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VIEWPOINT

Inefficiencies? Not on My Line

Pharmaceutical manufacturers can turn to Overall Equipment Effectiveness to improve operational efficiencies.

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Bottom-line pressures are mounting in the pharmaceutical industry. Competitive influences, regulatory changes, expiring patents, dwindling pipelines, and increasingly sophisticated consumers are combining to change the face of the market. All areas of the industry are under mounting demand to lower costs and boost productivity. Packaging is no exception, with supervisors and managers spending more and more time finding new ways to cut costs.

Particularly important in a manufacturing environment is the overall effectiveness and efficiency of operations. To increase overall efficiency, reduce costs, and maintain competitive position, pharmaceutical and medical device manufacturers must perform at optimal rates, while maintaining consistently high product quality. This means operating with minimal breakdowns and bottlenecks and, when problems do occur, having the ability to get back up to speed quickly.

Overall Equipment Effectiveness (OEE) has emerged as a best-practices tool for translating this complex web of factors into a simple set of numbers. That data can enable manufacturers to direct resources toward issue resolution and improved output.

OEE OVERVIEW

Today, most packaging line equipment has at least some information-gathering capability. This capacity can range from something as simple as a sensor counting the number of bottles exiting a filler, to alarms that sound when there is a jam, to complex inspection systems that gauge the readability of bar codes.

This information is valuable only if acted upon and used to improve the effectiveness of the entire process. By routing the information through an OEE system for analysis, the efficiency of individual machines, manufacturing cells, or assembly lines—even entire plants—can be monitored and resources directed to rectify an issue.

OEE targets the most common and critical sources of manufacturing productivity loss and places them into three primary categories—availability, performance, and quality.

Availability compares the amount of time a machine or line should ideally be available with the actual amount of time it is up and running. Performance statistics compare the ideal and optimal operating speeds of line or components. Quality quantifies manufactured pieces that do not meet quality standards (rejects, rework, scrap, etc.). All three factors, and OEE itself, are expressed as percentages reflecting efficiency, allowing for ease of comparison and improvement measurements.

OEE provides a structured approach to identifying complex production problems and distills them into a simplified, cohesive set of actionable intelligence to optimize line efficiency. As a result, OEE empowers manufacturing organizations to systematically improve processes and, in turn, ensure consistency, maximum quality, and productivity. The result is a measurable, direct bottom-line savings.

By using OEE to identify inefficiencies and boost capacity on existing lines, manufacturers often find that additional planned lines are unnecessary, saving tremendous equipment and staffing costs. Or, by making lines more efficient and freeing up existing staff, a manufacturer might be able to bring on new lines without hiring more staff. For example, an operation that averages an OEE of 55%, and then brings that number up by 10–20% will realize dramatic improvements.

Not all parts of a manufacturing operation will benefit equally from the implementation of an OEE system, so the first step is to determine which parts of the operation would benefit. It might be an individual line, a group of equipment in the facility—for instance, all of the labelers—or an entire manufacturing plant.

Currently, many packaging operations gather key information that provides efficiency ratings. OEE systems allow such companies to further refine the process with a detailed analysis of the factors that affect production efficiency. By specifying

the sources and causes of downtime, pinpointing production bottlenecks, and identifying quality issues, OEE arms organizations with the information they need to make timely and lasting improvements in the packaging process.

MAKING THE CASE

There are two basic types of OEE systems: stand-alone and integrated. Each presents its own set of benefits and challenges. Integrated OEE solutions offer the more flexible option. These solutions handle the process from line management and data collection through OEE analysis and reporting. An integrated OEE solution simplifies implementation and typically has intuitive user interfaces that allow simplified configuration. There is minimum custom development required, and the user can set parameters based on specific needs. This system reduces implementation time and is generally well supported by the manufacturer.

With all devices on the packaging line and other intelligent devices connected, complete data can be linked in real time. In addition, a system that can directly configure each production lot, vision system, PLC, bar code scanner, printer, checkweigher, and other machines provides consistency across the entire line. That ensures optimal product quality and security while decreasing downtime, scrap, and waste. The data collected from each machine enable operators to assess effective manufacturing rates and expected lot completion times, facilitating process improvements through scheduling optimization. Trend-analysis capability can identify problems so preventive actions can be performed before materials are lost.

Another benefit of such integrated systems is scalability. It allows an OEE program to begin with a limited number of machines or lines—for instance, the easiest and fastest to configure—and then scale up once the benefits have been demonstrated.

An integrated OEE solution typically allows manufacturers to quickly illustrate and reap the benefits, increasing throughput and productivity, reducing waste, and leading to faster return on investment. In the pharmaceutical industry, it is important to work with a solutions provider that has experience with the requirements of the pharmaceutical manufacturing process. Providers with such experience will respond more effectively to the packaging needs of pharmaceutical manufacturers, and can better complement the process side of their business operations.

IN-TIME MONITORING

Achieving a strong OEE rating is an excellent indicator, but continually optimizing line performance is paramount to realizing long-term value. An OEE percentage alone will not provide all the information necessary to address efficiency issues. Typically, problems that are displayed in an OEE analysis occur immediately on the packaging line. To address these problems, including potential bottlenecks and line inefficiencies, line supervisors can implement a monitoring and control solution to ensure in-time notifications of issues that will, if left unaddressed, impact line productivity. If a line supervisor is notified as a problem is happening on the line, then the problem can be addressed during the actual production run. As a result, this information can be applied to the production schedule, which will improve the line and facilities' OEE rating and prevent downtime, poor product quality, and lost revenue.

This combination of big-picture OEE analysis and constant line vigilance can deliver optimal line performance.

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