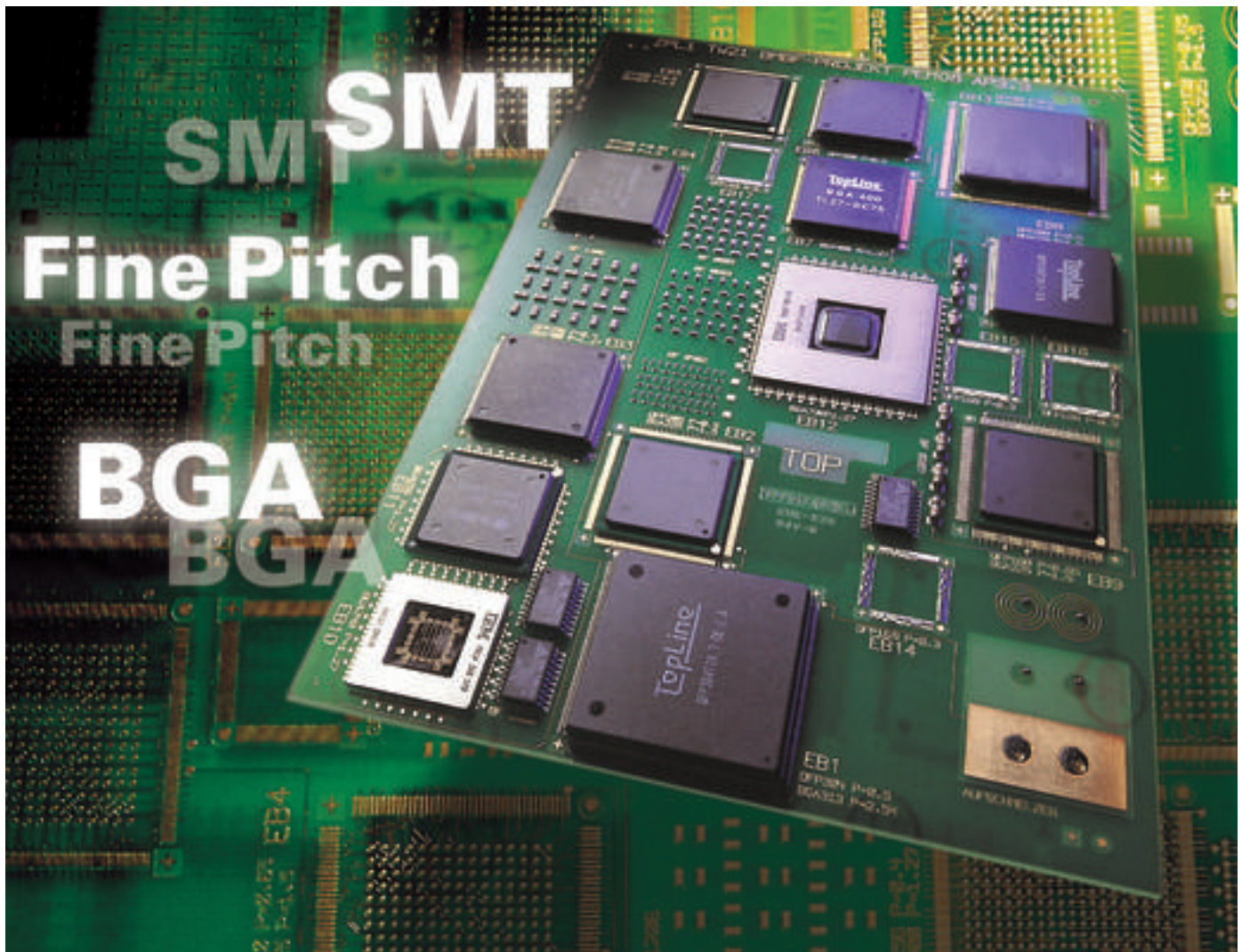


A gas-clear advantage

Gases increase productivity in circuit boards assembly



Gases optimize circuit boards assembly

With over 120 locations and roughly 4,400 employees world-wide, Messer is a leading provider of industrial gases. Our product line includes all types of technical gases, special-purpose gas, gas supply plants and air separation units. Our specialized customer-oriented departments support applications of these gases. We have a consulting team for circuit board assembly, offering services far beyond gas supply. We cooperate with electronics industry leaders in the development of new gas application techniques, covering the entire process chain from semiconductor production to circuit boards assembly.

