# Fume Extraction



Solutions and systems for soldering, rework and repair of electronics



## Fume **Extraction** Systems



As the full solution provider in the electronics industry, PACE has set the standards for over 20 years by leading technology development for fume extraction equipment specifically designed to meet the requirements of the electronics industry and by educating the industry on the effects of exposure and how to protect workers.

PACE offers Fume Extraction Systems that feature the latest advancements in filter condition monitoring and process control as well as cost effective solutions that incorporate many of our best features. A variety of collection accessories are available that offer highly effective source capture or wide area extraction to meet virtually any application.

Each system is composed of rugged steel construction and includes a heavy-duty, brushless motor for years of troublefree service. Convenient, disposable filter cartridges are easily changed, eliminating the need for messy cleaning and costly service visits.

### **The Benefits** OF PACE FUME EXTRACTION



Fumes are pulled away from the operator.

- 2 As flux fumes are removed at their source, secondary exposure of other operators is eliminated.
- 3 Assemblies and the work area are kept clean from flux fume contamination.
- 4 Filtered air is recirculated back into the work environment instead of being vented to the outside. Therefore, energy savings in the form of air conditioning and heating costs are realized.
- 5 Unfiltered air is not exhausted to the outside which may require costly environmental permits and pollution control devices.
- 6 PACE Fume Extraction Systems offer the greatest flexibility as they are modular and can be easily disassembled and reassembled in another location as manufacturing processes and layouts change.

It's a fact...hazardous fumes in the working environment result in increased absenteeism, employee turnover, worker's compensation claims and lost productivity. Medical research has confirmed an increased incidence of occupational asthma, chronic bronchitis, allergic reactions, contact dermatitis and other health related effects associated with exposure to flux fumes. The substances in flux fumes are regulated by international health and safety agencies and many have been designated as Occupational Sensitizers which means that exposure should be eliminated or reduced to as low a level as possible. Where manual soldering is being performed or where solder-pots/fountains are utilized, hazardous fumes are produced and workers need to be protected from them.



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### FACT: Exposure to Solder Fumes Leads to Respiratory Illness

When rosin-based or rosin-containing fluxes are heated, a substance called colophony is produced, which is one of the major causes of occupational asthma. In order to reduce exposure to colophony, rosin-based fluxes have been exchanged for no-clean or synthetic fluxes that contain no rosin or very low percentages. While this reduces or eliminates exposure to colophony, new chemical irritants may be introduced into the work place, many of which pose a more substantial threat to workers. Over 95% of the total fume produced from rosin-based fluxes are in the form of particulates. Chemical exposure from flux fume varies widely and is dependent on the chemical composition of the flux. Non-rosin or low-rosin fluxes use chemically aggressive substances such as acids, solvents, or alcohols in place of rosin to improve the cleaning action of the flux. **This is also true for Lead Free solders.** 

Exposure to these substances is also recognized as hazardous, and when flux is heated, the resultant chemical by-products can be even more hazardous. Additionally, the use of cleaners, solvents or adhesives, which are common in electronic soldering applications, expose workers to chemical hazards. The human body has been designed with defense mechanisms such as nasal passageways lined with mucus that will collect larger particles through a process known as impaction and ciliated breathing passageways to remove foreign substances from the main airways of the lungs. Flux fumes contain high levels of respirable particles (less than 3.5 microns in diameter similar in size to cigarette smoke), that can bypass these natural defense mechanisms and deposit themselves in the gas-exchange region of the lungs, thereby posing the greatest exposure hazard.

### FACT: Material Safety Data Sheets for Fluxes Recommend the Use of Local Exhaust Ventilation Systems

The health effects caused by exposure to flux fumes tend to be forms of respiratory illness and contact dermatitis. However, since the components of flux fume are often designated as occupational sensitizers, chronic or prolonged exposure increases the severity of health effects. PACE Fume Extraction is a key element in protecting workers from being exposed to flux fumes!





## Benchtop Fume Extraction





Arm-Evac 50



Arm-Evac 50 with optional Dual Arm Attachment



Providing fume extraction to two workstations

## Arm-Evac 50

The Arm-Evac 50 is a unique, portable, cost-effective, bench-top fume extractor that provides wide area fume extraction or highly efficient source capture at two points using the optional arm attachment. The Arm-Evac 50 features operator adjustable airflow, quiet operation and a wide variety of filters to meet the needs of virtually any application.

