# Advantages of an Automated Stencil Cleaning System

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We are frequently asked to quantify the financial advantages of an automated stencil cleaning system over a manual stencil cleaning operation. The fact is, based on time (labor) alone, there are no financial benefits associated with an automated stencil cleaning process.

In reality, an evaluation on the ROI of an automated stencil cleaning process must take into account several factors that are difficult to provide quantitative monetary returns. Many of the advantages are intangible.

To fully appreciate the advantages of an automated stencil cleaning process, let's examine a manual stencil cleaning process. Manual stencil cleaning requires an operator to apply a solder paste removing chemical to the surface of a stencil. This is accomplished with either a chemical trigger spray application or with a presaturated wipe. Once the chemical is applied, the operator wipes the stencil and removes the solder paste from the surface. Extreme care must be taken to avoid damaging the stencil. Fine apertures are easily damaged by course wipes. Normally, both sides must be thoroughly wiped down with an emphasis placed on the apertures.

Once all of the solder paste has been removed from a stencil, the stencil is normally rinsed and dried to remove the chemical's residue.

Manual stencil cleaning process have several associated costs. These costs include:

**Labor**

3 – 5 minutes per stencil. Most automated stencil cleaning systems require about the same time.

**Chemical**

Specific costs vary, but chemical costs are 3 – 4 times higher in manual cleaning applications compared to automated processes.

**Environmental**

Manual stencil cleaning processes have the greatest potential negative effect on the environment. Solder paste is a hazardous waste and must be disposed of in accordance with local, state, and federal law. Manual stencil cleaning processes rely on the operator to follow established hazardous waste handling and disposal procedures. A single operator determines the environmental efficacy of your company. Most automated stencil cleaning systems are equipped with filtration systems that automatically prevent solder paste from leaving the machine. This eliminates an operator from environmental equations.

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### Operator Safety

Stencil cleaning involves contact with solder paste and chemicals. A manual stencil cleaning process requires a human interface with lead and chemicals. Although the use of gloves and eye protection are required, ultimately the operator is working in direct contact with one and potentially two hazardous substances. Automated stencil cleaning systems reduce the contact between the operator and the hazardous materials.

### IPC Specifications

IPC 7526 Stencil Cleaning Specification states: “6.2 Manual Stencil Cleaning Manual cleaning of stencils is widely used by process technicians. However, the inherent limitations and hazards associated with manual cleaning usually far outweigh the benefits.”

### Consistency

Manual processes in general are less consistent than their automated counterparts. A manual process relies on pre-established best practices and procedures. Automated processes product consistent and stable results.

### Conclusion

A manual stencil cleaning process may appear to have a lower associated cost than automated stencil cleaning processes but one should not overlook the substantial costs associated with inconsistencies in manual processes, fines and penalties associated with inadvertent hazardous waste discharge, and OSHA and worker’s compensation expenses associated with manual labor.