CMC STEEL OKLAHOMA

CMC DURANT START UP & COMMISSIONING

2019 IRD

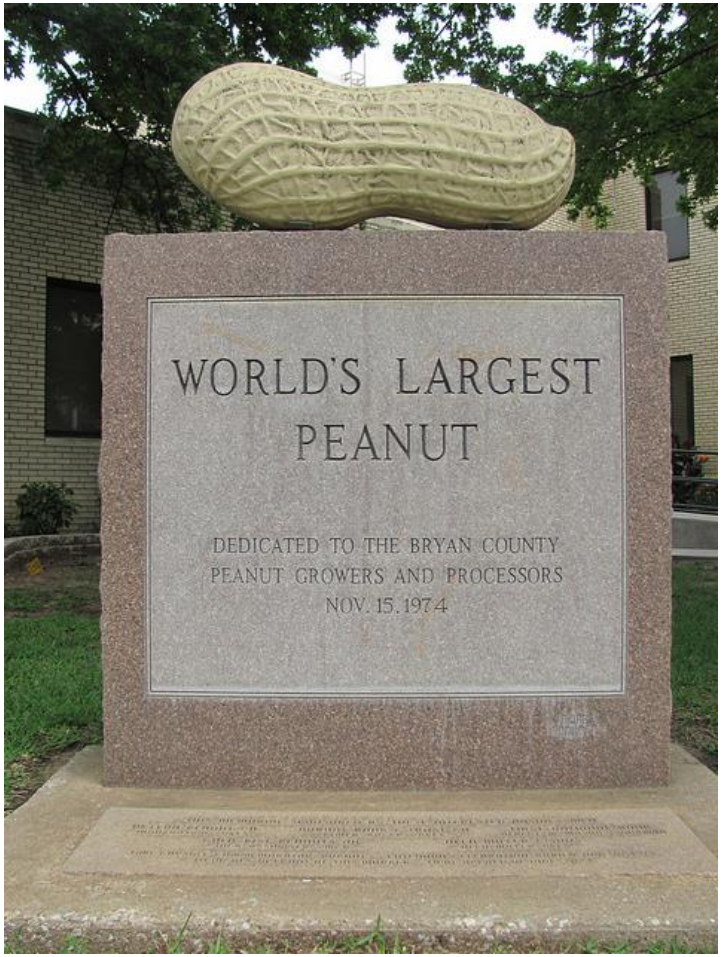
October 17, 2019

RECYCLING | MILLS | FABRICATION | WWW.CMC.COM

COMMITMENT
YOU CAN COUNT ON

Why Durant, Oklahoma

But, the main reason why we chose Durant, Oklahoma…



CMC Steel Oklahoma

CMC Steel Oklahoma wins Community Partner of the Year from the Durant Main Street organization for the volunteer work CMC Steel Oklahoma does for Durant.

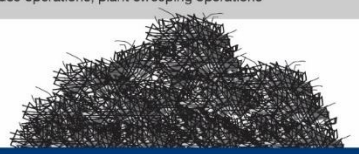
CMC Steel Oklahoma

Quick Steel mill Reference check

- **Integrated Steel Mill:**
  - Iron Ore to Product
  - Blast Furnace's to reduce ore
  - Finished product typically structural steel
- **Mini-Mill:**
  - Use scrap iron
  - EAF to produce steel
  - Finished products are "long" products
- **Micro-Mill:**
  - Similar to mini-mill
  - Limited product range
  - Focus on efficiency and cost reduction

Yard

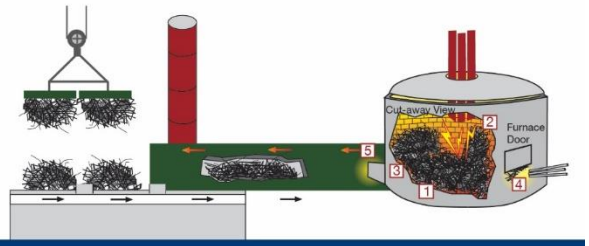
Yard Operations
- Provides over 1,200 tons per day to the Melt Shop
- Handles 400,000 tons per year of incoming scrap from trucks and rail
- Provides support services for outbound products shipped by truck and rail
- Supports baghouse operations; plant sweeping operations



