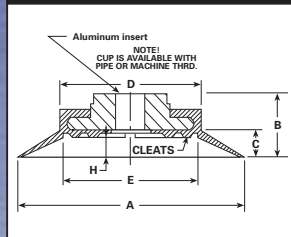
Style D page 18



Style E page 19,20



Style F page 20,21



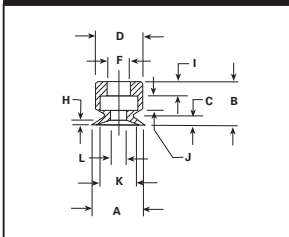
| VC No. | Style | A(1) | A-2 |
|--------|---------|------|------|
| 294C | J | 1.00 | |
| 331-4 | K | 1.00 | 1.00 |
| 364 | D | 1.00 | |
| 59G | B | 1.01 | |
| 59G1 | C | 1.01 | |
| 66 | C | 1.01 | |
| 113 | C | 1.01 | |
| 141 | A | 1.01 | |
| 147A | C | 1.01 | |
| 159A | C | 1.01 | |
| 2F | C | 1.02 | |
| 124 | K | 1.02 | |
| 214E | E | 1.02 | |
| 329J | SPCL* | 1.02 | 1.27 |
| 333 | K | 1.02 | |
| 340J | SPCL* | 1.02 | 1.03 |
| 14 | C | 1.03 | |
| 36J | A | 1.03 | |
| 124A3 | K | 1.03 | |
| 124F1 | K | 1.03 | |
| 147B | C | 1.03 | |
| 334A | SPCL* | 1.03 | |
| 388 | K | 1.03 | |
| R10 | C | 1.03 | |
| 9C | A | 1.04 | |
| 10 | B,E | 1.04 | |
| 10A | B,E | 1.04 | |
| 20 | A | 1.04 | |
| 147 | C | 1.04 | |
| 19A | C | 1.05 | |
| 283C | SPCL* | 1.05 | |
| 32H2 | D | 1.06 | |
| 53 | C | 1.06 | |
| 120 | A | 1.06 | |
| 145 | C,SPCL* | 1.06 | |
| 160C | C | 1.06 | |
| 160 | C | 1.06 | |
| 279D | B | 1.06 | |
| F25 | A | 1.06 | |
| 36E | B | 1.07 | |
| 196D | K | 1.08 | |
| 250 | C | 1.08 | |
| 374A | SPCL* | 1.08 | |
| 33E1 | K | 1.09 | |
| 193 | B | 1.09 | |
| 369 | C | 1.09 | |
| B28 | K | 1.09 | |
| 3313 | K | 1.10 | 1.76 |
| 134B2 | K | 1.10 | |
| 136B | C | 1.10 | |
| 136C | C | 1.10 | |
| 201C | SPCL* | 1.10 | |
| 323 | B | 1.10 | |
| 19 | C | 1.11 | |
| 107 | B,E | 1.11 | |
| 118 | C | 1.11 | |
| 196 | K | 1.11 | |
| 6 | B | 1.12 | |
| 33A4A | J | 1.12 | |
| 3311 | K | 1.12 | 1.37 |
| 186 | B | 1.12 | |
| 207A | B | 1.12 | |
| 209 | C | 1.12 | |
| 243 | SPCL* | 1.12 | |
| 331 | SPCL* | 1.12 | |

| VC No. | Style | A(1) | A-2 |
|--------|-------|------|------|
| 209A | K | 1.13 | |
| 224 | C | 1.13 | |
| 334 | SPCL* | 1.13 | |
| 381A | A | 1.13 | |
| 9 | A | 1.14 | |
| 9A | A | 1.14 | |
| 9A1 | A | 1.14 | |
| 9B | A | 1.14 | |
| 28 | A | 1.14 | |
| 33A4 | J,K | 1.14 | |
| 33H1 | K | 1.14 | 1.34 |
| 133E | K | 1.14 | |
| 281 | A | 1.14 | |
| 89 | O | 1.15 | 2.78 |
| 138 | G | 1.15 | |
| B1A-2 | K | 1.15 | |
| 33E2 | K | 1.16 | |
| 110B | C | 1.16 | |
| 316B | C | 1.16 | |
| 317 | A | 1.16 | |
| 6A | A | 1.17 | |
| 105A | A | 1.17 | |
| 177 | B | 1.17 | |
| 196A | K | 1.17 | |
| BH30 | B | 1.17 | |
| RM-30 | G | 1.17 | |
| 11 | B | 1.18 | |
| 32-C3 | K | 1.18 | |
| 331 | B | 1.18 | 2.34 |
| 100B-2 | A | 1.18 | 2.00 |
| 121 | A | 1.18 | |
| 121A | B | 1.18 | |
| 121B | B | 1.18 | |
| 127C | C | 1.18 | |
| 133A | B | 1.18 | |
| 138A | B | 1.18 | |
| 140 | C | 1.18 | |
| 258 | C | 1.18 | |
| 289 | J | 1.18 | |
| 301B | C | 1.18 | |
| 313 | G | 1.18 | |
| 313E | G | 1.18 | |
| 342 | C | 1.18 | |
| 2D2 | C | 1.19 | |
| 9D | A | 1.19 | |
| 32C3 | K | 1.19 | |
| 32H | D | 1.19 | |
| 33H | K | 1.19 | |
| 312J | SPCL* | 1.19 | 1.63 |
| 313B | C | 1.19 | |
| 337 | G | 1.19 | |
| 358 | SPCL* | 1.19 | |
| B4A | K | 1.19 | |
| 33AD1 | K | 1.20 | |
| 33K | K | 1.20 | |
| 152 | C | 1.20 | |
| 239 | C | 1.20 | 1.89 |
| 376 | K | 1.20 | |
| B1 | J,K | 1.20 | |
| B1C | K | 1.20 | |
| B1F | I | 1.20 | |
| B4AC | K | 1.20 | |
| #10 | SP3 | 1.21 | 2.04 |
| 88 | B,E | 1.21 | |
| 236 | C | 1.21 | |

