What’s New

Coming Soon! June 2009 Issue of JCT CoatingsTech:
By: Scott Detiveaux, Senior Consultant, Orr & Boss
The impact of the global economic downturn on the automotive OEM coatings market including both short and mid-term impacts.

March 2009 Issue of Coatings World:
“The State of Global Coatings Industry”
By: Scott Detiveaux, Senior Consultant, Orr & Boss
The current global economic downturn has affected virtually every industry,
including both short and mid-term impacts.

About IPPIC: IPPIC, the sponsoring organization of this critically acclaimed market analysis report, is comprised of paint and printing ink trade associations representing Australia, Brazil, Canada, China, Europe, Japan, Mexico and the United States. IPPIC provides a forum for information exchange and cooperation on the major issues and priorities facing the paint and printing ink industries worldwide.

About Orr & Boss, Inc.: IPPIC is pleased to say that it has contracted with Orr & Boss, Inc., a leading, international management-consulting firm to the specialty chemicals and coatings industries, to conduct the necessary in-depth market research and develop the final resource document.

For more information please contact NPCA’s John Hopewell at (202) 462-6272.

Energy Reduction

Many companies are beginning to look at energy reduction as a way to reduce manufacturing costs. Even with the recent decrease in oil and natural gas prices, energy reduction can still be a significant source of savings. Energy reduction programs are like material waste reduction programs: the benefits flow to the bottom line immediately. Also, similar to material waste reduction programs, energy reduction is the environmentally responsible thing to do.

The first step towards implementing an energy reduction program is to complete an audit. An energy audit will allow you to determine the large uses of energy in the plant. An energy audit can also help you understand your energy efficiency. Thus, the energy audit is the first step towards understanding how to reduce energy usage. The steps to complete an energy audit are straightforward.

They are:
1. Identify all users of electricity, natural gas, and steam in the plant. The first step is to simply identify all uses of energy in the plant. It is important to not leave any items out. Orr & Boss has come across many examples where companies thought that a piece of equipment was an insignificant user of energy when in fact it was one of the key energy users.
2. Make a schedule of all electricity users and motor power requirements. Once we complete Step 1, we will want to assign the motor power requirements to each piece of equipment. This will allow us to determine how much energy a piece of equipment may be consuming while it is running. The focus should be on those pieces of equipment with large power requirements. Of course, to really know how much power is being consumed, it will be necessary to go out to the plant with an amp meter to measure power usage of the large power users identified in Step 1.

At random points during the day, go out to the plant and measure power usage during the day, go out to the plant and measure power usage of the large power users identified in Step 1.

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Energy Education Reduction

(continued)

4. **Activity Sample the Equipment:** At the same time that you are measuring power, conduct an equipment activity sampling study. By this we mean, record at random times through the day, what a piece of equipment is doing. Is a certain piece of equipment running? Why is it running? Is material flowing through it? It has been our experience that equipment continues to run when not necessary. For examples, mixers continue to mix even though a particular batch has been completed. Why not shut these off and use them when you need them? An Equipment Activity sampling study will allow you to see how big of a problem this is.

5. **Conduct an energy balance around each use of natural gas and steam:** Natural gas and steam are most often used to heat up the batch. An energy balance can be conducted around each batch to determine how efficiently you are using the energy. Orr & Boss’s experience suggests that most chemical plants have energy efficiencies below 50%. Normally, leaks in the pipes and non-insulated stretches of piping and tanks are the cause of the low efficiencies. By knowing your energy efficiency, you can calculate the cost savings associated with fixing these issues.

The results of the steps above will allow you to determine where the big opportunities are to reduce energy usage. The outcome of the audit will determine the steps that are needed to realize those savings. For example, if dispersed process is the largest use of electricity, would the use of more easily dispersible pigments help reduce energy costs? Or if the energy balance indicates that steam and natural gas are not being used efficiently, would a boiler upgrade project help reduce energy usage? Or would a dedicated program to patching up leaks and improving insulation on the steam lines help reduce energy costs? These are the types of opportunities that can fall out of the energy audit.

Orr & Boss knows of several batch chemical companies that have realized significant savings by following this approach. One recent client was able to reduce natural gas consumption by over 35% by fixing leaks in the steam lines. Another was able to reduce electricity consumption by 40% by understanding where energy is used.

Energy reduction projects can be a source of significant savings. Energy reduction, like material waste reduction, has a fast impact on profitability. As soon as energy use is reduced, profitability improves. Furthermore, reducing your firm’s energy usage is the environmentally responsible thing to do.

Each plant will have different issues associated with these material waste types and the best solution will depend upon the specifics of the plant.