See page 7 for replacement filters.

Specifications	Arm-Evac 50
Part Number	8889-0050-P1
Dimensions	250mm (8.5") <b>H</b> x 330mm (13") <b>W</b> x 315mm (12.5") <b>D</b>
Weight	6 Kg (13 lbs)
Power Requirements	115 or 230 VAC, 50/60 Hz
Noise Level*	54 dBA
Number of Inlets	One laminar flow, plenum inlet
Flow Rate	Adjustable: 152m <sup>3</sup> /h (90cfm) max with Plenum, One Arm Adjustable: 84.5m <sup>3</sup> /h (45cfm) max, Two Arms Adjustable: 50m <sup>3</sup> /h (30 cfm) max per arm
Number of Collection Accessories	Up to six 45mm (1.75"), Up to four 75mm (3")
System Options	Dual Arm Accessory, 8886-0055-P1
Standard Primary Filter	General Purpose Filter
Filtration Options	General Purpose Filter, Cleanroom Filter

\* Airflow and noise level are nominal numbers and will vary based on voltage



### Portable Fume Extraction for 1 to 4 Workstations



See page 7 for replacement filters. See pages 7 through 9 for additional accessories.

## Arm-Evac **105**

The best protection from harmful fumes in its price range. The Arm-Evac 105 is portable, compact and can be easily placed on or under a workbench. The unit features a heavy-duty, maintenance-free brushless motor along with a filtration process which includes a pre-filter for course particle removal, and a High Efficiency Particulate Arrestor (HEPA)/Gas Filter Cartridge. An inlet cap is provided to seal the unused inlet if only one flex-arm is used.

Specifications	Arm-Evac 105	Arm-Evac 105E		
Part Number	8888-0110-P1	8888-0105-P1		
Power Requirements	115 VAC, 60 Hz	230 VAC, 50 Hz		
Dimensions	362mm (14.25") <b>H</b> x 290mm	n (11.5") <b>W</b> x 290mm (11.5") <b>D</b>		
Weight	11.5 Kg	(25.3 lbs)		
Noise Level*	55 dBA			
Number of Inlets	Two 75	Two 75mm (3")		
Flow Rate* General Purpose Filter	Single Inlet: 220m³/h (131 cfm); Dual Inlet: 118m³/h (70 cfm) per inlet			
Flow Rate* Cleanroom Filter Single Inlet: 187m <sup>3</sup> /h (110 cfm); Dual Inlet		Dual Inlet: 105m³/h (62 cfm) per inlet		
Number of Collection Accessories	Two 75	5mm (3")		
Maximum Duct Run	2.5m (8') per inlet			
Standard Primary Filter	General Purpose Filter			
Filtration Options	General Purpose Filter, Cleanroom Filter, Adhesive Filter Extended Life Filter, Economy Filter			

\* Airflow and noise level are nominal numbers and will vary based on voltage

## Arm-Evac **200**

The Arm-Evac 200 is designed to meet the needs of light-duty production as well as rework and repair operations. Lightweight and compact, the Arm-Evac 200 installs in minutes. A wide variety of collection accessory options and filters are available. An optional silencer/mobile cart is also available.

Specifications	Arm-Evac 200	Arm-Evac 200E	
Part Number	8889-0205-P1	8889-0200-P1	
Power Requirements	115 VAC, 60 Hz	230 VAC, 50 Hz	
Dimensions	393mm (15.4") <b>H</b> x 282mm (1	1.1") <b>W</b> x 365mm (14.3") <b>D</b>	
Weight	13.75 Kg (	30.25 lbs)	
Noise Level*	58 dBA		
Number of Inlets	Two 75mm (3")		
Flow Rate* General Purpose Filter	ieneral Purpose Filter Single Inlet: 288m³/h (170 cfm); Dual Inlet: 170m³/h (100 cfm) pe		
Flow Rate* Cleanroom Filter	Single Inlet: 255m <sup>3</sup> /h (150 cfm); Du	al Inlet: 135m³/h (80 cfm) per inlet	
Number of Collection Accessories	Up to four 45mm (1.75"), Up to four 75mm (3")		
Maximum Duct Run	5m (16') per inlet		
System Options	Silencer / Mobile Cart		
Standard Primary Filter	General Purpose Filter		
Filtration Options	General Purpose Filter, Clear Extended Life Filte	room Filter, Adhesive Filter, r, Economy Filter	



See page 7 for replacement filters. See pages 8 through 10 for additional accessories.

