



**GRANCO  
CLARK®**

Precision



# Precision

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## The Company

Since 1947, GRANCO CLARK has designed and manufactured custom high-grade, robust equipment for the aluminum extrusion industry, delivered and installed around the world.

**GRANCO CLARK** continues to develop and refine extrusion equipment for the industry becoming one of the rare “single source” suppliers available to extruders for all ancillary equipment around the extrusion press.

**GRANCO CLARK** has a reputation for manufacturing the most advanced and durable equipment in the business. In 1959, **GRANCO CLARK** introduced the first, direct-flame, impingement furnace to the industry. Our designs and technology continue to evolve through the years, and our **GRANCO CLARK** furnace remains one of the fastest, most efficient ways to heat billets and logs.

Along with this leading industry innovation, **GRANCO CLARK** has developed additional equipment that has enhanced productivity, reduced labor and increased profile quality. From the first computer-controlled handling system to the patented **GRANCO CLARK** FusionBond® and Hot Saw technologies (elimination of two-piece billets), **GRANCO CLARK** produces all required equipment to heat, cool, pull, stretch, handle, cut, stack, age and manage aluminum extrusions. Our automated equipment is designed, fully assembled and shop tested to the specific requirements of your extrusion process to deliver exceptional efficiency, productivity and longevity to give you the best return on your investment.

[www.GrancoClark.com](http://www.GrancoClark.com)

With experience dating to 1947, GRANCO CLARK has a reputation for manufacturing the most advanced and durable equipment in the business.





- **ALL In-House Mechanical Engineering**  
*Mechanical, Pneumatics, Heat Transfer  
(3D modeling, FEA, CFD)*
- **ALL In-House Controls Engineering**  
*Hydraulics, Combustion, Electric, Software  
(Rockwell, Siemens, Omron, Mitsubishi, GE)*
- **ZERO Outsourced Engineering or Service**

GRANCO CLARK has the expertise and know-how with twenty-four highly educated mechanical and controls engineers on staff.

With more than 40 years of experience in the field, our customers have access to time-tested knowledge and expertise. With cutting-edge software, our engineers can thoroughly design, test, and examine every aspect of your solution to ensure it will perform as expected.

All of your equipment is fully assembled and shop tested before it ships.

- 100% USA Engineered and Manufactured
- Customizable Purchased Components Specifications
- Engineered with Maintenance in Mind
  - Commonality of parts
  - Purchase component availability
  - Ease of part replacement
- Customer Collaboration Encouraged during Design Reviews
- Turn Key Solutions
- 24 hour Parts
- After Hours Service Program
- Extrusion Line Performance Consultation Services
- Controls System Upgrades
- Service and Inspection Contracts Available
- Graduate Engineers:
  - Michigan State University
  - University of Michigan
  - Western Michigan University
  - Grand Valley State University
  - Calvin College
  - Ferris State University





# Manufacturing



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For over 40 years, Granco Clark has provided quality USA-made Aluminum Extrusion Heating and Handling Equipment. American craftsmanship and technology, backed by a focus on quality, is an integral part of our custom equipment.

Granco Clark's 72,000 square foot modern facility is a full-service manufacturing facility, providing complete "in-house" manufacturing and control over your projects. With skilled and experienced personnel, we can ensure the quality and timely delivery of your equipment. Each piece of equipment is built and then tested on the production floor, providing a smooth implementation at the your site.



- **100% USA Engineered and Manufactured**
- **Certified Welders**
- **Cutting Edge CNC Machining Centers**



100% USA Supply



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Fully Assembled and Shop Tested





## Service

**GRANCO CLARK's** Service and Parts Departments are available 24/7. Our global team of trained service technicians are available to keep your production facility running smoothly at all times. They will find the best solution to meet your needs and provide on-site service and parts whenever necessary.

Remote support means less downtime. **GRANCO CLARK's** remote support program can get your system back up and running fast. This online diagnostic assistance is free during standard business hours, with additional assistance available 24/7.

If the issue cannot be fixed via remote diagnostics, **GRANCO CLARK** will dispatch the appropriate technician to be on site, in most cases, within 24 hours. Schedule your preventative maintenance service call and keep your equipment at its maximum efficiencies.



## Service

Contact **Service** at:

- +1-800-918-2600
- customerservice@grancoclark.com

## Parts

### Don't get caught with down equipment.

When replacement parts are needed, you can order them any day of the week, at any time, using **GRANCO CLARK's** 24-hour parts hotline or by e-mailing us at [parts@grancoclark.com](mailto:parts@grancoclark.com). Over 80% of component replacement parts are available for delivery the next day or sooner.

Our parts specialists will key your order into an inventory computer system, answer questions about parts availability and shipping times—and ship your part(s) immediately when available.

## Parts 24/7/365

Contact **Parts** at:

- +1-616-794-2600 (M-F 8am-4:45pm)
- +1-855-GRANCO1 (+1-855-472-6261)  
*after business hours or on weekends*
- [parts@grancoclark.com](mailto:parts@grancoclark.com)

# 24 / 7 / 365





Schedule

History

Dies/Configuration

EPICS

Help

Productivity

Actual Weight

Last Hour

7020

Current Rate

5586 LBS/Hour

8000

Recovery

Shift 1

86 %

Shift 2

87 %

Shift 3

89 %

Advance:

FCE






PLR

Current Station	Order	DieID	Billets	Bil Len	Pos	Cut Len	Alloy	Finish	RunID
STR SAW	33684-15-1-A-1	696498-1	10	35.7 in.	86	200 in.	6005	Mill Finish	249
	33684-15-1-A-1	696498-1	10	35.7 in.	86	200 in.	6005	Mill Finish	250
FCE PLR	33644-6-1-A-1	672501-1	5	37 in.	44	119 in.	6005	Mill Finish	228
	33452-1-1-A-1	7151-1	18	29.5 in.	85	294 in.	6005	Mill Finish	255
	33644-7-1-A-1	672501-1	5	38.8 in.	38	138 in.	6005	Mill Finish	229
	33684-1-1-A-1	3054-1	10	18.1 in.	103	156 in.	6005	Mill Finish	223
	33774-3-1-A-1	7112-1	18	24.8 in.	170	290 in.	6005	Mill Finish	253
	33686-1-1-A-1	696561-3	23	18.2 in.	470	144.13 in.	6005	Mill Finish	269
	33516-3-1-A-1	695808-1	10	42.9 in.	100	144 in.	6063	Mill Finish	212
	33662-4-1-A-1	696672-1	31	32.1 in.	500	96 in.	6063	Mill Finish	218

Dies

Supervisor Mode

Recipe Maintenance



Current Furnace Order/Die

33644-6

672501-1

Required: 5

Extruded: 30

Length: 37

Mode: Auto

Running

Current Puller/Press Order/Die

33644-6

672501-1

Required: 5

Extruded: 0

Mode: Auto

Blocked

Current Stretcher Order/Die

33684-15

696498-1

Mode: Manual

Down

Current ECS Saw Order/Die

33684-15

696498-1

Required: 86

Mode: Auto

Stopped

Current Shift

1

2

3

4

Cast

Run Code

Normal Run

Supervisor: DAVE

Operator: ELIZABETH

09/21/2016 11:35 AM

- Order Management
- Recipe Downloads
- Extrusion Line Metrics
- Graphical Diagnostics

First introduced in 1986, the **GRANCO CLARK** Supervisory Computer System (SCS) was developed to provide extruders with a completely integrated control system for automated extrusion lines.

SCS Extrude is a powerful software system that orchestrates the extrusion process. It enables communication among individual machines while providing the office with real-time information. It executes production schedules by automatically loading equipment parameters and recipes. It also tracks and diagnoses faults and then logs production and downtime data.

**Faster Changeover:**

- Load die change parameters without operator input

**Repeatable Setups:**

- Operating parameters can be precisely duplicated

**Automatic Reporting:**

- Tracks orders through your system and displays their status

**Fault Discovery/Correction:**

- Uncovers faults, diagnoses them, and displays recommendations to correct the problems

**Greater Product Output:**

- Quicker changeovers and less downtime for increased production per line

**Enhanced Quality:**

- Higher quality with less scrap

**Data Logging:**

- Stores production data

Die: 696498-1

SAW Order: 33684-15-1-A-1

Post

Pieces: 86

Length: 100 in.

