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Case study

Removal of flux residues on a Printed Circuit Board after soldering

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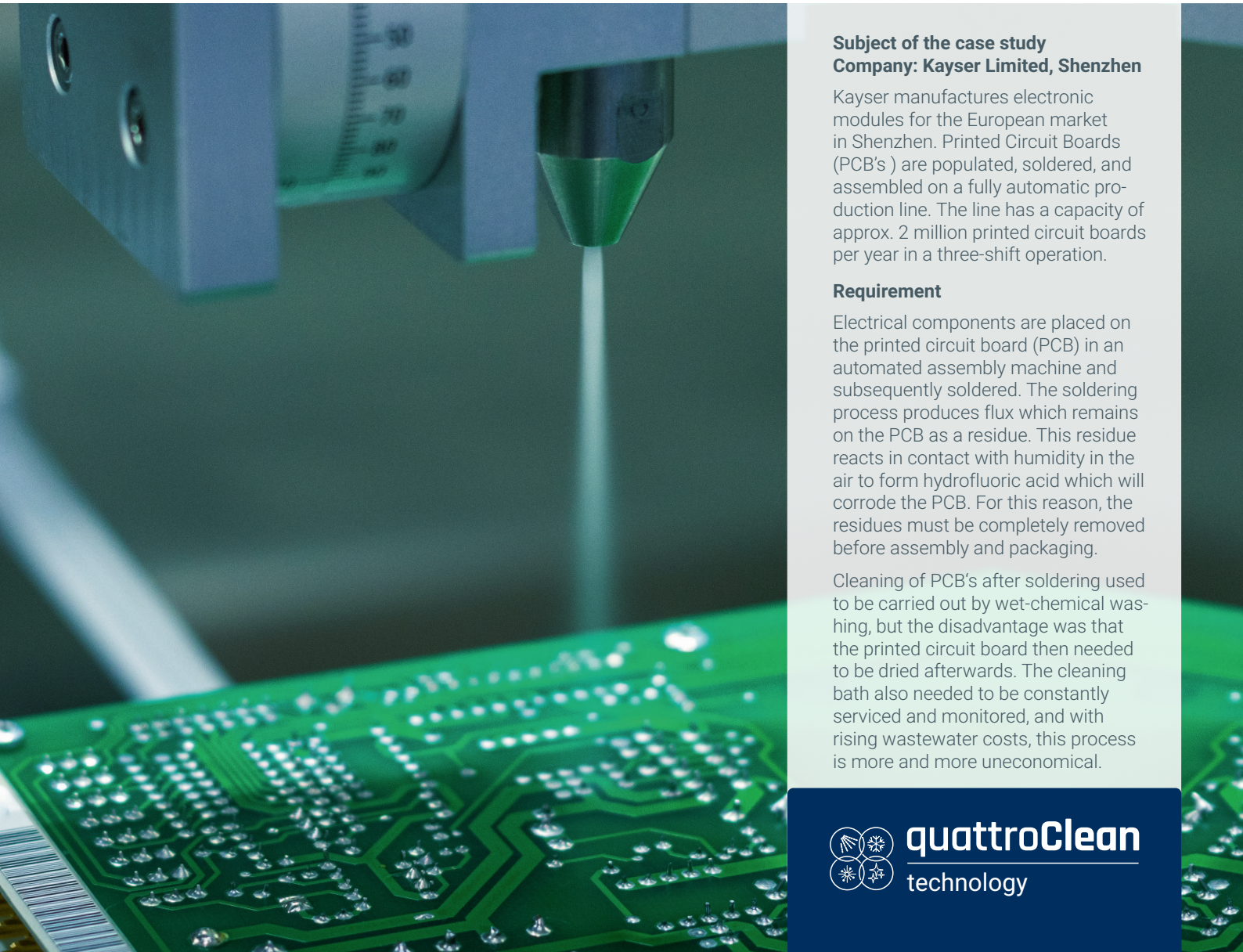

Subject of the case study
Company: Kayser Limited, Shenzhen

Kayser manufactures electronic modules for the European market in Shenzhen. Printed Circuit Boards (PCB's) are populated, soldered, and assembled on a fully automatic production line. The line has a capacity of approx. 2 million printed circuit boards per year in a three-shift operation.

Requirement

Electrical components are placed on the printed circuit board (PCB) in an automated assembly machine and subsequently soldered. The soldering process produces flux which remains on the PCB as a residue. This residue reacts in contact with humidity in the air to form hydrofluoric acid which will corrode the PCB. For this reason, the residues must be completely removed before assembly and packaging.

Cleaning of PCB's after soldering used to be carried out by wet-chemical washing, but the disadvantage was that the printed circuit board then needed to be dried afterwards. The cleaning bath also needed to be constantly serviced and monitored, and with rising wastewater costs, this process is more and more uneconomical.

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CO_2 snow-jet cleaning

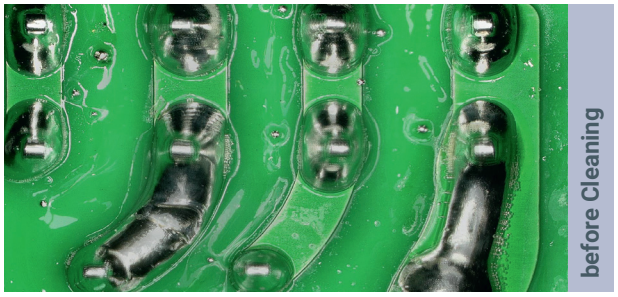
Objectives in Manufacturing
Dry, particle and film free products

Features & benefits
- Dry, chemical-free cleaning
- Fast & efficient (no drying cycle required)
- Residue free
- Selective
- No chemicals or wastewater
- Kind on the environment (recaptured CO_2)
- Manual or automated

Why acp?
For two years, Kayser Limited, Shenzhen. has been cleaning printed circuit boards using CO_2 snow-jet processes from acp systems AG. This company has a long history of partnership with acp systems AG and the former company ACI AG.

The Solution

5 pre-loaded PCB's are indexed into position under a mask inside the cleaning cell to isolate only the critical parts of the PCB that require cleaning. A single nozzle on a horizontal axis then selectively cleans all five PCB's in 20s, before returning the PCB's back to the line. The enclosed system is fully automated and includes an extraction system to remove contamination from the cell.



Summary & Benefits

By deploying a CO_2 snow-jet cleaning process, Kayser Ltd. saves time and above all production costs. In addition, the quality of the product is stabilized with this process, which is an essential requirement for European customers.

The main benefits for Kayser are:

Time saving
No drying necessary, the circuit board is dry after cleaning and can be packaged immediately.

Environmentally friendly
No toxic wastewater is produced; removed residues are separated and disposed of in an air filter.

Selectivity
The whole PCB does not need to be cleaned, ONLY the side containing flux residues.

Sensitivity
Flux residues are removed without effecting the structure of the PCB.

acp systems AG
Ditzingen
Berblingerstraße 8 · 71254 Ditzingen
Tel. +49 (0)7156 48014 - 0 · info@acp-systems.com
www.acp-systems.com

acp systems AG
Zimmern ob Rottweil
Albring 18 · 78658 Zimmern ob Rottweil
Tel. +49 (0)741 175299 - 0 · info@acp-systems.com
www.acp-systems.com