

# TABLE OF CONTENTS



<b>Terms and Conditions</b>		
How to Order	1	
<b>Table of Contents</b>	2	
<b>Trials and Demo Program</b>	3	
<b>SELF CONTAINED PEN-VAC®</b>		
<b>Vacuum Handling Tool Kits</b>		
Standard Size with Dissipative Buna-N Cups	4	
Vacuum Pen Holder VBM-3	4	
<b>SELF CONTAINED PEN-VAC® &amp; VACULA 3 ESD-Safe Vacuum Handling Tool Kits</b>		
Standard Size with Conductive Silicone Cups	5	
<b>PEN-VAC® PRO-SERIES™ ESD-Safe Economical Vacuum Handling Tool Kits</b>		
PRO-SERIES™ with Conductive Silicone Cups	6	
<b>Low-Cost ESD-Safe Vacuum Handling Tool Kits</b>		
HANDI-VAC®	7	
BULB-VAC™	7	
<b>Vacuum Cups</b>		
Vacuum Cups ESD-Safe	8	
Vacuum Cups Non-ESD-Safe	8	
<b>Vacuum Probes and Cups</b>		
Vacuum Probes with ESD Vacuum Cups	9	
Metal Probes without Vacuum Cups	9	
<b>ESD-Safe Continuous Vacuum Handling Systems</b>		
SMD-VAC™-HP	10	
Foot Switch with Handle	10	
Vacuum Tips Holder	10	
<b>Small Parts Kits</b>		
SMD-VAC™-HP	11	
Vacuum Tips Holder	11	
TV-1000	12	
<b>PAC-VAC® And STEALTH-VAC™ ELITE</b>		
PAC-VAC®	13	
STEALTH-VAC™	13	
<b>Small Parts Tips</b>		
Delrin / Acetal	14	
High-Temperature Torlon / Gold Plated Brass	15	
<b>PORTA-WAND® Rechargeable Wafer Handling Tools</b>		
PORTA-WAND® Elite Kit	16	
PORTA-WAND® Elite 220V	16	
<b>SERIES 3 PORTA-WAND® Wafer Handling Tools</b>		
PORTA-WAND® 3 Elite	17	
Rechargeable Battery Pack	17	
<b>PORTA-VAC®II Battery Operated Wafer Handling Tools</b>		
PORTA-VAC® II	18	
Battery Pack and Charger	18	
Air Filters	18	
<b>SERIES 3 PORTA-VAC® Battery Operated Wafer Handling Tools</b>		
PORTA-VAC® SERIES 3	19	
300mm Wafer Tip	19	
<b>Clean Room Safe Wafer Wands &amp; Holders</b>		
Push-Button Wafer Wand	20	
Slide-Switch Wafer Wand	20	
STEALTH-WAND™	21	
STEALTH-WAND™ ELITE	21	
<b>Wafer Handling Systems</b>		
WV-9000	22	
PAC-VAC® - Clean Room	22	
<b>Wafer Tips Press-Fit Molded Peek®</b>		
Molded Peek Wafer Tips	23	
<b>Rigid Vacuum Kits and Tips</b>		
Straight and Bent	24	
<b>ESD-Safe Vacuum Handles</b>		
Standard Push Button Vacuum Pen	25	
Vacuum Pen with Control Hole	25	
Vacuum Pen without Control Hole	25	
Pen Kit	25	
Push Button Vacuum Wafer Wand	25	
<b>Vacuum Hoses ESD-Safe</b>		
Gray Straight and Coiled	26	
Gray Custom Lengths	26	
Clear Straight and Coiled	26	
Clear Custom Lengths	26	
<b>Custom Tips</b>	27	
<b>General Guide For Selecting A Tip and Vacuum Source</b>	28	

# SELF CONTAINED PEN-VAC®

## ESD-SAFE Vacuum Handling Tools

Standard Size (5 3/4") With Static Dissipative Non-Marking  
Buna-N Cups Temperature Range (-5°F to 250°F) (-20°C to 120°C)



These vacuum pens are ideal for SMT assembly or for handling any parts that have a non-porous surface. No batteries or hoses necessary. The vacuum cups are Static Dissipative and non marking.

**STANDARD SIZE**  
5 3/4" (146mm) long  
1/2" (12.7mm) diameter

Rear storage cap for probes and cups.  
Available on standard unit only

Pocket clip

Silver aluminum body

Vacuum push button

Cups can be mounted directly to tool

VBM-3

### PEN-VAC® Kit With 4 Probes + Cups

PEN-VAC® with three bent probes with 1/8" (3.18mm), 1/4" (6.35mm), 3/8" (9.53mm), diameter vacuum cups, one straight probe with 1/4" (6.35mm) diameter vacuum cup.

PRICE EACH

**V8901-A-B** Standard PEN-VAC®, Static Dissipative Buna-N Cups



### PEN-VAC® Kit With 6 Probes + Cups

PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/8" (3.18mm), 1/4" (6.35mm), 3/8" (9.53mm) diameter.

PRICE EACH

**V8901-LMS-B** Standard PEN-VAC®, Static Dissipative Buna-N Cups



### PEN-VAC® Kit With 6 Probes + Cups

PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter.

PRICE EACH

**V8901-HLM-B** Standard PEN-VAC®, Static Dissipative Buna-N Cups



### PEN-VAC® Kit With 10 Probes + Cups

PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/8" (3.18mm), 3/16" (4.76mm), 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter.

PRICE EACH

**V8901-TEN-B** Standard PEN-VAC®, Static Dissipative Buna-N Cups



### PEN-VAC® Without Probes Or Vacuum Cups

PRICE EACH

PEN-VAC® only. You order the probes and cups that you need. See pages 8 and 9 for details.

**V8901-X-ESD** Standard PEN-VAC®

*No Probes or Cups.*

### Vacuum Pen Holder

Bench mount holder with posts to accommodate up to eight of our luer slip vacuum tips. The holder can be used to hold any of our vacuum handles or vacuum pens and helps protect the vacuum tips when not in use.

PRICE EACH

**VBM-3** Bench mount holder, holds up to eight luer slip vacuum tips.

### PEN-VAC® Kit With 8 Probes + Cups And Vacuum Pen Holder

PEN-VAC with five bent probes mounted with cup sizes 1/8" (3.18mm), 3/16" (4.76mm), 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter. Three straight probes mounted with cup sizes 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter. Includes Vacuum Pen holder with eight locations for holding your probes and cups.

PRICE EACH

**V8901-KIT-B** Standard PEN-VAC®, Static Dissipative Buna-N Cups, VBM-3 Vacuum Pen Holder

**V8901-KIT-ESD** Standard PEN-VAC®, Conductive Silicone Cups, VBM-3 Vacuum Pen Holder



Standard Size (5 3/4") **With Conductive Silicone Cups**  
Temperature Range (-65°F to 445°F) (-55°C to 230°C)

# SELF CONTAINED PEN-VAC® & VACULA 3 ESD-SAFE Vacuum Handling Tools

## PEN-VAC® Kit With 4 Probes + Cups

PEN-VAC® with three bent probes with 1/8" (3.18mm), 1/4" (6.35mm), 3/8" (9.53mm), diameter vacuum cups, one straight probe with 1/4" (6.35mm) diameter vacuum cup.

PRICE EACH

**V8901-A-ESD** Standard PEN-VAC®, With Conductive Silicone Cups



## PEN-VAC® Kit With 6 Probes + Cups

PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/8" (3.18mm), 1/4" (6.35mm), 3/8" (9.53mm) diameter.

PRICE EACH

**V8901-LMS-ESD** Standard PEN-VAC®, With Conductive Silicone Cups



## PEN-VAC® With 6 Probes + Cups

PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter.

PRICE EACH

**V8901-HLM-ESD** Standard PEN-VAC®, With Conductive Silicone Cups



## PEN-VAC® Kit With 10 Probes + Cups

PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/8" (3.18mm), 3/16" (4.76mm), 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter.

PRICE EACH

**V8901-TEN-ESD** Standard PEN-VAC®, With Conductive Silicone Cups



## PEN-VAC® Without Probes or Vacuum Cups

PRICE EACH

PEN-VAC® only. You order the probes and cups that you need. See pages 8 and 9 for details.

**V8901-X-ESD** Standard PEN-VAC®

*No Probes or Cups.*

## VACULA 3 Kit With 3 Cups

Our most powerful ESD-safe self contained tweezer designed to handle parts when moving them into and out of burn-in trays, test sockets or other component transfer operations. The plunger in the rear of the tool activates the vacuum. The VC-3 is provided without or with three vacuum cups, 1/2" (12.7mm), 5/8" (15.88mm) and 3/4" (19.05) diameter, that slip onto a dual barbed fitting. The barbed fitting provides extra lifting power.

PRICE EACH

**VC-3-B** With 3 Cups -Dual Barbed Fitting/Luer Slip Tip - With a 1/2" (12.7mm), 5/8" (15.88mm) and 3/4" (19.05mm) diameter Static Dissipative Buna-N Cups.

**VC-3-ESD** With 3 Cups -Dual Barbed Fitting/Luer Slip Tip - With a 1/2" (12.7mm), 5/8" (15.88mm) and 3/4" (19.05mm) diameter Conductive Silicone Cups.

**VC-3-X** Tool Only, No Cups or Probes.



## VACULA 3 Kit With Barbed Anti-Wobble Fitting And 1 Cup

Our most powerful ESD-safe self contained tweezer designed to handle parts when moving them into and out of burn-in trays, test sockets or other component transfer operations. The plunger in the rear of the tool activates the vacuum. The VC-3-AW is provided with one vacuum cup 3/4" (19.05) diameter, that slip onto a barbed anti-wobble fitting. The barbed fitting provides extra lifting power.

PRICE EACH

**VC-3-075-AW-B** With barbed anti-wobble fitting and 3/4" (19.05mm) diameter Static Dissipative Buna-N Cup.

**VC-3-075-AW-B-ESD** With barbed anti-wobble fitting and 3/4" (19.05mm) diameter Conductive Silicone Cup.



Our PEN-VAC® line offers a replacement for SMD tweezers. The soft suction cup material will not scratch your parts or damage delicate leads. This is an excellent tool for pick-and-place of many standard and odd size SMT components.

STANDARD SIZE  
5" (129.7mm) long  
3/8" (9.53mm) diameter

Vacuum push  
plunger

Black  
aluminum  
body

Dual barbed  
cup retainer

Quick  
change  
vacuum cup



# PRO-SERIES PEN-VAC® Vacuum Handling Tools

**Light Weight ESD-Safe Plastic Body With Static Dissipative  
Non-Marking Buna-N Cups** Temperature Range (-5°F to 250°F)  
(-20°C to 120°C)



The all plastic Static Dissipative body of the PRO-SERIES tools provides a lower cost vacuum handling tool for PCB assembly operations. A good addition to your tweezer tool kit.

PRO-SERIES PEN-VAC®  
5" (127mm) long  
1/2" (12.7mm)  
diameter

Pocket clip

Black or  
gray plastic  
body

Vacuum  
push  
button

Quick  
change  
luer probe  
+ cup

Cups can be  
mounted  
directly to tool



## PRO-SERIES PEN-VAC® Kit With 4 Probes + Cups

PRO-SERIES PEN-VAC® with three bent probes with 1/8" (3.18mm), 1/4" (6.35mm), 3/8" (9.53mm), diameter vacuum cups, one straight probe with 1/4" (6.35mm) diameter vacuum cup.

PRICE EACH

**V8910-9BK-B** Black Body, Static Dissipative Buna-N Cups

**V8910-9GR-B** Gray Body, Static Dissipative Buna-N Cups



## PRO-SERIES PEN-VAC® Kit With 6 Probes + Cups

PRO-SERIES PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/8" (3.18mm), 1/4" (6.35mm), 3/8" (9.53mm) diameter.

PRICE EACH

**V8910-BK-LMS-B** Black Body, Static Dissipative Buna-N Cups

**V8910-GR-LMS-B** Gray Body, Static Dissipative Buna-N Cups



## PRO-SERIES PEN-VAC® Kit With 6 Probes + Cups

PRO-SERIES PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter.

PRICE EACH

**V8910-BK-HLM-B** Black Body, Static Dissipative Buna-N Cups

**V8910-GR-HLM-B** Gray Body, Static Dissipative Buna-N Cups



## PRO-SERIES PEN-VAC® Kit With 10 Probes + Cups

PRO-SERIES PEN-VAC® with two of each size cup on one bent and one straight probe. Cup sizes are 1/8" (3.18mm), 3/16" (4.76mm), 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter.

PRICE EACH

**V8910-BK-TEN-B** Black Body, Static Dissipative Buna-N Cups

**V8910-GR-TEN-B** Gray Body, Static Dissipative Buna-N Cups



## PRO-SERIES PEN-VAC® Without Probes or Vacuum Cups

PRICE EACH

PRO-SERIES PEN-VAC® only. You order the probes and cups that you need. See pages 8 and 9 for details.

**V8910-BK-X** Black Body

**V8910-GR-X** Gray Body

*No Probes or Cups.*

## Vacuum Pen Holder

Bench mount holder with posts to accommodate up to eight of our luer slip vacuum tips. The holder can be used to hold any of our vacuum handles or vacuum pens and helps protect the vacuum tips when not in use.