Start: 9/21/2016 8:30:00 AM

Stop: 9/21/2016 8:30:00 AM

Post

Suggested Count: 80

Add Stock

Billets: 10

Next

Weight: 2.1 LBS/FT

Next

Post Code: Normal Run

Change

POSTED Order: 33644-3-1-A-1 Shift: 1 Pos: 100 Die: 696412-1

Change

View Unfinished

Queue

Index

Print Ticket

View Die

Scrap Codes

ORDER: 33684-15-1-A-1

Die: 696498-1

Copy (Pieces): 1

Length: 18.1 in.

Quantity: 10

Out Length: 156 in.

Quantity: 103

Alloy: 6005

Finish: Mill Finish

Facility: 3

Extrusion Date: 9/21/2016

Extrusion Length: 150.6 in.

Extrusion Unit: 1

Billet/Extrusion: 1

Exit

Add

Save

Cancel

Extrusion Line Number: 1

SCS Extrude Active Work Orders

Order	Die	Alloy	Finish	Length	Quantity	Out Length	Quantity
33684-15-1-A-1	696498-1	6005	Mill Finish	18.1 in.	10	156 in.	103

SCS Extrude Production Schedule

Order	Die	Alloy	Finish	Length	Quantity	Out Length	Quantity
33684-15-1-A-1	696498-1	6005	Mill Finish	18.1 in.	10	156 in.	103





# Log Table & Log Pusher



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- "No Roll" Loading Option
- No Impact – Quiet
- Reversible For Alloy Change

The **GRANCO CLARK** Billet/Log Table loads precut stock from the table to the Pusher, dramatically improving cycle times. While a billet or log is being pushed into a **GRANCO CLARK** Furnace, the loading section of the conveyor will lower allowing low impact transfer from the table. Once the pusher head is in the "home" position, the load will be raised and the head will begin processing the new stock.

When a new billet/log is loaded from the table in a lowered position, the roller bed will raise to allow the **GRANCO CLARK** Pusher to process the new billet/log.

## **Robust:**

- Strong engineered tube frame

## **Ready & Waiting:**

- Loading in the lowered position allows the pusher head to simultaneously return to the home position.
- New roller design eliminates marks on billets and logs.

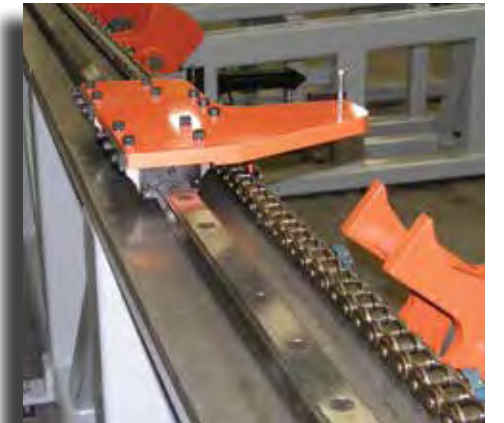
## **Cleaner Logs Using Rollers:**

- Significantly reduces friction and "scale" buildup

## **Special Feature:**

- Precut billets can be processed (option)

- Stores logs and billets
- Load logs in lowered position
- Improved cycle times
- Vertical Log Storage Magazines
- Overhead Billet and Log Loaders



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# Log Washer



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- No Explosive "By-Products" or Dust
- Extended Die Life
- Self Contained Water Circulation and Filtration

Improving the quality of logs for a superior extrusion begins with **GRANCO CLARK's** Log Washer. As logs pass through, they receive a high-pressure, 3000 psi, water spray that removes contaminants. By doing this, it extends the life of your die and container, reducing maintenance.

The **GRANCO CLARK** Log Washer is constructed of stainless steel, with sealed bearings, no brushes (*no aluminum dust explosion hazard and no brush replacement*). No electronics or electrical devices near the spray makes this log washer superior to any other log washer on the market. (*It has a simple, sleek design and can be added to an existing line with minimal effort*).

#### Improving the Quality:

- High pressure spray removes surface contaminants
- Less Die Repair

#### Durability:

- Stainless Steel Construction
- Sealed Bearings

- Single pass coverage that will wash in both directions
- Air knives on entry and exit for spray containment
- No electronics or electrical devices near the spray
- High pressure, 3000 psi spray with water recycling and filtration
- Six nozzle perimeter coverage
- Stainless steel construction
- Sealed bearings
- Optional heated water for improved cleaning performance
- No brushes to cause aluminum dust (*which eliminates explosion hazard*)
- Less maintenance
- Extends die life



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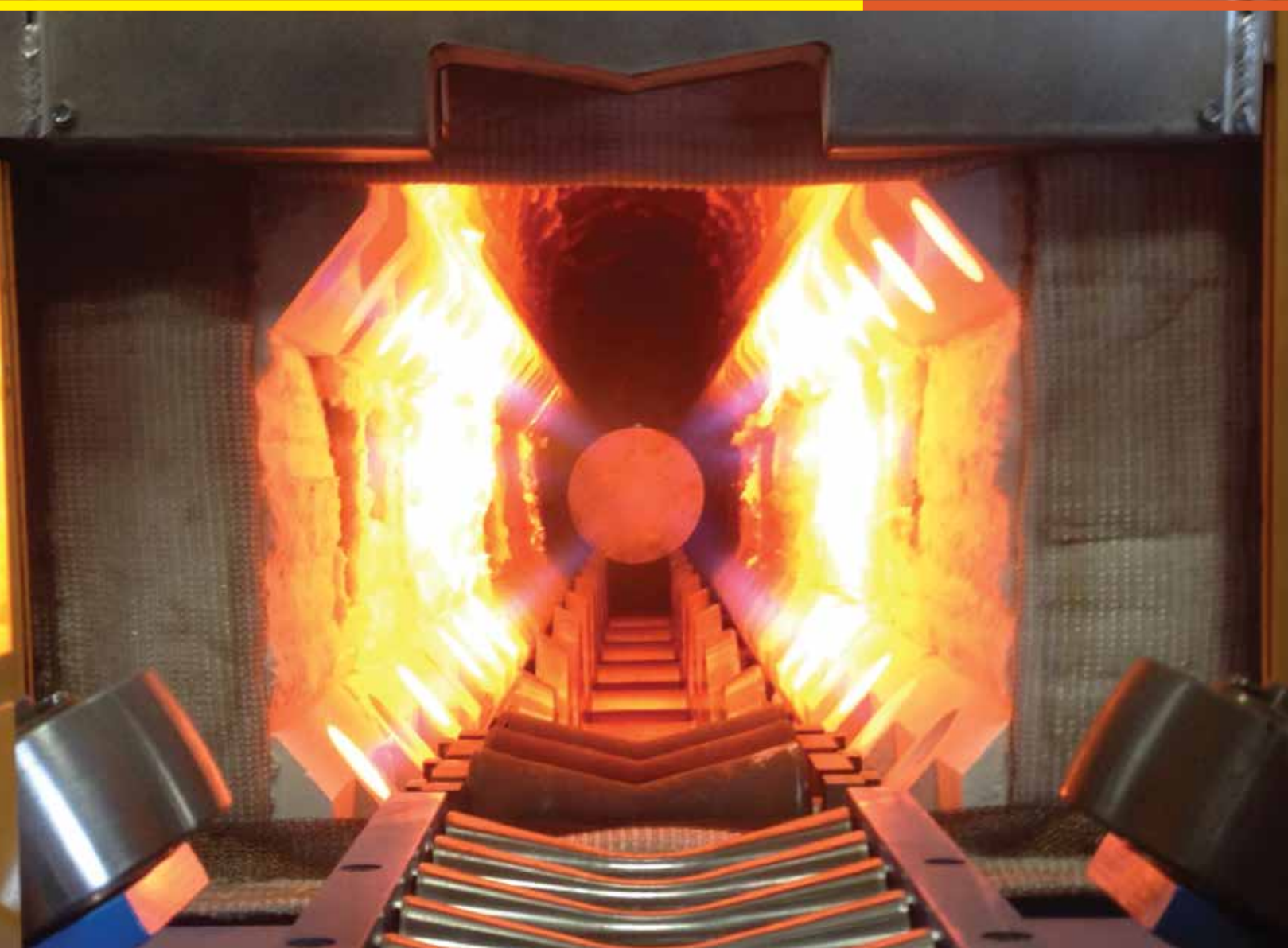
Fully Assembled and Shop Tested



# Hot-Jet Log & Billet Furnace



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- No Maintenance "EZ Roll" Rollers and Rail
- Optimized Flame Impingement
- High Efficiency At All Throughput Rates
- Low Fuel Consumption

We invented the flame-impingement furnace, the tunnel furnace, and the jet preheat furnace. Hundreds of manufacturing plants around the world have **GRANCO CLARK** furnaces; some more than 30 years old and still on the job.

