Blown Film Internals

D. R. Joseph, Inc. Blown Film Process Systems & Consulting

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Beat the Next Rush

Too often during busy times, production is running at maximum capacity and we cannot afford even an hour of downtime to improve the operation of the lines. Now that many of us are facing a slow down, what do we do? Some organizations turn the capital expenditures faucet off and attempt to wait it out. Others embrace the slow down as a time to focus on strengthening the company's position in the market.

Certainly it is prudent to reduce non-essential spending, but it is also wise to invest in projects that improve the infrastructure, increase capacity, and develop new products. This is a sensible approach because costs are generally lower when demands on available resources are low. We also know that each slow down is eventually followed by a recovery.

We all want to handle the busy times with improved ease and profitability. To best manage through the slow times, your organization has to understand the business cycle and ensure that during good times, the company is earning enough to have investment capital available when times are slow.

Whether or not your organization tightens the cash flow reins at the first sign of a slow down, take a minute and read this newsletter. We have put together several articles that will help you consider making training and equipment investments when times are slow. That way, you can beat the next rush instead of being overwhelmed by it. ◆

Buy Four IBC Systems; Get a Blown Film Line

Are you thinking about buying a new blown film line? After reading this article you might decide that a better alternative is to upgrade your equipment. Many of the blown film lines running in production today are drilled for Internal Bubble Cooling (IBC) but do not take advantage of the benefits of IBC. *On average, changing from non-IBC to IBC can boost production 25-30% or more.* <u>This means that for every four dies you upgrade to IBC, you actually obtain the same production increase that you would by adding a complete line</u> (depending on the application and size die you are running). The larger the die, the more percentage increase you can obtain. Even if your die is not drilled for IBC it is still very cost effective to upgrade your old die with a new die package that includes internal bubble cooling.

One of our customers recently upgraded five of their lines to the D.R. Joseph IS-IBC1® system. They averaged a 30% production increase on each line (150% more production than before). This is equivalent to adding 1.5 new lines to their plant without

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Is Your Water Really Chilled?

Chilled water is critical to the success of most blown film operations. When operations are slow, it is a good time to have your chilled air system evaluated and possibly upgraded to handle the current and anticipated load. While not everyone needs 32 degrees Fahrenheit (0 degrees Celsius), everyone does need the ability to maintain a specific chilled air temperature all year round. A maintained chilled air temperature will protect film specifications

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the expense and hassle of housing the new line. When compared to an upgrade, the cost savings are tremendous. A typical upgrade consisting of IS-IBC1® controls, IBC hardware, blowers, variable speed drives, optional cooling coil, and ducting costs approximately $60,000. To buy a basic extrusion line it costs approximately $900,000. Therefore, you could upgrade fifteen lines with IBC for the cost of one new extrusion line. With those fifteen upgrades, your production would be increased as if you had installed four new lines instead of one.

Upgrading poor performing IBC controls to the IS-IBC1® can also be very cost effective. *Replacing an older, less efficient IBC control system with the IS-IBC1® system can gain approximately 8-15% in production rates.* The cost of the upgrade is not as great because many of the key components are already installed (blowers, drives, cooling coil, ducting). Assuming all the other components were properly specified with the original order, the only thing that needs to be upgraded is the IBC controls. Under normal conditions the IBC control system can be upgraded and back in production the same day.

It is a great time to upgrade your equipment. The economy has slowed recently but will not remain in its current state forever. If you have a line that is down due to lack of orders, upgrade it now so it will be ready for the next big rush of orders. Why put off until tomorrow what you can do today? Call and get a quotation to upgrade your lines with the IS-IBC1® and get the production rates you deserve. ◆

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and production rates, which translates into protected profit level goals. Even a small increase in the chilled air temperature will begin to affect the properties and the production rate. A typical issue that occurs when the chilled air temperature increases is blocking. (Blocking occurs when the film surfaces stick together after passing through the main nip rollers.) The solution is either to add an anti-block additive (added cost), slow down the production rate (lost profits), or a combination of both.