PRICE EACH

**VBM-3** Bench mount holder, holds up to eight luer slip vacuum tips.

## PRO-SERIES PEN-VAC® Kit With 8 Probes + Cups and Vacuum Pen Holder

PRO-SERIES PEN-VAC® with five bent probes mounted with cup sizes 1/8" (3.18mm), 3/16" (4.76mm), 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter. Three straight probes mounted with cup sizes 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) diameter. Includes Vacuum Pen holder with eight locations for holding your probes and cups.

PRICE EACH

**V8910-BK-KIT-B** Black Body, Static Dissipative Buna-N Cups, VBM-3 Vacuum Pen Holder

**V8910-GR-KIT-B** Gray Body, Static Dissipative Buna-N Cups, VBM-3 Vacuum Pen Holder

**V8910-BK-KIT-ESD** Black Body, ESD Safe Conductive Silicone Cups, VBM-3 Vacuum Pen Holder



## HANDI-VAC® Kit With 5 Probes + Cups

A low cost, ESD-safe vacuum handling tool. The HANDI-VAC® kit is delivered to you with or without five vacuum cups and probes. The kit includes with one bent probe with 1/8" (3.18mm) diameter vacuum cup, one bent probe with 3/16" (4.76mm) diameter vacuum cup, one bent probe with 1/4" (6.35mm) diameter vacuum cup, one straight probe with 3/8" (9.53mm) diameter vacuum cup and one straight probe with 1/2" (12.7mm) diameter vacuum cup.

<b>HV-KIT-II-B</b>	Static Dissipative With 5 Probes & Buna-N Rubber Cups
<b>HV-KIT-II-ESD</b>	With 5 Probes and Conductive Silicone Cups
<b>HV-X</b>	Tool Only, No Cups or Probes



PRICE EACH

## HANDI-VAC® Kit With 4 Probes + Cups

The HANDI-VAC® kit is delivered to you with four vacuum cups and probes. The kit includes one bent and one straight probe with 1/8" (3.18mm) diameter vacuum cups, one bent probe with 1/4" (6.35mm) diameter vacuum cup, and one straight probe with 3/8" (9.53mm) diameter vacuum cup.

<b>HV-KIT-B</b>	Static Dissipative With 4 Probes & Buna-N Rubber Cups
<b>HV-KIT-ESD</b>	With 4 Probes and Conductive Silicone Cups
<b>HV-X</b>	Tool Only, No Cups or Probes



PRICE EACH

## HANDI-VAC-2® With One Vacuum Cup

This improved HANDI-VAC®-2 has a new and improved tip designed for better lifting capacity utilizing larger vacuum cups. This new tip can be purchased with one cup of your choice or the new anti-wobble tip (HV2-075-AW-ESD) for enhanced functionality and improved accuracy when picking and placing parts. The entire tool is constructed with ESD-safe materials.

- \* Handi-Vac with Non-marking Static Dissipative Buna-N vacuum cups
- \*\* Handi-Vac with Conductive Silicone vacuum cups

<b>*HV2-038-B</b>	<b>**HV2-038-ESD</b>	3/8" (9.53mm) Diameter Cup
<b>*HV2-050-B</b>	<b>**HV2-050-ESD</b>	1/2" (12.7mm) Diameter Cup
<b>*HV2-062-B</b>	<b>**HV2-062-ESD</b>	5/8" (15.88mm) Diameter Cup
<b>*HV2-075-B</b>	<b>**HV2-075-ESD</b>	3/4" (19.05mm) Diameter Cup
<b>*HV2-075-AW-B</b>	<b>**HV2-075-AW-ESD</b>	3/4" (19.05mm) Diameter Cup
<b>HV2-X-AW</b>	<b>HV2-X-AW</b>	Tool Only, No Cups
<b>HV2-X</b>	<b>HV2-X</b>	Tool Only, No Cups

PRICE EACH



HV2-050



HV2-075-AW



HV2-X

## BULB-VAC™ With One Vacuum Cup

This handling tool is for the user who needs minimal placement accuracy. The entire tool is constructed with ESD-safe materials. A plastic tip will hold the vacuum cup in place.

- \* Bulb-Vac with Non-marking Static Dissipative Buna-N vacuum cups
- \*\* Bulb-Vac with Conductive Silicone vacuum cups

<b>*BVJ-038-B</b>	<b>**BVJ-038-ESD</b>	3/8" (9.53mm) Diameter Cup
<b>*BVJ-050-B</b>	<b>**BVJ-050-ESD</b>	1/2" (12.7mm) Diameter Cup
<b>*BVJ-062-B</b>	<b>**BVJ-062-ESD</b>	5/8" (15.88mm) Diameter Cup
<b>*BVJ-075-B</b>	<b>**BVJ-075-ESD</b>	3/4" (19.05mm) Diameter Cup
<b>*BVJ-075-AW-B</b>	<b>**BVJ-075-AW-ESD</b>	3/4" (19.05mm) Diameter Cup
<b>*BVJ-X-AW</b>	<b>**BVJ-X-AW</b>	Tool Only, No Cups
<b>BVJ-X</b>	<b>BVJ-X</b>	Tool Only, No Cups

PRICE EACH

*Designed for use with 3/8" or larger vacuum cups.*



BVJ-050



BVJ-075-AW



BVJ-X



Our vacuum-bulb type tools are the lowest cost pick-and-place tools available. These tools operate very similar to a tweezer. Simply squeeze the vacuum bulb, place the soft suction cup to the part to be handled, then relax your squeeze and the part is firmly gripped. A second squeeze releases the part.

**HANDI-VAC® KIT**  
2 3/4" (69.85mm) long  
1/2" (12.7mm) diameter

Squeeze bladder for suction

Black Static Dissipative rubber



Cups can be mounted directly to tool

**BULB VAC™**  
3.5" (88.9mm) long  
1.56" (39.62mm) diameter

Black Static Dissipative rubber

Easy Squeeze bladder for suction





We offer a wide selection of vacuum cups to meet your handling needs. Our vacuum cups can handle electronic components, glass lenses, hot components in the soldering/rework process and certain medical applications.

#### Here's a tip...

Cups can be cleaned easily with clean water or Isopropyl Alcohol.



3/32"  
V9009-\*



1/8"  
V9013-\*



3/16"  
V9018-\*



1/4"  
V9025-\*



3/8"  
V9038-\*



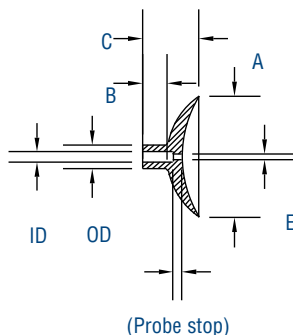
1/2"  
V9050-\*



5/8"  
V9062-\*



3/4"  
V9075-\*



#### Buna-N Static Dissipative non-marking Black Vacuum Cups

V9009-B	3/32" (2.38mm) diameter vacuum cup
V9013-B	1/8" (3.18mm) diameter vacuum cup
V9018-B	3/16" (4.76mm) diameter vacuum cup
V9025-B	1/4" (6.35mm) diameter vacuum cup
V9038-B	3/8" (9.53mm) diameter vacuum cup
V9050-B	1/2" (12.70mm) diameter vacuum cup
V9062-B	5/8" (15.88mm) diameter vacuum cup
V9075-B	3/4" (19.05mm) diameter vacuum cup
V9000K8-B	Kit of one each of the above vacuum cups (8 total)

#### ESD-Safe High-temperature Conductive Silicone Black Vacuum Cups

V9013-ESD	1/8" (3.18mm) diameter vacuum cup
V9018-ESD	3/16" (4.76mm) diameter vacuum cup
V9025-ESD	1/4" (6.35mm) diameter vacuum cup
V9038-ESD	3/8" (9.53mm) diameter vacuum cup
V9050-ESD	1/2" (12.70mm) diameter vacuum cup
V9062-ESD	5/8" (15.88mm) diameter vacuum cup
V9075-ESD	3/4" (19.05mm) diameter vacuum cup
V9000K8-ESD	Kit of one each of the above vacuum cups (8 total)

#### NON ESD-Safe High-temperature Silicon Clear Vacuum Cups

V9009-C	3/32" (2.38mm) diameter vacuum cup
V9013-C	1/8" (3.18mm) diameter vacuum cup
V9018-C	3/16" (4.76mm) diameter vacuum cup
V9025-C	1/4" (6.35mm) diameter vacuum cup
V9038-C	3/8" (9.53mm) diameter vacuum cup
V9050-C	1/2" (12.70mm) diameter vacuum cup
V9062-C	5/8" (15.88mm) diameter vacuum cup
V9075-C	3/4" (19.05mm) diameter vacuum cup
V9000K8-C	Kit of one each of the above vacuum cups (8 total)

#### Dimensions in Inches (millimeters)

PART #	SIZE	A	B	C	OD	ID	PS	E	Lifting Capacity in Grams @ 6" of Mercury
V9009-*	3/32	0.094(2.38)	0.140(3.56)	0.160(4.06)	0.078(1.98)	0.040(1.02)	0.045(1.14)	0.020(0.51)	5
V9013-*	1/8	0.125(3.18)	0.160(4.06)	0.180(4.57)	0.100(2.54)	0.060(1.52)	0.055(1.40)	0.035(0.89)	10
V9018-*	3/16	0.188(4.76)	0.175(4.45)	0.200(5.08)	0.130(3.30)	0.060(1.52)	0.055(1.40)	0.035(0.89)	25
V9025-*	1/4	0.250(6.35)	0.160(4.06)	0.200(5.08)	0.120(3.04)	0.060(1.52)	0.055(1.40)	0.035(0.89)	60
V9038-*	3/8	0.375(9.53)	0.190(4.83)	0.250(6.35)	0.125(3.18)	0.060(1.52)	0.055(1.40)	0.035(0.89)	150
V9050-*	1/2	0.500(12.70)	0.190(4.83)	0.300(7.62)	0.160(4.06)	0.060(1.52)	0.055(1.40)	0.035(0.89)	250
V9062-*	5/8	0.625(15.88)	0.175(4.45)	0.315(8.00)	0.160(4.06)	0.060(1.52)	0.055(1.40)	0.035(0.89)	400
V9075-*	3/4	0.750(19.05)	0.140(3.56)	0.320(8.13)	0.160(4.06)	0.060(1.52)	0.055(1.40)	0.035(0.89)	600

\*-B to order the black Buna-N Static Dissipative non-marking material. (-5°F + 250°F) (-20°C + 120°C)  $10^{11}$  to  $10^{12}$  OHMS  
 \*-ESD to order the black high-temperature Conductive Silicone material. (-65°F + 445°F) (-55°C + 230°C)  $10^4$  to  $10^6$  OHMS  
 \*-C to order the high-temperature clear Silicone material. (-65°F + 480°F) (-55°C + 250°C)  $> 10^{13}$

Lifting force is directly proportional to the vacuum level and the area of the vacuum cup being used.

ESD-Safe and  
NON-ESD-Safe

## Straight 1/2" (12.7mm) Metal Probe With Buna-N Static Dissipative non-marking Black Vacuum Cup

<b>V8903-D-S</b>	Straight 1/2" (12.7mm) probe with 3/32" (2.38mm) vacuum cup
<b>V8903-S-S</b>	Straight 1/2" (12.7mm) probe with 1/8" (3.18mm) vacuum cup
<b>V8903-P-S</b>	Straight 1/2" (12.7mm) probe with 3/16" (4.76mm) vacuum cup
<b>V8903-M-S</b>	Straight 1/2" (12.7mm) probe with 1/4" (6.35mm) vacuum cup
<b>V8903-L-S</b>	Straight 1/2" (12.7mm) probe with 3/8" (9.53mm) vacuum cup
<b>V8903-H-S</b>	Straight 1/2" (12.7mm) probe with 1/2" (12.7mm) vacuum cup
<b>V8903-J-S</b>	Straight 1/2" (12.7mm) probe with 5/8" (15.88mm) vacuum cup
<b>V8903-K-S</b>	Straight 1/2" (12.7mm) probe with 3/4" (19.05mm) vacuum cup

## Bent 1/2" (12.7mm) Metal Probe With Buna-N Static Dissipative non-marking Black Vacuum Cup

<b>V8903-D-B</b>	Bent 1/2" (12.7mm) probe with 3/32" (2.38mm) vacuum cup
<b>V8903-S-B</b>	Bent 1/2" (12.7mm) probe with 1/8" (3.18mm) vacuum cup
<b>V8903-P-B</b>	Bent 1/2" (12.7mm) probe with 3/16" (4.76mm) vacuum cup
<b>V8903-M-B</b>	Bent 1/2" (12.7mm) probe with 1/4" (6.35mm) vacuum cup
<b>V8903-L-B</b>	Bent 1/2" (12.7mm) probe with 3/8" (9.53mm) vacuum cup
<b>V8903-H-B</b>	Bent 1/2" (12.7mm) probe with 1/2" (12.7mm) vacuum cup
<b>V8903-J-B</b>	Bent 1/2" (12.7mm) probe with 5/8" (15.88mm) vacuum cup
<b>V8903-K-B</b>	Bent 1/2" (12.7mm) probe with 3/4" (19.05mm) vacuum cup

## Straight 1/2" (12.7mm) Metal Probe With ESD-Safe High-temperature Conductive Silicone Black Vacuum Cup

<b>V8904-S-S</b>	Straight 1/2" (12.7mm) probe with 1/8" (3.18mm) vacuum cup
<b>V8904-P-S</b>	Straight 1/2" (12.7mm) probe with 3/16" (4.76mm) vacuum cup
<b>V8904-M-S</b>	Straight 1/2" (12.7mm) probe with 1/4" (6.35mm) vacuum cup
<b>V8904-L-S</b>	Straight 1/2" (12.7mm) probe with 3/8" (9.53mm) vacuum cup
<b>V8904-H-S</b>	Straight 1/2" (12.7mm) probe with 1/2" (12.7mm) vacuum cup
<b>V8904-J-S</b>	Straight 1/2" (12.7mm) probe with 5/8" (15.88mm) vacuum cup
<b>V8904-K-S</b>	Straight 1/2" (12.7mm) probe with 3/4" (19.05mm) vacuum cup

## Bent 1/2" (12.7mm) Metal Probe With ESD-Safe High-temperature Conductive Silicone Black Vacuum Cup

<b>V8904-S-B</b>	Bent 1/2" (12.7mm) probe with 1/8" (3.18mm) vacuum cup
<b>V8904-P-B</b>	Bent 1/2" (12.7mm) probe with 3/16" (4.76mm) vacuum cup
<b>V8904-M-B</b>	Bent 1/2" (12.7mm) probe with 1/4" (6.35mm) vacuum cup
<b>V8904-L-B</b>	Bent 1/2" (12.7mm) probe with 3/8" (9.53mm) vacuum cup
<b>V8904-H-B</b>	Bent 1/2" (12.7mm) probe with 1/2" (12.7mm) vacuum cup
<b>V8904-J-B</b>	Bent 1/2" (12.7mm) probe with 5/8" (15.88mm) vacuum cup
<b>V8904-K-B</b>	Bent 1/2" (12.7mm) probe with 3/4" (19.05mm) vacuum cup

## Metal Probes No Cups

The precision metal probes have a metal hub that fits any of our vacuum handling tools. Custom bends and lengths are available upon request.