When we introduced our direct flame-impingement concept over 50 years ago, we set a new standard in the extrusion industry. That design has continued to evolve, most notably by the addition of an energy-saving "hot-jet" preheat section. It is still the fastest, most energy-efficient way to heat billets and logs.

## Flame-Impingement Furnace:

- One of the most energy efficient
- Hot-Jet preheat section
- Thermal efficiency up to 70%

## Improved Thermal Performance:

- New nozzle design
- New nozzle distribution
- Efficient hot air return

## Low Maintenance Transport:

- Large diameter rollers in machined bearings
- 5 year maintenance-free warranty on new style rollers
- Easy "lift-out" replacement of bearings and rollers

- Counter flow preheating system that captures and recirculates exhaust gases providing a broad energy curve
- State-of-the-art temperature control systems for superior temperature uniformity
- Furnace chamber pressure controller prevents cold air intake
- Charge and discharge equipment suitable for any application
- Multiple fuel source options
- Linkage free, fully modulating flame-impingement zones: high performance and low maintenance
- Automatic zone temperature set-points for ease of operation



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# Hot Billet Saw



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- Exact Length Billets, Fast Cycle Times
- Smooth Impact Free Pushback
- Optional FusionBond® Eliminates Two-piece Billets
- Best Chip Collection
- Thin Kerf, Long Life Blades
- Quietest Operation



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The **GRANCO CLARK** Hot Billet Saw provides a major enhancement to consistent line throughput. Its servo controlled physical stop allows the heated billets to be cut to the exact length needed just before they enter the press.

A hot billet saw eliminates the need to maintain an expensive inventory of different length billets. Billets are cut to required size after heating. Hot-cutting also prevents the downstream problem of having a furnace full of wrong-sized billets.

## Physical Stop Without Delay:

- Exact length billets
- Shock free pushback
- Stop functions as pushback - fast cycle times

## Maximum Efficiency:

- Optional Integrated FusionBond® eliminates two-piece billets, reducing waste and increasing yields
- Industry leading chip collection system

## Enhanced Quality:

- Perfect square cut
- Compensation cut
- Essentially 100% chip collection

## Hot Billet Saw advantages

- Multiple operating modes to meet production requirements
- Billets cut to size as needed: results in reduced inventory and improved flexibility
- Engineered for quick cycles to provide optimum throughput
- Excellent squareness of cut prevents profile blisters
- Can process all alloys
- Efficient recycling of chips

## Design features

- Precision clamping system contributes to excellent blade life
- Thin kerf blade minimizes scrap
- Billet storage gear automatically transfers short pieces back to the furnace
- Low-pressure hydraulics for low maintenance
- Vacuum chip collection system with optimized chip paths for unequaled performance



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**GRANCO CLARK FusionBond®** reliably eliminates two-piece billets and the problems that can slow down your line, e.g., unusable profiles. The gaps and inconsistencies caused by alignment issues where the two pieces meet can be eliminated. Spot welding will not eliminate gaps and oxidation, and the welds often break during transport to the furnace. The FusionBond produces a full face stronger bond compared to multi-point welds.

#### Two Become One:

- Eliminates two-piece billets

#### Stronger Bond:

- A complete bond using pressure and controlled rotation

#### Reduction of Oxides:

- Clean-up saw cut before bonding
- Inert gas atmosphere displaces oxygen *(optional)*

- Elimination of two-piece billets
- Integrates with hot saw
- Pressure controlled rotation
- "Clean-up" cut before bonding
- Optional inert gas atmosphere
- Increased yield up to 4%
- Remove cast cut face oxidation



Scan this with your QR code reader and watch a short FusionBond® movie clip.



- Truly NO Scrap From Logs
- Eliminate Press Billet Handling Issues, due to two piece
- NO Cast House End Cut Oxidation
- NO Trapped Air in Container

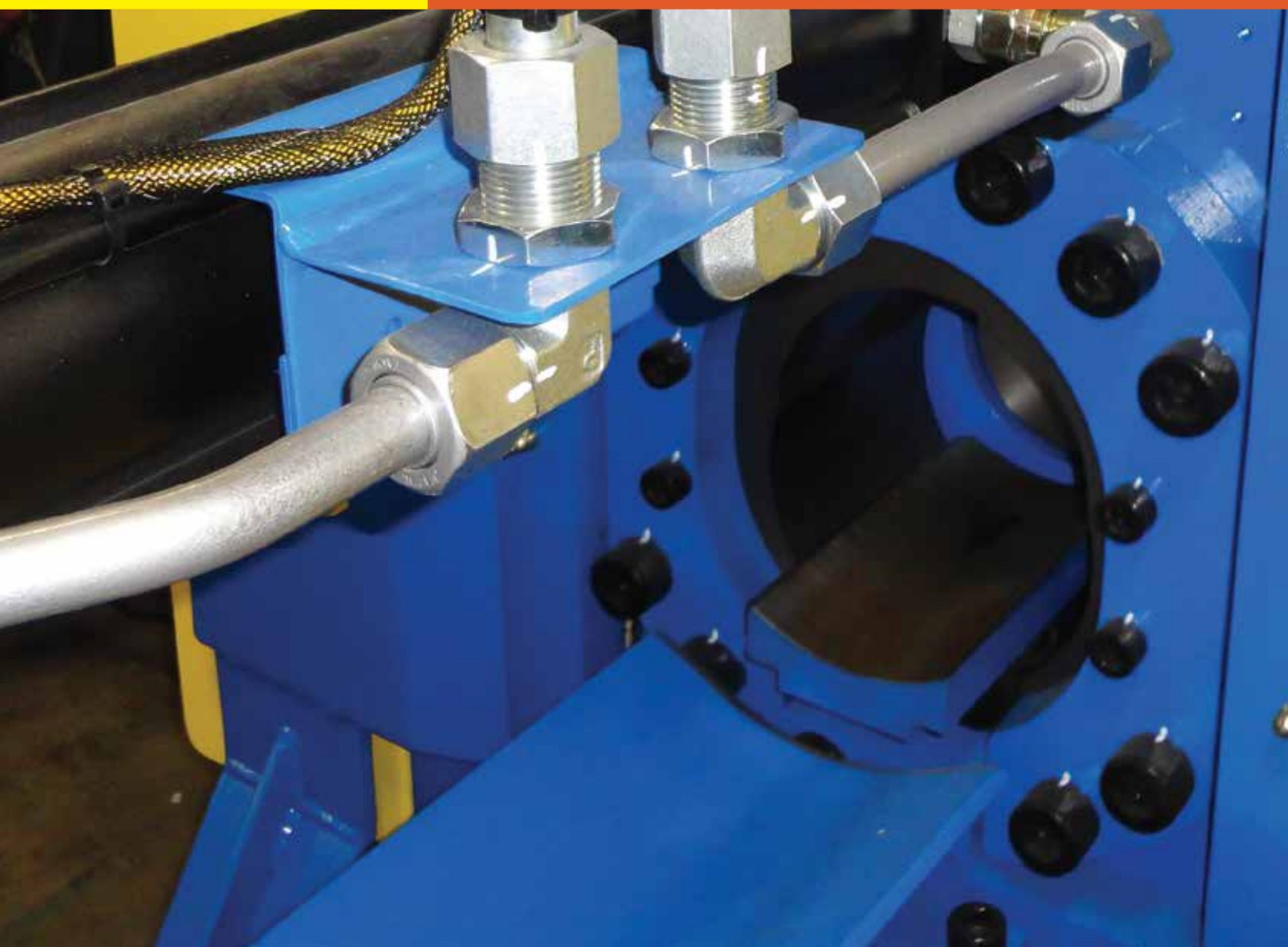




# Log Shear



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The **GRANCO CLARK** "Quick Cycle" Log Shear is built for better metal management. The electronically controlled shear cuts the correct length of billet every time. With this process you eliminate tied up cash in an expensive inventory of billets of different lengths by simply producing billets as needed.

