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The Double Puller

by Roger A.P. Fielding, BENCHMARKS

You don't have to travel far to find businesses where extrusions are still being manufactured in a series of disconnected steps—where production is entirely dependent on people for the completion of each step, and for moving the extrusions from step to step.

In such operations, billets are selected from stock, or sawn from log. They are then moved to the press area and loaded into the furnace by someone using a fork truck or crane. The heated billet is transferred to the extrusion press by the press operator “calling” the billet. The extrusion process is started and controlled by the operator, and the extrusions are guided down the runout table (and often transferred to the cooling table) by hand. Even in plants equipped with pullers, people are seen to be feeding extrusions into the puller at the start of each billet, and “helping” the transfer to the cooling table. In such operations, you can still find walking beams being used to move extrusions to the stretcher while they are cooling, and walking beams transferring the stretched extrusions to



Granco Clark Double Puller

the saw feed conveyor. The extrusions are invariably moved into and out of the stretcher by hand. At the finish cut saw, the extrusions are lined up by one person, and the saw is worked by another. The cut extrusions are stacked by hand.

The true cost of poor recovery is buried in the labor, materials, and energy used to produce scrap and in the cost of additional labor, materials, and energy required to “do it right” the second time. Understanding the problems that cause the scrap allows us to continuously improve the whole extrusion production system. Modern extrusion systems have a direct impact on reducing the source of wasted labor, time, and materials.

This article focuses on the operation of the Granco Clark double puller system and shows where it contributes to reducing waste in the extrusion plant and highlights how its programs increase productivity and recovery. We show the multiple activity chart for Program 6, the most frequently used program, in detail.

Program 1: Poor Billet Quality, No Log Shear

Used where billet weight is not controlled or when there are problems with the butt shear.

To ensure consistent butt length, puller #2 is stopped by the press. This program is invariably used when the billet weight is not controlled or there are problems with the butt shear.

Lawrence R. Difatta
President of Granco Clark



ET 2004 is just around the corner now. It's always a great forum to share information on advancements in technologies and processes and discuss industry changes, as well as to catch up with friends in the industry.

Much has happened at Granco Clark since ET 2000 was held in Chicago. We've completed a 20,000-square-foot expansion of our manufacturing facilities; earned certification to the ISO 9001-2000 standard; and introduced several new technologies, including the Granco Clark precision saw and a non-contact probe for our furnace.

In this newsletter, you'll read about the most recent addition to our equipment offerings. The Granco Clark infrared die oven not only provides customers with a much faster way to heat dies, its precise temperature control ensures that dies are heated to the correct temperature, without the risk of over- or under-heating.

We also discuss one of our tried-and-true technologies in this issue of the newsletter: the Granco Clark double puller, and the multiple programs with which it comes equipped. Knowing the best way to utilize these different programs will help you achieve higher recovery rates and maximize productivity.

We look forward to hearing about what's new in your business as well. We hope to see many of you at ET 2004—stop by and visit us at booth #323.

New Infrared Die Oven Offers Greater Flexibility, Fast Heating, Precise Temperature Control

Granco Clark has introduced an infrared die oven that measures the temperature of the die as it is heated, offering precise temperature control and the ability to accurately heat even warm dies. The new oven dramatically cuts heating time, bringing a die to heat in less than 25 percent of the time it would take in a traditional convection oven.

