

If Provided From One Source, Process Know-How Optimizes The First Pass Yield For All Products

Managing the SMT Key Processes

Tele Haase, Vienna & ERSA GmbH, Wertheim

First Past Yield – FPY is a constituent element and a measurand of every SMT production department, considering that it represents the number of assemblies which have passed through the initial production sequence without defect, and therefore do not require any repair or rework. It is directly related to cost of defects and other additional charges.

The level of competitiveness of manufacturers producing in locations where high labor costs prevail is decisively determined by their productivity. FPY is one measure of productivity. The FPY is determined as a parameter to get a reading on where on the slope of the learning curve the manufacturing process currently is found, and it serves, when used in combination with other methods used in quality management, to institute steps to improve quality and therefore achieve a higher FPY.

Producing successfully in a high-labor cost country such as Austria, TELE HAASE Steuergeräte GmbH, located in Vienna, is just such a corporation.



Picture 1: Headquarter of TELE Haase in Vienna

Haase was founded in 1963, as a trading company for electronic control units. **TELE** started in 1967 as manufacturer of electronic controls, and in 1973 both companies merged and formed **TELE Haase**. In addition to the Viennese head quarter and production facility, subsidiaries in Germany and Great Britain as well as a dense network of local partners in more than 60 countries round out TELE Haase's worldwide presence.

Over 40 years of international experience in the fields of development, manufacturing and marketing have laid the base for the advancement of innovative components in the field of monitoring technology. From its beginning, the company grew and prospered by producing time relays and components for the automation industry, products, which are still the main pillar of the company. TELE Haase considers itself a pioneer and a trend setter when it comes to providing intelligent solutions to both control and to keep in operation plants, buildings and equipment. Everything revolves around the precise acquisition and control of parameters for power, voltage, temperature, fill level, phase sequence or effective power. At TELE Haase, some of the most modern monitoring and control technology - of the highest quality level - is being developed and manufactured, all for worldwide distribution.

Manufacturing is located at the head quarter in Vienna, and approximately 650 000 modules per year are being manufactured and shipped. To achieve the mandated goal of an improved FPY, the engineers of TELE Haase decided to source the equipment for the two most demanding processes of an SMT line, viz. the stencil printer and the reflow system, from a single source. After a thorough analysis of what is available on the market, the choice was clear: the ERSA S1 stencil printer and the ERSA HF 3/14 reflow oven. Particularly the S1 printer stood out from the pack, as it is the only system on the market that offers an integrated 100% post print inspection feature.

“The ability to perform a 100% post print inspection with the S1 was for us ultimately the deciding factor in selecting this system”, states Gerhard Sattler, production manager of the SMT department.

Another very important criteria for TELE Haase was their need for quick set-up's and efficient set-up changes, since in its production it is not uncommon to go from batch size 2 to batch size 1000.

“In this regard, both systems offer ideal conditions for quick process changes. The software as well as the accessibility of the systems reduced the change overs to nothing more than a minor task.”

“And for programming the inspection feature of the printer, there is no need to define areas which should be inspected within the time available, no, you simply take the full area and you're done. It could not be easier!” relates Gerhard Sattler.



Picture 2: SMT production line with ERSA printer and reflow oven

In 2011, ERSA celebrates its 90th anniversary. It all had started with the development of electronic hand soldering tools, to be followed by the manufacture of equipment for automatic soldering in the wave-, selective- and reflow process. To finally round out the product line with rework- and inspection systems was only the logical conclusion.

The progression of the miniaturization during the last years, and the continuously rising demands levied by changes, be it through the extension of the range of components or through new processes such as the changeover from tin/lead to lead free alloys, have naturally had an immense impact on the nature of the individual process steps and on quality, and they will determine more and more the future of the manufacturing environment in electronic production.

This challenged ERSA to have a closer look at their line of equipment, and how well they would be able to cope with the new demands. In the area of reflow soldering, the HOTFLOW series has been redesigned to optimally meet these new process requirements, and it is already setting new standards for the industry. With ERSA's attention to future trends, and working together with its customers, who after all are the users of the process, continuous further development of the equipment by ERSA will assure that any future demands will and can be adequately met. The stated goal is: always be one step ahead of the demands.

The reflow process is one the two key processes in an SMT production line. When the goal is to improve the FPY, though, the largest impact can be achieved by looking at the printing process.

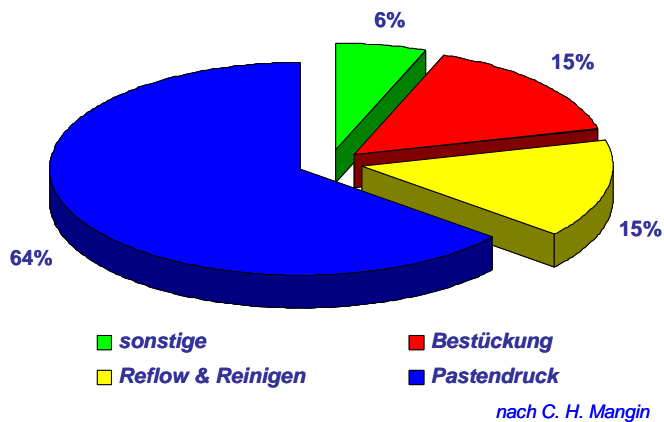


Fig. 1: Distribution of the possible defects

As can be seen from pic. 1, defects attributable to the printing process, together with defects shown after the reflow process, account for approximately 80% of all defects.

Realizing this, and at the same time desiring to take on more responsibility for a customer's SMT line, ERSA made the strategic decision to expand its product line by adding a printer.

In 2005, development of the new printer started. Today, it is a part of the VERSAPRINT line of printers.

Commensurate with ERSA's corporate philosophy of not simply developing *a product*, but to do so by offering to its future customers a product with added value when compared to the equipment on the market, a completely new venue was taken. The technical standard was newly defined for the new printer. The development of a line scan camera specifically designed for the inclusion in a stencil printer was a prerequisite for this new line of printers. This camera is suitable for the positioning of the board for the printing process as well as for the subsequent post print inspection of the complete assembly.

The ERSA LIST (Line Scan Technology) provides extensive new functions for the visual support of the operator during the set-up, the operation and the process optimization procedure: fast image capture, even for large areas; optimized interpretation of the results through diverse lighting, two-dimensional determination of the positioning data for a precise alignment.

The LIST camera is the feature that enables the VERSAPRINT's to provide 100% post print inspection, making the traditional, stand-alone inspection system installed after the printer, superfluous.

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„By utilizing the ERSA equipment, we have been able to further improve our already excellent quality, as well as to increase our FPY“, is the conclusion of a visible satisfied production manager.

For additional info: www.ersa.com



Picture. 3: Gerhard Sattler, Production Manager TELE Haase