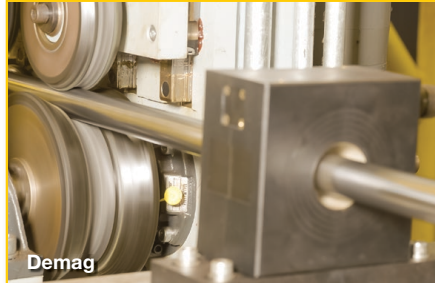


Advanced Heat Treating & Value Added Processing for SBQ Steel Bars & Tubes



 **GERDAU**
HUNTINGTON FACILITY

Specifications & Capabilities



GRADES TREATED

- All heat treatable grades of carbon, alloy, and stainless steels.

HEAT TREATMENTS

- Quench & Temper
- Thru-hardening
- Surface hardening
- Normalizing
- Stress Relief Annealing

BAR PRODUCTS

- Hot Finished or Cold Finished
- Size range—0.625" to 4.5"
- Hex Shape (Inquire)

TUBULAR PRODUCTS

- Welded or DOM
- Hot Finished Seamless
- Cold Drawn Seamless
- Size range—0.75" to 6.00" O.D.

LENGTH CAPACITY

- Bar—12 ft. to 32 ft.
- Tube—12 ft. to 60 ft.
- Max. weight per piece—2000 lb.

STRAIGHTNESS TOLERANCES

- BAR—0.125" per 5 ft.
- TUBE—0.030" per 3 ft.

TURNING & POLISHING

- Improved size, straightness, and concentricity
- Frees product from decarburization, seams, and other surface imperfections
- Circograph Rotary Eddy Current surface inspection
- Improved machinability

CUTTING

- Close tolerance custom cutting... saw and laser
- Cut to length for bar and tube product applications

OTHER VALUE-ADDED SERVICES

- Full metallurgical support and capability
- Demagnetization
- Chamfering
- Complete traceability
- Complete test reports
- Small quantities available
- Hex bundling
- Stenciling/color coding
- Experimental or trial orders encouraged
- Short lead times
- On-time, all-the-time delivery
- Overseas and specialized packaging
- Rust protective applications

Quench and Temper (Q&T) at It's Finest

The Gerdau Huntington Facility had its beginnings over thirty years ago as a “greenfield” operation in Huntington, Indiana. The location was selected for its proximity to major customer bases and it allowed ample room for future expansion. Gerdau heat treating experts carefully analyzed available manufacturing equipment and “re-engineered” the process with enhanced capabilities. The resulting unique quench and temper line was able to achieve the following results:

- 1 Straightness deviations of less than 0.030 inch per 3 ft. of tubing material and 0.125” per 5 ft. of bar material.**
- 2 Rockwell C hardness uniformity of less than 4 points.**
- 3 One-half commercial heat treat tolerances as cited by the (ASTM) American Society Testing and Materials in its A519 specification.**



Q&T Line #5.

Today, the Gerdau Huntington Facility has five full quench and temper lines coupled with a host of value-added services. Operators are highly skilled and undergo continual technical training that exceeds typical industry practice. With over three decades of experience Gerdau has taken heat treating from an art to a science.



Induction Heating.



Q&T Line #1.

Why Gerdau Heat Treating?

The Gerdau Huntington Facility is a complete state-of-the-art facility specializing in technically advanced induction heating for long length bars and tubes. Value-added support equipment for customized cutting, straightening, tensile testing and metallographic analysis are part of what this unique facility has to offer. Another distinctive attribute of this facility is that it can accommodate long bar from 12 to 32 ft. and tube product from 12 to 60 ft. in length. Customers receive the added benefit of single-source responsibility with an array of technical expertise and support that goes through the complete ranks of Gerdau in all their world class production facilities. Gerdau is recognized for its state-of-the-art metallurgical services and highly experienced product development support.

Unique to the Industry

Gerdau's Huntington facility offers the only complete “Steering Rack Blank Production Line” in North America. Utilizing the Q & T capability at the Huntington facility, Gerdau can then transform the material into precision engineered cut blanks with tight TIR controls by a combination of close dimensional turned and polished surface plus superior straightening capability.

In addition, Gerdau can prepare both ends of each piece with precise perpendicularity, bar centering and end drilling capability. Each bar blank is robotically placed into customer designed packaging containers

for easy use in their facilities. Also, Gerdau can “bump” straighten individual pieces to precise TIR compliance. Gerdau is even capable of marking each individual piece with a unique Data Matrix Code for traceability.