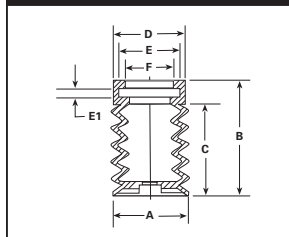
| VC No. | Style | A(1) | A-2 |
|----------------|-------|------|-------|
| 270 | B | 1.21 | |
| B1D | I | 1.21 | |
| BL30 | I | 1.21 | |
| 59J | C | 1.22 | |
| 214D | E | 1.22 | |
| 225-3 | SPCL* | 1.22 | |
| 110 | C | 1.23 | |
| 327 | C | 1.24 | |
| 2D | C | 1.25 | |
| 2EF | A | 1.25 | |
| 32 1.25x2.50 | L | 1.25 | 2.46 |
| 32 1.25x2.50D2 | L | 1.25 | 2.50 |
| 32 1.30x3.05 | L | 1.25 | 3.00 |
| 32 3x1.25 | SPCL* | 1.25 | 3.00 |
| 32MP1.25 | K | 1.25 | |
| 32W-4 | K | 1.25 | |
| 33A2 | J,K | 1.25 | |
| 33A2S | K | 1.25 | |
| 33A7 | K | 1.25 | |
| 42 | C | 1.25 | |
| 54C | B | 1.25 | |
| 57D | A | 1.25 | |
| 90 1.25x11.64 | N | 1.25 | 11.64 |
| 127B | C | 1.25 | |
| 144C1 | A | 1.25 | |
| 204E | E | 1.25 | |
| 264 | K | 1.25 | |
| B1P | D | 1.25 | |
| B1Q | K | 1.25 | |
| R24H | B | 1.25 | |
| R62 | A | 1.25 | |
| 2C1 | B | 1.26 | |
| 32W4 | SPCL* | 1.26 | |
| 313F | SPCL* | 1.26 | |
| B32 | J | 1.26 | |
| D30P | A | 1.26 | |
| B1PA | D | 1.27 | |
| 2 | C | 1.28 | |
| 33P | SPCL* | 1.28 | |
| 64 | C | 1.28 | |
| 2C | C | 1.29 | |
| 23 | B | 1.29 | |
| 23A | B | 1.29 | |
| 23B | B | 1.29 | |
| 47-H | SP2 | 1.29 | 2.29 |
| 57B | A | 1.29 | |
| 81B | SPCL* | 1.29 | 4.38 |
| 2A | C | 1.31 | |
| 2A1 | A | 1.31 | |
| 2EB | C | 1.31 | |
| 2EH | C | 1.31 | |
| 57C | A | 1.31 | |
| 180 | K | 1.31 | |
| 294A | K | 1.31 | |
| 57A | A | 1.32 | |
| 60 | C | 1.32 | |
| 65 | C | 1.32 | |
| 67 | B | 1.32 | |
| 225B | B | 1.32 | |
| 40 | K | 1.33 | |
| 292 | B | 1.33 | |
| 300 | K | 1.33 | |
| B30 | K | 1.33 | |
| 2EA | E | 1.34 | |
| B30-1 | I | 1.34 | |