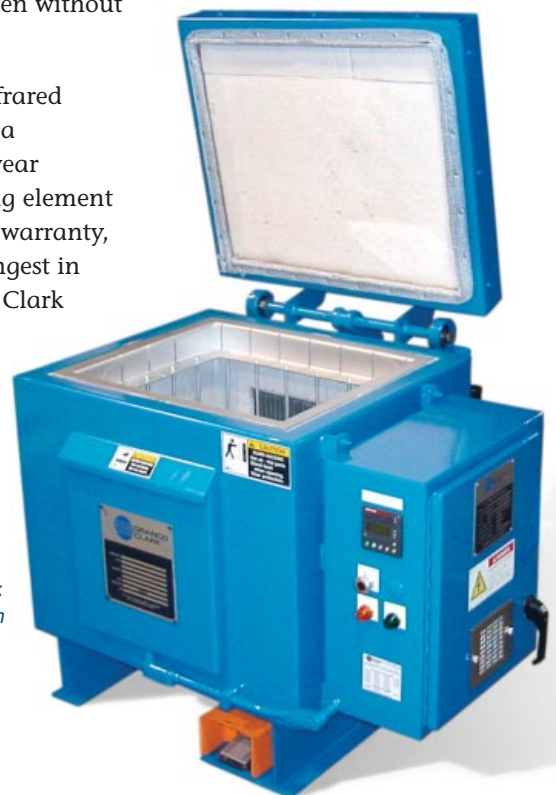
While traditional convection ovens take around four hours to heat a typical die for a mid-size press, the Granco Clark infrared oven can bring a die to temperature in less than an hour. This increases production flexibility, making it much easier for an operation to adjust scheduling if a die breaks or a rush order comes through.

"The infrared oven allows you to put dies in the oven much closer to when they're actually needed—you might only be working three dies ahead instead of twenty at the press," says David Jenista, Granco Clark Systems Engineer. "This helps to extend die life by minimizing the time dies spend at high heat and reducing the potential for annealing."

The Granco Clark infrared oven uses a thermocouple to measure the temperature of the die as it is heated, ensuring that dies are heated to the correct temperature.

"It's a more reliable method than using pre-programmed settings or a timer," Jenista says. "There's no risk of overheating or underheating the die by choosing the wrong setting. And because our infrared oven measures the temperature of the die instead of relying on a timer, you can put a warm die in the oven without overheating it."

The Granco Clark infrared die oven comes with a comprehensive one-year warranty. The heating element carries an 18-month warranty, believed to be the longest in the industry. Granco Clark has applied for a patent on the die oven and its method of operation. ●



Granco Clark
Infrared Die Oven

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The program allows for continuous extrusion. Cutting on the fly places the die or weld mark in the stretcher scrap, but use of this program results in variable extruded lengths. In addition, it wastes press time by extruding scrap.

It is also used when there are problems with the die and/or butt shear resulting in metal being pulled from the die by the shear.

Program 2: Single Puller Mode with Moveable Hot Saw

This program cuts the extrusions one customer length from the die face to maximize recovery when using the water quench.

Where space for “hand over” is limited, this program maximizes the extrusion speed which can be reached with a given die or alloy.

Program 3: Multiple Extrusions per Billet

Eliminating multiple pushes, operating “hand over hand.”

This program minimizes the waste time which occurs when multiple pushes are required to extrude light sections. Extrusion is continuous, until extrusion is stopped by the press, and the butt sheared.

Recovery is improved because the longest practical billet can be extruded. The extrusions are under tension throughout the extrusion of each production lot. Compared to the extrusion of successive small billets, only one butt is produced.

Program 4: Multiple Billets per Extrusion

Billet on billet extrusion: extruding long lengths of heavy sections.

P2 draws the extrusion down the runout table as each billet is extruded. When the desired number of billets have been extruded, the press stops the puller and shears the butt.



Program 5: Flat-Face Die—Non-Continuous Extrusion

Using both pullers eliminates the waste time which results when “waiting” for a single puller to return to the press. The program is also used with old tooling that does not justify replacing due to order frequency or order size.

Program 6: Maximized Productivity and Recovery

The most frequently used program.

After the die has been loaded, the extrusion is led out to puller #2. The extrusions are then held under tension by P1 or P2 until the die is removed from the press.

The puller stops the press the correct distance from the die face. Excess scrap is left in the butt, reducing melt losses. The exact length is extruded, thereby saving time.

Cutting on the weld mark minimizes scrap. The system takes the weld mark and puts it in the stretcher scrap.

