REDUCING CHANGEOVER TIME ON A COATING LINE

As the pressures to make production schedules rise, coating firms look for ways to increase productivity. Obvious answers are speeding up the machine, using overtime or additional shifts or new equipment. Another alternative is to look at the wasted time between coating runs.

Many coating lines run more than one product. To switch from one product to another may require more changes than just the web speed, tension and oven temperatures.

Other changes might include web width or caliper, web materials, fluids and delivery equipment (pumps, lines and filters), coating head, cleaning idler rolls and associated area cleanups.

This paper will cover the steps to consider in establishing a reduction in the changeover time. We will look at planning, data collection, analysis and what to do with this information.

Coating efficiencies and product quality can be improved by analyzing each of the process steps in and around the change over of a coating line. The objective is to find the optimum sequence and procedures for each step in the changeover. Not only can this process impact the bottom line, but it can also lead to major safety improvements.

First, I suggest that someone who is not familiar with the process details do the initial evaluation of the changeover and be appointed as the team coordinator. This can be an engineer from another area or plant or an outsider. All the crews and manufacturing support personnel should be involved in planning, executing and reviewing the findings.

The team approach can be very powerful using the operators, mechanics, engineer, foreman, etc., to gather the information and then brainstorm as a group. The recommendations for change from this taskforce will be more realistic and easer for all to accept.

The next step is to review the coating process to be studied. Look at the procedures and process set point guides (if they exist). Talk to the operators and become familiar with the operation. Spend some time watching a changeover and noting the general steps.

Next, create a data sheet to include items such as start time of each distinct step in the changeover. List the task, tools used, operator name, and comments column. I find the best format is an Excel sheet so any new items can be inserted as needed.

Once the form has been developed it is time to run a test of the form, typically on a short and simple change. Once the bugs are eliminated a full timed study can begin. Collecting the data will require constant observation, notations and asking questions about the process steps.

Once the data are available, the next step is for the team to evaluate this information, draw conclusions and make recommendation as to how the time of the various steps can be reduced.

During this review, look for obvious items adding to the time line. These might include the proper tools or equipment not available when needed, having to walk too far to get a roll, pump, tray, etc. Another typical problem is the sequence of performing the tasks. This might include assuring all rolls and fluids are at the coater before the coater is started.

Examples of time wasting opportunity I have found include:

- Substrates or fluids not ready at the coater
    - New hardware not clean (trays, pumps, filters, etc.)
    - Shift change not well coordinated. (Let them do it!)
    - Coater parts not designed for easy removal or placement
    - Lack of uniform procedures
    - Procedures not followed (I can do it better my way!)

The approach to finding the opportunities to improve change over can vary greatly. The steps noted earlier will point out the basic areas to study. Improving the process can be more challenging.

Finally, a worthwhile but more time-consuming option, is to have someone make a video of the changeover and use this tape, along with the data, to allow the team to find areas of opportunity.

As with most "time study" analysis, the effort itself can be threatening to some and requires management and labor to give top down approval and cooperation.

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