<b>V3950-B</b>	18 ga. bent 1/2" (12.7mm) probe (for 3/32" size cups only)
<b>V3950-S</b>	18 ga. straight 1/2" (12.7mm) probe (for 3/32" size cups only)
<b>V3950-B-1</b>	18 ga. bent 1" (25.4mm) probe (for 3/32" size cups only)
<b>V3950-S-1</b>	18 ga. straight 1" (25.4mm) probe (for 3/32" size cups only)
<b>V3972-B</b>	15 ga. bent 1/2" (12.7mm) probe
<b>V3972-S</b>	15 ga. straight 1/2" (12.7mm) probe
<b>V3972-B-1</b>	15 ga. bent 1" (25.4mm) probe
<b>V3972-S-1</b>	15 ga. straight 1" (25.4mm) probe

## Replacement Vacuum Tip Kits

This kit contains five bent probes with 3/32" (2.38mm), 1/8" (3.18mm), 3/16" (4.76mm), 1/4" (6.35mm), and 3/8" (9.53mm), as well as four straight probes with 1/8" (3.18mm), 1/4" (6.35mm), 3/8" (9.53mm) and 1/2" (12.70mm).

<b>VCS-9-B</b>	Replacement probe/cup - Static Dissipative Buna-N Vacuum Cups
----------------	---



Vacuum probes are available with or without attached vacuum cups, which will fit most of your handling applications. The luer slip connector fits all of our vacuum handling tools. Custom probe lengths and bends are available upon request.

### Here's a tip...

Cups can be cleaned easily with clean water or Isopropyl Alcohol.

### STRAIGHT PROBES & CUPS



### BENT PROBES & CUPS



Black ESD Safe  
(approximate size shown)

### BENT & STRAIGHT PROBES





The SMD-VAC™ pick-and place tools provide a bench top vacuum generator. The whisper-quiet operation makes these the choice tools for many PCB assembly operations. Parts ranging in size from 0.0075" (0.19mm) up to 4" (102mm) can easily be handled.

SMD-VAC™-HP  
3" X 2 1/2" X 6"  
(76mm X 64mm X 152mm)



SMD-VAC  
Tips  
included

OPTIONAL FOOT SWITCH



## SMD-VAC™-HP

Additional pick-up power for handling small to very large size components. The precision pump and motor generate over 15 inches of mercury. The compact tower design takes up a very small footprint on the bench. An electric eye pen holder on the side automatically shuts the unit off when the vacuum pen is placed in it. A solenoid jack on the rear of the V8100A series allows use of the optional foot or hand switch to control vacuum during pick and place operations. The SMD-VAC™-HP comes complete with the following features:

- Quiet operation.
- 5 feet of coiled vacuum hose, (VCH-1/16-5).
- A set of nine vacuum tips, (VCS-9-B).
- A vacuum pick-up handle, (VVP-200).
- 12 volt DC power source.
- Automatic vacuum pump ON/OFF control.
- Rubber no-skid feet.
- ESD connection on rear of unit.
- Produces vacuum of over 15 inches of mercury.

<b>V8100A</b>	SMD-VAC-HP for 110 Volt
<b>V8100A-FS</b>	SMD-VAC-HP with foot switch, for 110 Volt
<b>V8100A-220</b>	SMD-VAC-HP for 220 Volt
<b>V8100A-FS-220</b>	SMD-VAC-HP with foot switch, for 220 Volt
<b>V8100</b>	SMD-VAC-HP, <b>NO SOLENOID</b> or foot/hand switch connection, for 110 Volt
<b>V8100-220</b>	SMD-VAC-HP, <b>NO SOLENOID</b> or foot/hand switch connection, for 220 Volt

*Refer to pages 14-15 for small parts tips*

## SMD-VAC™-HP Small Parts Kit

SMD-VAC™-HP, runs on 12 VDC @ 500mA w/ solenoid. With a precision pump and motor that generates over 15 inches of mercury; this tool provides additional pick-up power for handling small to very large size components. This kit includes 5 feet of coiled vacuum hose 1/16" diameter (VCH-1/16-5), a set of nine ESD-Safe vacuum tips. (VCS-9-B), a push-button release vacuum pick-up handle. (VVP-200) Foot Switch & Vacuum Pen w/o control hole, (VFS-1), a set of ESD-Safe Delrin small parts tips (VSPT-TIPS-8-BD), a 16-position tip organizer/holder. (VTH-16), and a wall power supply for operation.

<b>V8100A-SP8-BD</b>	SMD-VAC-HP Small Parts Kit for 110 Volt
<b>V8100A-SP8-BD-220</b>	SMD-VAC-HP Small Parts Kit for 220 Volt

## Foot Switch With Vacuum Pen

Can be used with V8100A tools that have the optional solenoid jack at rear of unit.

*(This kit includes handle V3021 on page 25).*

<b>VFS-1</b>	Foot switch
--------------	-------------

## Vacuum Tips Holder

Table top luer slip vacuum tips holder with non-slip rubber feet. Posts will accommodate up to 16 of our luer slip vacuum tips.

<b>VTH-16</b>	Table top holder, holds up to 16 luer slip vacuum tips.
---------------	---



## ESD Safe Delrin Deluxe Small Parts Kits

<b>V8100A-FS-DLX-D</b>	SMD-VAC™-HP system (see page 10 for details) w/ solenoid, foot switch and an additional handle with no control hole, a selection of 9 rubber vacuum tips, a complete set of all 16 static dissipative delrin small parts tips, 16-position tip holder VTH-16 and 110 volt power supply.
<b>V8100A-FS-220-DLX-D</b>	This SMD-VAC™-HP system's features are identical to the above but powered with a 220 volt power supply.

## High Temperature Brass Deluxe Small Parts Kits

<b>V8100A-FS-DLX-B</b>	SMD-VAC™-HP system (see page 10 for details) w/ solenoid, foot switch and an additional handle with no control hole, a selection of 9 rubber vacuum tips, a complete set of all 16 gold plated brass small parts tips, 16 position tip holder VTH-16 and 110 volt power supply.
<b>V8100A-FS-220-DLX-B</b>	This SMD-VAC™-HP system's features are identical to the above a 220 volt power supply.

## ESD Safe Delrin Small Parts Kits

<b>VSPT-KIT-16-D</b>	A kit of 16 bent and straight ESD safe delrin small parts tips in the range of VSTP1005 to VSTP8060 with tip holder (VTH-16).
<b>VSPT-KIT-8-BD</b>	A kit of 8 bent ESD safe delrin small parts tips in the range of VSTP1005 to VSTP8060.
<b>VSPT-KIT-8-SD</b>	A kit of 8 straight ESD safe delrin small parts tips in the range of VSTP1005 to VSTP8060.



VSPT-KIT-16-D



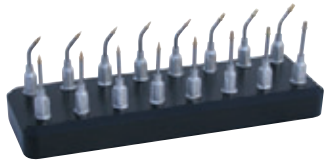
VSPT-KIT-8-BD



VSPT-KIT-8-SD

## High Temperature Brass Small Parts Kits

<b>VSPT-KIT-16-B</b>	A kit of 16 bent and straight gold plated brass small parts tips in the range of VSTP1005 to VSTP8060 with tip holder p/n VTH-16.
<b>VSPT-KIT-8-BB</b>	A kit of 8 bent gold plated brass small parts tips in the range of VSTP1005 to VSTP8060.
<b>VSPT-KIT-8-SB</b>	A kit of 8 straight gold plated brass small parts tips in the range of VSTP1005 to VSTP8060.



VSPT-KIT-16-B



VSPT-KIT-8-BB



VSPT-KIT-8-SB

## Tip Holder For Vacuum Tips

<b>VTH-16</b>	Tip holder with 16 locations for holding our luer slip vacuum pick up tips. Vacuum tips not included.
<b>VTH-8</b>	Tip holder with 8 locations for holding our luer slip vacuum pick up tips. Vacuum tips not included.



VTH-16



VTH-8

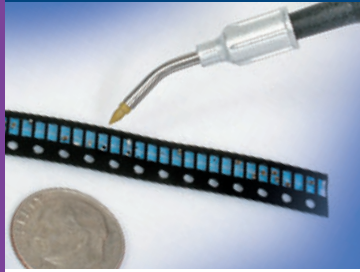


V8100A-FS-DLX-D  
KIT



V8100A-FS-DLX-B  
KIT





TV-1000

## TV-1000 TWEEZER VAC® Kits

A general purpose vacuum handling tool that plugs directly into 110 Volt 50/60 Hz. This compact unit will handle a wide variety of parts used in industry today. The long-life diaphragm vacuum pump generates up to 10 inches of mercury with an open air flow of 2.3 lpm. The unit connects to ground automatically with a three-wire power cord. The TV-1000 comes complete with the following features:

- Lighted On/Off switch.
- Whisper-quiet operation.
- Long-life pump.
- Push-button release vacuum pick-up handle VVP-200
- Produces vacuum of up to 10 inches of mercury.
- Rubber no-skid feet.
- Side mounted handle holder.
- Foot print measures 7-1/4" X 3" X 2-1/2" (185mm X 76mm X 64mm).

<b>TV-1000</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter, (VCH-1/16-5), a set of nine ESD-Safe vacuum tips (VCS-9-B), and a push-button release vacuum pick-up handle VVP-200.
<b>TV-1000-220</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter, (VCH-1/16-5), a set of nine ESD-Safe vacuum tips (VCS-9-B), and a push-button release vacuum pick-up handle VVP-200.

## ESD Safe Delrin TV-1000 TWEEZER VAC® Kits

<b>TV-1000-SP8-BD</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter, (VCH-1/16-5), a set of nine ESD-Safe vacuum tips (VCS-9-B), a push-button release vacuum pick-up handle (VVP-200), a set of ESD-Safe Delrin small parts tips (VSPT-TIPS-8-BD), a 16 position tip organizer/holder (VTH-16).
<b>TV-1000-SP8-BD-220</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter (VCH-1/16-5), a set of nine ESD-Safe vacuum tips (VCS-9-B), a push-button release vacuum pick-up handle (VVP-200), a set of ESD-Safe Delrin small parts tips (VSPT-TIPS-8-BD), a 16 position tip organizer/holder (VTH-16).
<b>TV-1000-DLX-D</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter (VCH-1/16-5), a push-button release vacuum pick-up handle (VVP-200), a set of ESD-Safe Delrin small parts tips (VSPT-KIT-16-D), including a 16 position tip organizer/holder (VTH-16).
<b>TV-1000-DLX-D-220</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter (VCH-1/16-5), a push-button release vacuum pick-up handle (VVP-200), a set of ESD-Safe Delrin small parts tips (VSPT-KIT-16-D), including a 16 position tip organizer/holder (VTH-16).

## High Temperature Brass TV-1000 TWEEZER VAC® Kits

<b>TV-1000-SP8-BB</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter, (VCH-1/16-5), a set of nine ESD-Safe vacuum tips (VCS-9-B), a push-button release vacuum pick-up handle (VVP-200), a set of bent gold plated brass small parts tips (VSPT-TIPS-8-BB), a 16 position tip organizer/holder (VTH-16).
<b>TV-1000-SP8-BB-220</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter (VCH-1/16-5), a set of nine ESD-Safe vacuum tips (VCS-9-B), a push-button release vacuum pick-up handle (VVP-200), a set of bent gold plated brass small parts tips (VSPT-TIPS-8-BB), a 16 position tip organizer/holder (VTH-16).
<b>TV-1000-DLX-B</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter (VCH-1/16-5), a push-button release vacuum pick-up handle (VVP-200), a set of bent gold plated brass small parts tips (VSPT-KIT-16-B), including a 16 position tip organizer/holder (VTH-16).
<b>TV-1000-DLX-B-220</b>	The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter (VCH-1/16-5), a push-button release vacuum pick-up handle (VVP-200), a set of bent gold plated brass small parts tips (VSPT-KIT-16-B), including a 16 position tip organizer/holder (VTH-16).