#### **Unmatched Productivity:**

- Cut billets to required length without scrap

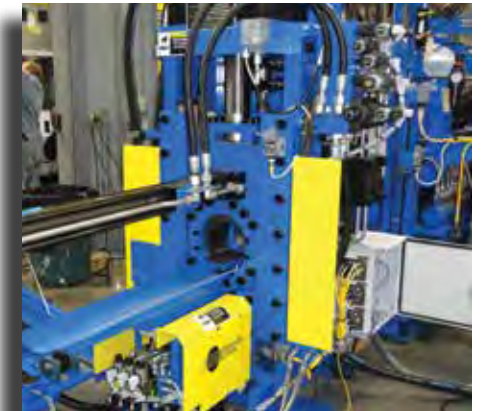
#### **Proven Technology:**

- Innovative ring design, wide opening for trouble-free loading
- Accurate cut
- Minimal deformation

#### **Forward Thinking:**

- Compensation cut
- Billet storage gear

- Billets sheared to length as needed for reduced inventory
- Multiple operating modes provide greater flexibility
- Selectable "no scrap" mode maximizes recovery
- Specially designed precision clamping system for superior cut
- Innovative shear ring design for minimal deformation
- Engineered for quick cycles and increased throughput
- Billet storage gear automatically transfers short compensation-cut pieces back to furnace
- Usable with precut billets in addition to one-piece and sawn-face-to-sawn-face cycles



- **No Saw Kerf Concerns**
- **Fast Cycle Times**
- **No Scrap Capable with Compensation Cut Algorithm**



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# Billet Transfer



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GRANCO CLARK provides a choice of billet transfer mechanisms to meet a variety of requirements. Each transfer system is custom-engineered to match the press delivery point and avoid all potential interferences.

## Furnace-to-Press Billet Transfer Systems:

- Reliable billet transport from the heating system to the extrusion press

### Tray-Style Transfer

- Ideal for use with press loaders designed to receive a billet by pushing in from the rear but adaptable to many arrangements.
- Ideal integration with a taper quench unit.
- Simple and reliable: The floor-mounted design is easily accessible for preventative maintenance.

### Overhead-Style Transfer:

- Clear floor appearance: The overhead design allows better operator vision around the press area.
- Ideal for use in a multi-station arrangement where billets are moved from multiple locations to the press loader.
- An overhead design provides a better opportunity to work around/above existing equipment in the press area.



*\*Integrate with Acetylene and Powder  
Billet Lube Systems*

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- Low Maintenance Linear Rails
- NO Billet Marking with Rollers in Trays
- Delivery Direct to Container Capable



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# Billet Taper Quench



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Isothermal extrusion—maintaining a constant exit temperature over the entire extrusion cycle is the overriding benefit of the Billet Taper Quench. It allows maximum extrusion speed for a given alloy profile and press tonnage. It also eliminates variations in dimension and structure along the length of the extruded product.

### Highest Quality Profiles:

- Reduced dimensional variation
- Maintain consistent extrusion temperature
- Eliminates end-of-extrusion blisters

### More Throughput:

- Taper heating allows faster press speeds
- Cycle time of less than 25 seconds

### Isothermal Extrusion:

- Lowest acquisition cost
- No induction heater

#### General Benefits

- Dramatic Increases in productivity
- Extrusion of longer billets
- Improved billet metallurgy
- Any combination of taper length and desired temperature will yield benefits for all profiles

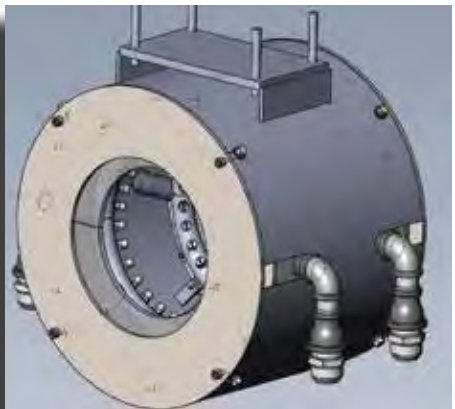
#### Design Features

- Unique transport - billets are suspended, no conveyor drag and full water coverage
- Ball/Screw actuated, all drive components are isolated from water and steam
- Servo Motor gives accurate speed and position control
- Stainless steel construction
- Standard “V” jet nozzles for ease of maintenance



Granco Clark Re-Designed  
Taper Quench

Scan this with your QR  
code reader and watch  
a short movie clip.



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- Improve Billet Metallurgy
- 10% - 40% Ram Speed Increase
- Higher Yield
- True Isothermal, Isopressure Extrusion without Slowing the Press
- Very Low Maintenance



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# Air Quenching & Medium Cooling Systems



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Uniform, efficient cooling is essential for boosting profile quality, throughput and your bottom line. This is where **GRANCO CLARK's** experience in profile quenching stands above the rest.

We have a 45 year history of design innovations in profile quenches. No other manufacturer can match that level of experience. We offer a variety of quenching and cooling systems, which accommodate a wide range of performance requirements and budget parameters.

**Rollover Water Wall Quench:**

- Economical solution for achieving moderate heat transfer rates

**Integral Run-Out Cooling:**

- Efficient air cooling in the extrusion run-out area

**Overhead Cooling Duct System:**

- With inside/outside air blend system

**Cooling Table Systems:**

- Individual fans
- Ducted arrangement

- Overhead Air – Lowering
- Integral Air
- Up to 10,000 FT/Min Velocity
- Water wall
- Mist



- System Performance Consultation Available
- Highest Cooling Rates Available
- Best Distortion Control in the Industry



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# High Impact Velocity Quench



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- Unmatched Cooling Rates
- FEA Analyses For Any Shape
- Performance Guaranty
- Eliminate Distortion with Progressive Quenching
- All Stainless Construction
- Crash Profiles

**GRANCO CLARK** has been supplying “high impact velocity” quenches since 1985. We documented the underlying science more than a dozen years ago in a seminar paper at the Extrusion Technology Symposium in 2004 *(ET-04)*.

Cooling rate is determined by quench technology and profile thickness. For most crash box sections our systems can provide cooling rates of more than 200°F per second on enclosed hollows *(that is - quenching only the outside of the profile)*.

**GRANCO CLARK’s** High Impact Velocity Quench provides the maximum heat transfer available in a profile quench. Unlike flood quenches, the High Impact Velocity Quench penetrates the steam barrier surrounding the profile and puts water droplets directly on the aluminum. More importantly, the **GRANCO CLARK** High Impact Velocity Quench provides adjustability unlike any other, for a gain in profile quality.

With the **GRANCO CLARK** High Impact Velocity Quench, the speed of the cooling process is greatly increased—in fact, it can provide more than twice the cooling rate of a flood quench and three times the cooling rate of other spray quenches.