The extrusion is taken to the correct position on the runout each cycle. The stretcher tailstock is not moved until cut length and/or multiples change. ●

Program 6

Step 1

- Puller #1 P1 with the saw is stationary at the press.
- Puller #2 P2 stops the press at a distance equal to an integer multiple of the finish cut length plus stretcher scrap, and, if applicable, the sample length. (P2 is pulled back towards the press as the extrusion cools.)

Step 2

- Puller #2 At the end of the dead-cycle, P2 continues to pull the extrusion down the runout table.
- Puller #1 When the die or weld mark appears, P1 accelerates to extrusion speed, clamps the extrusion and cuts “on the fly” at the die or weld mark.

Step 3

- Puller #1 P1 continues down the table at the extrusion speed.
- Puller #2 P2 accelerates down the table, slows, and releases the extrusion at the desired location. P2 returns to meet P1 somewhere along the table.

Step 4

- Puller #1 P1 continues down the table at the extrusion speed.
- Puller #2 P2 slows to a stop when it is about 6.5 feet (2 meters) from P1, and then starts to move down the table in the same direction, but slower than P1.
When P1 is within 1/2" (10 mm) of P2, both pullers will be moving at the same speed.
- Puller #2 P2 clamps onto the extrusion; total pulling power is kept constant while the pulling force is transferred from P1 to P2.
- Puller #1 P1 withdraws its clamp arm when the P1 pulling force reaches zero.

Step 5

- Puller #1 P1 returns to the press position and waits. When P2 is the correct distance from the die, P1 accelerates to extrusion speed, clamps the extrusion, and cuts “on the fly.”
- Puller #2 P2 continues down the table.

Step 6

- Puller #1 P1 continues down the table at the extrusion speed.
- Puller #2 P2 accelerates down the table, slows, and releases the extrusion at the desired location. P2 returns to meet P1 somewhere along the table.

Return to Step 4

New Equipment Installations

North America

YKK AP America, Inc.

Dublin, Georgia, USA

YKK Architectural Products has selected Granco Clark to supply a High-Pressure Spray Quench for its facility in Dublin, Georgia. A leading manufacturer of aluminum building products, YKK AP manufactures storefront, entrance, and curtainwall systems.

This quench is being installed on the handling system Granco Clark supplied in 2002. The quench will be used in producing new products not covered in the requirements for the initial press line installation.

The High-Pressure Spray Quench is the Granco Clark 450GPM design. It includes electrical control of the water volume settings for repeatability, and also features a traveling quench chamber that prevents the creation of a critical zone in the profile during the dead cycle.

Indalex Aluminum Solutions

Point Claire, Québec, Canada

Granco Clark has been awarded an order by Indalex Aluminum Solutions to supply a full handling system for its facility in Point Claire, Québec. Indalex is North America's second-largest supplier of extruded aluminum components, serving various industries, including construction, transportation, and consumer durables.

The new handling system, a retrofit of an existing 1800-ton press line, will allow Indalex to enhance throughput and extrusion quality. The order includes a Granco Clark



Granco Clark Controlled Vertical Crush Stretcher

Hot-Jet Furnace and Quick-Cycle Log Shear, 500-pound Double Puller, and 35-ton Controlled Vertical Crush Stretcher.

May 18-21, 2004 • Orlando, Florida

ET 2004 is almost here! Be sure to visit Granco Clark at Booth #323, at the Gaylord Palms Resort and Convention Center in Orlando, Florida, on May 18-21. For additional information on ET 2004, visit www.etfoundation.org.

A Note to Our Customers

We recently learned that a Kansas City, Missouri importer of aluminum extrusions from China (with an associate office in Pennsylvania) has been operating under the name Granco Inc., China Aluminum Division. The similarity of the name to ours has generated some confusion

with our customers, and we want to make it clear that there is no connection between Granco Clark and Granco Inc., China Aluminum Division. We have been in contact with this company, and they have agreed to change their name. ●

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