 $^{\ast}$  Airflow and noise level are nominal numbers and will vary based on voltage

## Portable Fume Extraction



See page 7 for replacement filters. See pages 8 through 10 for additional accessories.

## Arm-Evac 250

The Arm-Evac 250 is ideal for heavy-duty operations that need high capacity and continuous particle filter monitoring. Incorporating microprocessor technology, an easy-to-read graphical LED filter condition monitor changes from green to yellow to red as the filter becomes clogged. Additionally, flow sensors increase power to the motor as filters become blocked to assure peak performance. The filter monitoring system self calibrates using a membrane keypad on the front panel and an audible alarm alerts the operator when a filter change is required. A three-position motor speed button is also on the front panel. A wide variety of collection accessory options and filters are available. An optional silencer/mobile cart is available.

Specifications	Arm-Evac 250	Arm-Evac 250E	
Part Number	8889-0255-P1	8889-0250-P1	
Power Requirements	115 VAC, 60 Hz	230 VAC, 50 Hz	
Dimensions	393mm (15.4") <b>H</b> x 282mm (1	1.1") <b>W</b> x 365mm (14.3") <b>D</b>	
Weight	14 Kg (3	31 lbs)	
Noise Level*	58 dBA		
Number of Inlets	Two 75mm (3")		
Flow Rate* General Purpose Filter	Single Inlet: 288m <sup>3</sup> /h (170 cfm); Dua	<b>I Inlet:</b> 170m³/h (100 cfm) per inlet	
Flow Rate* Cleanroom Filter Single Inlet: 255m <sup>3</sup> /h (150 cfm); Dual Inlet: 135m <sup>3</sup> /h (80 cfm)			
Number of Collection Accessories	Up to four 45mm (1.75")	, Up to four 75mm (3")	
Maximum Duct Run	5m (16') p	per inlet	
System Options	Silencer / M	obile Cart	
Standard Primary Filter	General Purpose Filter		
Filtration Options	General Purpose Filter, Clean Extended Life Filter	room Filter, Adhesive Filter, r, Economy Filter	

\* Airflow and noise level are nominal numbers and will vary based on voltage



## Fume Extraction Filters



#### **Our Filtration Systems**

PACE's Filtration Systems have been specifically designed for applications in the electronics industry. A wide variety of filtration options are available for use with PACE Fume Extractors ensuring that you always have the right filter for the job.

Filtration systems for soldering applications are comprised of three filters. As fumes are collected, they first encounter the Pre-filter, which is a lower efficiency particle filter that is used to protect the primary filter from large particles, extending the life of the primary filter. Next is the Primary Particle Filter which is a particulate filter with large surface area having efficiency ratings of 85% and higher. A variety of filtration

efficiencies are available to suit your needs. Lastly, a Gas Filter is included to eliminate any hazardous gases that may be present. PACE's Gas Filters use high-grade activated carbon or they combine adsorptive and chemisorptive technologies to maximize effectiveness. To fully understand your gas filtration needs, always consult your Material Safety Data Sheet. The Arm-Evac 50, 105, 200 & 250 use "Combo Filters" which means that the Primary and Gas filters are contained in one filter cartridge. The Arm-Evac 500 uses separate Primary and Gas filters which need to be changed individually. Pre-filters should be inspected at least weekly. When they become clogged, they should be replaced immediately to maximize primary filter life.

