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The Acquisition of Modern Aluminum Extrusion Systems

by Roger A.P. Fielding, BENCHMARKS

The first article in this series, entitled "The Acquisition of Modern Aluminum Extrusion Systems: Motivation," introduced profit as the prime force driving change. Reduced conversion costs, resulting from shorter lead times, improved productivity and recovery, are the measure. The intrinsic safety and the reduced emissions from state-of-the-art equipment ensure that one can stay in business.

The second article: "Conception" discussed how each part of a modern, integrated aluminum extrusion system contributes to increased productivity and recovery. It emphasized the importance of top quality billet and extrusion dies, and showed how less than 100% reliability affects press down time. Quality — in the broadest sense — was shown to be the means by which manufacturing lead time (and hence conversion cost) is minimized.

The first article was intended to make people think about modernizing their facilities. The second article related the physical aspects of modernization — the hot log shear, double pullers (cutting on the fly, at the stop mark), the belt handling systems, automated saws and stackers — to improvements in quality and the resulting reduction of lead time.

This and future articles deal in greater depth with "Specification," "Evaluation," "Selection," and "Commissioning and Start-up."

Specification writing is the critical phase of any capital project. To be successful, the user must specify the performance expected of the project, and define how the completed project will be judged to be successful, without placing undue constraints on the potential suppliers. The suppliers can then draw on their varied experiences to design equipment to meet those goals.

But, all too often, the user produces a specification which

Specification

Definition: A Detailed, Precise Description

Key Words:

Goals, Performance Standards, Design

goes beyond performance standards to define how (in the user's mind) the goals will be achieved. In these cases, the user places unnecessary constraints on the suppliers, and in effect, takes responsibility for the ultimate performance away from the suppliers at an early stage.

see "Acquisition" continued on page 2

The Acquisition of Modern Aluminum Extrusion Systems

Motivation:

Definition: Something that encourages.

Key Words: Profit, cost, lead time, productivity, recovery, safety, environment.

Conception:

Definition: What remains in the mind as the product of careful mental activity.

Key Words: Recognition, understanding.

Specification:

Definition: A detailed, precise description.

Key Words: Goals, performance standards, design.

Evaluation:

Definition: The act of judging the worth or value of something.

Key Words: Fitness for purpose, comparison, alternatives, price.

Selection:

Definition: The act of choosing.

Key Words: Measurement, cost-benefit analysis.

Commissioning and Start-up:

Definition: To put in working order.

Key Words: Acceptance, performance.

Lawrence R. Difatta
President of Granco Clark



There was a time when some ideas for new equipment or fresh approaches to old problems came from our customers, resulting in a collaborative effort involving both companies and their combined focus and resources . . . a case of one plus one equaling three. Under those conditions, solutions were optimal and all contributors experienced a win.

Such practices seem to have faded away, and simultaneously so has the opportunity to jointly apply practical experience and technical know-how. We don't believe it has to remain that way. We still believe excellent ideas can come from our customers. In that light, we encourage our customers to work through and with us in the application of ideas to the continuous search for solutions within the extrusion environment.

Over the years Granco Clark has invested much in the way of energy and money on product development ideas that we believed were beneficial to any extrusion plant committed to operational efficiencies. Examples include our billet taper quench, which is an important factor in achieving isothermal extrusion. Another is our new controlled vertical crush stretcher (CVCS) described on page 3 of this newsletter. Other examples include our ongoing product refinements to furnaces, shears, and pullers that accommodate varying conditions from plant to plant. These products and modifications are generally developed in our own facility and represent our ongoing efforts to meet the needs of our global customer base.

It is the entrepreneurial nature and spirit found within certain equipment manufacturers that has provided the industry with progressive operational improvements over many years of development. Granco Clark with its long history of product innovation, is numbered among such companies. We are not only an industry supplier, but a company with more than 40 years of service to the extrusion industry.

Acquisition from page 1

The best specifications use few words to describe project goals, for example:

“. . . put a man on the moon by 1969!”

“. . . an aluminum extrusion system operated by 3 persons, delivering an average of 4000 lbs. per hour of 6063 and 6060 extrusions at 88% recovery.”