*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

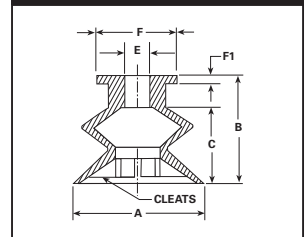
Style G page 22



Style H page 22,23



Style I page 23

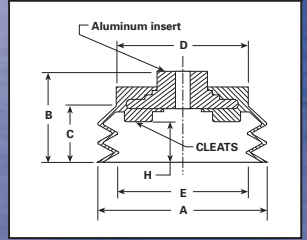


| VC No. | Style | A(1) | A-2 |
|---------------|-------|------|------|
| 2E2 | A | 1.35 | |
| 132 | B | 1.35 | |
| 134A | H | 1.35 | |
| 144C | A | 1.35 | |
| B30 | J | 1.35 | |
| 2E | C | 1.36 | |
| 2E1 | C | 1.37 | |
| 32H6 | D | 1.37 | |
| 33A-1 | J | 1.37 | |
| 33AR | J | 1.37 | |
| 33ATC | SPCL* | 1.37 | |
| 59H | B | 1.37 | |
| 60A | B | 1.37 | |
| 205 | B | 1.37 | |
| 294 | J | 1.37 | |
| 294A | J | 1.37 | |
| B30-2 | I | 1.37 | |
| 32H6-1 | J | 1.38 | |
| 131 | C | 1.38 | |
| 134 | H | 1.38 | |
| 187 | SPCL* | 1.38 | |
| B1A | J,K | 1.38 | |
| 33E9 | K | 1.39 | |
| 47-Z-2 | SP3 | 1.39 | 2.53 |
| 126 | C | 1.39 | |
| 177B | C | 1.39 | |
| 177C | C | 1.39 | |
| 33A1 | J,K | 1.40 | |
| 12 | B | 1.40 | |
| 146 | B | 1.40 | |
| 166 | A | 1.40 | |
| 299 | A | 1.40 | |
| 33C | D | 1.41 | |
| 33A | J,K | 1.42 | |
| 51A | B | 1.42 | |
| 146A | B | 1.42 | |
| 174 | K | 1.42 | |
| 374B | SPCL* | 1.42 | |
| R61 | A | 1.42 | |
| 97 | C | 1.43 | |
| 125A | N | 1.43 | 3.71 |
| 257 | B | 1.43 | |
| 383C | SPCL* | 1.43 | 3.56 |
| 47PS | SPCL* | 1.44 | 2.25 |
| 225A | C | 1.44 | |
| 32-1.50x2.75 | L | 1.46 | 2.73 |
| 33A8 | K | 1.47 | |
| 89A | O | 1.47 | 2.96 |
| 202 | H | 1.47 | |
| 33 | D | 1.48 | |
| 55AU | SP3 | 1.48 | 2.37 |
| 368A | E | 1.48 | |
| 105 | A | 1.49 | |
| 32 1.5x2.75D2 | L | 1.50 | 2.75 |
| 32 1.5x3.87 | L | 1.50 | 3.84 |
| 32H3 | D | 1.50 | |
| 33D | D,J | 1.50 | |
| 33J | D | 1.50 | |
| 37A | B,E | 1.50 | |
| 37B | B,E | 1.50 | |
| 55 | O | 1.50 | |
| 55F | A | 1.50 | 2.39 |
| 59E | E | 1.50 | |
| 59F | E | 1.50 | |
| 87 | B | 1.50 | |

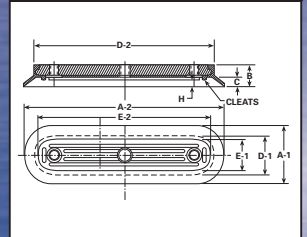
| VC No. | Style | A(1) | A-2 |
|-------------|-----------|------|-------|
| 90 1.5x2.12 | SPCL* | 1.50 | 2.13 |
| 90 1.5x8 | N | 1.50 | 8.00 |
| 90 1.5x10 | N | 1.50 | 10.00 |
| 127 | C | 1.50 | |
| 143 | C | 1.50 | |
| 188A | N | 1.50 | 2.87 |
| 188A TALL | N | 1.50 | 2.87 |
| 204D | C,E | 1.50 | |
| 256 | SPCL* | 1.50 | |
| 261 | K | 1.50 | |
| 313C | SPCL* | 1.50 | |
| 322A | J | 1.50 | |
| 8 | B | 1.51 | |
| 54J | B | 1.51 | |
| 100F | A | 1.51 | |
| 7B | C | 1.52 | |
| 32MP1 | K | 1.52 | |
| 33B | D | 1.52 | |
| #10 | SP3 | 1.53 | 2.12 |
| 33N | J | 1.53 | |
| 37 | B | 1.53 | |
| 37C | E | 1.53 | |
| 47PG1 | SP1,SPCL* | 1.53 | |
| 57 | A | 1.53 | |
| 210 | B | 1.53 | |
| 47-Y-3 | SP3 | 1.54 | 2.50 |
| 49A | C | 1.56 | |
| 49A1 | C | 1.56 | |
| 49B | C | 1.56 | |
| 50 | C | 1.56 | |
| 83 | N | 1.56 | 4.09 |
| 183 1.56x4 | N | 1.56 | 4.00 |
| 290 | J | 1.56 | |
| 341 | SPCL* | 1.56 | |
| 370 | K | 1.56 | |
| BL40 | J | 1.56 | |
| RM-40 | G | 1.56 | |
| 50A | A | 1.57 | |
| 54B | B | 1.57 | |
| 100J | B | 1.57 | |
| BH40 | B | 1.57 | |
| 47L | C,SP2 | 1.58 | |
| 307 | B | 1.58 | |
| 33M | D | 1.59 | |
| 233 | C | 1.59 | |
| 373 | C | 1.59 | |
| BL40 | K | 1.59 | |
| 7C | C | 1.60 | |
| 100H | B | 1.60 | |
| 214C | E | 1.60 | |
| U40 | A | 1.60 | |
| 33L | D | 1.62 | |
| 54F | B | 1.62 | |
| 90 1.62x4.0 | N | 1.62 | 4.00 |
| 100G | B | 1.62 | |
| 121C | A | 1.62 | |
| 133B | C | 1.62 | |
| 144A1 | A | 1.62 | |
| 163 | B | 1.62 | |
| 54K | B | 1.63 | |
| 225E | SPCL* | 1.63 | |
| 7 | C | 1.64 | |
| 7-1 | C | 1.63 | |
| 7A | C | 1.64 | |
| 32W3 | J,K | 1.64 | |

