When the soldering specialist bans soldering fume

Soldering unit vendor SEHO ensures clean air around their systems

A global success story

In 1976, a still prevalent success story began: SEHO Systems GmbH originally started as ‘SEHO Seitz & Hohnerlein GmbH’ to drive rapid technology developments in electronics industry. The enterprise emerged from a small wave soldering system provider into a global player offering customers compete solutions for soldering processes and automated production lines.

Image 1: SEHO Systems GmbH headquarters in Kreuzwertheim/Germany

SEHO develops and manufactures machines for all fields of automated soldering processes. Founded in 1976, the company started its business with the production of wave soldering systems. By 1985, the product range had been expanded to include reflow machines. SEHO revolutionized the production of electronic devices with the introduction of its first nitrogen wave soldering system in 1986.

The ongoing miniaturization of components resulted in the development of a completely new soldering technology: In 1998, SEHO introduced the first selective soldering system with robotic handling.

During recent years, SEHO successfully implemented its strategy of providing complete solutions and developed from a standard machine provider to one of the leading system

suppliers with innovative automation technology for board handling and materials management. Today, SEHO offers its customers complete solutions for a large variety of manufacturing tasks.

In 2014, a new demonstration center was opened to illustrate these concepts to visitors. The SEHO Technology Center provides customers a multitude of information in a very pleasant atmosphere. Being approximately 960 m², there is enough space for demonstration systems, meeting rooms, and a large event room for seminars and technology days.

The entire SEHO product range of soldering units can be found in the demo center. Naturally, all systems are ready for operation, executing all common soldering tasks for electronic assemblies. Various PCB variants of different sizes, weights, or placement types (single-sided, double-sided, multilayer etc.) are processed.

Image 2: Demonstrations of all soldering systems take place in the SEHO Technology Center

Odorless and clean premises

It is apparent that Technology Center visitors do not notice any odors, but every tinkerer knows the typical smell of molten solder. “There are strict legal regulations on air purification during system operation“, explains Hermann Liebler, Sales Area Manager with SEHO. “Any soldering unit must not be operated without extraction and filtration.” Based on decades of activities with SEHO, among others in the area of process consulting, Hermann Liebler is considered as one of the soldering technology experts in Germany.

Depending on PCB type and mounted components, different solder alloys and fluxes are utilized. During a soldering process, large parts of the fluxes and smaller portions of the solder evaporate. Resulting aerosols and particles are released into the process air. In addition to spreading unpleasant odors, they can cause severe illnesses to the personnel. Aldehydes, occurring from substances containing colophony, are particularly dangerous having carcinogenic potential.
Furthermore, gases evolving during the heating of conformal coatings, adhesives or carrier material must also be considered.
„The protection of machines and products should not be underestimated“, says Udo Kempf, Head of Application with SEHO. Soldering fumes additionally contain adhesive aerosols, which may settle in the soldering systems and, in the worst case, contaminate products. This leads to increased maintenance efforts because system functionality can be reduced.

In order to guarantee required air purification, extraction and filtration systems are applied. But there are no piping or suction hoods on the ceiling. The reason is the building architecture with its wooden beam look was not to be destroyed by such installations, i.e., a centralized extraction solution was simply unsuitable. That is why SEHO decided to run an extraction and filtration device with each soldering system.

Flexible extraction solution for changing requirements
Currently, each of the seven stations in the demo center features an LRA 200 extraction and filtration unit from ULT. The vendor’s LRA system series was developed for soldering fume removal. All filtration systems are placed adjacent to the soldering machines and connected to the systems via piping. These extraction channels, installed by SEHO themselves, are designed to be run also with changing demonstration units. Hence, this is a flexible way to extract and filter soldering fume from the systems. Filtration rate of the exhaust air is extremely high (99.95%), so that it can be fed back to the working area after the filtration process.

If an interested party decides to purchase a soldering unit, SEHO always recommends the acquisition of an air purification system – depending on the air pollutant volume they may vary in size and filtration performance. Partly, extraction devices are integrated into the soldering machine, if the customer’s production situation requires such a solution.

Image 3: LRA 200 fume extraction unit with flexible piping to SEHO soldering systems

The LRA 200 extraction and filtration units are small devices for medium volumes of soldering fume. They are fully adequate in the SEHO Technology Center: “Our soldering systems are not running for several hours or even around the clock”, explains Udo Kempf. “Additionally, we use few fluxes, so that vapors hardly occur and the entire contaminant volume is relatively low“.

Since the extraction system purchase in 2015, filter exchange has not been necessary, as they had not yet been saturated. This is reasoned on the one hand by the low quantities of soldering fume, and on the other by the special filtration concept within the LRA 200 systems, which focusses on long-term filter lives at high filtration rate.

However, there are further applications: in contrast to selective soldering, in wave soldering processes an entire circuit board is wetted with flux.
The emerging spray mists from alcohol-based flux and other assembly evaporations may lead to explosive, highly flammable vapor/air mixtures.
In this case, a larger extraction unit is utilized. It features an expanded metal prefilter to reduce the risk of explosions or fires.

The SEHO Academy – knowledge creates the future

In such a dynamic industry as electronics production, it is important to build up and continuously improve know-how, to ensure production at the highest quality level and simultaneously reduce manufacturing cost. The SEHO Academy lays the foundation for this. Well-educated and experienced trainers with many years of practice provide their knowledge in intensive seminars about the soldering processes, the operation and maintenance of machines. The efficiency of the SEHO training courses is based on a simple principle: to provide a perfect balance of theory and practical application.

Image 4: Training area for hand soldering seminars in the SEHO Academy with extraction installations at each workplace

In addition to process seminars and machine training courses, hand-soldering seminars can be attended at the SEHO Academy. To this end, six workplaces were set up, at which a clean working environment plays a critical role. An LRA 300 filtration unit is utilized for soldering fume removal, providing a central extraction solution. There are extraction arms (Alsident 50) with respective capturing elements (suction tip) at each workplace. These extraction arms are connected to the filtration system via piping. They efficiently remove all generated airborne pollutants. This way, seminar attendees, trainers, work materials, products and workplaces are protected from the hazardous impact of soldering fumes and vapors.

A long-term relationship

The entire extraction and filtration technology applied at SEHO is provided by a single source. One reason is the long-term partnership between the soldering specialist and the company IVH INDUSTRIEVERTRIEB HENNING, ULT's distribution partner in South Germany for nearly 20 years. Long before building the demonstration center and training

rooms, SEHO soldering systems have been run with ULT extraction and filtration systems at numerous customer sites. Udo Kempf considers the lasting relationship with IVH as an important reason in the purchase process of filtration solutions for the new demo center. “Why changing a working relationship?“, he is asking with a smile. IVH assisted SEHO in an advisory capacity during the premises furnishing and, additionally, helped to make sure that “all things flew”, describes Udo Kempf.

The extraction and filtration systems run smoothly and straightforwardly – and nearly noiseless. “One of the ULT devices’ major advantages is their quiet operation“, says Udo Kempf. “Easy operation, high extraction and filtration performance; and one can hardly hear the systems running. That is fun air purification.”

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