### Profile Quality:

- Uniform
- Efficient cooling

### High-Pressure Spray:

- Unmatched heat transfer in a profile quench

- Highest pressure
- Maximum heat transfer available in a profile quench
- Nozzles arranged in adjustable rings, divided into 8 zones (more for larger press sizes)
- High pressure, in-line filtration system removes particles from water
- Scrap preventing dead cycle sequence is available
- Air knives at each quench opening minimize water running down the profile length and water spray entering work area
- All stainless steel construction
- Nozzles are protected from impact
- Penetrates steam barrier, thereby dramatically increasing cooling speeds
- Maximum extrusion speed with minimum space requirements
- Precise cooling control appropriate to profile
- Distortion control
- Recipe system
- Pressure and flow feedback per zone
- Reproducibility of spray patterns
- First billet pull through capability



First Billet Pull-Through



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# Pass-Through System



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**2,500lb 4,000 Ton Press**  
Quench with Double Puller Pull-Through Capabilities

- **NO First Billet Scrap**
- **Perfect Guidance Through Quench on First Billet**
- **Ideal For Small Production Runs**

GRANCO CLARK's Flying-Cut Double Puller and High Impact Velocity Quench each provide world-class capabilities and maximize throughput and yield.

The Flying Cut Double Puller and High Impact Velocity Quench are provided in our pass-through system. The puller clamps onto the profile and controls the end as it passes through the quench unit.

## Pass-Through Quench:

- Allowing the captivated profile end to pass through the quench

- Puller and Quench work together to process the captive profile through the quench
- A double seal on the puller traverse slot keeps the water in the quench
- Lowering rollers in the quench allow the puller jaw to operate at the same level as the rollers for optimum profile handling
- Revised puller head geometry moves the profile pick-up point closer to the press to minimize the time before the profile enters the quench
- Specialized puller jaws pass through the quench with the clamped profile
- The puller electrics and saw motor remain outside the quench for maximum reliability
- Welding Dies: for direct presses operating with welding dies, the first billet profile of each die can be fully processed by the quench, so there is no loss of usable material on the first billet
- Flat-Face Dies: for operation with flat-face (non-welding) dies, every profile can be captivated by the puller and processed through the quench
- Piercing Operation: for piercing operation each profile is processed through the quench and the double puller provides slug-cutting/handling capability
- Indirect Operation: for indirect operation each profile is processed through the quench and the double puller provides die stripping at the end of extrusion



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# Pullers: *Single, Double*



The Original  
Often Copied - Never Duplicated

- Excellent Chip Collection
- Drop Away Rollers - No Lifting
- Simplest Design – Low Maintenance
- No Marking
- No Foundation Work
- Best Install Time
- Nine Modes of Operation
- No Stanchions

## Single Puller

When space or budget constraints don't allow for the use of our Double or Twin Pullers, **GRANCO CLARK's** Single Pullers can still improve your productivity. They produce even, twist-free profiles and reduce scrap about 3% over operation without a puller. Line efficiency is further enhanced when you combine our Single Puller with the **GRANCO CLARK** under-table Hot Extrusion Saw.

With a **GRANCO CLARK** puller you can convert more metal into profitable product. **GRANCO CLARK** offers four types of pullers: Single, Double, Twin and Twin/Twin—in order to meet varying operational requirements and budget parameters. All of our pullers deliver greater line efficiency and even, twist-free profiles. Drop away rollers prevent marking of profiles. Bluetooth communications reduce maintenance.

- Puller applies just the right amount of tension as the profile emerges from the die
- Suitable for use with an under-table Hot Extrusion Saw
- Even, twist-free, dimensional profiles
- Enhanced safety
- 3% less scrap over operation without a puller
- Additional level of efficiency and automation



## Double Puller

The **GRANCO CLARK** Double Puller features two puller heads on the same track, allowing it to seek the weld mark and cut profiles on the fly. This allows it to meet short press dead-cycle times.

After the press, all scrap represents a loss in profitable product. While some scrap is inevitable, reducing it to a small percentage will significantly benefit your bottom line. The active chip collection maximizes the recovery of waste allowing you to add it back to your bottom line. A flying cut or double length puller system provides world class recovery, and greatly reduces scrap post press.

- Two puller heads on a single track
- AC drive motors with head mounted brakes
- Ability to seek weld mark, cuts profiles on the fly
- Multiple operational modes
- Laser position measurement
- Industrial Bluetooth (wireless) communications
- Continuous production
- Highly efficient use of space
- Increased production
- Ability to meet short press, dead-cycle times
- 2–3% less scrap than single puller and up to 6% over operation without a puller
- Flexibility, selection of sequence that best meets your needs
- Fast identification of faults - Built-in diagnostics and predictive maintenance messages
- Increased effectiveness of compensation-cut programs on furnace/shear installations, reducing butt scrap - Ability to use longer billets





# Pullers: *Twin, Twin/Twin*



*Table of Contents*



- Excellent Chip Collection
- Simplest Design – Low Maintenance
- No Marking
- Best Install Time
- Nine Modes of Operation

## Twin Puller

In addition to the Single and Double Puller, **GRANCO CLARK** also offers Twin and Twin/Twin Pullers equipped with multiple operational programs. The Twin Puller includes two heads on separate tracks and an adjustable hot saw that cuts the profile during the dead cycle. When installed in a double length system it can be used to cut on the weld mark. A Flying Hot Saw is also available.

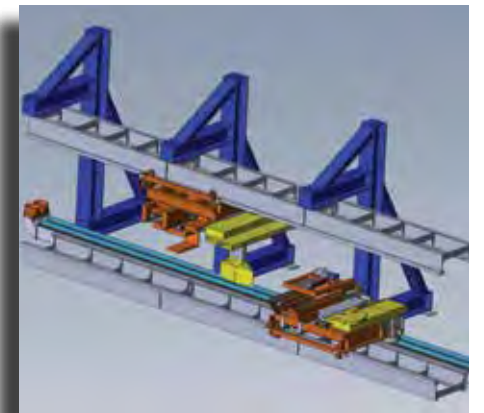
- Well-suited for use with double length systems
- Multiple operational modes
- Available with flying hot-saw
- Ability to cut on weld mark during dead cycles or on the fly
- Flexibility to select sequence that best meets your needs



## Twin/Twin Puller

On the **GRANCO CLARK** Twin/Twin Puller, both puller heads feature a saw. This allows the profile to be cut on the weld mark on the fly, as with a double puller, and no additional third head or saw is required. As with the Double Puller, **GRANCO CLARK's** Twin and Twin/Twin Pullers reduce scrap an additional 2-3% over single pullers and up to 6% over operation without a puller.

- Saws on each of the two puller heads
- Multiple operational modes
- Ability to cut on the weld mark on the fly, with no additional handover necessary or during dead cycle requirements
- Flexibility to select sequence that best meets your needs



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- Fully Automatic
- Controlled Crush Available
- Robust
- No Man Stretching

Stretching is one of the most critical post-quenching operations in the extrusion process. Performing that function correctly often makes the difference between usable product and scrap. An overstretched profile will be out of tolerance. A profile that is not stretched past its yield point will not be straight. Both are destined to become scrap.

**GRANCO CLARK** Stretchers deliver precise, accurate stretching, which enhances profile quality and keeps scrap to a minimum. When used in conjunction with our belt systems, our Stretchers straighten and batch profiles for efficient downstream operations increasing throughput as well.

**GRANCO CLARK** Stretchers accommodate a broad range of requirements. Our Stretchers are available in cam-style, diagonal "uni-slide," and controlled vertical crush jaw designs. One, two, or no-man operational modes offer labor savings and give you the flexibility you need to meet operational challenges.

**Cam Style:**

- Ideal for accommodating a variety of profile shapes

**Controlled Vertical Crush Stretcher:**

- Maximum gripping with minimum distortion

- Efficient, accurate stretching
- State-of-the-art safety features, including safety mats, light curtains and two-handed safety controls
- Various jaw designs:—cam-style, diagonal "uni-slide," controlled vertical crush
- One, two, or no-man operational modes
- Controlled crush distance and pressure (CVC model)
- Increased usable product
- Maximum operator safety
- Accommodates various operational needs
- Flexibility to meet varying operational challenges
- Preservation of profile surface quality and dimensional integrity
- Elimination of slippage
- Recipe Control:
  - Stretch By Length
  - Stretch By Percent
  - Accurate Pre-Stretch Force Monitoring





# Profile-Handling Equipment



*Table of Contents*



- Pre Assembly Options
- Minimal Field Wiring
- Safety Rated Solutions
- Fully Automatic - *Three Man Operation Including the Press*
- Large Diameter Rollers to Reduce Profile Damage

Dents, scratches, chill marks. These are the consequences of outdated conveyors and walking beam systems that can damage profiles, increase scrap, and increase operating costs. Delivering a flawless product isn't just a lofty goal, it's what our customers deserve.

