

Multi Vacuum

The Soldering
Process of
the Future



Multi Vacuum

Innovative Technology for Top Soldering Results

As early as 1999 ASSCON set a milestone in industrial electronics production with its invention of the world's first vapor phase vacuum soldering process. Since then the company has launched a stream of new developments onto market, which satisfy the increased requirements of modern soldering technology. The centerpiece is Multi Vacuum technology.

In the Multi Vacuum soldering process products are placed under a vacuum both before and during melting of the solder paste. A vacuum before reaching the liquidus temperature is particularly effective because the air inclusions, so-called bubbles or voids, arising when the solder parts are joined, are removed before the solder paste is melted. The main cause of gaseous bubbles on the solder joint in the subsequent production process is outgassing from components, PCBs and substrate material, and also reactive gas released when the oxide layers are removed by flux.

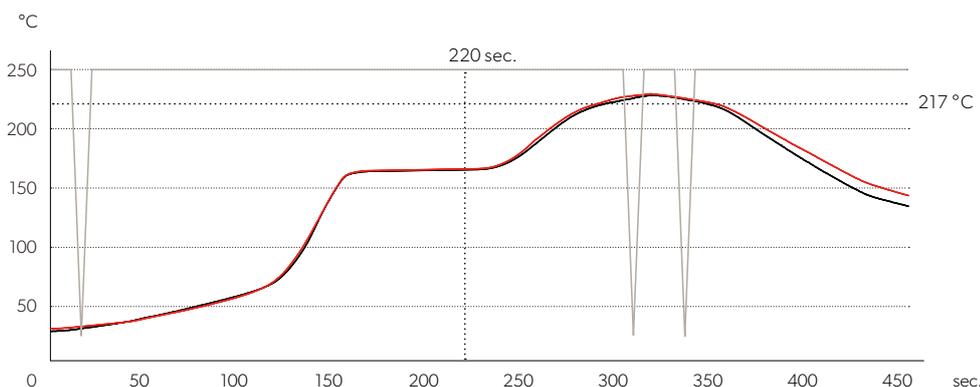
In order to effectively remove these bubbles as well, modules are exposed to a series of separately controlled vacuum processes as part of the patented ASSCON vacuum soldering process. Air or gas bubbles on the solder joint are removed by suction and vanish. Particularly in the case of large-area solder joints, considerably more bubbles can be removed that would be possible in a single vacuum stage.

The Multi Vacuum process also permits void-free solder joints on products with an above-average outgassing potential, for instance in multi-layer applications. Gases still occurring during the first vacuum stage can also be effectively removed from the solder joint while still liqueous during follow-up vacuum stages. Even large voids can be removed from the solder joint in this process consisting of several small phases.

Multi Vacuum soldering is the answer to the challenges of the future. ASSCON is the leader in the field of vapor phase soldering technology and develops innovative processes.

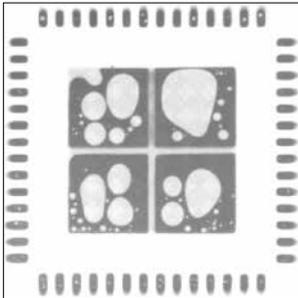
MULTI VACUUM

A typical temperature profile with pre- and two main vacuum phases after soldering.

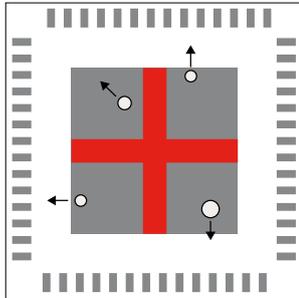


MULTI VACUUM PROCESS

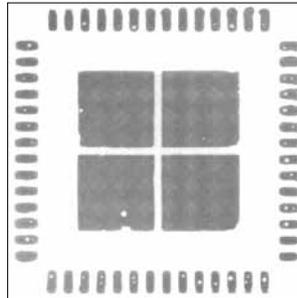
Procedure for reducing void quota prior to the soldering process



SOLDER JOINT PRIOR TO VACUUM PROCESS
High void occurrence



VACUUM PROCESS
Voids are transported to the peripheral areas



SOLDER JOINT AFTER VACUUM PROCESS
Result after two main vacuum phases



after

**voids
< 1%**

After Multi Vacuum treatment.
asscon.de/multivacuum

FUTURE CHALLENGES

Soldering processes are subject to ever increasing demands in the manufacture of industrial electronics. Cycle times are getting shorter and shorter, while products must be top quality to stay abreast of increasing demands.

- Power electronics modules, for instance, require large-area joint faces. They must be void-free to achieve maximum module efficiency.
- Electronic modules are being used increasingly in key daily service areas. Failsafe reliability is essential precisely in this sector. Voids in solder joints represent one of the major risks of failure.
- This is also true of the life span of such modules. Void-free solder joints are also imperative to achieve this goal.
- Spatial electronic modules – known as 3D MID applications – will play a key role in the future. And the same applies: Void-free formation of the solder joint at lowest and homogeneous process temperature can only be achieved by vacuum soldering in the vapor phase.

Tomorrow's Electronics: Powerful and reliable



RENEWABLES



SATELLITE TECHNOLOGY



AVIATION



AEROSPACE



MEDICAL ENGINEERING



ELECTRIC VEHICLES

SMD components are already used today in many sectors. In the future they will assume an increasingly important role in EV, the distribution of electricity generated by renewables, in aerospace, medical engineering and military applications. These implementation areas call for the highest standards of performance. Optimum connexion of components with the printed board achieved by the Multi Vacuum process is thus vital. Manufacturers can thus enhance the reliability and service life of their products.

Our Product Series

Multi Vacuum Technology

IMPLEMENTATION AREA

SMALL SERIES

SERIES PRODUCTION

LARGE SERIES PRODUCTION



PRODUCT

VP800 VACUUM

VP6000 VACUUM

VP7000 VACUUM

TECHNICAL DATA

Maximum solder material format (mm)

480 x 295

600 x 600

520 x 450/optional 1000 x 450

Supply voltage

400V/3/N/PE - 50Hz/60Hz

400V/3/PE/N - 50Hz/60Hz

400V/3/PE/N - 50Hz/60Hz

Average energy consumption per hour

2,2kWh/2,7kWh*

3.0kWh

4.0kWh

Ready for operation

ca. 60min.

ca. 35min.

ca. 45min.

Operating mode

Batch

Batch/upgradable to inline

Inline

Vacuum pump

0.5 mbar

0.5 mbar

0.5 mbar

50 %

less energy
consumption

**0.5
mbar**

vacuum

OUR CERTIFICATES

ASSCON permits compliance with the statutory provisions (WEEE and RoHS) for the conversion of all electronic products to lead-free technology. All systems are suitable for lead-free solder temperatures.

The quality management of ASSCON Systemtechnik-Elektronik GmbH has been certified to DIN EN ISO 9001:2015 (ZN: 01 100 060704).



Management
System
ISO 9001:2015

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* Capacity 80 % /100 %