| VC No. | Style | A(1) | A-2 |
|------------|-------|------|-------|
| 51 | C | 1.64 | |
| 259 | F | 1.64 | |
| 272 | A | 1.64 | |
| 387 | G | 1.64 | |
| 100 | A | 1.65 | |
| 100A | A | 1.65 | |
| 100C | A | 1.65 | |
| 100E | A | 1.65 | |
| 225D | SPCL* | 1.65 | |
| 272A | E | 1.65 | |
| B40 | J | 1.65 | |
| 127A | C | 1.66 | |
| 353 | E | 1.66 | |
| 100B | A | 1.67 | |
| 100B1 | A | 1.67 | |
| 100C1 | A | 1.67 | |
| 100S1 | C | 1.67 | |
| 47-F-2 | SP3 | 1.68 | 2.42 |
| DD2 | SP1 | 1.68 | 2.71 |
| #2 | SP1 | 1.70 | 2.50 |
| 47-F-1 | SP3 | 1.70 | 2.42 |
| 47-Z-1 | SP3 | 1.70 | 2.70 |
| 100S | C,E | 1.70 | |
| B40P | I | 1.70 | |
| 54HD | B | 1.71 | |
| 47-S | SP2 | 1.73 | 2.41 |
| 47-Y-1 | SP1 | 1.73 | 2.78 |
| 274A | K | 1.73 | |
| 32EP | K | 1.74 | |
| 90 1.75x16 | N | 1.75 | 16.00 |
| 32 | D | 1.75 | |
| 32C5 | K | 1.75 | |
| 32MP | K | 1.75 | |
| 111 | B | 1.75 | |
| 144A | A | 1.75 | |
| 162A | B | 1.75 | |
| 200 | SPCL* | 1.75 | 3.25 |
| 204C | C,E | 1.75 | |
| 274 | K | 1.75 | |
| 316A | C | 1.75 | |
| 322C | J | 1.75 | |
| B1PA1 | D | 1.75 | |
| 54A | B | 1.78 | |
| 32W | D,J | 1.79 | |
| 627-4 | SPCL* | 1.80 | |
| 320 | D | 1.81 | |
| 47-04 | SP3 | 1.82 | 3.03 |
| 150 | B | 1.82 | |
| 59C | E | 1.83 | |
| 255A | SPCL* | 1.83 | |
| 45 | B | 1.84 | |
| 142 | A | 1.85 | |
| 144 | A | 1.85 | |
| 144B | A | 1.85 | |
| 3 | C | 1.86 | |
| 3A | C | 1.86 | |
| 47-31 | SP1 | 1.87 | 3.12 |
| 47-02 | SP3 | 1.87 | 2.73 |
| 47Y | SP1 | 1.87 | 2.81 |
| 32TC | D | 1.88 | |
| 32UJ | D | 1.88 | |
| 47F | SP3 | 1.88 | 2.50 |
| 90 1.87x16 | N | 1.88 | 16.00 |
| 81A | N | 1.89 | 4.12 |
| 541 | B | 1.90 | |