During the hottest months of the year, keeping a steady chilled air temperature can be very difficult. For newer blown film facilities, maintaining the correct chilled water temperature should not be a problem. The chillers and heat exchangers are new, clean, and sized according to the anticipated load of the plant. As the plant ages and heat exchangers gradually degrade, the actual water temperature at the point of use begins to increase. In addition, most plants expand over time by adding new production lines or upgrading to IBC, thereby increasing the load on the chilled water system. Unless chilling capacity is added to accommodate the new additions the whole plant begins to suffer, particularly during the summer.

The most typical chilled air temperature that is run for blown film applications is 50° F (10° C). Lower temperatures are utilized, but during summer months relative humidity can cause significant amounts of condensation outside and inside the airflow ducting. In the cases where a lower temperature is necessary, insulating the ducting and the air ring will reduce the condensation problems - even in high humidity. To reduce condensation inside the ducting, water traps should be installed after the cooling coils to trap and remove the water. Without the traps, water will flow to the lowest elevation point and accumulate. That location normally ends up being the plenum and pipes below the die cart. The water does not typically enter the die, but it does reduce the airflow through the passageway causing other process problems (unstable layflat control).

D.R. Joseph can provide the calculated chiller load for each IBC system we sell. This allows our customers to anticipate the load the IBC system will place on the chiller. For systems that are at maximum capacity, the added load may result in reducing the maximum effective production rate that is possible with the IBC equipment. The chiller system is basically part of the hidden infrastructure of the plant. That makes it easy to forget about heat exchanger cleanings and capacity evaluations. It is much more cost effective to prevent a problem during slow times than to repair it during busy times. ◆

Upgrade Corner

In each newsletter, we will let you know what upgrades are available for your IS-IBC1® control system. The following is a list of all the upgrades that are now available:

1. **Systems with Layflat Control**: Gravimetric interface to Process Control's Gravitrol Gravimetric System. Update accepts layflat setpoint changes from the Gravitrol and sends layflat information back to the unit.

2. **Systems with Cage Control**: Enhanced cage control feature that automatically restarts the sizing cage to keep the layflat more precisely on size during long production runs.

3. **Diagnostics 2 Interface Software** (for use on all non-touch screen systems): Enhanced printing capability allows any screen to be printed or saved to disk. Trending now shows both engineering units and common units for easier understanding of the data. A new zoom option allows the user to select a specific graph region to display at higher magnification.

Previous Upgrades:

1. **Color Touch Screen – 6 inch** (160mm): New TFT technology provides the widest viewing angle possible with a brighter screen, double the memory and faster response time. Compatible with any IS-IBC1® color touch screen system.

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Upgrade Corner

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2. **New Ultrasonic Sensors -** Now available in a convenient upgrade package that includes one new sensor, the new multiple sensor multiplexor, and an interface adapter cable to make installation quick and easy. Ask for the PP4 upgrade package. You will also receive a free user manual, a color operator manual, and a software update.

3. **Automatic Blower Balance -** Eliminates the need for operators to balance or null blowers prior to every startup of the line. The system also automatically rebalances the blowers if needed. We have easy to install upgrade kits available.

4. **Layflat Control** – Adds a second control loop to the IBC system that reduces the time to achieve a desired layflat, with or without gusseting. Easy upgrade to any Automatic Blower Balance system.

5. **Cage Control** – Adds the ability for the system to automatically position the cage diameter to the correct size to produce the desired layflat. Easy upgrade to any Layflat Control system. ◆