Refer to pages 14-15 for small parts tips



TV-1000-SP8-BD



TV-1000-DLX-B



### PAC-VAC®

The PAC-VAC® is battery operated and self-contained, runs up to eight hours continuously on one 9 volt alkaline battery. This versatile unit can be clipped to your belt or pocket for one-handed portable operation. The PAC-VAC® is constructed with ESD safe materials and comes complete with the following features:

- Bright blue power on LED indicator light.
- A belt/pocket clip on the housing.
- 5 feet of coiled vacuum hose, VCH-1/16-5.
- A set of nine vacuum tips, VCS-9-B.
- A vacuum pick-up handle, VVP-200.
- 9 volt disposable alkaline battery.
- Lightweight - only 156 grams.
- Produces vacuum of up to 16 inches of mercury.

<b>V3200</b>	PAC-VAC kit
<b>V3200-CLN</b>	PAC-VAC kit Clean room safe
<b>VCS-9-B</b>	Replacement probe/cup kit

Refer to pages 14-15 for small parts tips



The PAC-VAC is a portable continuous vacuum handling system that operates off a standard size 9 volt battery.



### STEALTH-VAC™

The STEALTH-VAC operates directly on compressed air or nitrogen. Simply place the vacuum tip on the part to pick it up and tap the control button to release the part.

**VVSV-KIT** The normally open Stealth Vac Kit with a set of 9 vacuum tips, 6 feet of 1/16" coiled vacuum hose, a set of nine ESD-Safe vacuum tips (VCS-9-B), a (V3014-1/8NPT) 1/8" NPT to 1/16" barb adapter for the supply line, the vacuum generating handle and a (VBM-3) holder for the wand. Operates off of 30 to 70 psi compressed air or nitrogen. This tool grips the part without depressing the button. A slight tap of the button releases the part.

**VVSV-X** The normally open Stealth Vac vacuum generating handle. Includes 6 feet of 1/16" coiled vacuum hose, a (V3014-1/8NPT) 1/8" NPT to 1/16" barb adapter for the supply line and the vacuum generating handle. Operates off of 30 to 70 psi compressed air or nitrogen. This tool grips the part only while depressing the button. A slight tap of the button releases the part.

### STEALTH-VAC



### STEALTH-VAC™ ELITE

The STEALTH-VAC operates directly on compressed air or nitrogen. Simply place the vacuum tip on the part to pick it up and press the control button to pick up the part and press the button again to release the part.

**VVSV-NC-KIT** The normally closed Stealth Vac™ ELITE Kit with a set of 9 vacuum tips, 6 feet of 1/16" coiled vacuum hose, a set of nine ESD-Safe vacuum tips (VCS-9-B)a (V3014-1/8NPT) 1/8" NPT to 1/16" barb adapter for the supply line, the vacuum generating handle and a (VBM-3) holder for the wand. Operates off of 30 to 50 psi compressed air or nitrogen. This tool grips the part only while depressing the button. Releasing the button releases the part. Conserves factory air.

**VVSV-NC-X** The normally closed Stealth Vac ELITE vacuum generating handle. Includes 6 feet of 1/16" coiled vacuum hose, a (V3014-1/8NPT) 1/8" NPT to 1/16" barb adapter for the supply line and the vacuum generating handle. Operates off of 30 to 50 psi compressed air or nitrogen. This tool grips the part only while depressing the button. Releasing the button releases the part. Conserves factory air.

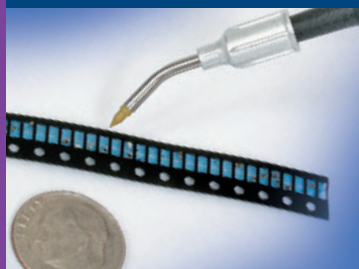
### STEALTH-VAC ELITE



Operates on  
compressed  
air or nitrogen

# ESD SAFE DELRIN & ACETAL SMALL PARTS TIPS

Vacuum Handling Tool  
Accessories



Our machined small parts tips are designed to be used with a continuous vacuum source for handling parts as small as .006" (.152mm).

Delrin Tip

Stainless Steel

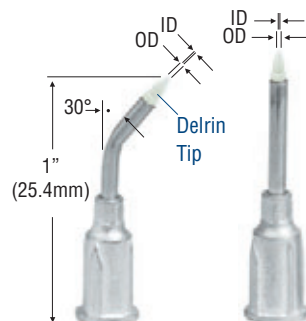
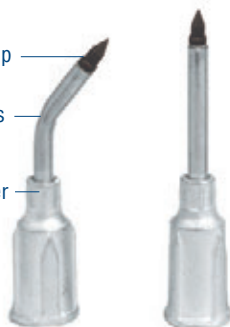
Zinc Luer Fitting



Acetal Tip

Stainless Steel

Zinc Luer Fitting



## Small Parts Tips

These tips are designed for handling very tiny parts. Tips are available in ESD Safe Delrin plastic so there is no chance of static or mechanical damage. For a lower cost tip Non-ESD Safe Acetal is also available.

**These tips must be used with continuous vacuum systems only.**

- Beige Delrin - Static Dissipative temperature up to 212°F (100°C).
- Black Delrin/Acetal - Non ESD Safe temperatures up to 212°F (100°C).

## Beige ESD Safe Delrin Small Parts Tips

VSPT1005-BD	Bent	0.010" (0.25mm) OD x 0.005" (0.13mm) ID	Delrin
VSPT2010-BD	Bent	0.020" (0.51mm) OD x 0.010" (0.25mm) ID	Delrin
VSPT2515-BD	Bent	0.025" (0.64mm) OD x 0.015" (0.38mm) ID	Delrin
VSPT3020-BD	Bent	0.030" (0.76mm) OD x 0.020" (0.51mm) ID	Delrin
VSPT4030-BD	Bent	0.040" (1.02mm) OD x 0.030" (0.76mm) ID	Delrin
VSPT6040-BD	Bent	0.060" (1.52mm) OD x 0.040" (1.02mm) ID	Delrin
VSPT7050-BD	Bent	0.070" (1.78mm) OD x 0.050" (1.27mm) ID	Delrin
VSPT8060-BD	Bent	0.080" (2.00mm) OD x 0.060" (1.52mm) ID	Delrin

VSPT1005-SD	Straight	0.010" (0.25mm) OD x 0.005" (0.13mm) ID	Delrin
VSPT2010-SD	Straight	0.020" (0.51mm) OD x 0.010" (0.25mm) ID	Delrin
VSPT2515-SD	Straight	0.025" (0.64mm) OD x 0.015" (0.38mm) ID	Delrin
VSPT3020-SD	Straight	0.030" (0.76mm) OD x 0.020" (0.51mm) ID	Delrin
VSPT4030-SD	Straight	0.040" (1.02mm) OD x 0.030" (0.76mm) ID	Delrin
VSPT6040-SD	Straight	0.060" (1.52mm) OD x 0.040" (1.02mm) ID	Delrin
VSPT7050-SD	Straight	0.070" (1.78mm) OD x 0.050" (1.27mm) ID	Delrin
VSPT8060-SD	Straight	0.080" (2.00mm) OD x 0.060" (1.52mm) ID	Delrin

## Black Non ESD Safe Acetal Small Parts Tips

VSPT1005-BA	Bent	0.010" (0.25mm) OD x 0.005" (0.13mm) ID	Acetal
VSPT2010-BA	Bent	0.020" (0.51mm) OD x 0.010" (0.25mm) ID	Acetal
VSPT2515-BA	Bent	0.025" (0.64mm) OD x 0.015" (0.38mm) ID	Acetal
VSPT3020-BA	Bent	0.030" (0.76mm) OD x 0.020" (0.51mm) ID	Acetal
VSPT4030-BA	Bent	0.040" (1.02mm) OD x 0.030" (0.76mm) ID	Acetal
VSPT6040-BA	Bent	0.060" (1.52mm) OD x 0.040" (1.02mm) ID	Acetal
VSPT7050-BA	Bent	0.070" (1.78mm) OD x 0.050" (1.27mm) ID	Acetal
VSPT8060-BA	Bent	0.080" (2.00mm) OD x 0.060" (1.52mm) ID	Acetal

VSPT1005-SA	Straight	0.010" (0.25mm) OD x 0.005" (0.13mm) ID	Acetal
VSPT2010-SA	Straight	0.020" (0.51mm) OD x 0.010" (0.25mm) ID	Acetal
VSPT2515-SA	Straight	0.025" (0.64mm) OD x 0.015" (0.38mm) ID	Acetal
VSPT3020-SA	Straight	0.030" (0.76mm) OD x 0.020" (0.51mm) ID	Acetal
VSPT4030-SA	Straight	0.040" (1.02mm) OD x 0.030" (0.76mm) ID	Acetal
VSPT6040-SA	Straight	0.060" (1.52mm) OD x 0.040" (1.02mm) ID	Acetal
VSPT7050-SA	Straight	0.070" (1.78mm) OD x 0.050" (1.27mm) ID	Acetal
VSPT8060-SA	Straight	0.080" (2.00mm) OD x 0.060" (1.52mm) ID	Acetal

## ESD Safe Small Parts Tips For As Small As 100 Microns (0.004")

VSPT0803-BD	Bent	0.008" (.203mm) OD x 0.003" (.076mm) ID	Delrin
VSPT0803-SD	Straight	0.008" (.203mm) OD x 0.003" (.076mm) ID	Delrin
VSPT0803-BA	Bent	0.008" (.203mm) OD x 0.003" (.076mm) ID	Acetal
VSPT0803-SA	Straight	0.008" (.203mm) OD x 0.003" (.076mm) ID	Acetal

## Small Parts Tips

These tips are designed for handling very tiny parts. High temperature Torlon for soldering applications, or Brass for general handling applications, all attached to a metal probe.

**These tips must be used with continuous vacuum systems only.**

- Olive Torlon - non ESD Safe temperatures up to 475°F (232°C).
- Gold Plated Brass - Conductive, gold plated temperatures up to 500°F (260°C).

### Olive Torlon Small Parts Tips

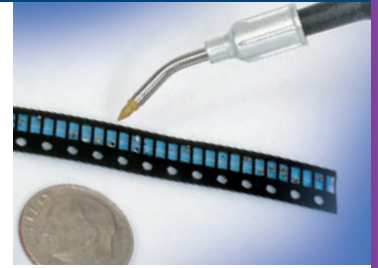
VSPT1005-BT	Bent	0.010" (0.25mm) OD x 0.005" (0.13mm) ID	High-Temp Torlon
VSPT2010-BT	Bent	0.020" (0.51mm) OD x 0.010" (0.25mm) ID	High-Temp Torlon
VSPT2515-BT	Bent	0.025" (0.64mm) OD x 0.015" (0.38mm) ID	High-Temp Torlon
VSPT3020-BT	Bent	0.030" (0.76mm) OD x 0.020" (0.51mm) ID	High-Temp Torlon
VSPT4030-BT	Bent	0.040" (1.02mm) OD x 0.030" (0.76mm) ID	High-Temp Torlon
VSPT6040-BT	Bent	0.060" (1.52mm) OD x 0.040" (1.02mm) ID	High-Temp Torlon
VSPT7050-BT	Bent	0.070" (1.78mm) OD x 0.050" (1.27mm) ID	High-Temp Torlon
VSPT8060-BT	Bent	0.080" (2.00mm) OD x 0.060" (1.52mm) ID	High-Temp Torlon

VSPT1005-ST	Straight	0.010" (0.25mm) OD x 0.005" (0.13mm) ID	High-Temp Torlon
VSPT2010-ST	Straight	0.020" (0.51mm) OD x 0.010" (0.25mm) ID	High-Temp Torlon
VSPT2515-ST	Straight	0.025" (0.64mm) OD x 0.015" (0.38mm) ID	High-Temp Torlon
VSPT3020-ST	Straight	0.030" (0.76mm) OD x 0.020" (0.51mm) ID	High-Temp Torlon
VSPT4030-ST	Straight	0.040" (1.02mm) OD x 0.030" (0.76mm) ID	High-Temp Torlon
VSPT6040-ST	Straight	0.060" (1.52mm) OD x 0.040" (1.02mm) ID	High-Temp Torlon
VSPT7050-ST	Straight	0.070" (1.78mm) OD x 0.050" (1.27mm) ID	High-Temp Torlon
VSPT8060-ST	Straight	0.080" (2.00mm) OD x 0.060" (1.52mm) ID	High-Temp Torlon

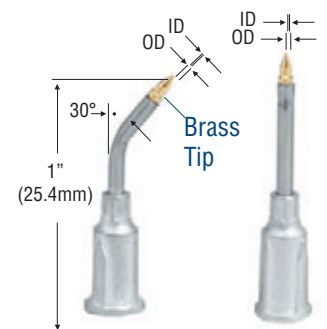
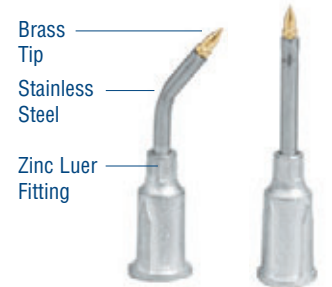
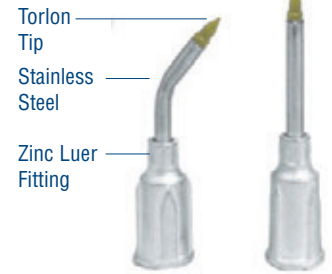
### Gold Plated Brass Small Parts Tips