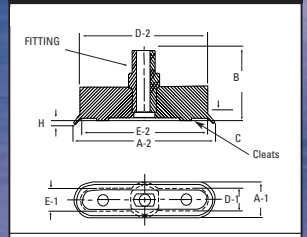
Style M page 29



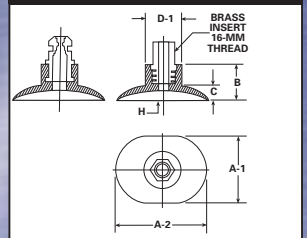
Style N page 30,31



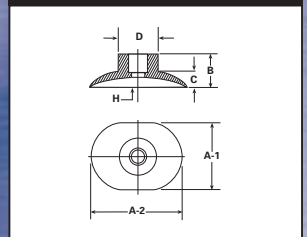
Style O page 32



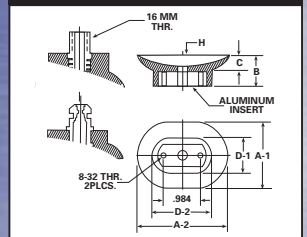
Style SP1 page 33



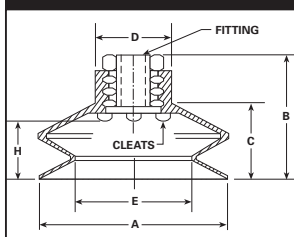
Style SP2 page 33



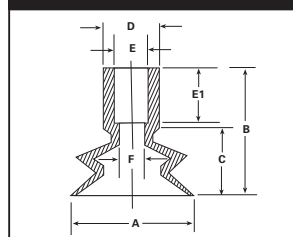
Style SP3 page 33



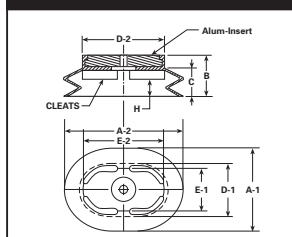
Style J page 24



Style K page 25-27

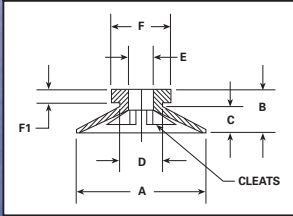


Style L page 28

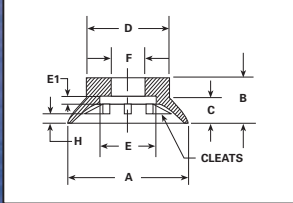


*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

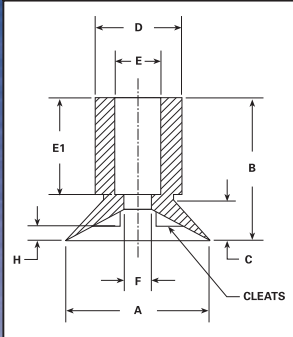
Style A page 8,9



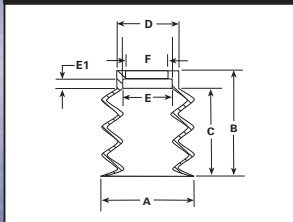
Style B page 10-12



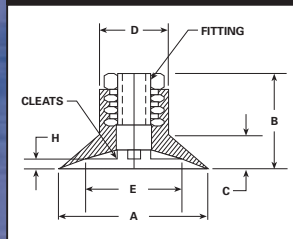
Style C page 13-17



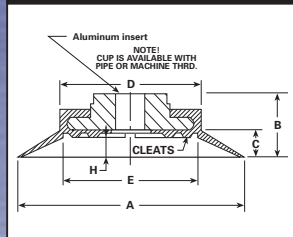
Style D page 18



Style E page 19,20



Style F page 20,21



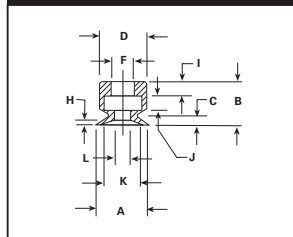
| VC No. | Style | A(1) | A-2 |
|------------|-------|------|-------|
| 271J | SPCL* | 1.90 | |
| 47T | SP1 | 1.91 | 3.32 |
| 47N1 | C,SP2 | 1.91 | |
| 47-O3 | SP3 | 1.92 | 3.09 |
| #1 | SP2 | 1.93 | 2.81 |
| 54 | B | 1.93 | |
| 32A | D | 1.94 | |
| 32ABC | D | 1.94 | |
| 47-O | SP3 | 1.95 | 2.65 |
| 32W1 | D | 1.95 | |
| 47B | SP2 | 1.95 | |
| 380 | F | 1.95 | |
| BH50-2 | B | 1.95 | |
| 271F | SPCL* | 1.96 | |
| 52 | C | 1.97 | |
| 130E | M | 1.97 | |
| 271H | SPCL* | 1.97 | |
| 271I | SPCL* | 1.97 | |
| 271K | SPCL* | 1.97 | |
| 32D1 | K | 1.98 | |
| 47-SG | SP3 | 1.98 | 3.37 |
| 54E-2 | B | 1.98 | |
| 58 | C | 1.98 | |
| 58A | C | 1.98 | |
| 162 | B | 1.98 | |
| 162B | B | 1.98 | |
| 32MW | K | 1.99 | |
| 27A1B | F | 2.00 | |
| 32 2x3.25L | L | 2.00 | 3.25 |
| 32 2x3.5 | L | 2.00 | 3.50 |
| 32C | J,K | 2.00 | |
| 32C1 | K | 2.00 | |
| 32C1F | J | 2.00 | |
| 32D | J,K | 2.00 | |
| 32DS | K | 2.00 | |
| 47-U | SP3 | 2.00 | |
| 59 | B,E | 2.00 | |
| 59A | E | 2.00 | |
| 59B | E | 2.00 | |
| 90 2x10 | N | 2.00 | 10.00 |
| 99 | B,E,F | 2.00 | |
| 149 | B | 2.00 | |
| 168 | B,E | 2.00 | |
| 183 2x4R | N | 2.00 | 3.54 |
| 183 2x4 | N | 2.00 | 4.00 |
| 183 2x5 | N | 2.00 | 5.00 |
| 183 2x6R | N | 2.00 | 5.59 |
| 183 2x6 | N | 2.00 | 6.00 |
| 183 2x7 | N | 2.00 | 7.00 |
| 195 | B | 2.00 | |
| 201A | SPCL* | 2.00 | |
| 216A | F | 2.00 | |
| 216B | F | 2.00 | |
| 321B4 | D | 2.00 | |
| 322D | J | 2.00 | |
| BH50 | B | 2.00 | |
| 47-O1 | SP3 | 2.01 | 2.68 |
| 47PG | SP2 | 2.01 | |
| 54E2 | B | 2.01 | |
| 32C2 | K | 2.02 | |
| 32CS | I | 2.02 | |
| 32J | K | 2.02 | |
| 47U1 | SPCL* | 2.02 | |
| 106A | B,E | 2.03 | |
| 204B | C,E | 2.03 | |

| VC No. | Style | A(1) | A-2 |
|---------------|---------|------|------|
| D50P | A | 2.03 | |
| 46 | B,E | 2.04 | |
| 390 | SPCL* | 2.05 | |
| 81 | N | 2.06 | 4.00 |
| U50 | A | 2.06 | |
| 47-W | SP3 | 2.07 | 3.06 |
| 54E | B | 2.07 | |
| 54E1 | B | 2.07 | |
| 266 | G,SPCL* | 2.07 | |
| 5 | B | 2.09 | |
| 54G | B | 2.09 | |
| 86 | E,F | 2.09 | |
| 368 | E | 2.09 | |
| 5A | B,E | 2.10 | |
| 5A-1 | E | 2.10 | |
| 5B | A | 2.10 | |
| 245C | F | 2.10 | |
| B50 | J | 2.10 | |
| B50P | I | 2.10 | |
| B50P1 | I | 2.10 | |
| 47C | SP3 | 2.12 | 2.79 |
| 47E | SP3 | 2.12 | 3.26 |
| 232 | F | 2.12 | |
| B50 | K | 2.12 | |
| 54H | B | 2.13 | |
| B53 | K | 2.13 | |
| 54HA | B | 2.15 | |
| 32 2.25x3.87 | L | 2.18 | 3.84 |
| 47AV1 | D | 2.19 | |
| 33D2 | D | 2.19 | |
| 90 2.2x7.5 | N | 2.20 | 7.50 |
| 91A | B,E | 2.20 | |
| 201D | D | 2.20 | |
| 90 2.75x3.5 | N | 2.21 | 3.48 |
| 130B | M | 2.21 | |
| 217A | J | 2.21 | |
| 27A1A | F | 2.25 | |
| 32W2 | D | 2.25 | |
| 90 2.25x3.0 | N | 2.25 | 3.00 |
| 130F | M | 2.25 | |
| 32G1 | J | 2.26 | |
| 137B | K | 2.26 | |
| 225F | SPCL* | 2.27 | |
| 32G | D | 2.28 | |
| 47I | SP2 | 2.29 | 3.31 |
| 90 2.25x5.25 | N | 2.29 | 5.26 |
| 198A | B | 2.29 | |
| 318 | SPCL* | 2.31 | |
| BH60F | B | 2.31 | |
| 59L | E | 2.32 | |
| 91 | B,E | 2.33 | |
| 242 | C | 2.34 | |
| 90-2.36x5.12 | SPCL* | 2.36 | 5.12 |
| 130D | M | 2.36 | |
| 137 | J,K | 2.36 | |
| 32F1 | J | 2.37 | |
| 91B | B | 2.37 | |
| 214 | F | 2.37 | |
| 32F | J,K | 2.38 | |
| 90 2.375x4.25 | N | 2.38 | 4.25 |
| 101 | C | 2.40 | |
| 32FB | J | 2.42 | |
| 137C | J | 2.42 | |
| 262 | F | 2.42 | |
| 171 | B | 2.43 | |