Both projects were successful . . .

Faced with such succinct statements of the project goals, potential suppliers can enter into constructive dialogue with the customer and present their best solutions. In the process, the customer becomes fully acquainted with the state-of-the-art, and is then in a position to properly judge each supplier's capabilities.

How do you write a specification for new equipment?

- 1) List your key performance measures and your current performance: safety, lead time, conversion cost, reliability, productivity, yield.
- 2) Establish the benchmark numbers representing the best practice in your sector of the worldwide aluminum extrusion industry.
- 3) Use the numbers to describe your objectives:

Performance Indicator	Performance Measure	Benchmark Number
Safety	# Accidents	0
Lead Time	# Days
Conversion Cost	¢ per lb.
Reliability	Mean Time Between Failures
Productivity	lbs per manned-hour
Yield	% recovery

- 4) Write a sentence, or list in point form the numbers which will be used to measure the success of the project.

“. . . an aluminum extrusion system operated by 3 persons, delivering an average of 4000 lbs. per hour of 6063 and 6060 extrusions at 88% recovery.”

- 5) Present your objectives to the leading suppliers to the industry.

The leading suppliers of aluminum extrusion presses and aluminum extrusion systems: log or billet furnaces; hot shears; quenches and run-out systems; double pullers; belt handling systems; automatic stretchers; finish cut saws and stackers; will have questions, but, they'll have no problem configuring a system capable of meeting the goals.

The next article will discuss the evaluation process which ensures that all potential suppliers are offering equipment which meets your performance standards.

to be continued . . . ●

Granco Clark unveils a new controlled vertical crush stretcher of novel design

To meet the continuously higher quality expectations of the extrusion customer, a closer look is being given to each of the components in an extrusion line. The aggressive jaws of stretchers often create additional scrap by distorting the cross section of profiles along their length. This is particularly true with large circle size, thin wall profiles. Sophisticated stretchers are available which perform a controlled vertical crush, but they incur additional price.

Granco Clark has developed a novel approach to the design of its controlled vertical crush stretcher (CVCS). The key difference between Granco Clark's model and other stretchers on the market is the motion of the stretcher's upper jaw.

The CVCS features a hydraulically-controlled pivoting upper jaw that can be set to any closing dimension, minimizing the distortion that can be caused by traditional jaw designs. For example, if stretching a 6" high extrusion, the operator can elect to crush to 3" from the lower jaw, eliminating much of the distortion that would be caused if crushed fully to the lower jaw.

The same principle governs the opening dimension of the CVCS. The home position of the upper jaw can be set to accommodate any extrusion height. If running extrusions that are not very tall, the upper jaw does not need to travel fully

open, saving time on each stretcher cycle. When maximum gripping is



Controlled Vertical Crush Stretcher

required, as when stretching solid bar stock, the upper jaw can be set to fully pivot until the desired upper jaw hydraulic pressure is reached. This assures that maximum crushing force is exerted, preventing slippage.

The "up and back" motion of alternate stretcher designs can occasionally result in the extrusion "sticking" in the teeth of the jaw. Because the CVCS facilitates a virtually

vertical motion, the extrusion does not get "hung up" in the teeth of the jaw — eliminating operational delays and manual intervention.

Our CVCS, with its simple pivoting jaw design, is easy to maintain. Reliability

is enhanced because the clamping cylinder is not subjected to perpendicular forces. The streamlined construction utilizes readily available components, and also makes it more affordable than other controlled vertical crush designs.

For additional engineering and performance specifications, contact Granco Clark at (616) 794-2600 or via e-mail at ginfo@grancoclark.com. ●

The Cutting Edge

Developed by engineers experienced in aluminum extrusion processes, the Granco Clark ECS Series of extrusion cut-off saws (ECS) are available with numerous options. Multiple table-width designs can more than triple the capacity of traditional cut-off saws. Wide tables are necessary in automated systems where manual intervention and nesting is eliminated. Throughput is enhanced with its drop-down arbor design. This feature allows the profiles to advance to the gauge while the blade returns to its home position.

