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Peter Bollinger and Vince Cook

Evaluating Capital Equipment

Overcome the challenges of purchasing surface-mount production equipment.

Problem:

Despite improving forecasts, many manufacturers still hesitate when weighing new capital equipment investments. For printed circuit board (PCB) assemblers, hesitation borders on sheer reluctance—thanks to the severity of our industry's last slump.

However, new component technologies, aggressive delivery schedules and enterprising financial justifications are compelling PCB assemblers to weigh new equipment acquisition. If you are in such a position, perform the necessary due diligence, since many equipment suppliers are offering vastly different capabilities than they did a few years ago.

Problem Solved:

New technologies are taking the market by storm, and not every machine is capable of meeting their demanding requirements. For example, placing a 0.5 mm chip-scale package (CSP) with a 0.125 mm ball diameter will require a machine capable of attaining 45 μm at 4 sigma to achieve acceptable yields, assuming bump-to-pad ratios are appropriately designed. While accuracy is only one metric used to classify machines, possessing a complete understanding of performance characteristics is not only critical, but can impact decisions that drive future growth.

Examine Global Support Infrastructure

Future growth may also depend on how fast newly designed products can be transferred from original equipment manufacturers (OEMs) to contract manufacturers (CMs) or from original design manufacturers (ODMs) to low cost production facilities in other regions of the world. Thus, global sourcing and support is a vital consideration for the PCB manufacturer. Equipment suppliers can play a key role in job transfer if they have an established and far-reaching support infrastructure in place. Globally based sales and service centers and spare parts depots provide manufacturers the ability to address problems immediately, or modify their equipment to tackle market demands, whether they are timely or unexpected.

Estimate Cost of Ownership

An enduring consequence of the last few years, financial justification remains more important than ever to the investment decision. Return on investment often comprises many subtle factors, ranging from inconsistencies in global pricing—pricing that varies depending on global region can translate into higher investment costs—to long-term cost of ownership. If the initial investment costs are low but the costs to maintain the equipment are high, a company can quickly be in a position of having purchased the most expensive machine, even though the original agreement seemed like a real bargain.

Gauge Flexibility and Response Time

An old saying states that time waits for no one. Projects become active overnight, and lead times can shrink from months to weeks and sometimes days. Therefore, PCB assemblers must take into account delivery of everything from components to production equipment. For equipment especially, flexibility and the ability to quickly retool for new projects may offer manufacturers a competitive advantage. As the industry ramps up, response time will be crucial to success.

Conclusion

While nobody has a crystal ball, the signs of growth for 2004 and beyond are emerging. Integrating automation is becoming relevant to traditional and low labor-cost centers as a means of reducing expenditures and improving first-pass yield. With these factors in mind, PCB manufacturers can make sound investments that assure profitability for their operations and customers today and into the foreseeable future. ■

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