Nitrogen application: quality improvement in reflow soldering

In reflow soldering, the quality of the connection is largely determined by the melting conditions of the soldering paste. The soldering results are equally dependent upon the atmospheric residual oxygen content.

A residual oxygen content of 1 % will significantly reduce error rates. Messer offers valuable compact units for this purpose, using nitrogen produced in-house as required by the unit. In the case of especially high quality standards, residual oxygen values under 100 ppm are programmed. For this purpose, Messer offers complete gas supply (liquid nitrogen) including entire installation from one source.

Inert gas: the advantage in circuit board soldering

The continuing trend towards miniaturization of electronic devices and the concurrent introduction of new parts and encasing techniques (BGA, CSP et al) result in increased demands on the quality of soldered connections. At the same time, the productivity in electronics assembly production must be continuously improved in order to survive international competition.

Intelligent application of industrial gases in electronics assembly production is one way to meet these demands in a sound economical manner.

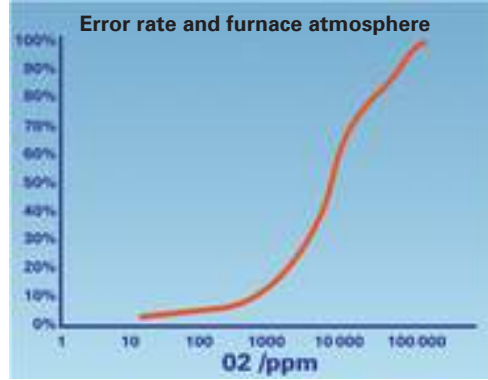
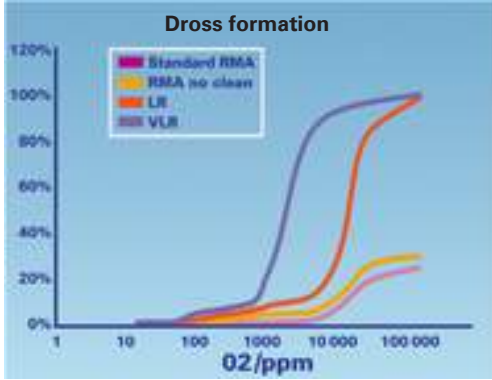


Modern inert gas wave soldering units such as ERSA's "powerflow" represent a new generation of machines combining all aspects of modern production. (Photo: ERSA)

Soldering with nitrogen

- increases the process window
- allows the use of low-residue soldering pastes and flux
- improves wetting
- reduces error rates (reworking) and
- suppresses dross formation in wave soldering.





Reflow systems using inert gas pave the way for demanding soldering techniques such as fine-pitch or bare copper. (Photo: ERSA)

Wave soldering with nitrogen

Wave soldering will continue to play an important role in the future. Here, as in reflow soldering, results can be improved by the use of nitrogen. A residual oxygen content of 1 % will already effectively reduce dross formation. Messer also provides assistance in the retrofitting of existing wave soldering units.

Services

The production of electronic assemblies is a complex process. Messer offers a complete, productivity-oriented consulting and service package for all gas-related areas:

- profitability studies and gas applications consulting
- gas supply and installations consulting
- gas analysis (i.e. residual oxygen monitoring)
- soldering result analysis by qualified personnel and a variety of methods, e.g. SEM and AES.

Development projects

In addition to the large number of services they provide, our development department is also closely involved in the conversion of printed circuit board production to "lead-free" technology. This has meant initiating numerous cooperation projects with well-respected partners and customers. The practical implementation of our employees' technological know-how and the utilization of the findings from our fundamental studies are in the forefront of these projects. The surface tension and binding behavior of lead-free solders in inert-gas atmospheres with various residual oxygen contents has been of particular



interest. Such information represents a vital basis for pcb manufacturers' decisions regarding the choice of solder materials to use.

A small selection of our activities demonstrates that the development of solutions in collaboration with our customers is an essential part of our philosophy. We offer our customers individual solutions, tailored to their needs and based on our knowledge as well as that of our partners and independent institutes. If you would also like to benefit from our extensive contact network and technological expertise, please do not hesitate to contact us!



Modern gas-separation technologies such as our membrane systems in compact cabinet enclosures allow cost-effective and user-oriented in-house nitrogen production.