The Steel Heat Treating Process

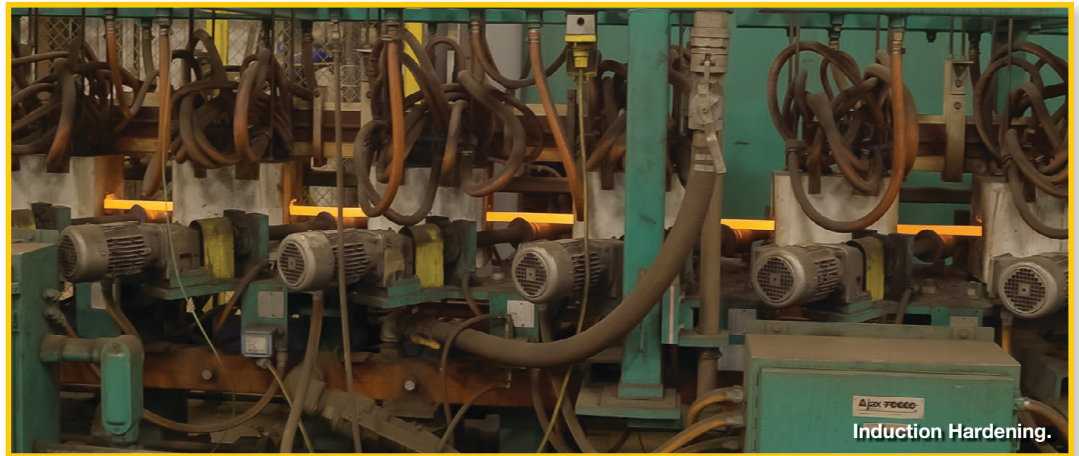
Individually, every bar or tube is processed through precision controlled induction heating coils to the optimum hardening temperature. The next step is a proprietary quench that achieves the highest quench factor for the most complete transformation. Induction tempering then provides a uniform structure to meet your strength and hardness requirements.



Steering Rack Product.

Full length heat treating of bar and tubing enables Gerdau customers to machine distortion-free parts, eliminate production processes and save money.

This is really the essence of what makes the Gerdau Huntington Facility unique and special in today's market place.

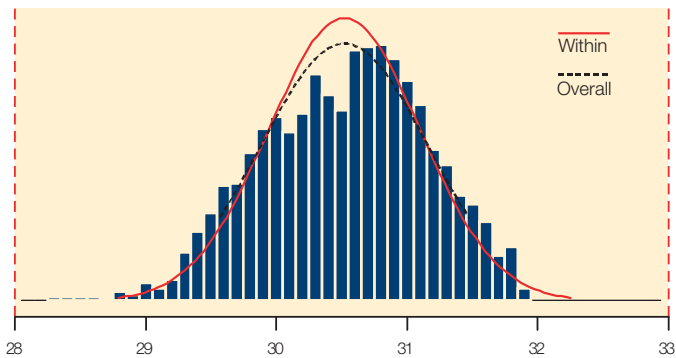


Induction Hardening.

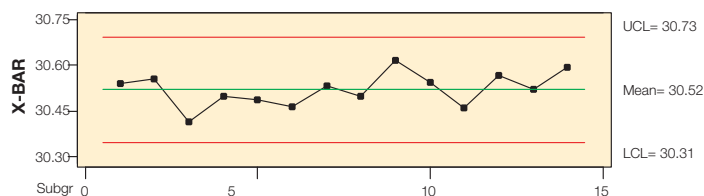
Gerdau Huntington Facility Process Capability

(Grade 4145, 1.062" diameter)

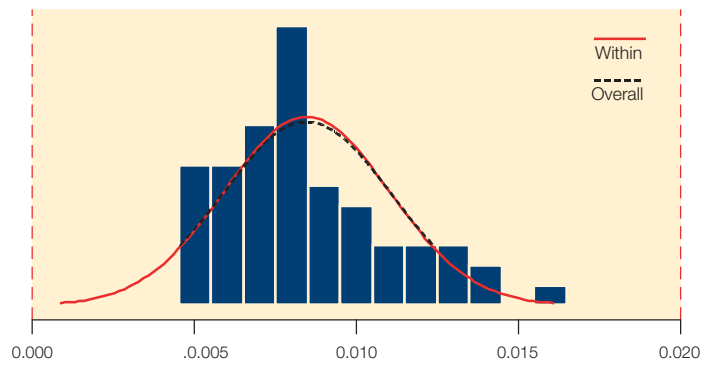
LSL ANALYSIS FOR HARDNESS (Rc) USL



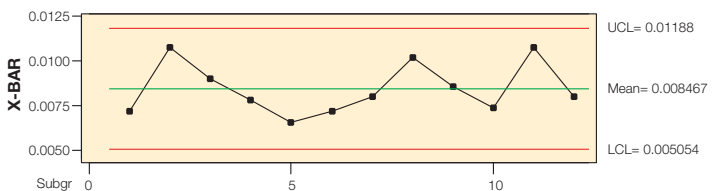
Process Data		Potential (Within) Capability	
USL	33.0000	Cp	2.88
Target	*	CPU	2.86
LSL	28.0000	CPL	2.91
Mean	30.5201	Cpk	2.86
Sample N	1357		
StDev (Within)	0.578314		
StDev (Overall)	0.635911		