VSPT1005-BB	Bent	0.010" (0.25mm) OD x 0.005" (0.13mm) ID	Brass
VSPT2010-BB	Bent	0.020" (0.51mm) OD x 0.010" (0.25mm) ID	Brass
VSPT2515-BB	Bent	0.025" (0.64mm) OD x 0.015" (0.38mm) ID	Brass
VSPT3020-BB	Bent	0.030" (0.76mm) OD x 0.020" (0.51mm) ID	Brass
VSPT4030-BB	Bent	0.040" (1.02mm) OD x 0.030" (0.76mm) ID	Brass
VSPT6040-BB	Bent	0.060" (1.52mm) OD x 0.040" (1.02mm) ID	Brass
VSPT7050-BB	Bent	0.070" (1.78mm) OD x 0.050" (1.27mm) ID	Brass
VSPT8060-BB	Bent	0.080" (2.00mm) OD x 0.060" (1.52mm) ID	Brass

VSPT1005-SB	Straight	0.010" (0.25mm) OD x 0.005" (0.13mm) ID	Brass
VSPT2010-SB	Straight	0.020" (0.51mm) OD x 0.010" (0.25mm) ID	Brass
VSPT2515-SB	Straight	0.025" (0.64mm) OD x 0.015" (0.38mm) ID	Brass
VSPT3020-SB	Straight	0.030" (0.76mm) OD x 0.020" (0.51mm) ID	Brass
VSPT4030-SB	Straight	0.040" (1.02mm) OD x 0.030" (0.76mm) ID	Brass
VSPT6040-SB	Straight	0.060" (1.52mm) OD x 0.040" (1.02mm) ID	Brass
VSPT7050-SB	Straight	0.070" (1.78mm) OD x 0.050" (1.27mm) ID	Brass
VSPT8060-SB	Straight	0.080" (2.00mm) OD x 0.060" (1.52mm) ID	Brass



Our machined small parts tips are designed to be used with a continuous vacuum source for handling parts as small as .006" (.152mm).





Every PORTA-WAND® is tested to meet Class 1 clean room particle contamination requirements. A serialized particle counter printout is provided with every tool.

PORTA-WAND® ELITE  
110 Volt Kit



PORTA-WAND® ELITE  
220 Volt Kit



Rechargeable battery



### PORTA-WAND® ELITE 110 Volt Kit

The PORTA-WAND® ELITE kit comes with a detachable 9.6V NiMH rechargeable battery pack, an in-stand charger (VPW6000BQ-CHRG) and one wafer tip as listed below. The detachable battery pack (VPWE-150-SILVER) contains the rear exhaust filter for the entire tool to ensure better than Class 1 performance. The battery pack can be recharged when attached to the tool or when separated from the tool. Ideal for handling wafers, disk media, flat panels, or any item that has a flat hard surface. A power on indicator flashes when the battery pack needs to be recharged or interchanged with a fully charged battery pack. A PUSH-BUTTON provides easy on/off control with a lock to on position. An intake air filter (VPW6000-FIL-5) is replaceable from the front of the tool.

*Optional Feature: The two pins at the front of the tool allow use of the optional anti-rotate adaptor.*

*This adaptor locks any of our molded wafer tips into one of eight rotational positions around the front of the wafer handling tool. See item number VMWT-ADAPT-AR on page 23 for a description of the operation.*

<b>VPWE7000AR-MW4</b>	PORTA-WAND ELITE with PEEK wafer tip VMWT-A, up to 8" (200mm) wafers
<b>VPWE7000AR-MW6</b>	PORTA-WAND ELITE with PEEK wafer tip VMWT-B, handles up to 6" (150mm) wafers
<b>VPWE7000AR-MW8</b>	PORTA-WAND ELITE with PEEK wafer tip VMWT-C, handles up to 8" (200mm) wafers

### PORTA-WAND® ELITE 220 Volt Kit

The PORTA-WAND® ELITE kit comes with a detachable 9.6V NiMH rechargeable battery pack, an in-stand charger (VPW6000BQ-CHRG-220) and one wafer tip as listed below. The detachable battery pack (VPWE-150-SILVER) contains the rear exhaust filter for the entire tool to ensure better than Class 1 performance. The battery pack can be recharged when attached to the tool or when separated from the tool. Ideal for handling wafers, disk media, flat panels, or any item that has a flat hard surface. A power on indicator flashes when the battery pack needs to be recharged or interchanged with a fully charged battery pack. A PUSH-BUTTON provides easy on/off control with a lock to on position. An intake air filter (VPW6000-FIL-5) is replaceable from the front of the tool. Provided with a CE approved 220 Volt power power supply.

*Optional Feature: The two pins at the front of the tool allow use of the optional anti-rotate adaptor. This adaptor locks any of our molded wafer tips into one of eight rotational positions around the front of the wafer handling tool. See item number VMWT-ADAPT-AR on page 23 for a description of the operation.*

<b>VPWE7000AR-MW4-220</b>	PORTA-WAND ELITE with PEEK wafer tip VMWT-A, handles up to 4" (100mm) wafers
<b>VPWE7000AR-MW6-220</b>	PORTA-WAND ELITE with PEEK wafer tip VMWT-B, handles up to 6" (150mm) wafers
<b>VPWE7000AR-MW8-220</b>	PORTA-WAND ELITE with PEEK wafer tip VMWT-C, handles up to 8" (200mm) wafers

### Rechargeable Battery Pack

Rechargeable battery pack for the PORTA-WAND® ELITE hand tools. This 9.6V NiMH rechargeable battery pack (VPWE-150) also contains the rear exhaust filters for the entire tool to ensure better than Class I performance. The battery pack can be recharged when attached to the tool or when separated from the tool.

**VPWE-150-SILVER**

### Anti Rotate Adaptor

This adaptor is used with any of our PORTA-WAND® "AR" series tools that have the pins protruding from the front end of the tool. The adaptor slides onto the front of the tool and engages the pins in one of eight possible positions to prevent rotation of the adaptor. Amolded wafer tip can now be inserted into the front of the PORTA-WAND® with the flat of the wafer tip engaging the slot in the adaptor. The wafer tip is now secure from rotating during wafer handling operations.

**VMWT-ADAPT-AR** ESD-Safe Anti Rotate Tip Adaptor



## Rechargeable Battery Operated Wafer Handling Tools

### SERIES 3 PORTA-WAND® ELITE Kit With 300mm Wafer Tip

The SERIES 3 PORTA-WAND® ELITE kit comes with a detachable 9.6V NiMH rechargeable battery pack, an in-stand charger (VPW6000-CHRG) and one 300mm Wafer Tip (VWT-5R page 19). The detachable battery pack (VPWE-150 page 17) contains the rear exhaust filter for the entire tool to ensure better than Class I performance. The battery pack can be recharged when attached to the tool or when separated from the tool. Ideal for handling wafers, disk media, flat panels, or any item that has a flat hard surface. The OPERATION INDICATOR turns on only when proper vacuum has been established to firmly grip the wafer. The same light flashes when the battery pack needs to be recharged or interchanged with a fully charged battery pack. A PUSH-BUTTON provides easy on/off control with a lock to on position. An internal air filter (VPW6000-FIL-5) is replaceable from the front of the tool.

*Optional Feature: The two pins at the front of the tool allow use of the optional anti-rotate adaptor.*

*This adaptor locks any of our molded wafer tips into one of eight rotational positions around the front of the wafer handling tool. See item number VMWT-ADAPT-AR on page 23 for a description of the operation.*

<b>VPWE7300AR-VWT5R-AR</b>	SERIES 3 PORTA-WAND ELITE with 300mm Wafer Tip VWT-5R, handles up to 12" (300mm) wafers, 110 VOLT
<b>VPWE7300AR-VWT5R-220-AR</b>	SERIES 3 PORTA-WAND ELITE with 300mm Wafer Tip VWT-5R, handles up to 12" (300mm) wafers, 220 VOLT

### SERIES 3 PORTA-WAND® ELITE Kit With MOLDED PEEK Wafer Tip

Same tool as described above except it is provided with a MOLDED PEEK wafer tip. Ideal for handling wafers, disk media or any item that has a hard, flat surface.

<b>VPWE7300AR-MW4</b>	SERIES 3 PORTA-WAND ELITE with wafer tip VMWT-A, handles up to 4" (100mm) wafers, 110 VOLT
<b>VPWE7300AR-MW6</b>	SERIES 3 PORTA-WAND ELITE with wafer tip VMWT-B, handles up to 6" (150mm) wafers, 110 VOLT
<b>VPWE7300AR-MW8</b>	SERIES 3 PORTA-WAND ELITE with wafer tip VMWT-C, handles up to 8" (200mm) wafers, 110 VOLT
<b>VPWE7300AR-MW4-220</b>	SERIES 3 PORTA-WAND ELITE with wafer tip VMWT-A, handles up to 4" (100mm) wafers, 220 VOLT
<b>VPWE7300AR-MW6-220</b>	SERIES 3 PORTA-WAND ELITE with wafer tip VMWT-B, handles up to 6" (150mm) wafers, 220 VOLT
<b>VPWE7300AR-MW8-220</b>	SERIES 3 PORTA-WAND ELITE with wafer tip VMWT-C, handles up to 8" (200mm) wafers, 220 VOLT

### Battery Charger System

This charger system is used with the VPW6000B, VPW6300B, VPWE7000 and VPWE7300 series PORTA-WAND® and PORTA-WAND® ELITE vacuum handling tools.

<b>VPW6000BQ-CHRG</b>	for 110 VOLT operation, with Power Supply
<b>VPW6000BQ-CHRG-220</b>	for 220 VOLT operation, with Power Supply
<b>VPW6000BQ-CHRG-XT</b>	Charger only no Power Supply
<b>VPW6000-TRANS</b>	for 110 VOLT operation, Power Supply only
<b>VPW6000-TRANS-220</b>	for 220 VOLT operation, Power Supply only

### Rechargeable Battery Pack

Rechargeable battery pack for the PORTA-WAND® ELITE hand tools. This 9.6V NiMH rechargeable battery pack (VPWE-150) also contains the rear exhaust filters for the entire tool to ensure better than Class I performance. The battery pack can be recharged when attached to the tool or when separated from the tool.

**VPWE-150-SILVER**

### Intake Air Filters

Five pack of replaceable 40 micron air filters for the PORTA-WAND®/and PORTA-WAND® ELITE

**VPW6000-FIL-5**



The Series 3 vacuum handling tools are key to handling up to 300mm wafers.



Battery Charger System



Charging base

Rechargeable battery



# PORTA-VAC® II & PORTA-VAC Battery Packs & Accessories

Battery Operated Wafer Handling Tools



The PORTA-VAC® II wafer handling tool operates on a standard 9 volt alkaline battery or an optional rechargeable battery pack. This wafer tweezer replacement easily handles any size semiconductor wafer when equipped with the proper wafer tip.

PORTA-VAC® II with Molded PEEK Tip



Battery Pack and Charger System



Intake Air Filters



## PORTA-VAC® II Kit With Molded Peek® Wafer Tip

This wafer handling tool kit comes with one MOLDED wafer tip as listed below. Ideal for handling wafers, disk media or any item that has a flat, hard surface. Easily lifts over 500 grams. A disposable 9V battery is included. Rear exhaust of the pump air is standard on these units. The battery low indicator flashes red when the battery needs to be changed or recharged. A switch setting on the bottom of the tool allows selection of alkaline battery or NiMH battery discharge characteristics for the battery low indicator. A large on/off switch provides easy on/off control. An internal air filter (PV4000-FIL-5) is replaceable from the front of the tool. The Class 1 exhaust filter ensures clean operation. An optional rechargeable battery pack and in-stand charger are also available for this tool (see below for details).

<b>PV4000A-MW4</b>	PORTA-VAC II with wafer tip VMWT-A, handles up to 4" (100mm) wafers
<b>PV4000A-MW6</b>	PORTA-VAC II with wafer tip VMWT-B, handles up to 6" (150mm) wafers
<b>PV4000A-MW8</b>	PORTA-VAC II with wafer tip VMWT-C, handles up to 8" (200mm) wafers

## PORTA-VAC® II Tool

Ideal for handling wafers, disk media or any item that has a flat, hard surface. Easily lifts over 500 grams. A disposable 9V battery is included. Rear exhaust of the pump air is standard on these units. The battery low indicator flashes red when the battery needs to be changed or recharged. A switch setting on the bottom of the tool allows selection of alkaline battery or NiMH battery discharge characteristics for the battery low indicator. A large on/off switch provides easy on/off control. An internal air filter (PV4000-FIL-5) is replaceable from the front of the tool. The Class 1 exhaust filter insures clean operation. A disposable battery is included. An optional rechargeable battery pack and in-stand charger is also available for this tool (see below for details).

