Importance of Critical Component Tracking

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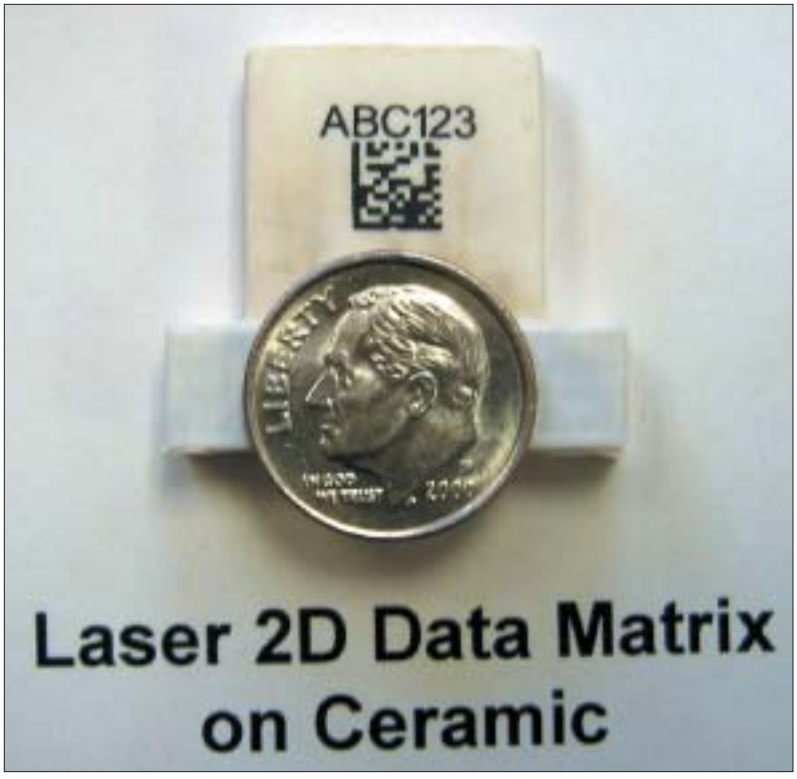

Figure 1: Picture of a quality laser mark on ceramic.

What a wonderful opportunity technology provides visionary managers today. Never before in history have so many tools been available to collect, analyze and present data.

Intense competitive pressures dictate that companies utilize these technologies. The total cost of implementing performance tracking programs for equipment, parts and personnel is so minor compared with the return that no company will be able to remain competitive in the future without the knowledge these systems provide. Information will be a prime factor in the success or failure of textile producers. Knowledge combined with vision will determine what facilities remain operational after the current capacity reductions are complete.

CASE STUDY

One fiber plant implemented a program of tracking the critical components of each spinning pack and their performance. An additional benefit they obtained was information about the performance of each spinning cell and each employee who built, installed or removed the packs.

The program produced immediate results. For example, it made it clear that some employees were assembling packs that had a failure rate five times that of other employees. The posting of failure rates by employee, combined with additional training and removal of poor performing parts, resulted in a 50% reduction of packs that failed on startup. Could your operation benefit from this type of performance analysis?

The critical component tracking program consists of four basic steps:

- Identify. Uniquely identify all critical components, people and production equipment.
- Track. Track the performance of each production resource.
- Analyze. Analyze each resource and identify the poor performers.
- Action. Take action to correct the deficiencies identified in the analysis.

Each of these steps is discussed below.

IDENTIFYING

Technology exists today to permanently mark most equipment and parts used in the production processes of most industries. The ability to tag parts and equipment has existed for several years. This was sufficient in many areas, but some critical parts or equipment could not be marked because of environmental conditions or space constraints.

Recent advances in the direct marking of parts now make it feasible to mark and track most parts and equipment. Normally, the best mark to apply is a 2D Data Matrix. This format allows the user to get more data onto a much smaller space.

Lasers can be used to apply direct marks to a wide range of materials, including metals and ceramics. For ceramic direct marking, lasers are the only viable choice because other methods will shatter the ceramic.

A dot peen 2D Data Matrix direct mark is very durable in most conditions and the equipment costs

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are about 20% to 40% of a laser purchase. The marks will withstand grit blasting, heat treatment and most cleaning processes. This process can only be used with Data Matrix marks not 1D bar codes.

A third method of direct marking is BBC (Bumpy Bar Code). This technology consists of either raised or indented parallel lines that are similar to a 1D bar code. They are read with a reader that detects a change in the elevation of the marks. An advantage of this mark is that it does not depend on contrast and can be painted and still be read.

Figure 2: A dot peen 2D Data Matrix direct mark.

A combination of these technologies, along with existing tags and RFID technology, will allow the user to mark all the critical parts and equipment in a production facility. While identification of each part is important, it is just the beginning of a successful program.

TRACKING

After all the parts are marked it is necessary to record the interaction, movement and conditions concerning each component, equipment and employee. To be successful, the data collection must be easy. The software program must provide for the automatic entry of user and date/time stamp, plus the use of scanners, to reliably enter data. Good software programs will allow the user to maneuver between screens with the use of a scanner, and without the user ever having to touch a keyboard or mouse.

Figure 3: Picture of BBC method of direct marking.

The individual action screens must be simple to use. Screens that vary in color by the function being performed are excellent because they visually inform the user which action they are performing. Ideally a screen will change color (to red) when an error occurs. Frequently in an industrial environment, auditory cues are difficult to detect while visual alerts are easily recognized.

ANALYZING

Raw data is of very little value to a manager. The data must be sliced, diced and combined into a format that adds value. The data should allow the user to easily obtain different views to provide information about his situation at any given time. The data from tracking spin packs, for example, may require the following views:

- Analysis of parts (Critical Components).
- Analysis of employees.
- Analysis of thread lines.

The primary analysis screens must provide the ability to filter and sort the data in many different ways. In addition to the standard analysis, the users must be able to access the data and perform custom analysis for unique situations.

ACTING

No system adds value unless the information is used to identify and correct problems. We have found the best way to assist a manager is to present the data in a form that readily shows the problem areas and email it to him for action. This assures he does not have to remember to enter the program and become a systems expert.

The implementation of a tracking system will improve the competitive position of a company by improving yields and improving employee performance. Improving product quality while increasing pack life is obtainable today with available technology.

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