Use of nitrogen in wave or reflow soldering

With the help of an innovative gas separation waste heat concept， nitrogen production becomes a decarbonized system that protects the environment and your wallet at the same time. Internal power generation is also part of a sustainable development strategy， which leaves significantly lower CO2 emissions.

Nitrogen (N2) is used in the production of electronic products because it creates a protective atmosphere that prevents oxidation during the soldering process， thus ensuring optimal product quality. Thanks to XITE's latest technological innovation， the on-site generation of N2 offers the possibility to make production more environmentally friendly. the self-generation of N2 will also be part of a sustainable development strategy， as it leaves much lower CO2 emissions than the LIN (liquid nitrogen) supply.

Profitability and productivity are the primary goals of every company. Therefore， companies are always looking for ways to reduce costs in order to improve their competitiveness. At the same time， legal requirements in terms of environmental protection

and decarbonization are increasing， which are usually associated with increased costs. However， what at first glance appears to be a competing goal turns out in practice to be a win-win situation from which companies derive a double benefit.

Requirements for lead-free soldering

Nitrogen is used specifically in selective soldering， wave soldering or reflow soldering processes. The inert gas replaces the oxygen in the system and prevents oxidation for high-quality solder connections in electronic components. Contamination by the formation of dross and whiskers and the corresponding subsequent damage (e.g. short circuits) is effectively avoided and the consumption of solder and flux is reduced. In addition， the use of nitrogen gas is a prerequisite for soldering lead-free solder according to the EU RoHS (Restriction of Hazardous Substances) directive.

The nitrogen required for this can be produced on site in an environmentally friendly manner. An N2 generator uses PSA technology to adsorb the required quantity and quality of nitrogen from the ambient air. The compressed air used is generated by a compressor. The disadvantage here is that most of the electrical energy provided is converted into heat by the compressor and evaporated without any effect. The solution would be an innovative waste heat concept for gas power generation which reduces the electricity demand and at the same time makes the generated heat energy available.

Energy savings with hydrogen and heat recovery

The production of nitrogen requires different amounts of compressed air. While conventional systems require a compressed air factor of 12 to 14， the new PSA system consumes only 6.7 - 7.0 cubic meters of compressed air per cubic meter (N2). With the help of the NKat hydrogen catalyst， the amount of compressed air required is significantly reduced. In the two-stage process， the "raw" nitrogen is 99.9% pure and then， with the help of hydrogen， nitrogen of 99.999 - 99.9999% pure is produced in a second step. In this way， large quantities of high purity nitrogen can be produced with significantly reduced

compressed air requirements (compressed air factor of 3.0)， allowing savings of up to 70% of the electricity required by conventional PSA technology.

In addition， the waste heat from the air compressor can be recovered to improve the energy balance for self-generation. Using heat recovery technology (WRG)， waste heat is used as warm air or hot water to heat rooms and processes. By using waste heat， fossil fuels can often be replaced and saved. Hydrogen and heat recovery can save energy

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Sustainable actions

Legal guidelines encourage a shift towards more sustainability. Companies are increasingly following the EU's ESG guidelines， which require sustainable actions in the ecological， social and legal (governance) fields. The federal government's national climate protection law mandates a 55% reduction in greenhouse gas emissions by 2030. In addition， greenhouse gas neutrality is to be achieved by 2050. Investing in resource-efficient and environmentally friendly technologies to reduce CO2 emissions from industrial processes