And that's the biggest reason for investing in **GRANCO CLARK's** automated profile-handling equipment.

With its superior degree of automation, our handling equipment will help you achieve maximum throughput. It will improve the overall surface quality of your product, reduce labor costs, scrap, physical effort and downtime. Your equipment is built to last, and to be serviced and repaired easily.

## Run-Out Conveyors:

- Equipped to handle maximum extrusion speeds
- Integrated cooling

## Run-Out Transfer Systems:

- A smooth transition from run-out to cooling
- Unique cooling station design

## Transfer & Cooling Table:

- Positive drive belts
- Gentle extrusion handling for best profile quality
- Quick change belt feature
- Industry supporting - extruded aluminum construction

## Load/Unload:

- Smooth transport through the stretching cycle

## Batching and Saw-Feed:

- Multi-functional belt system keeps manual handling to a minimum

- Automatic batching, saw feed
- Storage tables can be set to form tight batches of profiles or "loose pack" batches with space between each profile
- Auto-batching capability, auto-saw-feed loading
- Variety of belt and roller materials to properly protect the profile surface
- Reduction of manual handling
- Preservation of surface quality
- Protection for more sensitive profiles
- Maximized batch-to-saw throughput
- Reduced manpower requirements
- Every system is customized and engineered to meet your needs



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# Saw and Gauge Systems



*Table of Contents*



- Precision Cuts
- Superior Throughput
- Customizable Batching Lengths for Packing and Aging

Cutting large batches of extrusions is one of the keys to reaching high levels of productivity. But most existing Cut-off Saws have a limited width capacity, and are therefore inefficient and unproductive.

**GRANCO CLARK's** Extrusion Cut-off Saws are large-capacity, high-quality, high-performance saws that provide extremely close tolerances and an excellent surface finish. They are durable, with low maintenance, and designed for safety.

**GRANCO CLARK's** Extrusion Cut-off Saws provide superior cut tolerance, maximum throughput, and safe operation by means of a process that involves minimum manual intervention.

### Superior Cut Tolerance:

- High-capacity, high-performance saw ensures throughput

### Advanced Automation:

- Servo-controlled gauge head positioning

### Safety:

- Floor mounted console or pedestal away from cutting area
- Electronically interlocked saw panels

### Substantial Gains:

- Wide table capacity maximizing throughput

### Quality Considerations:

- Drop down arbor design
- Large Diameter Rollers
- Powered roller table
- Chip collector with air valve

- Under-table design
- Removable side panels
- Automatic blade height adjustment
- Excellent cutting tolerances
- "Drop down" arbor design
- Maximum safety
- Minimum noise
- Easy maintenance
- Optimizes blade performance
- Lower tooth angle minimizes impact
- Better cut quality, less damage to thin shapes
- Higher-quality product
- Minimum waste
- Elimination of offline cut
- Eliminates back rake
- Enhances productivity by allowing process to continue while blade is making return stroke



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# Profile Stacking System



*Table of Contents*



- Reliable Spacer Insertion
- Impressive Cycle Times
- Customizable Spacers and Racks
- Spacer-less Options Available

Off-loading cut profiles from the gauge table to aging racks can be a costly and labor intensive operation. Profiles can be damaged, and throughput can be limited.

A **GRANCO CLARK** Stacking System, eliminates these concerns by automating the process. The result is operator safety, lower labor costs and reduced risk of profile marking – less scrap, major savings.

**GRANCO CLARK's** automatic stackers quickly offload extrusions from the gauge table to aging racks. With no manual handling, profiles maintain their original surface quality.

And, of course, when you eliminate manual handling, you reduce manpower requirements and run a safer line—saving you money in labor and injury-related costs. Our stacking systems also feature automated spacer insertion, or can be run spacer-less.

## Major Savings:

- Quickly offload profiles from gauge table

## Flexibility:

- Single or multiple end to end batch processing

- Automated oven rack loading/unloading
- Automated spacer insertion
- Single or multiple batch processing
- Reduced labor and injury-related costs through elimination of manual handling
- Enhanced profile surface quality
- Greater, more consistent throughput
- Time saver
- Labor saver
- Rack stacking
- Rack destacking



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# Billet & Log Auto-Bander & Stacker



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Logs are loaded onto the log pusher, and conveyed into the saw system where they are cut to billet lengths. Once cut, they are discharged onto a conveyor and marked by the automated billet stamper for identification. Laser marking is also an option.

The cut billets move down the conveyor to the overhead stacker mechanism. The stacker grips the billets on the ends and stacks them into one of two patterned jig fixtures on a rotary table. Once billets are stacked, the full cart is rotated to the banding position, billets are banded, then removed while the second cart is being loaded uninterrupted by the banding process.

## **Billet Stacker :**

- Overhead positioner grips billets on the ends

## **Rotary Table :**

- Stacks billets into one of two patterned jig fixtures

## **Auto-Banding :**

- Band billets or logs

- Many Bundle Configurations
- Log and Billet Banding
- Highest Billets/Hour Stacking
- Fully Automatic Processing
- Diverse Diameter Capability



- **Stack Billets of All Diameters**
- **Automatic Fixture Accommodates All Bundle Configurations**
- **Band Logs and Billets**
- **Offload Bundles without Process Interruption**



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# Age & Anneal Ovens



*Table of Contents*



- Custom Heat Cycles and Recipes
- True NFPA Compliance
- Low NOx Capable
- Gas and Electric Options
- Auto Rack Conveyance
- Low Emissions

**GRANCO CLARK** Age Ovens are designed to deliver rapid, complete aging of every profile in every batch. This translates into maximum profile quality and throughput with a dramatic reduction in scrap. We produce several different oven designs to balance performance requirements, space restrictions and budget parameters.

Our Age Ovens bring loads to temperature quickly, a nominal one to two hours. Due to high-volume airflow, they uniformly heat faster than competitive ovens, a major efficiency.

- Single End Flow Age Oven:**
  - Simple, low-maintenance design delivers uniform temperatures
- Reversing End Flow Oven:**
  - Fast heat-up, excellent temperature uniformity
- Double End Flow Age Oven:**
  - Faster heat-up with higher temperature uniformity
- Side Flow Age Oven:**
  - Cross-flow circulation for highest thermal uniformity
- Continuous Aging Oven:**
  - Continuous production flow for highest throughput
- Rack Handling Systems:**
  - Minimum manpower requirements, maximum profile quality

- Excellent temperature uniformity—a nominal  $\pm 7^{\circ}\text{F}$  ( $4^{\circ}\text{C}$ )
- Quick heat-up of load (nominal one to two hours)
- Chamber sizes designed to meet your needs
- Charge and discharge transport systems, including rack stackers and rack destackers
- Available with multiple, pre-programmed age oven cycles or operator adjustable cycles
- Uniform hardness for high product quality, minimal scrap
- Increased throughput
- Adaptable to virtually any space requirements
- A range of prices to fit your budget
- Process can be varied to suit requirements of individual products
- Rack Stackers
- Rack Destackers
- Inventory Storage and Retrieval





# Infrared Die Ovens



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The **GRANCO CLARK** Infrared Die Oven provides the fastest die heating times available. It heats dies uniformly in less than 25 percent of the time required by traditional die ovens. While a typical die for a mid-size press takes approximately four hours in a convection oven, the **GRANCO CLARK** Infrared Die Oven brings the same die to temp in less than 60 minutes.

This fast heat-up increases production flexibility making it easier to adjust scheduling if a die breaks or when a rush order is received. Dies can be placed in the oven much closer to the time when they're actually needed, minimizing the time they spend at high temperature, extending die life.

All internals are protected against damage from die mishandling.

