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Incorporating efficiency into OEE

Operational equipment effectiveness (OEE) is a simple but powerful tool that helps operators and managers predict and eliminate losses on a packaging line. OEE isn't a fad—it has been around for decades. The terms "effectiveness" and "efficiency" have been around even longer, yet there has been confusion between them in the last decade or so. To understand OEE and to incorporate effectiveness and efficiency, we must first make a clear distinction between the two terms.

While calculating effectiveness shows to what extent your packaging process is achieving the intended results, calculating efficiency shows the degree to which your packaging process is making good use of resources. Effectiveness is determined by comparing the potential yield to the actual yield of a process. If your machine is capable of making 100 quality packages per hour, and it makes only 70, then it is 70 percent effective. But we don't know how efficient it is. Efficiency is determined by taking into account the resources required to run your machine. Resources include the number of operators, the amount of energy the machine consumes, and the amount of material used to produce the package. Thus, if your machine is 50 percent effective with one operator and becomes 65 percent effective with two operators, the effectiveness increases by 30 percent when one operator is added. However, its efficiency decreases to 50 percent because of the increase in labor.

In addition to streamlining labor, incorporating efficiency into OEE helps you determine what you lose from ineffective operations and why you lose it. After all, producing 14,400 packages by operating a machine at half its maximum speed is completely different from producing 28,800 packages and rejecting 14,400 of them because they were defective. In this example, calculating OEE without incorporating efficiency wouldn't pinpoint the loss of potential packages, at least on paper. (Sure, you would have seen the difference if you had been on the production floor, but who stands there nowadays, watching and documenting operations?)

Separating OEE into three components—availability, performance, and quality—will help you pinpoint that loss and others. To determine availability, analyze how production time is used. For example, a standard packaging shift lasts 480 minutes. However, operator downtimes and changeover take 180 minutes, reducing packaging time to 300 minutes. Thus, the shift can never be more than 62.5 percent effective, assuming your machine runs at maximum speed with no package loss. To determine performance, analyze how many packages your machine can produce. For example, if your machine produces 60 packages per minute, ideally a 300-minute shift would produce 18,000 packages. However, operator-lowered speed, cycle stops, and scale-up slow your machine to 12,000 packages, reducing packaging time to 200 minutes and effectiveness by 33.3 percent. Thus, the shift that was 62.5 percent effective is now 41.7 percent effective. To determine quality, analyze how many packages meet your specifications. Say that, out of the 12,000 packages produced, 3,000 were defective. The defective products took 50 minutes to produce, reducing packaging time to 150 minutes and effectiveness by another 25 percent. Thus, the shift that was 41.7 percent effective is now 31.28 percent effective.

When determining OEE, don't forget about the efficiency-related components. Incorporating them will help operators and managers pinpoint wasted resources and pursue improvements. The result? Fewer headaches and more profits. *T&C*

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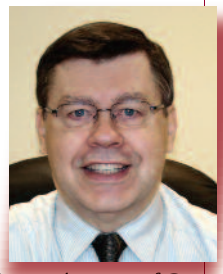

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