

Just In Time Manufacturing

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Just In Time

With the advent of manufacturing strategies that require delivery of inventory "just in time" to be assembled and sent to the next process, the concept of cellular manufacturing is gaining widespread acceptance. This concept is having incredible impact on the logistic control patterns of manufacturing facilities by dividing the plant floor into smaller, more manageable sub units. It is offering production supervisors the opportunity to be more flexible in their scheduling patterns and more disciplined in performing their preventative maintenance requirements.

This concept of individual production units is proving most profitable in the metal forming and stamping industry. Organizations are now able to produce a wide range of product designs while remaining specialized in similar material. They can provide prototype products, profitably produce short run parts, engineer minor design changes without re-engineering the entire line and halt or slow production of one line to increase that of another line. This type of manufacturing process lends itself particularly well to the theory that many small units are better than one large unit.

In the traditional stamping plant one can expect to see varying levels of the following, all of which decrease the ability for the operation to perform effectively:

- Heavy, dangerous fork lift truck traffic patterns moving large bins of parts from the end of presses to a central area to be washed, then from the washer to the next process.
- Heavily soil-laden bins that collect the parts prior to washing and then collect them again after the washing has taken place.
- High levels of work-in-process are either waiting to be transported to the washer, being transported to the washer, being made ready to go through the washer, waiting to be sent to the next process or en route to the next process.
- Reliance on a central wash system to clean each part before it goes to the next manufacturing process and then again before it is shipped to the customer.

Each of these realities contributes to an attack on the company's bottom line and the deterioration of a positive attitude toward the work being done there.

Non-value added labor costs in the form of fork-lift truck drivers. Fork truck drivers only transport from end of one task to the beginning of the next task. The cost to have them provide this transportation does nothing to enhance the value of the product.

Each part as it comes off of the press is loaded with drawing lube and other residues from the previous forming process. After they are stamped, parts are run off of the press into the collection bin. As this occurs, all of the soil on those parts goes into the bin as well. Parts are then washed and must be collected in those same bins before they can be transported to the next process. Clean parts come off of the washer and are dropped into the dirty bin, which contaminates the parts all over again. This renders much of the washing process pointless.

Costly work-in-process inventory levels must be kept high in order to facilitate a continuous build process. This not only ties up valuable floor space with parts waiting to be brought to the next process, but the cost of goods being built is a cash flow killer.

Another tremendous drawback to using one central wash system is that every part has to go through that one piece of equipment. That necessity puts an incredible amount of pressure on that one unit. When this happens, preventative maintenance is ignored because of the inability of the production schedule to allow for the washer to be down for it to be done. Lack of preventative maintenance in a washer contributes significantly to pre-mature failure of all washing components including heating elements, pumps, conveyor

systems, blowers and filtering systems. Each of these becomes coated to some degree with the soil being washed off of the part. Unless that soil is removed from the washer's component on a regular basis, it will put uncommon stress on its operation and cause failure. When that happens, the washer is then forced to operate out of the customer-approved parameters or, in the case of a failed pump, not operate at all.

The solution to each of these issues involves creating a separate manufacturing cell, which is able to wash parts after each stamping press. Benefits of this alternative include:

- The ability to wash each part immediately as it exits the press, which eliminates the opportunity for drawing lube to dry on the stamping which would increase the difficulty involved in cleaning it off.
- Wash stampings before they are directed to a transportable container.
- Eliminate the existence of unwashed, inventoried, parts.
- Significantly reduce the amount of forklift traffic in the plant and diminish the non-value-added labor of their operators.
- Allow production to stockpile cleaned, ready to ship or assemble stampings.
- Provide washer down time that can be used to perform preventative maintenance and treat the fluid in order to remove the contamination.

Those in the stamping industry realize the magnitude of the above benefits, which would be realized by implementing a plant wide cellular manufacturing concept. In order to implement this smoothly, however, the stamping facility must work with a vendor that has extensive experience in this concept and this industry.

Midbrook has worked with a myriad of metal forming companies to help make the transition from a central wash system to an arsenal of small units, which would be able to be individually configured to each stamping press. Whether the facility's presses are built by Verson, Niagra, Glow, Chen Li, Minster, Heim or any other machinery builder, the parts cleaning vendor will need to know the best way to take the washer and allow it to work smoothly in conjunction with the press.

Design issues arise, like where should the washer's electrical box, clean out doors and access panel be located in regards to the press. What is the best way for the washer to roll into position with the press? Where is the least obtrusive spot for the washer components to be when the press dies need to be changed or when a lube line breaks? A parts cleaning vendor needs to have experience with the machinery to be able to know potential headaches and how to avoid them as cost effectively as possible. That means using a standard design that already is used in the industry.

The standard Midbrook Mini Belt Washer is the perfect small and mobile washer to make these benefits part of a profitable work cell. This washer recycles wash fluid through a stainless steel tank of less than 200 gallons. It can be installed on transporting casters and designed within a limited footprint to allow for easy maneuverability from metal forming station to station.

Auxiliary components can be added to each specific cellular washer to accommodate the washing of a diverse number of products. Thin film oil removal systems can be used where there are heavy tramp oils in the prior processes. Particulate filtration systems can be installed where there is grinding swarf to be removed. Diffusion separation systems can be plumbed where synthetic coolants are employed. In addition, careful process analysis can specify cleaning and rust inhibitor combinations that are most appropriate for each individual cell.

Midbrook's mini cell washer allows stampers to address each product category with both steel-specific cleaning chemical blends and soil-specific in process water treatment systems. This creates the opportunity for better cleaning, within a smaller area and at a more efficient speed.