**Controlled Temperature:**

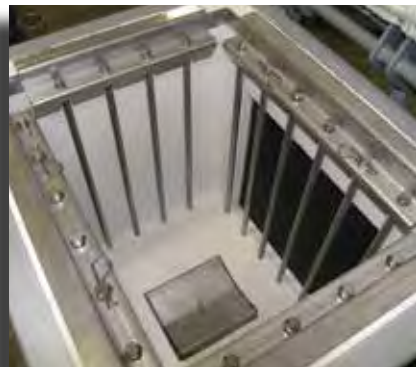
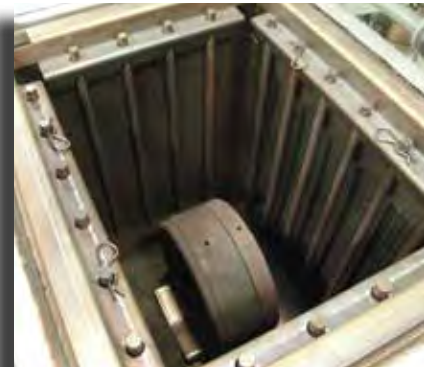
- Triple thermocouples (Air, Die and Elements) to ensure dies are evenly heated
- Measured die temperature allows reheating warm dies

**Built To Last:**

- Strong 3/16" (5mm) shell, stainless steel interior

Oven	Typical Press	Maximum Die	Heating Time
1. Model 20	1,800 ton	14" diameter, 7" thick	Approximately 60 minutes
2. Model 30	2,750 ton	18" diameter, 10" thick	Approximately 75 minutes
3. Model 40	3,600 ton	22" diameter, 12" thick	Approximately 90 minutes

- Die Temp Monitoring - *No Die Damage*
- Long Life Heaters with Over-temp Protection
- Customizable Configurations
- Heat the Die, Not the Air







- Leader in Heat Up Times
- Convection, Radiant and Hybrids Available
- Many Configurations Available Top/Front/Even Bottom Load
- Cool Skin Temperatures

For the extrusion process to run smoothly, accurate temperatures are key. Nowhere is this more important than at the press. Not only must the billet be heated to the correct temperature, the die must be as well. A die that isn't at the proper temperature when it is needed will slow the operation down, and add stress to the press.

With **GRANCO CLARK** Die Ovens, airflow and recirculation are engineered for quick and uniform heating. This results in less downtime, less strain on the press, and better surface quality for the extrusion.

One of the hallmarks of **GRANCO CLARK** Die Ovens is their durability. They feature strong shells that are extremely resistant to the impacts of die mishandling. You'll spend very little time maintaining them, and they're constructed with maintenance in mind.

Whatever your operational and budgetary parameters are, there's a **GRANCO CLARK** die oven that will meet them.

#### Chest-Type Model

- Rugged construction
- Well designed air-circulation system
- Top opening, hinged lid or sliding lid
- Longevity
- Low maintenance
- Space savings

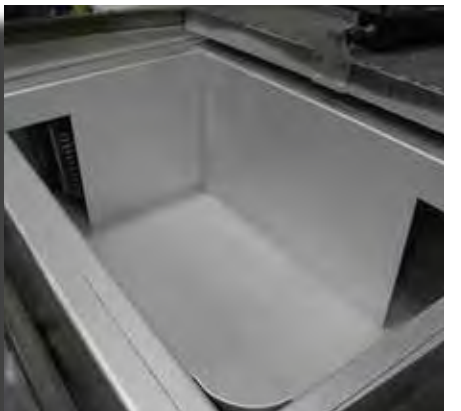
#### Multi-Compartment Model

- Multiple, individually heated drawers, each capable of holding several dies
- Easy access to all dies
- Top-quality construction
- Simultaneous heating of dies with different thermal requirements, increasing productivity
- Better thermal uniformity (less need to mix cold dies with hot dies)
- Reduced heat loss during die handling, which saves energy and increases temperature uniformity for better profile quality
- Increased safety
- Increased efficiency
- Durability
- No reaching required

#### Infrared Model (see page 51, 52)

##### Infrared Hybrid

- Convection oven reliability with faster heat-up times
- Top-loading and front-loading designs are available
- Less thermal stress
- Excellent for large die sizes





# Cold Billet Sawing System



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- Log Optimizing Two-Piece Algorithms
- Quiet Operation
- Full Integration with Stacker and Bundle Operations
- Fast Cycle Times

Delivering the right length billet to the press at the right time is essential to efficient operations. Overcompensate, and create costly scrap. Use a billet that's too short and lose a cut length at the saw (more scrap)–another costly mistake in both time and money.

With the **GRANCO CLARK** Demand Billet Saw you'll always have the correct length billet on hand. There's no need to inventory billets of various lengths, you simply produce what you need when you need them.

## Eliminates Costly Scrap:

- Accurate billet lengths every time

## Compensation/Two-Piece Billet Cutting:

- Maximum usage of raw materials

## Square Cuts:

- Clean cut, sharp edge billets

- Rugged construction
- Fully enclosed saw blade
- Compensation/two-piece billet cutting
- Servo controlled measurement
- Integrated with loading and unloading tables
- Square cuts
- Longevity
- Dependability
- Increased safety for operator
- Low noise level
- Maximum usage of raw materials
- Reduced complexity of the equipment, cutting down on maintenance requirements
- Provides the information for accurate cut lengths
- Complete sawing system designed for ease of use and precise control
- Delivers a clean-cut, sharp-edged billet



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# Precision Saw



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- **Unmatched Reliability**
- **Unmatched Throughput**
- **Robust Design**
- **24/7 Production**

The **GRANCO CLARK** Precision Finish Saw is a cut above the rest in the areas that matter: speed, accuracy, safety and ease of use. In addition, its exceptional reliability ensures consistent productivity.

The **GRANCO CLARK** Precision Saw is a computerized saw that can deliver a highly accurate cut faster than any saw of its kind in the industry. Its cut-lengths, straightness, and squareness are measured in thousandths of an inch.

Cutting stroke rates and back gauge advance and return movements are fast and can double productivity.

## Industry's Most Productive Saw:

- Exceptionally close tolerances combined with highest levels of productivity
- High speed plus large batch window
- Hitch feed provides maximum precision
- Tightest Tolerances

- Vertical and horizontal clamping on both sides of saw line for extremely precise cut
- Back gauge clamps product, providing the fastest indexing in the industry
- Unique hitch-feed mode prevents backrake, allowing for less additional machining and less scrap
- Batch-cuts any number of extrusions that can be contained in the 24 x 8 inch clamping window
- Back gauge lengths to meet any requirement
- Latches: safety interlocks instead of screw on machine guards for rapid blade change and maintenance
- Recipe setup for increased productivity
- Exceptionally close tolerances:
  - Cut length accuracy  $\pm 0.005$
  - Straightness of cut  $\pm 0.002$
  - Horizontal squareness  $\pm 0.002$  inches per foot, corner to corner
  - Vertical squareness  $\pm 0.0005$  inches per inch of thickness
  - Parallelism  $\pm 0.003$
  - Surface micro-finish 8-32 RMS



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# Extrusion Expertise That's Always Within Reach

GRANCO CLARK's commitment to assuring maximum equipment performance has earned us a record of more successful extrusion installations than any other company in North America.

First, we work with you to recommend the right equipment for your particular needs, then we ensure a smooth acquisition from purchase order to manufacturing. Once the equipment is installed, we adjust it, train your personnel for operation and get it into production.

After installation, we follow up to make sure your equipment is performing at peak efficiency and that you're completely satisfied. We back all of your equipment with the industry's best warranty.

With GRANCO CLARK, you have peace of mind that your extrusion line is delivering the highest possible performance and productivity. You can count on us for continued service and support over the full life of your equipment.

## 24-Hour Parts Hot-line

Round-the-clock support just a phone call away

When you need replacement parts you can order them any day of the week, at any time, using GRANCO CLARK's 24-hour parts hot-line or e-mailing us at [parts@grancoclark.com](mailto:parts@grancoclark.com). Over 80% of component replacement parts are available for delivery the next day or sooner.

Simply call +1 (616) 794-2600 between 8 am and 4:45 pm EST, Monday through Friday, or +1-855-GRANCO1 (+1-855-472-6261) after business hours or on weekends. Our parts specialists will key your order into an inventory computer system, answer questions about parts availability and shipping times, then ship your part(s) immediately when available.