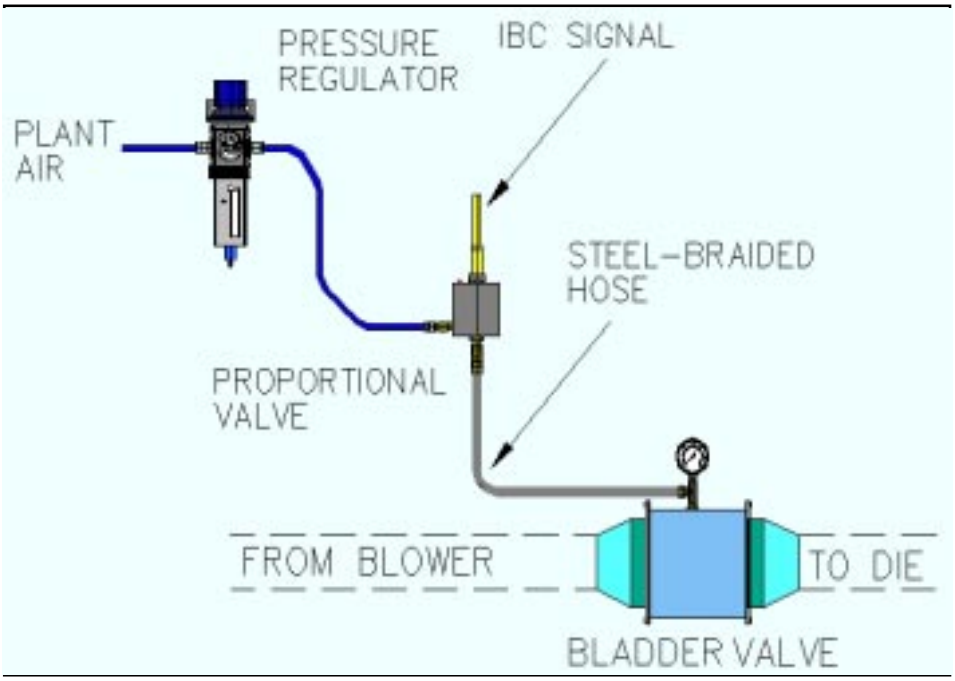
TECH TIP

Proper Pneumatic Settings

To maintain accurate size control, the pneumatic components of the IS-IBC1® system need to be properly maintained. The pneumatic components include: pressure regulator, proportional valve, and for this article, a bladder valve. (See the figure.) Keeping these components properly maintained will ensure proper operation and will eliminate those tough to find bubble stability problems. Below is a description of each component and the proper setup.

Regulator

The IS-IBC1® system will not control at all if the compressed air supply is removed or compromised. The IS-IBC1 system needs an oil free, dry supply of air. The regulator must be set to 28 PSI (2 bar). If the pressure is too low, the valve will be slow to respond and the bubble will over inflate. If the pressure is set more than ten percent higher than 28 PSI, the proportional valve may dump any excess air into the bladder valve causing the system to control erratically. If there is too much moisture in the compressed air supply, the bowl trap will capture the water until it fills. Then the water will enter the proportional valve. In extreme cases excessive amounts of water will fill up the bladders in the bladder valve causing reduced airflow into the bubble. Make sure the regulator bowl is emptied on a regular basis. It is also possible to open the bowl drain a small amount so accumulated water is drained immediately.



Proportional Valve

The proportional valve takes an electrical signal from the IS-IBC1® system and converts it to a pressure output to control the bladder valve. The most common reason a proportional valve fails is contamination from oil and/or water. A common system performance problem is a leak between the proportional valve and the bladder valve. Older systems use a plastic poly-hose but all newer systems use a custom length steel-braided hose to connect the two devices. A leak here will cause the bubble to run oversize and the system will seem sluggish. If you suspect a leak, call us and we will fax or email our document for checking the proportional valve. If you need to replace the steel braided hose, call us for a replacement to ensure proper operation.

Bladder Valve

The bladder valve is very durable and needs very little attention under normal circumstances. If the bladders become filled with water, you may remove the valve from the inlet ducting, remove the steel-braided hose and turn the valve on its side to drain the water. **It is not necessary to disassemble the bladder valve.** If cleaning of the vanes becomes necessary, use a soft cloth to remove the debris. Never apply more than 20 psi of air pressure to the bladder valve as the vanes will become distorted and improper operation will result. On the side of the bladder valve, just below the pressure gauge connection, there are several small rubber lines that connect the air from the metal tube to the individual bladders. Inspect these hoses to ensure that they are not kinked; a kinked hose will prevent smooth operation of the bladder valve.