<b>PV4000A-X</b>	PORTA-VAC II only
------------------	-------------------

## Battery Pack And Charger System

The in-stand NiMH battery pack and charger are designed to charge the battery pack while the PORTA-VAC® tool is in the stand. A micro-processor monitors the charge status and terminates the charge when the battery is at full capacity. Charge time for a depleted NiMH battery is two hours. LED indicators show status of the charge. The base is designed to sit on your work station surface or be mounted directly on a wall.

<b>PV2070BQ-RE</b>	9.6 volt in-stand battery charger with wall power supply and rear exhaust battery.
<b>PV2070BQ-220-RE</b>	9.6 volt in-stand battery charger with 220 volt wall power supply and rear exhaust battery.
<b>PV2074-RE</b>	9.6 volt in-stand rear exhaust battery pack only.

## Intake Air Filters

<b>PV4000-FIL-5</b>	5 pack of replaceable 40 micron air filters for the PORTA-VAC®.
---------------------	---

Series 3 PORTA-VAC® Kit With 300mm Wafer Tip

This wafer handling tool kit comes with one machined wafer tip as listed below. Ideal for handling wafers, disk media or any item that has a flat, hard surface. Easily lifts 300mm wafers. A disposable 9V battery is included. Rear exhaust of the pump air is standard on these units. The OPERATION INDICATOR turns on only when proper vacuum has been established to firmly grip the wafer. The same light flashes when the battery needs to be replaced or recharged. A switch setting on bottom of the tool allows selection of alkaline battery or NiMH battery discharge characteristics for the battery low indicator. A large on/off switch provides easy on/off control. An internal air filter (PV4000-FIL-5) is replaceable from the front of the tool. The Class 1 exhaust filter ensures clean operation. An optional rechargeable battery pack and in-stand charger are also available for this tool (see page 18 for details).

PV4300-VWT5R	Series 3 PORTA-VAC with wafer tip VWT-5R, handles up to 12" (300mm) wafers
PV4300-X	Series 3 PORTA-VAC only, no wafer tip



The Series 3 PORTA-VAC® vacuum handling tools are key to handling up to 300mm wafers. A safe vacuum level indicator illuminates only after vacuum is established between the wafer being handled and the wafer tip.

Series 3 PORTA-VAC® Kit With Molded Peek Wafer Tip

Same tool as described above except it is provided with a MOLDED PEEK wafer tip. Ideal for handling wafers, disk media or any item that has a hard, flat surface.

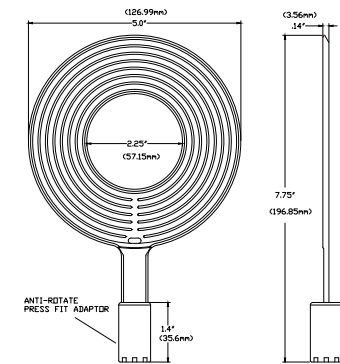
PV4300-MW4	Series 3 PORTA-VAC with wafer tip VMWT-A, handles up to 4" (100mm) wafers
PV4300-MW6	Series 3 PORTA-VAC with wafer tip VMWT-B, handles up to 6" (150mm) wafers
PV4300-MW8	Series 3 PORTA-VAC with wafer tip VMWT-C, handles up to 8" (200mm) wafers



300mm Wafer Handling Tip

Designed for safely handling 300mm wafers. The large five inch (127mm) outside diameter provides the support required to securely hold the large wafer. The center hole helps reduce the wafer tip weight and minimizes contact area. The dual press fit adapter provides both inner and outer o-ring gripping areas for added handling security. Now with anti-rotate tip.

VWT-5R-AR
-----------



# WAFER WANDS

## PUSH-BUTTON OR SLIDE SWITCH

ESD and  
Clean Room Safe



Our clean room safe wafer wands and holders are designed to be used with a continuous or in-house vacuum system.



PUSH-BUTTON  
WAFER  
WAND KITS

VWP-500-2.5mm

Push-button  
release

Accepts Molded  
Peek Wafer Tips  
See Page 23  
For Sizes



PUSH-BUTTON  
WAFER WAND



VBM-2 for  
VWWB Series  
Wands



SLIDE-SWITCH  
WAFER WAND



VBM-5 for Push-  
Button or Slide  
Switch Wands

### Push-Button Wafer Wand Kits

The lightweight push-button wafer wand is designed for connection to continuous vacuum systems. Operation is controlled by pushing the button. This tool can be used with an in-house vacuum system or with one of Virtual Industries high performance continuous vacuum systems. Can be used with all of our press-fit tips, adapters and vacuum hoses. Vacuum normally on – Push button to shut off vacuum and to release the wafer. Handling tool constructed from Static Dissipative Delrin. The source vacuum is shut off when the handle is placed in the holder. Kits includes a wafer wand, 6' of coiled vacuum hose, a VBM-2 holder for the wafer wand and a wafer tip.

**VWWB-2A-MW4-1/16** PUSH BUTTON KIT for 1/16" ID vacuum hose - Wafer Tip (VMWT-A) handles wafers up to 4".

**VWWB-2A-MW4-2.5mm** PUSH BUTTON KIT for 2.5mm ID vacuum hose - Wafer Tip (VMWT-A) handles wafers up to 4".

**VWWB-2A-MW4-1/8** PUSH BUTTON KIT for 1/8" ID vacuum hose - Wafer Tip (VMWT-A) handles wafers up to 4".

**VWWB-2A-MW6-1/16** PUSH BUTTON KIT for 1/16" ID vacuum hose - Wafer Tip (VMWT-B) handles wafers up to 6".

**VWWB-2A-MW6-2.5mm** PUSH BUTTON KIT for 2.5mm ID vacuum hose - Wafer Tip (VMWT-B) handles wafers up to 6".

**VWWB-2A-MW6-1/8** PUSH BUTTON KIT for 1/8" ID vacuum hose - Wafer Tip (VMWT-B) handles wafers up to 6".

**VWWB-2A-MW8-1/16** PUSH BUTTON KIT for 1/16" ID vacuum hose - Wafer Tip (VMWT-C) handles wafers up to 8".

**VWWB-2A-MW8-2.5mm** PUSH BUTTON KIT for 2.5mm ID vacuum hose - Wafer Tip (VMWT-C) handles wafers up to 8".

**VWWB-2A-MW8-1/8** PUSH BUTTON KIT for 1/8" ID vacuum hose - Wafer Tip (VMWT-C) handles wafers up to 8".

**VWWB-2A-MW12-1/16** PUSH BUTTON KIT for 1/16" ID vacuum hose - Wafer Tip (VMWT-D) handles wafers up to 12".

**VWWB-2A-MW12-2.5mm** PUSH BUTTON KIT for 2.5mm ID vacuum hose - Wafer Tip (VMWT-D) handles wafers up to 12".

**VWWB-2A-MW12-1/8** PUSH BUTTON KIT for 1/8" ID vacuum hose - Wafer Tip (VMWT-D) handles wafers up to 12".

### VWP-500 Push Button Wafer Wand - ESD Safe

Push-Button Wafer Pen with replaceable filter, for the clear 2.5mm ID hose barb. Normally open, push to release. This product requires a continuous vacuum source, either in house vacuum or our Tweezer-Vac TV-1000.

**VWP-500-1/16** Push Button Wafer Wand

**VWP-500-2.5mm** Push Button Wafer Wand

**VWP-500-1/8** Push Button Wafer Wand

### Push-Button Wafer Wands

**VWWB-2A-SD-1/16** For 1/16" (1.59mm) ID hose, wafer wand only.

**VWWB-2A-SD-2.5mm** For 2.5mm (2.5mm) ID hose, wafer wand only.

**VWWB-2A-SD-1/8** For 1/8" (3.18mm) ID hose, wafer wand only.

### Push-Button Wafer Wand Holder

This series of holders for the VWWB series of wafer tweezer wands holds the wafer wand and turns off the vacuum air when not in use.

**VBM-2** Bench mount wand holder

### Slide Switch Wafer Wands

**VWW-2-SD-1/16** For 1/16" (1.59mm) ID hose, wafer wand only.

**VWW-2-SD-2.5mm** For 2.5mm (2.5mm) ID hose, wafer wand only.

**VWW-2-SD-1/8** For 1/8" (3.18mm) ID hose, wafer wand only.

### Push-Button Or Slide Switch Wafer Wand Holder

This holder for the VWW-2 series of wafer tweezer wands holds the wafer wand when not in use.

**VBM-5** Bench mount holder. For use with any Push-Button or Slide Switch series wands.

**STEALTH-WAND™ Kits**

The Virtual Venturi Stealth-Wand™ vacuum generating handle with a wafer tip. The front connecting tip accepts all of our press fit wafer tips. Includes 6 feet of coiled (VCH-1/16-6) 1/16 inch vacuum hose, a (V3014-1/8NPT) 1/8 NPT to 1/16" barb adapter for the supply line, a wafer tip as specified below the vacuum generating handle, and a VBM-4 wafer wand holder. Operates off of 30 to 70 psi compressed air or nitrogen.

<b>VVSW-MW4</b>	The above kit with the VMWT-A which handles wafers up to 4".
<b>VVSW-MW6</b>	The above kit with the VMWT-B which handles wafers up to 6".
<b>VVSW-MW8</b>	The above kit with the VMWT-C which handles wafers up to 8".
<b>VVSW-MW12</b>	The above kit with the VMWT-D which handles wafers up to 12".

\* Normally open vacuum

<b>VVSW-X</b>	The Virtual Venturi Stealth-Wand™ vacuum generating handle, with 6 feet of 1/16 inch coiled vacuum hose, a 1/8 NPT to 1/16" barb adapter for the supply line. No wafer tip or holder.
---------------	---

**STEALTH-WAND™ ELITE Kits**

The Virtual Venturi Stealth-Wand™ Elite vacuum generating handle with a wafer tip. The front connecting tip accepts all of our press fit wafer tips. Includes 6 feet of coiled (VCH-1/16-6) 1/16 inch vacuum hose, a (V3014-1/8NPT) 1/8 NPT to 1/16" barb adapter for the supply line, a wafer tip as specified below and a VBM-4 wafer wand holder. Operates off of 30 to 50 psi compressed air or nitrogen.

<b>VVSW-NC-MW4</b>	The above kit with the VMWT-A which handles wafers up to 4".
<b>VVSW-NC-MW6</b>	The above kit with the VMWT-B which handles wafers up to 6".
<b>VVSW-NC-MW8</b>	The above kit with the VMWT-C which handles wafers up to 8".
<b>VVSW-NC-MW12</b>	The above kit with the VMWT-D which handles wafers up to 12".

\* Normally closed vacuum

\* Uses air only when button is pushed

<b>VVSW-NC-X</b>	The Virtual Venturi Stealth-Wand™ ELITE vacuum generating handle, with 6 feet of coiled (VCH-1/16-6) 1/16 inch vacuum hose, a (V3014-1/8NPT) 1/8 NPT to 1/16" barb adapter for the supply line. No wafer tip or holder.
------------------	---

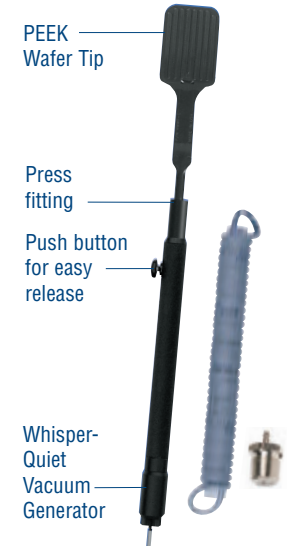
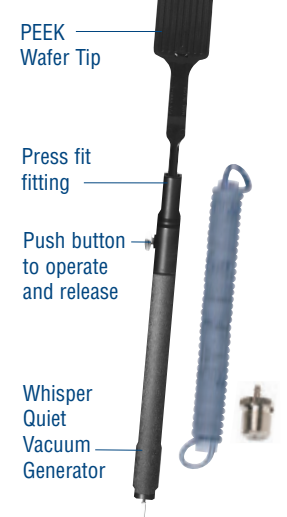
<b>VBM-5</b>	Bench mount holder. For use with any Stealth Wand series vacuum wands.
--------------	--

**Threaded Replacement Fitting**

<b>V3014-1/8NPT</b>	Adapt to 1/16" ID hose, for compressed air applications.
---------------------	--



Our STEALTH-WANDS™ provide the highest level of pick-up-power. These compressed-air-powered wafer handling tools are whisper quiet and consume a minimal amount of compressed air or nitrogen.

**STEALTH-WAND™****STEALTH-WAND™ ELITE**

VBM-5





WV-9000 WAFA-VAC System  
WV-9000-MW6



### WV-9000 WAFA-VAC System

A general purpose wafer vacuum handling tool that plugs directly into 110 Volt 50/60 Hz. This compact unit will handle a wide variety of parts used in industry today. The long-life diaphragm vacuum pump generates up to 10 inches of mercury with an open air flow of 2.3 lpm. The unit connects to ground automatically with a three-wire power cord. The WV-9000 comes complete with the following features:

- Lighted On/Off switch.
- Whisper-quiet operation.
- Long-life pump.
- Class 100 Cleanroom Safe
- Push-button wafer tip pen VWP-500-2.5mm
- 6 foot clear coiled vacuum hose (VCH-2.5mm-6).
- Rubber no-skid feet.
- Top mounted handle holder.
- Foot print measures 7-1/4" X 3" X 2-1/2" (185mm X 76mm X 64mm).
- Produces 10 inches of mercury.