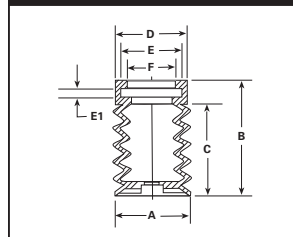
| VC No. | Style | A(1) | A-2 |
|--------------|-----------|------|------|
| 13 | C,E | 2.45 | |
| 32-2.50x6.00 | L | 2.46 | 5.95 |
| 47-14 | SP1 | 2.46 | 1.51 |
| 144F | A | 2.46 | |
| 185 | B | 2.46 | |
| 49 | C,E | 2.47 | |
| 13A | C,E | 2.48 | |
| 4 | C,E | 2.50 | |
| 32 2.50x6.DP | L | 2.50 | 6.00 |
| 32ABC1 | J | 2.50 | |
| 32C4 | K | 2.50 | |
| 32E1 | D,J | 2.50 | |
| 59D | B | 2.50 | |
| 70A | B | 2.50 | |
| 72A | E | 2.50 | |
| 90 2.5x3.75 | N | 2.50 | 3.75 |
| 90 2.5x5 | N | 2.50 | 5.00 |
| 106 | B,E | 2.50 | |
| 106PG | B | 2.50 | |
| 125 | N | 2.50 | 5.50 |
| 254 | C | 2.50 | |
| 353A | E | 2.50 | |
| 70 | E,F,SPCL* | 2.51 | |
| 204A | C,E | 2.51 | |
| 204A1 | E | 2.51 | |
| 18C | SPCL* | 2.52 | |
| 49C | C | 2.55 | |
| 49D | C | 2.55 | |
| 271E | SPCL* | 2.56 | |
| 181A | SPCL* | 2.57 | |
| 325 | B | 2.57 | |
| 385 | B | 2.58 | |
| 271C | SPCL* | 2.59 | |
| 271D | SPCL* | 2.59 | |
| 271 | SPCL* | 2.61 | |
| 130C | K | 2.63 | |
| 1 | C | 2.62 | |
| 116 | B | 2.62 | |
| 271A | SPCL* | 2.62 | |
| 226 | SPCL* | 2.64 | |
| 47N | C,SP2 | 2.65 | |
| 62 | B | 2.65 | |
| 70B | B | 2.67 | |
| 90 2.68x3.5 | N | 2.68 | |
| 90 2.68x5.75 | N | 2.68 | 5.75 |
| 90 2.68x6.62 | N | 2.68 | 6.62 |
| 338 2.718x6 | N | 2.72 | 6.00 |
| 106B | B | 2.73 | |
| 130A | M | 2.73 | |
| 303 | B | 2.73 | |
| B30A | K | 2.73 | |
| 830A | SPCL* | 2.74 | |
| 32 2.75x6.5 | L | 2.76 | 6.50 |
| 90 2.75x4.75 | N | 2.75 | 4.75 |
| 130A5 | M | 2.75 | |
| 181 | B | 2.75 | |
| 288 | N | 2.75 | 5.85 |
| 298 | D | 2.75 | |
| 32BM | K | 2.77 | |
| 237 | C | 2.77 | |
| 32E | D,J | 2.77 | |
| 335A | SPCL* | 2.77 | |
| 18D | B | 2.80 | |
| 32B | J,K | 2.80 | |
| 32B1 | J | 2.82 | |

*SPCL = SPECIAL. Call Vi-Cas for additional information, 513-791-7741.