**Conclusion:**

Material waste reduction is the best way to immediately improve profitability and cash flow. Upon implementation, benefits immediately flow to the bottom line. There are no other manufacturing projects that can so quickly impact results. Thus, material waste reduction projects should be targeted as an area of opportunity. This is especially true in cases where sales are falling and capacity addition projects are not needed. In addition to the ideas described in this article, Orr & Boss has put together a publication titled “101 Tips to Reduce Waste”. If you would like a copy of this publication, please let us know.

Material Waste Reduction

(continued)

Once the costs and the sources of material waste are identified, we can start to determine what to do about it. Some of the possible fixes for material losses are given in the table below.

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For many manufacturing businesses, material waste reduction is a gold-mine. It nearly always has an extremely rapid payback—months rather than years. Material waste reduction reduces material costs and also saves on disposal costs. Material waste reduction can easily fit into a company’s sustainability strategy.

Orr & Boss normally measures material waste through two different methods. First is it measured from the accounting system. Measuring waste from the accounting system allows you to understand overall plant material waste values and the cost that it is having on your business. However, the accounting data alone does not allow you to understand where the waste is occurring and what to do to eliminate it. To do that, it is necessary to physically measure waste in the plant. This is the second method of waste measurement: going out in the plant to observe and measure actual material waste generation.

**Accounting Data**

There are several places where waste costs can be found in the accounting data. The most common places are:

- **Material Waste Reduction**
  - **Under-Delivery of Raw Materials:** Are your suppliers actually delivering what they promise? Sometimes, they may be shorting you. However, in some cases, suppliers are actually delivering slightly more than promised. A 50 lb bag of material may actually contain 55.5 lbs of material. If suppliers are over-delivering, this means that your material yield could be higher. Spot checking deliveries will help you determine if suppliers are over- or under-delivering your raw materials.
  - **Process Losses:** Are we getting all the material out of tanks when we transfer material? Are spills or leaks occurring in the process? Is all the material being emptied out of bags or drums or is some residual material left over? Changeover Loss: What happens to the material when you changeover products, how much material is wasted? Are we flushing out the lines and tanks with solvent? What happens to this material? Is it saved and re-worked or discarded? There may be an opportunity to improve yields.
  - **Over-Addition:** Are we over-filling our containers? Does a one-gallon pail of product actually contain 1.01 gallons of material? Check weighing sample outgoing materials should help us identify waste.
  - **Evaporation:** Material, especially solvent, can be lost through evaporation. Calculations can be used to estimate the amount of material loss due to evaporation.
  - **Scrap Batches:** How many batches are being scrapped due to quality problems? If this is a significant source of waste, a quality improvement or variation reduction program should be put in place.

One recent Orr & Boss client has used the material waste and energy reduction ideas presented in this issue to significantly cut costs. This particular coatings company has recently seen a downturn in its business. The manufacturing managers were under pressure to cut costs. As discussed in this issue, the fastest way to cut costs is through material waste and energy reduction projects. Thus they decided to focus their efforts in these areas.

To begin with the company conducted an audit. The goal of the audit is to determine the company’s true material waste and energy efficiencies. Orr and Boss conducted these audits.

**Material Waste Analysis:**

First, Orr & Boss worked with the plant accounting department to determine the overall material waste percent and its value. The bills of material (BOMs) for the company’s products were analyzed to determine how much material waste was built into the standards. The results of this indicated numerous places in the plant where leaks and losses were occurring. The results of this indicated numerous places in the plant where leaks and losses were occurring. By repairing the leaks, the plant was able to improve energy efficiency to above 50% at a savings of over $200,000 per year.

The combined savings of both of these projects was greater than $500,000 per year. The company was able to start realizing the savings immediately. The steps needed to complete these projects are all straightforward. Minimal capital expenditures were required. This is normally the case with material waste and energy reduction projects.

**Case Study: Material Waste and Energy Reduction**

The results of the energy audit indicated that natural gas and steam efficiencies were below 30%. With this knowledge, maintenance personnel went about tracing all of the steam lines to determine where leaks and losses were occurring. The results of this indicated numerous places in the plant where leaks in the steam lines were occurring. By repairing the leaks, the plant was able to improve energy efficiency to above 50% at a savings of over $200,000 per year.

Energy Reduction:

In the energy reduction part of the project, Orr & Boss started by conducting an energy audit. The five steps in the energy reduction article were followed. The five steps are:

1. Identify all users of electricity, natural gas, and steam in the plant.
2. Make a schedule of all electricity users and motor power requirements.
There is a misconception in industry that using Six Sigma teams to help reduce cost always takes a long time. In fact, using trained Six Sigma teams can be one of the fastest ways to make real change happen in your facility. The analytical skills that the teams obtain from Six Sigma training allow them to quickly pinpoint opportunities and to develop the techniques that will allow that can provide the team with the support that they need and can provide training on additional techniques as team members develop. The reason that most Six Sigma teams are ineffective is that they have spent most of their time training and not actually using the techniques that they have learned. Most people are not good at applying training learned in the classroom to the workplace. One role of the facilitator is to help with this transition.

