Equipment Reliability Made Simple:
Effective Labeling Enhances Asset Performance

Our thanks to Brady for allowing us to reprint the following article.

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INTRODUCTION:
Manufacturers on the lean journey are discovering how critically important it is to stabilize and optimize equipment performance.

While lean initiatives can deliver significant advantages, they can also mean you'll need to improve equipment reliability. If you reduce inventory, for example, you won't have as much buffer stock to fall back on in the event of a breakdown, and you'll need to depend even more on your equipment to function properly.

Many companies are also realizing that reliable production processes and equipment can be a key competitive advantage. In fact, it's one of the few differentiators that you can leverage and sustain over the long term. In many industries, competitors all have access to the same technology and equipment. But if you can maintain that equipment at a higher level, you can create a sustainable competitive advantage for your company.

As a result of these trends, the focus of maintenance is shifting from fixing breakdowns to maximizing overall equipment effectiveness (OEE).

Reliability-focused maintenance practices such as Total Productive Maintenance (TPM) have taken their place alongside 5S and Standard Work concepts as a cornerstone of world-class manufacturing programs. Just as 5S is used to stabilize the work environment, and Standard Work is used to stabilize work practices and procedures, TPM is used to stabilize equipment performance and reliability.

Visual Systems Improve Maintenance

While visual devices are widely used in 5S, Standard Work, Quick Changeover, Kanban and other lean techniques, you should also consider them as an important component of your proactive maintenance strategy.

Incorporating visual devices into your reliability program can provide many benefits:

- Simplified training
- Improved quality, fewer errors and defects
- Ability for virtually anyone to detect abnormalities at a glance
- Faster troubleshooting and repairs
- Fewer unplanned maintenance, repair and operation (MRO) purchases
- Reduced inventory
- Improved safety and employee morale

Simplify Preventive Maintenance

A good starting point is to use signs and labels to identify preventive maintenance (PM) points and to provide basic cleaning, inspection and lubrication instructions.

Using visual devices to identify PM points and provide detailed instructions is especially important if your company has implemented an autonomous maintenance program. When responsibilities for routine care and inspection are transferred to equipment operators instead of trained maintenance professionals, it becomes critical to clearly define their tasks and checkpoints.

For example, improper lubrication–too little or too much–is a major cause of equipment failure. A simple **lube label** as shown below can save your company significant costs in motor repair and replacement.

In addition, **color-coded markings** can be applied to zerk fittings and grease guns to guard against using the wrong type of lubrication.

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Oil level indicators can also be applied to sight tubes to simplify oil management. The use of green and red striped labels placed behind the sight tube lets the operator easily detect when oil levels are too high or too low.

Optimize Predictive Maintenance

Even when maintenance personnel retain control of these activities (rather than equipment operators), the growing number of new and relatively inexperienced technicians in the workforce is increasing the risk of errors and omissions.

As baby boomers retire – about 78 million in the next 10 to 15 years – the coming shortage of skilled workers will significantly affect industry. One large, well-known manufacturer recently forecasted that by 2014, approximately 70 percent of its maintenance staff will have less than five years of relevant job experience.

In addition, maintenance workers must learn how to use a growing number of sophisticated predictive maintenance technologies such as vibration analysis, ultrasound and thermal imaging. When performing predictive maintenance, it's critical to take measurements at the same exact place each time. To ensure that the location for readings remains consistent – regardless of who conducts the inspection – you can apply **predictive maintenance targets** such as the one shown here.

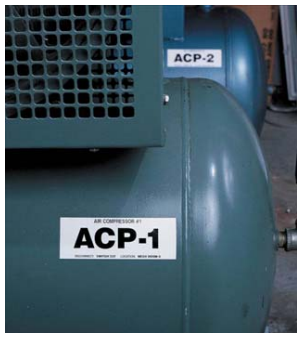
When implementing predictive maintenance programs, reliability technicians often use inspection routes to streamline the process and maximize efficiency. One drawback to this approach, however, is that the technician may not be familiar with each and every piece of equipment, and the proper readouts may vary across different machines.

Visual controls like the **gauge label** below help to alleviate this obstacle by making it clear to anyone at a glance whether the temperature or pressure is within the normal operating range. In fact, these visuals make it so easy to detect abnormalities, that anyone walking by becomes a potential inspector, facilitating early detection of potential problems.

The visuals below not only make it easy to detect when **chain tension** is too loose, but they also advise when to replace the chain. When tension slackens, links from the chain should be removed, and the adjustment block can be shifted to restore proper tension with the shorter chain. Once a specified number of links have been removed, the edge of the block extends outside of the green area, clearly indicating that the chain should be replaced.

Speed Troubleshooting and Repair

Visuals can also speed **troubleshooting and repairs**. Including "to" and "from" information on equipment ID labels makes it easier to trace lines in electrical systems and pipe networks. As a result, you can perform repairs faster and reduce the risk of errors and potential injury.



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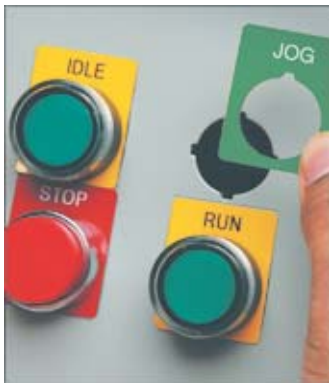
Maintenance stores are perhaps the biggest contributor to maintenance inefficiencies, and your storeroom may offer plenty of opportunities for improvement through visual management. You can make repairs even more efficient by ensuring that the proper replacement part and its storage location are clearly identified, ideally by putting the information right at the point of need as shown.

To reduce search time, and ultimately reduce downtime, clearly label **shelves and bins** in stock rooms and tool cribs. Where possible, use graphics and/or photos on your labels for faster recognition and to avoid pulling the wrong part.

To enhance safety and reduce hazards, many companies are posting graphical lockout procedures, including instructive photos, right on or at their equipment. Posting hazard warnings and safe work instructions right at the point of need is the most effective way to reduce accidents and injuries at your plant, and is as important (if not more so) than classroom or computer-based safety training.

Promote Error-Free Setup

When restoring equipment to operation, how can you ensure efficient and error-free setup? Visuals such as the **operator control panel labels and alignment aids** shown below help to simplify machine settings and positioning.



In addition, labeling the **rotational direction on gears and shafts** can help you avoid costly setup errors that can damage or destroy motors and drive systems.

Make Your Own Visuals

You may be surprised to learn that all of the visuals shown in this document were created using Brady's MarkWare™Lean Tools software and GlobalMark® printers.

This versatile system allows you to create your own industrial-grade visuals on site and on demand, at a

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fraction of the cost of having them printed by an outside vendor.

MarkWare software uses template wizards to speed and simplify the design and layout of custom visuals. The software includes over 1,000 safety and industrial pictograms, and even lets you import your own logos or photos. You can also import data from spreadsheets and databases to include on your labels.

The GlobalMark line of printers can print multiple colors without manual ribbon changes, and can even print photographic images. These printers output to a wide variety of media, including permanent- and repositionable-adhesive labels, tags and kanban cards, magnets and more. The printed visuals stick to a wide variety of surfaces including floors and walls, and they withstand harsh industrial environments and outdoor conditions.

GlobalMark printers are also available with a built-in plotter cutter that allows you to easily create cut letter door signs and even paint stencils. All these capabilities and more make the Brady system the ultimate make-it-yourself visual workplace system for use in lean and world-class manufacturing environments.

As you look to improve equipment performance and reliability, it pays to keep your eyes open for new ways in which visual systems can benefit your overall lean initiatives.

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