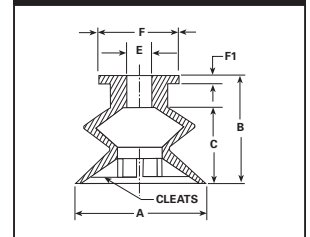
Style G page 22



Style H page 22,23



Style I page 23

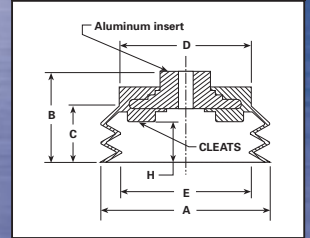


| VC No. | Style | A(1) | A-2 |
|--------------|-------|------|-------|
| 194 | B | 2.87 | |
| 321 | D | 2.87 | |
| 255 | SPCL* | 2.89 | |
| 153 | B,E | 2.90 | |
| 153A | B | 2.90 | |
| 245B | F | 2.90 | |
| 18A | C | 2.93 | |
| TC75 | F | 2.95 | |
| 18 | B | 3.00 | |
| 32 3x3.25 | L | 3.00 | 3.25 |
| 32 3x7 | L | 3.00 | 7.00 |
| 47PG2 | SPCL* | 3.00 | |
| 90 3x8 | N | 3.00 | 8.00 |
| 90 3x10 | N | 3.00 | 10.00 |
| 90 3x12 | N | 3.00 | 12.00 |
| 90 3x13 | N | 3.00 | 13.00 |
| 103C | E | 3.00 | |
| 106C | B,E | 3.00 | |
| 322 | M | 3.00 | |
| 328 | E | 3.00 | |
| B1A4 | K | 3.00 | |
| 18B | G | 3.05 | |
| 31B | F | 3.05 | |
| 103A | F | 3.05 | |
| 130SQ | SPCL* | 3.05 | |
| 30 | C,E | 3.06 | |
| 78 | F | 3.06 | |
| 92 | B,E | 3.07 | |
| 181B | SPCL* | 3.07 | |
| 30 | C | 3.08 | |
| 212 | E | 3.08 | |
| 30B | C | 3.09 | |
| 31A | C,E | 3.09 | |
| 92A | B | 3.09 | |
| 103A | F | 3.09 | |
| 30A | C | 3.09 | |
| B75 | M | 3.09 | |
| 82 | N | 3.12 | 6.00 |
| 73A2 | F | 3.12 | |
| 216 | F | 3.12 | |
| 216C | F | 3.13 | |
| 214A | F | 3.17 | |
| 72 | E,F | 3.18 | |
| 227 | SPCL* | 3.18 | |
| 245 | F | 3.21 | |
| 291A | SPCL* | 3.23 | |
| 129 | L | 3.25 | 7.87 |
| 27A | F | 3.25 | |
| 27A1 | F | 3.25 | |
| 27B | F | 3.25 | |
| 29 | B,F | 3.25 | |
| 90 3.25x15.5 | N | 3.25 | 15.50 |
| 90 5x3.25 | N | 3.25 | 5.00 |
| 175 | J,K | 3.25 | |
| 271G | SPCL* | 3.25 | |
| 27A2 | SPCL* | 3.28 | |
| 156 | B | 3.28 | |
| 130 | M | 3.31 | |
| 130G | M | 3.31 | |
| 130SB | M | 3.31 | |
| 271B | SPCL* | 3.33 | |
| 155 | B | 3.35 | |
| 291D | SPCL* | 3.35 | |
| 130D2 | M | 3.36 | |
| 114 | B | 3.37 | |

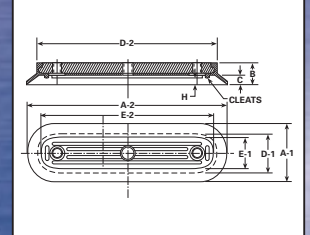
| VC No. | Style | A(1) | A-2 |
|------------------|-------|------|-------|
| 175A | K | 3.37 | |
| B85 | J | 3.37 | |
| 130H | SPCL* | 3.38 | |
| 175B | J | 3.38 | |
| 115 | B | 3.40 | |
| 15A | E | 3.42 | |
| 260 | SPCL* | 3.43 | |
| 213 | N | 3.44 | 7.68 |
| 32 3.5x5 | L | 3.45 | 4.93 |
| 15 | C,E | 3.45 | |
| 363 | SPCL* | 3.47 | |
| 32 3.5x10 | L | 3.50 | 10.00 |
| 74 | N | 3.50 | 7.50 |
| 74A | N | 3.50 | 7.50 |
| 90 3.5x7.5 | N | 3.50 | 7.50 |
| 90 3.5x11 | N | 3.50 | 11.00 |
| 90 3.5x14 | N | 3.50 | |
| 80 | F | 3.50 | |
| 204 | C,E | 3.50 | |
| 204-1 | E | 3.50 | |
| 322F | M | 3.50 | |
| 332 | SPCL* | 3.50 | 10.50 |
| 4.1x3.5 | SPCL* | 3.51 | 4.08 |
| BH89 | B | 3.52 | |
| 219 | F | 3.56 | |
| 284 | B | 3.57 | |
| 90 5.375x3.625 | N | 3.63 | 5.38 |
| 104 3.75 | M | 3.75 | |
| 378 | B | 3.78 | |
| 244 | C | 3.84 | |
| 346A | SPCL* | 3.85 | |
| 245D | F | 3.87 | |
| 201B | SPCL* | 3.88 | |
| 75 | N | 3.90 | 8.75 |
| 203A | F | 3.90 | |
| TC100 | F | 3.90 | |
| 203 | F | 3.93 | |
| 104A | D | 3.97 | |
| 32-4x5.38 | SPCL* | 4.00 | 5.38 |
| 73A | N | 4.00 | 9.00 |
| 90 4x8 | N | 4.00 | 8.00 |
| 90 4x14 | N | 4.00 | 14.00 |
| 103 | F | 4.00 | |
| 198 | B | 4.00 | |
| 208 | F | 4.00 | |
| 77 | F | 4.12 | |
| 357 | SPCL* | 4.12 | |
| 27 | F | 4.25 | |
| 32 4.25x5.63-1 | SPCL* | 4.25 | 5.63 |
| 73 | F | 4.31 | |
| 104 4.33 | M | 4.33 | |
| 326 4.375x15.874 | SPCL* | 4.38 | 15.88 |
| B111 | J | 4.45 | |
| 104PC | SPCL* | 4.49 | |
| 104 4.5 | M | 4.50 | |
| 235 | SPCL* | 4.50 | 5.56 |
| 241 | F | 4.50 | |
| 104 5.5 | SPCL* | 4.53 | 4.25 |
| 335 | SPCL* | 4.57 | |
| B110 | M | 4.62 | |
| BH115 | F | 4.62 | |
| 291 | SPCL* | 4.68 | |
| 38 | F | 4.75 | |
| 63 | F | 4.75 | |
| 90 5x12 | N | 4.96 | 12.00 |