Besides its productivity-enhancing qualities, the Granco Clark ECS also possesses a host of distinctive details designed to facilitate

operation. Automatic blade height adjustment, electronically adjustable blade-stroke length, and mechanical lubrication reduce demands on operators. Its acoustically insulated clamp hood dampens sounds to effect quiet performance. Flexibility is another benefit of the Granco Clark ECS, as the technology can be tailored to fit either manual or automatic extrusion handling systems.

Safety is one of the most critical aspects to consider when purchasing a saw. Granco Clark has incorporated numerous safety devices and procedures into its ECS Series. During the forward stroke of the saw, the

clamping hood conceals the blade. The ECS also offers an under-table blade return. It includes vacuum chip



Extrusion Cut-Off Saw

collection above and below the profiles to minimize accumulation on the table. ECS users are afforded further protection with electrically interlocked side panels; the saw cannot run without the panels in place. When used as a component of an

automated system, the ECS allows operators to control the unit from a remote location, minimizing manual interference.

Finally, the Granco Clark ECS Series makes dramatic improvements in product quality. Its adjustable-pressure pneumatic clamping hood holds extrusions tightly without crushing or marking the profiles. Its under-table blade return prohibits backrake and ensures a quality finish cut. The Granco Clark ECS Series also utilizes a hydraulic-powered blade stroke feed system free of pulsating or fluttering, which can cause detrimental blade overload, teeth damage, rough cutting, and premature blade wear. ●

New Equipment Installations

North America

Franklin Aluminum

Franklin, Georgia

Franklin Aluminum is a manufacturer of automotive roof rack and trunk rack systems. The company is currently installing its fourth extrusion line, incorporating a 2,200-ton press.

Franklin Aluminum has chosen Granco Clark to provide the billet and die heating equipment for the new press line. The billet heating furnace, Model 69-35-3, is capable of delivering 7,350 pounds per hour of 7-inch diameter billet.

Vistawall Architectural Products

Terrell, Texas

A division of Butler Manufacturing Company, Vistawall produces a complete offering of architectural glazing systems — everything from complex high-rise curtainwall systems to standard storefront products.

Vistawall recently installed a new Granco Clark "Hot-Jet" billet/log furnace and shear on its 8-inch press line. In 1997, Vistawall installed its first Granco Clark "Hot-Jet" billet/log furnace and shear on the company's 7-inch press line.

International Extrusions

Alhambra, California

International Extrusions recently installed a Granco Clark Model 812-35-3 billet log furnace and Model 9/12 log shear with transveyor, marking the commencement of the plant's modernization program.

The furnace shear system replaces an existing billet furnace. International is looking forward to a sizable reduction of its metal inventory along with 3% scrap savings!

Caradon Indalex

Port Coquitlam,
British Columbia

A world leader in the manufacture of high-quality aluminum extrusions, Caradon Indalex recently ordered a handling system as part of a plant upgrade.

The new equipment features transfer belts across the system, a controlled crush stretcher, and improved quality sawing. Granco Clark is working closely with Caradon personnel on an ambitious installation program.

Easco Aluminum

Elkhart, Indiana

Easco Aluminum just awarded Granco Clark an order for two furnace shear systems. Part of an expansion of the Easco's Elkhart facility, these furnace shears will replace existing billet furnaces.

The Elkhart plant focuses its business on customers in many markets, including the transportation, marine, building and construction, and material-handling industries.

Abroad

Cheng Hsin Aluminum

Taipei, Taiwan

A multi-press extruder located in the metropolitan Taipei area, Cheng Hsin Aluminum Corporation recently purchased two Granco Clark LPG-fueled billet furnaces.

Granco Clark Model 57-25-2 provides 1,900 kg (4,200 lb) per hour of 178-mm (7-inch) billet for an 1,800-ton press. Model 69-30-3 produces 3,000 kg (6,700 lb) per hour of 203-mm (8-inch) billet for a 2,200-ton press.

Aluar

Abasto, Argentina

A division of Elaborados, Aluar recently purchased a high-efficiency Double End Flow Aging Oven and Multi-Compartment Die Oven. The oven complements the Granco Clark, automated extrusion line installed by Aluar in 1997.



Worldwide

Serving the information needs of the international aluminum extrusion community.

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