There is also a belief that to be effective the team members must go through extensive training that can take weeks. Our experience shows that with as little as one day of basic training and an experienced facilitator, teams can be very effective in developing cost cutting solutions. Much of the traditional Six Sigma training is never used by the participants in the field. It is in their toolbox in case they ever have the opportunity to use it. A perfect example is SPC training. In most batch chemical operations it is only mildly useful. Why spend several days training people to use a technique that may not be effective in helping them in their goal of reducing cost? Providing the teams with a smaller toolbox of techniques and more hands on experience in the facility has proven to make the teams more effective. The graphic above shows the techniques that are part of our initial one day training.

Teams can be very effective using just the techniques above.

One of the keys to this approach, with relatively newly trained teams, is having an effective experienced facilitator that can provide the team with the support that they need and can provide training on additional techniques as team members develop. The reason that most Six Sigma teams are ineffective is that they have spent most of their time training and not actually using the techniques that they have learned. Most people are not good at applying training learned in the classroom to the workplace. One role of the facilitator is to help with this transition.

One of the first questions that a new team will ask is “Where do we start?” As part of the initial one day training the team clearly defines the problem that they are going to work on and develops an action plan of how they will address the problem. This eliminates needing to answer that question because the action plan has already been developed.

The teams met for one hour every two weeks to report their successes and failures and to develop the next steps. Most of the work of the teams was done in the periods between meetings. The meetings were only used to report progress, provide additional training and to plan the next steps.

As in most new processes the teams had their successes and their setbacks. One of the roles of the facilitator was to help the teams when they have had setbacks and to challenge the team to set very high goals. All of the teams met their initial goals within a few months and are now working on reducing costs further. The goals the teams achieved are:

- Reducing cleaning time on mills from 14 hours to 3 hours;
- Increasing filling line uptime by 25%;
- Improving schedule adherence from 60% to over 80%.

Using a team approach to cutting costs can be very effective and does not have to take months. Training team members in just the techniques that they need in order to solve their cost cutting opportunity and having an effective facilitator are keys to getting quick results.

“One of the first questions that a new team will ask is “Where do we start?””

“Think of it as a big party where costs are uninvited guests, and savings are the cool people you want to hang out with.”
There is a misconception in industry that using Six Sigma teams to help reduce cost always takes a long time. In fact, using trained Six Sigma teams can be one of the fastest ways to make real change happen in your facility. The analytical skills that the teams obtain from Six Sigma training allow them to quickly pinpoint opportunities and to develop the techniques that will allow you to reduce costs in your plant or office.

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HOW THIS WORKS IN REAL LIFE

A global coatings manufacturer wanted to quickly reduce costs and to change how the different functions within the company worked together. We agreed with management that in order not to overwhelm the facility we would limit the number of teams to three. The site manager identified three cost cutting opportunities that would benefit the company.

To make the training more effective we collected data about each of the cost cutting opportunities and used that data in the course material to make it more relevant to the participants. Teams were limited to between 6 and 8 participants not including the external facilitator. Each team received 8 hours of initial training and additional training as it became apparent that additional techniques were needed. The teams used the action plan developed as part of the training as their blueprint for their cost cutting efforts.

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Material Waste Reduction
By: Doug Bohn

For many manufacturing businesses, material waste reduction is a gold-mine. It nearly always has an extremely rapid payback-months rather than years. Material waste reduction reduces material costs and also saves on disposal costs. Material waste reduction can easily fit into a company’s sustainability strategy. Orr & Boss normally measures material waste through two different methods. First it is measured from the accounting system. Measuring waste from the accounting system allows you to understand overall plant material waste values and the cost that it is having on your business. However, the accounting data alone does not allow you to understand where the waste is occurring and what to do to eliminate it. To do that, it is necessary to physically measure waste in the plant. This is the second method of waste measurement: going out in the plant to observe and measure actual material waste generation.