#### **Filter Types**

Less		Filter Type	Filter Efficiency Rating	Recommended Application
	Pre-filters	90% ARRESTANCE EU 4	Recommended for use with all filtration systems.	
	Economy Filters	N/A N/A	Ideal for applications where coarse dust is generated.	
		General Purpose Filters	85% EU 8	Recommended for soldering applications where normal volumes of fumes are being generated for 1 or 2 shifts. (.2-80 microns)
	Cleanroom Filters	99.99% EU 13	Recommended for applications in Cleanroom environments or where the highest filtration efficiency is required. (.2-2 microns)	
	High Capacity Filters	85% EU 8	Recommended for soldering applications where heavy volumes of fumes are generated or where operations are running 3 shifts. Filter contains additional filtration media and will last longer.	
	Adhesive Filters	N/A	Recommended for any bench-top application utilizing adhesives, solvents, or cleaners used in small quantities and not in open containers or "baths".	

#### **Filter Selection**

The following chart is a quick reference guide for PACE Filtration Systems. Simply select your fume extraction central filtration unit and the type of filter you need to identify the part number of the filter. (**Bold part numbers indicates standard primary filter in Central Filtration Unit**).

System	Pre-filter	High Capacity Pre-filter	Economy Filter	General Filter	Cleanroom Filter	High Capacity Filter	Carbon Filter	Adhesive Filter
Arm-Evac 50	8883-0125-P5	N/A	N/A	8883-0280-P1	8883-0290-P1	N/A	N/A	8883-0295-P1
Arm-Evac 105	8883-0111-P5	8883-0986-P10*	8883-0871-P1	8883-0901-P1	8883-0921-P1	8883-0987-P1*	N/A	8883-0951-P1
Arm-Evac 200	8883-0111-P5	8883-0986-P10*	8883-0871-P1	8883-0931-P1	8883-0921-P1	8883-0987-P1*	N/A	8883-0951-P1
Arm-Evac 250	8883-0111-P5	8883-0986-P10*	8883-0871-P1	8883-0931-P1	8883-0921-P1	8883-0987-P1*	N/A	8883-0951-P1
Arm-Evac 500	8883-0145-P10	N/A	N/A	8883-0955-P1	8883-0965-P1	N/A	8883-0956-P1	N/A

\* High Capacity Pre-filters must be used in combination with a High Capacity Filter. When filters need to be replaced, simply remove them

from the Fume Extractor and replace with a new one. Disposal of filters should be done in compliance with local environmental regulations.



## **ESD Safe** Flex-Arm

PACE's ESD Flex-Arm can be positioned anywhere on the workbench. The ESD Safe Flex-Arm features a highly flexible hard plastic that easily adjusts to an infinite number of positions. The ESD Flex-Arm can be mounted directly to the workbench by cutting a hole in the bench top, or it can be mounted using the optional quick mounting bracket (P/N 8886-0552-P1).

Specifications	ESD Safe Flex-Arm	
Part Number	8886-0750-P1	
ESD Rating	Surface Resistivity: 1.00E3 Ohm; Volume Resistivity: <6.00E2 Ohm-cm	
Length / Diameter	915mm (36") / 75mm (3")	
Mounting	Directly onto Fume Extractor or uses optional Bench Mounting Bracket	
Standard Endpiece	Round	



Contains everything needed to mount an ESD Safe Flex-Arm to a workbench.

Part Number: 8886-0765-P1 Includes: (1) ESD Safe Flex-Arm (part number 8886-0750-p1), (1) Quick-Mount Bench Mounting Bracket Kit (part number 8886-0745-P1).

### **Mounting Bracket for 75mm** (3") ESD Safe Flex-Arm

Allows the ESD Safe Flex-Arm to be mounted virtually anywhere. Quick Mount clamp allows for arm and bracket to be repositioned in seconds.

Part Number: 8886-0770-P1

### 75mm (3") Expansion Kit

Allows two 75mm (3") diameter arms to be connected to one 75mm (3") inlet on the fume extractor. Contains one 3m (10') length of 75mm (3") flex hose, one 1.5m (5') length of 75mm (3") flex hose, one 75mm (3") "Y" connector, and four 75mm (3") endcuffs.