If your equipment goes down, help is available immediately with GRANCO CLARK's broadband support. Diagnostics assistance is free during standard business hours with additional assistance available 24/7. We'll run diagnostics on your system via broadband and step you through any repairs.





# Full-Line Snap Shot

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## Pick your press, we will do the rest

GRANCO CLARK has always been and will continue to be on the front lines of cutting edge technology.

GRANCO CLARK has a reputation for manufacturing the most dependable and durable equipment in the business. Those aren't our words; we hear them from customers who have plenty of industry experience, and research their purchases very carefully. Quality equipment is the starting point. You can't make a great system from mediocre components.

## New Technologies

Innovation is another key focus of GRANCO CLARK. The most important new technology and the most productive refinements of existing components have come from GRANCO CLARK. Many, like our Hot-Jet Log and Billet Furnace, have become industry standards.

## Don't Let Productivity Slip Away

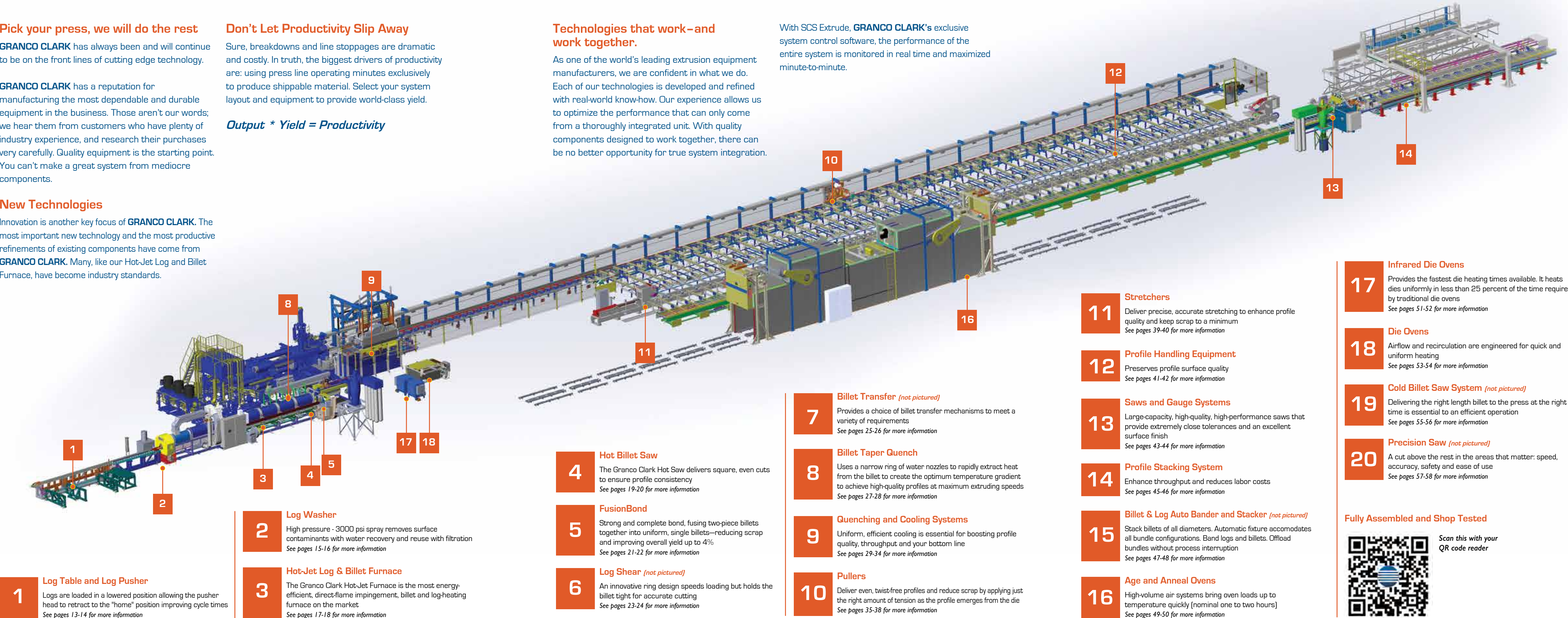
Sure, breakdowns and line stoppages are dramatic and costly. In truth, the biggest drivers of productivity are: using press line operating minutes exclusively to produce shippable material. Select your system layout and equipment to provide world-class yield.

*Output \* Yield = Productivity*

## Technologies that work—and work together.

As one of the world's leading extrusion equipment manufacturers, we are confident in what we do. Each of our technologies is developed and refined with real-world know-how. Our experience allows us to optimize the performance that can only come from a thoroughly integrated unit. With quality components designed to work together, there can be no better opportunity for true system integration.

With SCS Extrude, GRANCO CLARK's exclusive system control software, the performance of the entire system is monitored in real time and maximized minute-to-minute.



**1** **Log Table and Log Pusher**  
Logs are loaded in a lowered position allowing the pusher head to retract to the "home" position improving cycle times  
See pages 13-14 for more information

**2** **Log Washer**  
High pressure - 3000 psi spray removes surface contaminants with water recovery and reuse with filtration  
See pages 15-16 for more information

**3** **Hot-Jet Log & Billet Furnace**  
The Granco Clark Hot-Jet Furnace is the most energy-efficient, direct-flame impingement, billet and log-heating furnace on the market  
See pages 17-18 for more information

**4** **Hot Billet Saw**  
The Granco Clark Hot Saw delivers square, even cuts to ensure profile consistency  
See pages 19-20 for more information

**5** **FusionBond**  
Strong and complete bond, fusing two-piece billets together into uniform, single billets—reducing scrap and improving overall yield up to 4%  
See pages 21-22 for more information

**6** **Log Shear (not pictured)**  
An innovative ring design speeds loading but holds the billet tight for accurate cutting  
See pages 23-24 for more information

**7** **Billet Transfer (not pictured)**  
Provides a choice of billet transfer mechanisms to meet a variety of requirements  
See pages 25-26 for more information

**8** **Billet Taper Quench**  
Uses a narrow ring of water nozzles to rapidly extract heat from the billet to create the optimum temperature gradient to achieve high-quality profiles at maximum extruding speeds  
See pages 27-28 for more information

**9** **Quenching and Cooling Systems**  
Uniform, efficient cooling is essential for boosting profile quality, throughput and your bottom line  
See pages 29-34 for more information

**10** **Pullers**  
Deliver even, twist-free profiles and reduce scrap by applying just the right amount of tension as the profile emerges from the die  
See pages 35-38 for more information

**11** **Stretchers**  
Deliver precise, accurate stretching to enhance profile quality and keep scrap to a minimum  
See pages 39-40 for more information

**12** **Profile Handling Equipment**  
Preserves profile surface quality  
See pages 41-42 for more information

**13** **Saws and Gauge Systems**  
Large-capacity, high-quality, high-performance saws that provide extremely close tolerances and an excellent surface finish  
See pages 43-44 for more information

**14** **Profile Stacking System**  
Enhance throughput and reduces labor costs  
See pages 45-46 for more information

**15** **Billet & Log Auto Bander and Stacker (not pictured)**  
Stack billets of all diameters. Automatic fixture accommodates all bundle configurations. Band logs and billets. Offload bundles without process interruption  
See pages 47-48 for more information

**16** **Age and Anneal Ovens**  
High-volume air systems bring oven loads up to temperature quickly (nominal one to two hours)  
See pages 49-50 for more information

**17** **Infrared Die Ovens**  
Provides the fastest die heating times available. It heats dies uniformly in less than 25 percent of the time required by traditional die ovens  
See pages 51-52 for more information

**18** **Die Ovens**  
Airflow and recirculation are engineered for quick and uniform heating  
See pages 53-54 for more information

**19** **Cold Billet Saw System (not pictured)**  
Delivering the right length billet to the press at the right time is essential to an efficient operation  
See pages 55-56 for more information

**20** **Precision Saw (not pictured)**  
A cut above the rest in the areas that matter: speed, accuracy, safety and ease of use  
See pages 57-58 for more information

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that's always within reach

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