

Weller®

FUME EXTRACTION

**COOPER** Tools

www.cooperhandtools.com/weller

Solder fumes are dangerous

Fumes and particles are released into the operator's breathing zone when heating solder wire with flux cores, or when using flux with lead-free solders. These fumes (mostly aldehydes and alcohols) can lead to occupational asthma and other allergic reactions when inhaled.

Intense testing by health institutes have proven that specialized equipment for extracting and filtering of dangerous fumes in electronics are necessary to prevent fumes from getting into the operators breathing zone.

Solder fumes consist of 99.5% particles and 0.5% gases. Particles in solder fume that are a threat to human health are lead particles (in dust and smoke) larger than 0.1 micron and fumes of aliphatic aldehydes and isocyanates.

The most common health symptoms are shortness of breath, coughing, wheezing and tightness of the chest in combination with irritation of the eyes, headaches, dizziness and dry cracked skin.

The loss of productivity and working time due to employee illness is incalculable. An investment in a safe and productive working environment will protect your employees and your profits.

Fume Extraction: The Right Way

Best practice for the removal of solder fume is to remove the fumes where they originate. The method of fume extraction used is determined by the type of job the operator has to perform.

An efficient fume extraction system is characterized by the following attributes:

- The extraction point can be either a small tube at the tip of a soldering iron, or a hood or nozzle over the working area.
- A vacuum pump, which provides airflow (vacuum) of the dangerous fumes. The type of motor depends on the system you choose.
- A filtering concept, which removes the dangerous fumes from the airflow.

When performing hand soldering, the most effective method of fume removal is the **tip extraction system**. The dangerous fumes are removed directly from the source at the tip of the soldering iron. The tube can be integral to the soldering iron or can be affixed to an iron as a clip-on kit.

Filter Concept

An arm extraction system is preferred when performing electronics repairs using hot air. Other arm system applications include the use of solder pot, adhesives, or solvents. A free moving arm with a funnel or a hood is placed as close as possible to the working zone.

The Filter Concept consists of three essential components:

- A dust filter which removes larger particles
- A micro filter which removes all smaller particles and increases the lifetime of the gas filter. The separation degree of this filter is 99.97% DOP.
- A gas filter where the airflow is cleaned. The gas filter is made of activated carbon with a chemisorbent.

The chemisorbent increases the lifetime of the filter and allows filtering of a wider range of gases. The dimensions and volume of the filter material is optimized to provide ideal interaction between gas filter media and the gases in the airflow.

The lifetime of the filter varies from three to 12 months depending on working hours, quantity of particles passing through the system and the type of pollution. Most Weller filter systems are equipped with an alarm function indicating when the filter should be replaced. The alarm function employs a vacuum pressure sensor combined with an hour use meter.

Vacuum Pump

Tip extraction systems and arm extraction systems require differing kinds of pumps. For tip extraction a pump with a high vacuum is required. This type of pump provides high airflow speed which enables the removal of gases through small tubes. For arm extraction a pump with low vacuum and high volumes is preferred.

Depending on your choice of extraction principle Weller can provide you with the correct system, advise you on the correct accessories and support you with knowledge about filtering of dangerous gases.

WFE 2X and WFE 8S

These units are suitable for connection to extraction arms or cabinets. The WFE 2X is a mobile system for one or two arms and is typically used for soldering, gluing, and lab work. The WFE 8S

can support a maximum of eight extraction arms. The units are ESD-safe.

Extraction arms

Weller has a wide assortment of extraction arms giving you flexibility and high performance with low total cost of ownership.

More information can be found at:

www.cooperhandtools.com/weller or at:

www.agius.com

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Parts of this brochure have been produced with the courtesy of Dr. Raymond Agius.