**WV-9000-MW4** WAFA-VAC system with 4 inch molded wafer tip (VMWT-A).

**WV-9000-MW6** WAFA-VAC system with 6 inch molded wafer tip (VMWT-B).

**WV-9000-MW8** WAFA-VAC system with 8 inch molded wafer tip (VMWT-C).

**WV-9000-MW4-220** WAFA-VAC 220 volt system with 4 inch molded wafer tip (VMWT-A).

**WV-9000-MW6-220** WAFA-VAC 220 volt system with 6 inch molded wafer tip (VMWT-B).

**WV-9000-MW8-220** WAFA-VAC 220 volt system with 8 inch molded wafer tip (VMWT-C).



WV-9000-MW6

PAC-VAC Kit  
V3200-CLN-MW6-2.5mm



### PAC-VAC® Kit For Up To 8" Wafers And Substrates-Operates On A Nine Volt Battery

The PAC-VAC-CLN Cleanroom safe tool is battery operated and self-contained, runs up to eight hours continuously on one 9 volt alkaline battery. This versatile unit can be clipped to your belt or pocket for one-handed portable operation. This PAC-VAC® is constructed with ESD safe materials and comes complete with the following features:

- Bright blue power on LED indicator light.
- Class I Cleanroom Approved.
- A belt/pocket clip on the housing.
- 5 feet of coiled vacuum hose (VCH-2.5mm-5).
- A wafer/substrate handling tip for up to 8" substrates VMWT-C.
- A vacuum pick-up handle, VWP-500-2.5mm.
- One 9 volt disposable alkaline battery.
- Lightweight - only 156 grams.
- Produces vacuum of up to 16 inches of mercury.

**V3200-CLN-MW4-2.5mm** PAC-VAC KIT with 4 inch molded wafer tip (VMWT-A).

**V3200-CLN-MW6-2.5mm** PAC-VAC KIT with 6 inch molded wafer tip (VMWT-B).

**V3200-CLN-MW8-2.5mm** PAC-VAC KIT with 8 inch molded wafer tip (VMWT-C).

### Press Fit Hub Adaptor ESD-Safe

Adaptor connects to VWP-500 Push-Button Wafer Pen or any of our wafer handling tools, also allows for use with vacuum cups with stainless steel probe and luer slip hub (see page 9 for details), small parts vacuum tips with stainless steel probe and luer slip hub (see page 14-15 for details) and delrin rigid lens handling tips with stainless steel probe and luer slip hub (see page 24 for details).

**V2404** Press Fit Hub Adaptor



VWP-500  
Pen

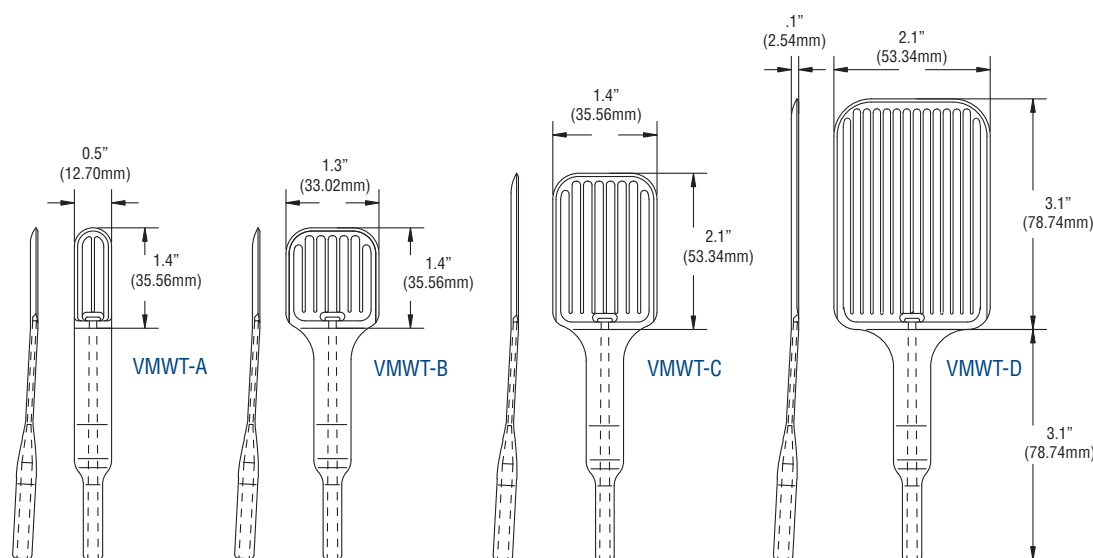
V2404 Press  
Fit Adaptor

Adaptor with  
Cup and  
Probe

Adaptor with  
Small Parts  
Tip

Adaptor with  
Rigid Lens  
Handling  
Tip

Press-Fit  
Molded Peek®



## Molded Peek Wafer Tips

These Wafer Tips are molded from ESD safe PEEK plastic to handle wafers up to 100°C. The low profile of the wafer tip head provides easy access to wafers in industry standard boats. These tips attach to all of our wafer handling tools as well as competitive systems.

**VMWT-A** Recommended for handling up to 4" (100mm) wafers.

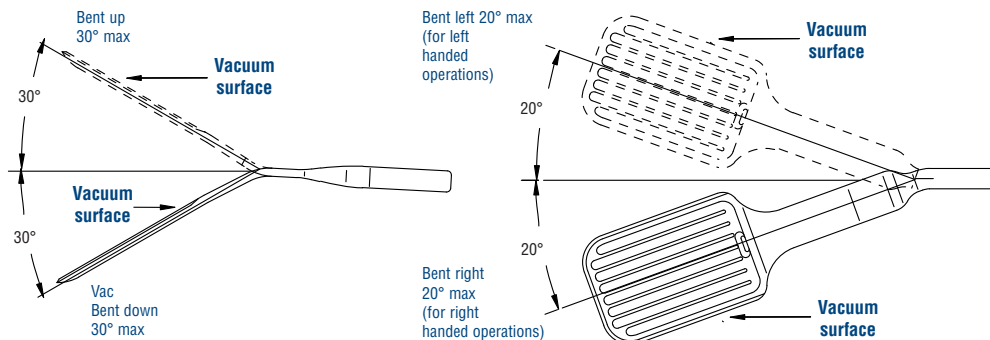
**VMWT-B** Recommended for handling up to 6" (150mm) wafers.

**VMWT-C** Recommended for handling up to 8" (200mm) wafers.

**VMWT-D** Recommended for handling larger sized wafers, (no left/right angles available).

For High-Temperature Hard Anodized Wafer Tips, visit our online store at [www.virtual-ii.com](http://www.virtual-ii.com)

Prices subject to change without notice.



Molded Wafer Tips VMWT-A, VMWT-B and VMWT-C are available with a 10°, 20° or 30° bend in the up or down direction as shown in the left drawing above. To order a tip with the up or down bend, add the angle plus a "U" for up or a "D" for down to the part number. *EXAMPLE: Part number VMWT-A20D is a VMWT-A Wafer Tip with a 20 degree bend in the down direction. Custom angles are available upon request. Pricing is as above.*

Molded Wafer Tips VMWT-A, VMWT-B and VMWT-C are available with a 10° or 20° bend in the left or right direction as shown in the right drawing above. To order a tip with the left or right bend, add the angle plus a "L" for left or an "R" for right to the part number. *EXAMPLE: Part number VMWT-C20R is a VMWT-C Wafer Tip with a 20 degree bend in the right direction. Custom angles are available upon request. Pricing is as above.*

## Anti Rotate Adaptor

This adaptor is used with any of our PORTA-WAND "AR" series tools that have the pins protruding from the front end of the tool. The adaptor slides onto the front of the tool and engages the pins in one of eight possible positions to prevent rotation of the adaptor. A molded wafer tip can now be inserted into the front of the PORTA-WAND with the flat part of the wafer tip engaging the slot in the adaptor. The wafer tip is now secure from rotating during wafer handling operations.

**VMWT-ADAPT-AR** ESD-Safe Anti Rotate Tip Adaptor



The PEEK® material selected for our molded wafer tips is an industry standard. They have excellent resistance to most chemicals. The non-sloughing carbon renders the wafer tips ESD safe. Excellent for applications up to 212°F (100°C).



PORTA-WAND "AR" Series with pins.

Anti Rotate Adaptor slides on to front of tool engaging pins in one of eight positions of adaptor to prevent rotation.

Wafer tips flat surface engages into the slot of the adaptor to prevent any rotation.

# RIGID VACUUM KITS AND TIPS FOR OPTICS OR SUBSTRATES HANDLING

Handle Concave, Convex and Flat Surfaces



These tips are perfect for handling optics. Custom sizes are available to match the outside perimeter of coated lenses to insure contamination free handling. The rigid construction securely holds parts for inspection or assembly operations.

## RIGID HANDLING TIPS



### Straight Or Bent Rigid Handling Tips

These tips are designed for easy handling of optic lenses of all shapes and must be used with a powered vacuum source. The deep cupped circular design will accommodate concave, convex and flat surfaces. Precision machined from Delrin insures contamination free lens handling.

*For lenses or optics that are smaller than 3.18mm (1/8") see our Delrin small parts tips on page 14.*

The following lens handling tips are mounted on a straight or bent 45° 1" (25.4mm) stainless steel probe with a luer slip hub.

*These tips must be used with continuous vacuum systems only.*

<b>VRT-125-S</b>	1/8"	(3.18mm) lens tip straight probe	<b>VRT-125-B</b>	1/8"	(3.18mm) lens tip 45° bent probe
<b>VRT-188-S</b>	3/16"	(4.76mm) lens tip straight probe	<b>VRT-188-B</b>	3/16"	(4.76mm) lens tip 45° bent probe
<b>VRT-250-S</b>	1/4"	(6.35mm) lens tip straight probe	<b>VRT-250-B</b>	1/4"	(6.35mm) lens tip 45° bent probe
<b>VRT-375-S</b>	3/8"	(9.53mm) lens tip straight probe	<b>VRT-375-B</b>	3/8"	(9.53mm) lens tip 45° bent probe
<b>VRT-500-S</b>	1/2"	(12.7mm) lens tip straight probe	<b>VRT-500-B</b>	1/2"	(12.7mm) lens tip 45° bent probe
<b>VRT-750-S</b>	3/4"	(19.05mm) lens tip straight probe	<b>VRT-750-B</b>	3/4"	(19.05mm) lens tip 45° bent probe
<b>VRT-1000-S</b>	1"	(25.4mm) lens tip straight probe	<b>VRT-1000-B</b>	1"	(25.4mm) lens tip 45° bent probe

### TV-1000 Rigid Vacuum Kit

#### TV-1000-VRT-KIT8

The TWEEZER-VAC® comes complete with the following accessories/ features: 5 feet of coiled vacuum hose 1/16" diameter, (VCH-1/16-5), four straight probes with luer slip hub mounted with delrin cup sizes 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) 3/4" (19.05mm) diameter, 4 bent probes with luer slip hub mounted with delrin cup sizes 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) 3/4" (19.05mm) diameter (VRT-KIT8), an 8-position tip organizer/holder. (VTH-8), and a push-button release vacuum pick-up handle VVP-200.

### V8100A Rigid Vacuum Kit

#### V8100A-VRT-KIT8

SMD-VAC™-HP, runs on 12 VDC @ 500mA w/ solenoid. With a precision pump and motor that generates over 15 inches of mercury; this tool provides additional pick-up power for handling small to very large size components. This kit includes 5 feet of coiled vacuum hose 1/16" diameter (VCH-1/16-5), four straight probes with luer slip hub mounted with delrin cup sizes 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) 3/4" (19.05mm) diameter, 4 bent probes with luer slip hub mounted with delrin cup sizes 1/4" (6.35mm), 3/8" (9.53mm), 1/2" (12.7mm) 3/4" (19.05mm) diameter (VRT-KIT8), an 8-position tip organizer/holder. (VTH-8), a push-button release vacuum pick-up handle (VVP-200), Foot Switch & Vacuum Pen w/o control hole, and a wall power supply for operation.



TV-1000-VRT-KIT8

V8100A-VRT-KIT8

## Standard Push Button Vacuum Pen - ESD Safe

Lightweight aluminum 1/2" diameter handle for vacuum handling systems. This new vacuum pen allows you to immediately pick up a part by touching the vacuum tip to the surface of the part. A slight press of the button releases the part. The unique design eliminates internal O-rings for years of maintenance free operation. Available for 1/16" or 1/8" ID diameter vacuum hose. 5 1/4" (133.35mm) long, 1/2" (12.70mm) diameter.

*Must be used with a continuous vacuum source.*

<b>VVP-200-1/16</b>	1/16" (1.59mm) ID hose barb
<b>VVP-200-2.5mm</b>	2.5mm ID hose barb
<b>VVP-200-1/8</b>	1/8" (3.18mm) ID hose barb

## Vacuum Pen With Control Hole

Lightweight aluminum 1/2" diameter handle for continuous air vacuum handling systems. A 1/16" or 1/8" inside diameter vacuum hose connects at the rear of the tool. Vacuum tips attach to the front of the tool. Covering and uncovering the hole enables the vacuum to grasp and release the part. 5-1/4" (133.35mm) long, 1/2" (12.70mm) diameter.