Part Number: 8882-0105-P1

### **Optional Endpieces**

- A Round Endpiece for omni-directional fume collection. Part Number: 8886-0792-P1
- **B** Collection Tube Endpiece for focused and pin-point fume collection. Part Number: 8886-0794-P1
- C Cowl Endpiece for high volume laminar flow fume extraction. Part Number: 8886-0793-P1



Includes: 2.5m (8') of 75mm (3") ESD Safe Flex

Hose (8886-0755-P1) and Bench Mounting

75mm (3") Flex-Arm Bench

**Mounting Bracket Kit** 

Part Number: 8886-0745-P1

Bracket (8886-0770-P1).

**ESD Safe Flex-Arm Extension Tube** 

75mm (3") Flex-Arm used to increase the length of 8886-0750-P1. 305mm (12") long. Part Number: 8886-0790-P1















## Fume Extraction Accessories

## Static-Safe Flex-Arm

Specifications	36" 50mm (2") Static-Safe Flex-Arm	24" 50mm (2") Static-Safe Flex-Arm
Part Number	8882-0435-P1	8882-0415-P1
Material	Static Safe Flexible Plastic	Static Safe Flexible Plastic
Diameter / Length	50mm (2") <b>D</b> x 915mm (36") <b>L</b>	50mm (2") <b>D</b> x 610mm (24") <b>L</b>





### 50mm (2") Flex-Arm Bench Mounting Kit

Kit includes one 3m (10') Length of 75mm (3") ESD Safe Flex Hose, one 75mm (3") to 50mm (2") reducer endcuff, one 75mm (3") endcuff and one Bench Mounting Bracket (8886-0552-P1). Part Number: 8886-0553-P1



### 50mm (2") Expansion Kit

Allows two 50mm (2") diameter arms to be connected to one 75mm (3") inlet on the fume extractor. Contains one 3m (10') length of 75mm (3") flex hose, one 1.5m (5') length of 75mm (3") flex hose one 75mm (3") "Y" connector, three 75mm (3") endcuffs, and one 75mm (3") to 50mm (2") reducer endcuff. Part Number: 8882-0692-P1



**Bench Mounting Bracket** 50mm (2") Flex-Arm. Part Number: 8886-0552-P1



### **Replaceable Fume-Scoop**

Static Safe Fume Scoop for 50mm (2") ESD Safe Flex-Arm.

Part Number: 8882-0408-01-P1



### 2" to 3" End Cuff

75mm (3") to 50mm (2") Reducer. Part Number: 8882-0775-P1



75mm (3'') Y

75mm (3") Y connector. Used to connect two hoses to a single hose. Part Number: 8882-0691-P1



### 3" End Cuff

75mm (3") end cuff. Threads onto 75mm (3") flex hose for easy connection to 75mm (3") Flex-Arms and fume extractor inlets.



\*See pages 11-13 for installation tips and configurations

Part Number: 8882-0776-P1

### Fume Extraction Accessories

### 75mm Air Flow Controller

The Air Flow Controller for the 75mm (3") ESD Safe Flex-Arm gives the user complete control over the fume extraction air flow at their work bench. It is infinitely adjustable from fully-closed to fully-open to precisely deliver the ideal airflow needed to protect workers' health and eliminate any excessive air flow that could cool the solder/reflow work area.



Part Number: 8886-0795-P1

### **50mm Air Flow Controller**

The air flow controller can be connected to any part of the ESD Safe Flex-Arm (P/N 8882-0435-P1 or 8882-0415-P1). The controller is mounted in the base of the arm for ease access. The air flow controller features an adjustable sliding gate valve that is easy to use and adjust.



Part Number: 8886-0509-P1

### **Metal Plenum**

The Plenum is ideal for providing fume extraction to work spaces where soldering is being performed over a large area, such as at several locations on a large PCB. At 455mm (18") wide laminar airflow is supplied over the entire work area, protecting the operator from exposure to harmful fumes. The Plenum also preserves bench-top space as it provides a sturdy shelf. The Plenum is constructed from rugged 18 gauge steel, is static-safe and includes 3m (10') of 75mm (3") ESD Safe Flexible Hose for easy connection to the Arm-Evac 105, 200, 250 or 500.