Accounting Data
There are several places where waste costs can be found in the accounting data. The most common places are:

- **Waste built into the product costs standards:** For every 1.0 lb of product, do your product cost standards assume that you will use 1.01 lbs of raw materials? If so, the cost systems assumes 1% waste and this will not show up in the plant material usage variances.
- **Material Usage Variances:** Monthly material usage variances will let you know how much above and beyond the waste that is built into the product standards is occurring.
- **Inventory Scrap:** Inventory scrap due to quality or obsolescence is also a source of waste.
- **Cycle Count Adjustment:** Cycle counts can also highlight waste issues. If your company is having to continually make negative cycle count adjustments, it means that your material waste is higher than your product standards and material usage variance suggest.
- **Disposal Costs:** Often times there is a cost associated with disposing of any material waste. This is especially true of any hazardous waste.
- **Under-Delivery of Raw Materials:** Are your suppliers actually delivering what they promise? Sometimes, they may be shorting you. However, in some cases, suppliers are actually delivering slightly more than promised. A 50 lb bag of material may actually contain 50.5 lbs of material. If suppliers are over-delivering, this means that your material yield could be higher. Spot checking deliveries will help you determine if suppliers are over or under-delivering your raw materials.
- **Process Losses:** Are we getting all the material out of tanks when we transfer material? Are spills or leaks occurring in the process? Is all the material being emptied out of bags or drums or is some residual material left over?
- **Changeover Loss:** When do we changeover products, how much material is wasted? Are we flushing out the lines and tanks with solvent? What happens to this material? Is it disposed of, or is it re-worked or discarded? There may be an opportunity to improve yields.
- **Over-Addition:** Are we over-filling our outgoing containers? Does a one gallon pail of product actually contain 1.01 gallons of material? Check weighing sample outgoing materials should help us identify waste.
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“Material Waste Reduction”

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To begin with the company conducted an audit. The goal of the audit is to determine the company’s true material waste and energy efficiencies. Orr and Boss conducted these audits.

**Material Waste Analysis:**
First, Orr & Boss worked with the plant accounting department to determine the overall material waste percent and its value. The bills of material (BOMs) for the company’s products were analyzed to determine how much material waste was built into the standards. It was determined that a material waste of 2% was built into the company’s standards. The accounting data also showed additional losses in material waste, inventory scrap, cycle count, and waste disposal costs. The total material waste in the accounting data was shown to be 5%.

Then, Orr & Boss went out into the plant to actually measure waste. Samples of the top moving SKUs were weighed. The results indicated that on average the company was overfilling containers by 3.1%. Also material losses were found in the changeover process, evaporation, and scrap batches. Of these, scrap batches was the largest at 0.9%.

Thus overfill of containers and scrap batches accounted for 4% of the material waste. The data indicated that most of the overfill and scrap batches was occurring in one area of the plant. With this knowledge, the company was able to set up kaizen teams to attack these areas. SPC procedures and standard work procedures were put together in the filling line area to reduce the variability and improve the consistency of the fill volume. Better standard work procedures were developed for the mixing area and the reactors to improve the manufacturing consistency of the product. These procedures resulted in a decrease of material waste of 1.2% and savings of over $300,000 per year.

Energy Reduction:
In the energy reduction part of the project, Orr & Boss started by conducting an energy audit. The five steps in the energy reduction article were followed. The five steps are:

1. Identify all users of electricity, natural gas, and steam in the plant
2. Make a schedule of all electricity users and motor power requirements
3. Measure Power Consumption

The results of the energy audit indicated that natural gas and steam efficiencies were below 30%. With this knowledge, maintenance personnel went about tracking all of the steam lines to determine where leaks and losses were occurring. The results of this indicated numerous places in the plant where leaks in the steam lines were occurring. By repairing the leaks, the plant was able to improve energy efficiency to above 50% at a savings of over $200,000 per year.

The combined savings of both of these projects was greater than $500,000 per year. The company was able to start realizing the savings immediately. The steps needed to complete these projects are all straightforward. Minimal capital expenditures were required. This is normally the case with material waste and energy reduction projects.
Energy Education Reduction (continued)

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Have You Seen our Site Lately?

www.orrandboss.com

Orr & Boss, Inc. is an international business consulting firm that delivers increased shareholder value to our clients within the specialties chemicals, formulated products and related industries.

We recently updated our website to reflect an expanded set of services.

Please visit our website for more information.

Shareholder Value Creation For Our Clients

Whether the challenge is maneuvering your company through an economic downturn, completing the acquisition of a leading industry supplier, developing an effective market entry strategy, or strengthening one’s global competitive position through a much improved supply chain organization, Orr & Boss is there to help our clients succeed. Our toolkit of fact-based analyses, previous related experiences and practical solutions all converge to get the job done right. We act as our clients’ catalyst for positive change.

Three simple words capture the very essence of what we achieve for our clients — Client Value Creation.

Industries We Serve

- Adhesives & Sealants
- Automotive
- Building Materials
- Chemicals
- Construction Products
- Food & Beverage
- Inks
- Material Sciences
- Paint & Coatings
- Personal Care
- Pharmaceuticals
- Plastics
- Printing Industries
- Polymer Sciences
- Private Equity
Recent and Upcoming Events

ASC 2009 Spring Convention & Expo
April 5-7th

NPCA, 122nd Annual Meeting & Industry Leadership Conference
April 26-28th

RadTech Spring Membership Meeting 2009
May 18-19th

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