*Must be used with a continuous vacuum source.*

<b>V3020-RF-1/16</b>	1/16" (1.59mm) ID hose barb
<b>V3020-RF-2.5mm</b>	2.5mm ID hose barb
<b>V3020-RF-1/8</b>	1/8" (3.18mm) ID hose barb

## Vacuum Pen Without Control Hole, No Filter

Lightweight aluminum 1/2" diameter handle for continuous vacuum handling systems. A 1/16" or 1/8" inside diameter vacuum hose connects at the rear of the tool. Vacuum tips attach to the front of the tool. Designed for external vacuum release. 5 1/4" (133.35mm) long, 1/2" (12.70mm) diameter.

*Must be used with a continuous vacuum source.*

<b>V3021-1/16</b>	1/16" (1.59mm) ID hose barb
<b>V3021-2.5mm</b>	2.5mm ID hose barb
<b>V3021-1/8</b>	1/8" (3.18mm) ID hose barb

## Control Hole Vacuum Pen Kit

This kit is for the users who have an in-house vacuum system. This kit includes 5 feet of coiled vacuum hose (VCH-1/16-5), a set of 9 vacuum tips (VCS-9-B) and a vacuum pick-up handle with control hole (V3020-RF). *Must be used with a continuous vacuum source.*

**VV-PEN-KIT**

## Push Button Vacuum Pen Kit

This kit is for the users who have an in-house vacuum system. This kit includes 5 feet of coiled vacuum hose (VCH-1/16-5), a set of 9 vacuum tips (VCS-9-B) and a push button vacuum pick-up handle (VVP-200). *Must be used with a continuous vacuum source.*

**VV-PEN-KIT-PB**

## Push Button Vacuum Wafer Wand

Lightweight aluminum 1/2" diameter handle accepts any of our press fit tips for handling solar cells or semiconductor wafers. This normally open vacuum wafer pen allows you to pick up a wafer by touching the vacuum tip to the surface of the part. A slight press of the button releases the solar cell or wafer. The unique design eliminates internal O-rings for years of maintenance free operation. 5 1/4" (133.35mm) long, 1/2" (12.70mm) diameter.

*Must be used with a continuous vacuum source.*

<b>VWP-500-1/16</b>	1/16" (1.59mm) ID hose barb
<b>VWP-500-2.5mm</b>	2.5mm ID hose barb
<b>VWP-500-1/8</b>	1/8" (3.18mm) ID hose barb



For the customer who has existing plumbed vacuum systems. Our line of vacuum pens and hoses will provide parts handling capability.





The Static Dissipative Polyurethane is available in two diameters and also either straight or coiled. The ESD safe Silicone hose provides high-temperature resistance.

1/16" Coiled Static Dissipative Hose



Custom lengths  
Straight  
1/16" Gray Static Dissipative Poly Hose

## Gray Standard Lengths

The ESD-safe, Static Dissipative Polyurethane vacuum hoses are available in standard lengths either straight or coiled. The coiled hose is provided with a 6" (152.4mm) tail at each end.

	Inside diameter	Outside diameter	Extended length	Style
VCH-1/16-5	1/16" (1.59mm)	1/8" (3.18mm)	5 ft.	coiled
VCH-1/16-6	1/16" (1.59mm)	1/8" (3.18mm)	6 ft.	coiled
VCH-1/16-8	1/16" (1.59mm)	1/8" (3.18mm)	8 ft.	coiled
VCH-1/8-5	1/8" (3.18mm)	1/4" (6.35mm)	5 ft.	coiled
VCH-1/8-6	1/8" (3.18mm)	1/4" (6.35mm)	6 ft.	coiled
VCH-1/8-8	1/8" (3.18mm)	1/4" (6.35mm)	8 ft.	coiled

## Gray Custom Lengths

The ESD-safe, Static Dissipative Polyurethane vacuum hoses are available in custom lengths either straight or coiled. The coiled hose is provided with a 6" (152.4mm) tail at each end.

The pricing is per foot. In the part number below replace the "L" with the length in feet that you want to order. *EXAMPLE: VCH-1/16-10 is the part number for a 1/16" (1.59mm) ID coiled vacuum hose that has a 10 feet of working length when extended.*

	Inside diameter	Outside diameter	Extended length	Style	
VSH-1/16-L	1/16" (1.59mm)	1/8" (3.18mm)	custom	straight	Priced per Foot
VCH-1/16-L	1/16" (1.59mm)	1/8" (3.18mm)	custom	coiled	
VSH-1/8-L	1/8" (3.18mm)	1/4" (6.35mm)	custom	straight	
VCH-1/8-L	1/8" (3.18mm)	1/4" (6.35mm)	custom	coiled	

• Hoses can be coiled to a minimum of 1 foot and up to a maximum of 10 feet.

## Clear Permanent Static Dissipative Standard Lengths

Permanent Static Dissipative special design for cleanroom application. Our custom blend hose with 2.5mm ID and 4mm OD.

	Inside diameter	Outside diameter	Extended length	Style
VCH-2.5mm-5	2.5mm (.098")	4mm (.158")	5 ft	coiled
VCH-2.5mm-6	2.5mm (.098")	4mm (.158")	6 ft	coiled
VCH-2.5mm-8	2.5mm (.098")	4mm (.158")	8 ft	coiled

## Clear Flexible Static Dissipative Custom Lengths

Flexible Static Dissipative special design for cleanroom application. Our custom blend hose with 2.5mm ID and 4mm OD are available in custom lengths either straight or coiled. The coiled hose is provided with a 6" (152.4mm) tail at each end.

The pricing is per foot. In the part number below replace the "L" with the length in feet that you want to order. *EXAMPLE: VCH-2.5mm-10 is the part number for a 2.5mm ID coiled vacuum hose that has a 10 feet of working length when extended.*

	Inside diameter	Outside diameter	Extended length	Style	
VSH-2.5mm-L	2.5mm (.098")	4mm (.158")	custom	straight	Priced per Foot
VCH-2.5mm-L	2.5mm (.098")	4mm (.158")	custom	coiled	

• Hoses can be coiled to a minimum of 1 foot and up to a maximum of 10 feet.

2.5mm Clear Coiled Static Dissipative Hose



Custom Lengths  
Straight  
2.5mm Clear Straight Static Dissipative Hose

## In-Line Hose Filters ESD Safe Nickel Plated Brass

These filters come with a replaceable 40 micron mesh o-ring filter.

		Inlet Connection	Outlet Connection
VF-1616	Barbed hose filter	1/16" (1.59mm) ID Hose	1/16" (1.59mm) ID Hose
VF-2.5MM	Barbed hose filter	2.5mm (.098") ID Hose	2.5mm ID Hose
VF-1818	Barbed hose filter	1/8" (3.18mm) ID Hose	1/8" (3.18mm) ID Hose



VF-1616



VF-2.5MM



VF-1818

## Disposable 43 Micron In-Line Hose Filters

VF-FILTER-43 Barbed hose filter, 1/16" (1.59mm), 43 microns.



## Replaceable In-Line Hose Filters

VF-40M 5 pack of replaceable 40 micron mesh o-ring filters.



## Custom Made Vacuum Tips For Any Application

### Custom And Semi-Custom Vacuum Handling Tips

Many of our customers' special handling needs can be solved with our semi-custom or custom handling tip. Some of the custom tips developed in the past are shown on the right side bar.

### Dual Cup Handling Tips

These tips are application specific. You specify the end to end spacing, as well as the size and material of the vacuum cups to be used. Typical applications are for items that are elongated or where an opening needs to be bridged. These tips can typically be used with all of our vacuum handling tools.

### Three Cup Tips

These tips are application specific. You specify the triangular area to be formed, as well as the size and material of the vacuum cups used. Typical applications are for items that are large odd shaped or where an opening needs to be bridged. These tips can typically be used with all of our vacuum handling tools.

### Extended Reach Tips

We can make vacuum tips with extended reaches up to 18 inches in length.

### Right Angle Tips

We can form the metal probe section to any angle up to 90 degrees.

### Custom Handling tips

Custom handling tips typically require drawing or parts from the customer describing the exact dimensions of the part to be handled or the vacuum tip to be manufactured. Our manufacturing department will then work with your engineers to determine the feasibility and cost of the vacuum tip.

### Procedure of Semi-Custom and Custom Tips

Semi-Custom Tips require you specify the end to end spacing as well as the size and material of the vacuum cups to be used.

Custom Tips require you to send samples of your part(s), drawings, along with exact dimensions and description of your application to our Technical Applications Department at:

Virtual Industries, Inc.  
Attn: Technical Applications Department  
2130 Victor Place  
Colorado Springs, CO 80915

Virtual Industries, Inc. will respond with a detailed recommendation and quote for your order. Please allow up to two weeks.

### Requirements

1. A VALID credit card OR purchase order number with a hard copy must be submitted showing the full value and payment of the custom order.
2. Full name and phone number of person(s) testing the unit(s).
3. If not a current customer, credit references must be provided (unless a credit card number is provided).
















### Conditions

1. There are no returns or refunds on custom orders.

If you need a vacuum source or wish to try any of our quality products, see page 3 for a 10 Day Trial offer!



# General Guide For Selecting A Tip And Vacuum Source

COMPONENT SIZE RANGE Please note the overlap in sizes. One tip will handle many sizes. A heavier part requires a larger cup size. The best method for tip selection is by experimenting on your actual application.		COMPONENT SIZE APPROXIMATION	RECOMMENDED BASIC TIP SIZE	RECOMMENDED VACUUM SOURCE Source Type - C = Continuous S = Self-contained W = Wafer Wand See Legend For Details	COMMON USES Some small parts can be handled from the side. Uses are limited only by your imagination. Replaces conventional tweezers in many applications.
.004" (.102mm)	.01" (.330mm)		VSPT0803-XX	C	Die, 0101, Optics, Small Parts, Mems
.010" (.254mm)	.040" (1.02mm)		VSPT1005-XX	C	Die, 0101, Optics, Small Parts, Mems
.020" (.508mm)	.060" (1.52mm)		VSPT2010-XX	C	Die, 0402, Optics, Small Parts, Mems
.025" (.635mm)	.075" (1.91mm)		VSPT2515-XX	C	Die, Optics, Small Parts, Mems
.030" (.762mm)	.100" (2.54mm)		VSPT3020-XX	C	Die, Optics, Small Parts, Mems
.040" (1.02mm)	.120" (3.05mm)		VSPT4030-XX	C	Die, Optics, Small Parts, Mems
.060" (1.52mm)	.180" (4.57mm)		VSPT6040-XX	C	Die, Optics, Small Parts, Mems
.070" (1.78mm)	.220" (5.59mm)		VSPT7050-XX	C	Die, Optics, Small Parts, Mems
.080" (2.03mm)	.250" (6.35mm)		VSPT8060-XX	C	Die, Optics, Small Parts, Mems
.100" (2.54mm)	.300" (7.6mm)		V9009-X VSPT8060-XX	C	Optics, SMD, Mechanical Parts
.150" (3.80mm)	.400" (10mm)		V9013-X VSPT8060-XX VRT-125-X	C or S	C Optics, SMD, Mechanical Parts
.200" (5.08mm)	.600" (15mm)		V9018-X VRT-188-X	C or S	C Optics, SMD, Mechanical Parts
.250" (6.35mm)	.750" (19mm)		V9025-X VRT-250-X	C or S	C Optics, SMD, Mechanical Parts
.400" (10mm)	1.50" (38mm)		V9038-X	C or S	C Optics, SMD, Mechanical Parts
.500" (12.7mm)	2.00" (50mm)		VRT-375-X V9038-X	C or S C	C Optics, SMD, Mechanical Parts
.600" (15mm)	3.00" (76mm)	(Space Limitation)	V9050-X VRT-500-X	C or S C C	Optics, SMD, Mechanical Parts
.800" (20.3mm)	4.00" (100mm)		V9075-X VRT-750-X	C or S C	Optics, SMD, Mechanical Parts
1.50" (38.1mm)	4.00" (100mm)		VRT-1000-X VMWT-A	C W	Optics, SMD, Mechanical Parts Wafers, Displays, Glass, Solar Cells
1.75" (44.5mm)	6.00" (150mm)		VMWT-B	W	Wafers, Displays, Glass, Solar Cells
2.25" (57mm)	8.00" (200mm)		VMWT-C	W	Wafers, Displays, Glass, Solar Cells
4.00" (101mm)	12.00" (300mm)		VMWT-D	W	Wafers, Displays, Glass, Solar Cells
6.00" (152mm)	12.00" (300mm)		VWT5R-AR	W	Wafers, Displays, Glass, Solar Cells
1.00" (25.4mm)	up to 12" (300mm)	Customer Specified Dimensions	Dual Cup Tip	C or S	Large or Unusually Shaped Items
1.00" (25.4mm)	up to 24" (600mm)		Three Cup Tip	C or S	Large or Unusually Shaped Items

LEGEND	C = Continuous Vacuum Handling Systems are those that are battery operated such as the PAC-VAC®; those that plug into a power source such as the TV-1000, SMD-VAC-HP, and those that operate on a compressed air supply or connect to an in-house vacuum system.
	S = Self-Contained Manually Operated Handling Tools are those such as the PEN-VAC®, HANDI-VAC®, or VACULA® tools that generate a vacuum through pressing a vacuum button or squeezing the tool to create a vacuum. Note: Objects to pick-up must be non-porous.
	W = Wafer Handling Tools such as the PORTA-VAC®, PORTA-WAND®, STEALTH-WAND or any of our other wafer handles that connect to an in-house vacuum source.
	X or XX = Material selection or straight or bent probe.