Keeping the pneumatic components maintained and set to specification will allow the IS-IBC1® system to provide the tightest layflat specifications available. Neglecting these components will result in unexplained problems and possibly damaged equipment. ◆

The Last Word

I walked into a customer's plant some time ago and saw a sign that said "CAUTION, THIS MACHINE HAS NO BRAIN. USE YOUR OWN." I found the sign to be a refreshing way for management to communicate a profound truism to the employees – they each have a brain and the company needs them to use it. Teaching operators to use their brains is a positive first step in the training process, but they typically need more information to maintain the optimum performance of each machine. The fact is that very few operators can sit down and be trained in one session. At D. R. Joseph, we often use the following training formula: Initiate, Operate, Explore and Review. The overall objective is to synchronize the operator's abilities with the machine in a series of steps over time.

Initiate

The first step is to introduce the operator to the machine through the use of an easy to read, color operator manual and a short training course. We encourage management to provide each operator with a personal copy of the manual. We explain the basic functions of the machine and describe any unfamiliar features. We do a quick walk through on how to start the machine, how to get a stable bubble, and what to do if there are any basic problems.

Operate

Next, we give the operator a chance to get familiar with the controls. We have them start the line with only verbal guidance. Once the line is started successfully, we repeat the process several times with several operators. Because production is as important as operator proficiency, we help the operator get the line into production and give them basic instructions on handling exceptions. The goal for the first evening and night shifts is to be able to run in production through the night without assistance. This helps to build confidence and allows the operator to move on the next step.

Explore

At this stage, the operators are running the machine without assistance. As they operate the equipment, they will run into some issues that will require them to explore the capabilities of the machine. Maintenance personnel will be given their version of training so they will know how to work on the equipment. Production will be given technical support contacts, manuals, and production objectives for the next few weeks. The overall goal is for everyone associated with the use of the machine to explore all of the functions of the system and to develop questions that are used in the next step.

Review

Ideally a trainer will return to the plant, to commission another line or on a specific trip to complete the review process. The goal is to allow all personnel to ask questions relative to their functions and to brainstorm on how to best utilize the equipment to eliminate processing problems. Sometimes, the result of this session is a change in the operation of the machine or the addition of a new feature. Most times, the operators receive an improved understanding of what the machine can and cannot do. It also provides an opportunity to dispel any "wives tales" that have developed as a result of word-of-mouth training. The last goal is to help one or two people become company experts on using the system. This helps new operators have an in-house resource to ask questions about the system.

Duplicating the Process

It takes a commitment from the production department to allocate time and money to run the initial training sessions and to repeat the four-step process with new operators. Because of time and production constraints, the only training many new operators receive will be from the previous shift operator, who might provide the comforting, but deceptive words: "It runs itself. Just hit the start button and everything will be fine!"

To help operators in this predicament, DRJ provides a color touch screen based IBC system that has online and context sensitive training and tutor screens. When an operator is left to run the machine without any formal training, the tutors help with the Initiate, Operate and Explore steps of the process. The Review step is still needed. Without it, glitches in operator skills can show up in the form of lower production rates, slower order change times, and increased scrap rates. This is why it is important for the production department to develop one or two company experts on the machine. Readily available expertise will reduce the need for the operators to blame the machine for what is really degradation in their skills.

Returning to the initial premise, the right approach to implementing new technology is to balance formalized training with encouragement, and to let operators know that their brains are needed in order to get the most out of the machines. ◆

Forms of Payment.

D.R. Joseph, Inc. also accepts payment by credit cards. We accept American Express, MasterCard, and Visa for spare parts orders. This is a great way to order those emergency spare parts orders quickly without the hassle of issuing a purchase order. Don't delay – get the parts you need today. ◆

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