| VC No. | Style | A(1) | A-2 |
|-------------|-------|-------|-------|
| 76 | F | 5.00 | |
| 90 5x14 | N | 5.00 | 14.00 |
| 103D | F | 5.00 | |
| 112 | B | 5.03 | |
| 109 | B | 5.18 | |
| 71 | F | 5.31 | |
| 260A | SPCL* | 5.37 | |
| 278 | SPCL* | 5.48 | |
| 35 | F | 5.50 | |
| 104 5.60 | M | 5.60 | |
| 93 | F | 5.87 | |
| 90 6x6 | N | 6.00 | 6.00 |
| 90 6x8.5 | N | 6.00 | 8.50 |
| 90 6x10 | N | 6.00 | 10.00 |
| 90 6x10DP | N | 6.00 | 10.00 |
| 90 6x14DP | N | 6.00 | 14.00 |
| 90 6x90BRD | N | 6.00 | 9.00 |
| 90 6x1212DP | N | 6.00 | 12.00 |
| 39 | F | 6.00 | |
| 104 6.0 | M | 6.00 | |
| 154 | SPCL* | 6.03 | |
| 34 | F | 6.25 | |
| 34A | F | 6.25 | |
| 295 | F | 6.31 | |
| 291C | SPCL* | 6.40 | |
| 104 6.4 | M | 6.43 | |
| 117 | B | 6.50 | |
| 346C | SPCL* | 6.58 | |
| 240 | SPCL* | 6.80 | |
| 90 7x12 | N | 7.00 | 12.00 |
| 94 | F | 7.00 | |
| 104 7.0-1 | M | 7.00 | |
| 104 7.0 | M | 7.00 | |
| 96C | F | 7.20 | |
| 104 7.5 | M | 7.37 | |
| 104 7.94 | M | 7.94 | |
| 90 8x15 | N | 8.00 | 15.00 |
| 90 8x20DP | N | 8.00 | 20.00 |
| 340 | F | 8.00 | |
| 96A | F | 8.12 | |
| 90 8.5x10DP | N | 8.50 | 10.00 |
| 96 | F | 8.50 | |
| 96B | F | 8.50 | |
| 104 8.5-2 | M | 8.50 | |
| 104 8.5 | M | 8.50 | |
| 90 9.5x10.5 | N | 9.50 | 10.50 |
| 104 9.5 | M | 9.50 | |
| 345 | SPCL* | 9.50 | |
| 90 9.75x14 | SPCL* | 9.85 | 14.14 |
| 104 10 | M | 10.00 | |
| 95A | F | 10.50 | |
| 95D | F | 10.50 | |
| 90 10.75x13 | N | 10.75 | 13.00 |
| 221 | SPCL* | 10.87 | 15.25 |
| 95 | F | 11.00 | |
| 366 | SPCL* | 11.36 | |
| 95F | F | 11.80 | |
| 90 12x12 | N | 12.00 | 12.00 |
| 95C | F | 12.00 | |
| 104 12.5 | M | 12.50 | |
| 95B | F | 14.00 | |
| 95E | F | 14.68 | |

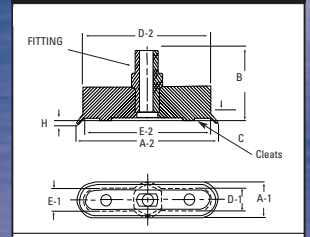
Style M page 29



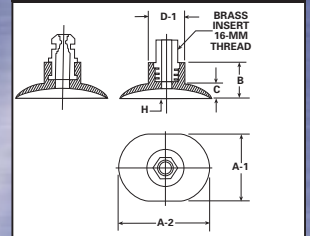
Style N page 30,31



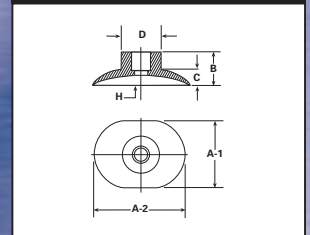
Style O page 32



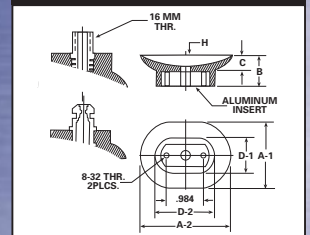
Style SP1 page 33



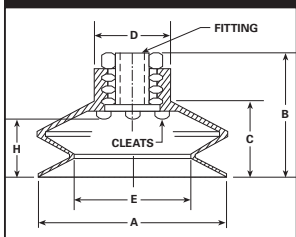
Style SP2 page 33



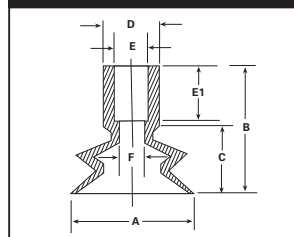
Style SP3 page 33



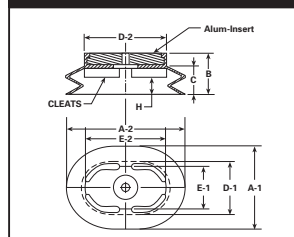
Style J page 24



Style K page 25-27



Style L page 28



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