Specifications	Static-Safe Metal Plenum
Part Number	8886-0366-P1
Dimensions	130mm (5") <b>H</b> x 460mm (18") <b>W</b> x 130mm (5") <b>D</b>
Weight	2.7 Kg (6 lbs)
Material	18 gauge steel
Inlet	One 75mm (3") inlet

#### **Silencer / Mobile Carts**

Specifications	Silencer/Mobile Cart Arm-Evac 200	Silencer/Mobile Cart Arm-Evac 250	Fume Extractor
Part Number	8885-1225-P1	8885-1225-P1	•
Weight	4.5kg (10 lbs)	4.5kg (10 lbs)	
Description	Constructed of 18-Gauge steel a Arm-Evac 250 Silencer/Mobile Car	nd acoustical foam baffle liner. rt includes front locking casters.	

## Fume Extraction Installation & Examples

### **Arm Evac 50 Configurations**

120 V and 230 V



Arm-Evac 50: P/N 8889-0050-P1 (Refer to page 3 for system specifications.)

Arm-Evac 50: P/N 8889-0050-P1 AE 50 Arm Kit: P/N 8886-0055-P1 (One arm shown. Kit comes with 2.) Arm-Evac 50: P/N 8889-0050-P1 AE 50 Arm Kit: P/N 8886-0055-P1 (Two arms shown.)

### Arm-Evac 105, 200 or 250 Configurations

For workstations requiring a single fume collection point



Arm-Evac 105, 200 or 250 (Arm-Evac 105 shown. See pages 4-5 for specifications.)

One 75mm (3") ESD Safe Flex Arm Kits: P/N 8886-0765-P1 Optional flow controller shown: P/N 8886-0795-P1

Arm-Evac 105, 200 or 250 (Arm-Evac 105 shown. See pages 4-5 for specifications.) One 75mm (3") ESD Safe Flex Arm: P/N 8886-0750-P1

### For workstations requiring 2 fume collection points



Arm-Evac 105, 200 or 250 (Arm-Evac 105 shown. See pages 4-5 for specifications.) Two 75mm (3") ESD Safe Flex Arms: P/N 8886-0750-P1

### For workstations requiring 1 or 2 metal plenums



Arm-Evac 105, 200 or 250 (Arm-Evac 105 shown. See pages 4-5 for specifications.) One Metal Plenum Kit (includes hose): P/N 8886-0366-P1



Arm-Evac 105, 200 or 250 (Arm-Evac 200 shown. See pages 4-5 for specifications.) Two 75mm (3") ESD Safe Flex Arm Kits: P/N 8886-0765-P1 Two Optional flow controllers shown: P/N 8886-0795-P1



Arm-Evac 105, 200 or 250 (Arm-Evac 200 shown. See pages 4-5 for specifications.) Two Metal Plenum Kits (includes hose): P/N 8886-0366-P1



### Arm-Evac 200 and 250 Configurations

For workstations requiring 2 to 4 50mm (2") Flex Arms



Arm-Evac 200 or 250 (Arm-Evac 200 shown. See pages 4-5 for specifications.) Two 50mm 24" Long ESD Flex Arm: P/N 8882-0415-P1 Two 50mm Bench Mounting Kit: P/N 8886-0553-P1



Arm-Evac 200 or 250 (Arm-Evac 250 shown. See pages 4-5 for specifications.) Two 50mm (2") diameter 36" long ESD Flex Arms: P/N 8882-0435-P1 Two 50mm Bench Mounting Kits: P/N 8886-0553-P1



Arm-Evac 200 or 250 (Arm-Evac 200 shown. See pages 4-5 for specifications.) Four 50mm (2") diameter, 24" Long ESD Flex Arms: P/N 8882-0415-P1 Two 50mm (2") Bench Mounting Kits: P/N 8886-0553-P1 Two Bench Mounting Brackets: P/N 8886-0552-P1

Two ESD Safe 50mm (2") Flex Arm Expansion Kits: P/N 8882-0692-P1



Arm-Evac 200 or 250 (Arm-Evac 250 shown. See pages 4-5 for specifications.) Four 50mm (2") diameter, 36" long, ESD Flex Arms: P/N 8882-0435-P1 Two 50mm (2") Bench Mounting Kits: P/N 8886-0553-P1 Two Bench Mounting Brackets: P/N 8886-0552-P1

Two ESD Safe 50mm (2") Flex Arm Expansion Kits: P/N 8882-0692-P1