LSL ANALYSIS FOR BAR STRAIGHTNESS (TIR) USL

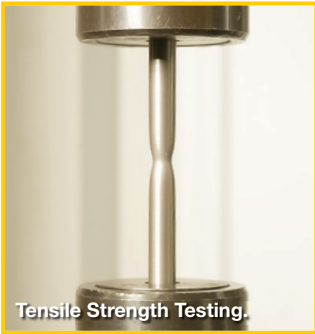


Process Data		Potential (Within) Capability	
USL	0.0200000	Cp	2.62
Target	*	CPU	3.02
LSL	0.0000000	CPL	2.22
Mean	0.0084667	Cpk	2.22
Sample N	60		
StDev (Within)	0.0025437		
StDev (Overall)	0.0026113		



Quality, Consistency And Dependability

Gerdau takes great pride in the quality of its products and in the consistency in which they are delivered. Quality control measures are routine throughout our entire quench and temper process assuring you a reliable product. Also, when Gerdau steel is specified for the raw material, you can count on a stress



Tensile Strength Testing.

free engineered Quench & Tempered bar custom designed for your needs. In any production process a “consistent” quality material is what puts dollars on the bottom line. And that’s exactly what you get from the Gerdau Huntington Facility.

Ask For The Gerdau Experts

Let us help you discover new ways to save on your application with a heat treated product. Our people are ready and eager to help you right from the initial design all the way through the production process. Heat treating before machining is a perfect way for you to machine distortion-free parts and eliminate several production steps, thereby saving bottom-line dollars. Test our capabilities. We’re ready to work with you from concept to reality. From long-run OEM contract orders to Steel Service Center conversion work, Gerdau Huntington Facility is ready, willing and more than able.



Intertek Intertek



Steering Rack Product-Ready for Shipment.



Rockwell Hardness Testing.



Brinell Hardness Testing.

The Real Advantage of Q&T from Gerdau

ONE PIECE AT A TIME

Each bar or tube is individually heat treated, one bar at a time. This is better than “batch” heat treating.

UNIFORM HEATING

Each rotating bar or tube is uniformly heated to a precise temperature through computer controlled induction coils.

INDIVIDUAL BAR & TUBE QUENCHING

Every bar or tube is individually quenched through a proprietary quench process that achieves optimum transformation kinetics.

SUPERIOR STRAIGHTNESS

Rotation of individual bars or tubes through the spray quench leads to superior straightness.

STRENGTH AND TOUGHNESS

Each bar and tube transforms to a martensitic structure that is tempered in line to the desired strength and toughness.

UNIFORM HARDNESS

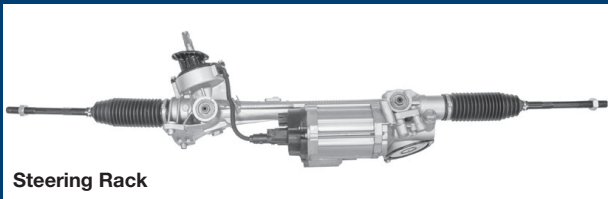
Every bar and tube has uniform hardness end-to-end, piece-to-piece and order-to-order.

STRESS FREE & DECARB FREE

Each bar and tube is stress free, decarb free and ready for your critical part applications.

VALUE-ADDED SERVICES

Orders can be custom cut (saw or laser) for specific product applications along with a host of other available services.



Steering Rack



Stabilizer Bars



Axle Shafts



Gun Barrels



Farm Equipment



Construction Equipment



Trucks & Trailers

TYPICAL APPLICATIONS

- Automotive drivetrains & suspensions
- Automotive safety appliances
- Axle tubing
- Axle shafts
- Bolting stock
- Construction equipment
- Crane booms
- Drill collars
- Farm equipment machinery
- Gun barrels
- King pins
- Machinery
- Motor shafting
- Off-road equipment
- OCTG high pressure casing & tubing
- Oil country accessories
- Perforator guns
- Screw machine parts
- Stabilizer bars
- Steering racks
- Tool joints
- Torsion bars
- Truck & Trailers

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