Electric Arc Furnace (EAF)

Melting Process
Scrap Steel is Melted in 4 Ways

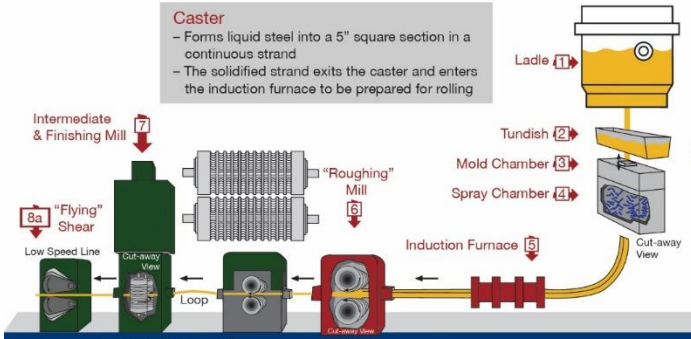
1. "Hot Heel" Practice
2. Electrical Energy
3. Natural Gas Energy
4. Chemical Energy
5. Exhaust Heat



Rolling Mill

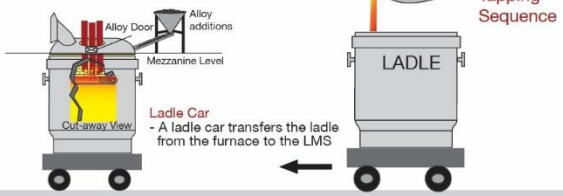
Continuous Caster

Caster
- Forms liquid steel into a 5" square section in a continuous strand
- The solidified strand exits the caster and enters the induction furnace to be prepared for rolling



Ladle Metallurgical Station (LMS)

LMS Functions
- Adds alloys to refine steel according to chemical specifications
- Establishes consistent temp and mixture throughout the ladle
- "Stages" ladles between furnace and caster to aid billet flow

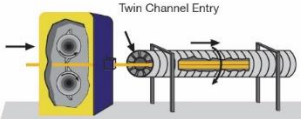


Ladle Car
- A ladle car transfers the ladle from the furnace to the LMS

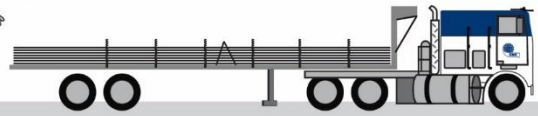
Finishing & Transportation

Finishing & Transportation
- Loads CMC trucks, customer trucks, and commercial carriers
- Arranges shipment of all finished products
- Arranges transportation of inbound materials including CMC truck "backhauls"

8b High-Speed Bar Breaking System



9 Bundling & Shipping
Automated bundling systems prepare products for movement by overhead crane to storage areas or directly to customer trucks.



MICROMILL PROCESS

CMC Commercial Metals

Why Build a Micromill?

YALE is the key

- **Y – Yield**
- **A – Alloys**
- **L – Labor**
- **E – Energy**

A lean, energy efficient, cost effective high productivity plant

Plant site at time of purchase

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Creek before and after

Finished Goods Warehouse built first

FG finished – now the plant

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Challenges and Benefits

Challenges

- Rain
  - *2015 was 77” of rain*
  - *2016 is 36” from 1/1 to 6/15*
- Soil Conditions
- Relocate a gas line crossing through the middle of the property
- Relocate a residential power line crossing through the middle of the property
- Number of Easements
- Number of Drilled Shafts

Benefits

- Working with The City of Durant
- Working with The State of Oklahoma
- We all feel very welcome

Rain, rain Go Away!

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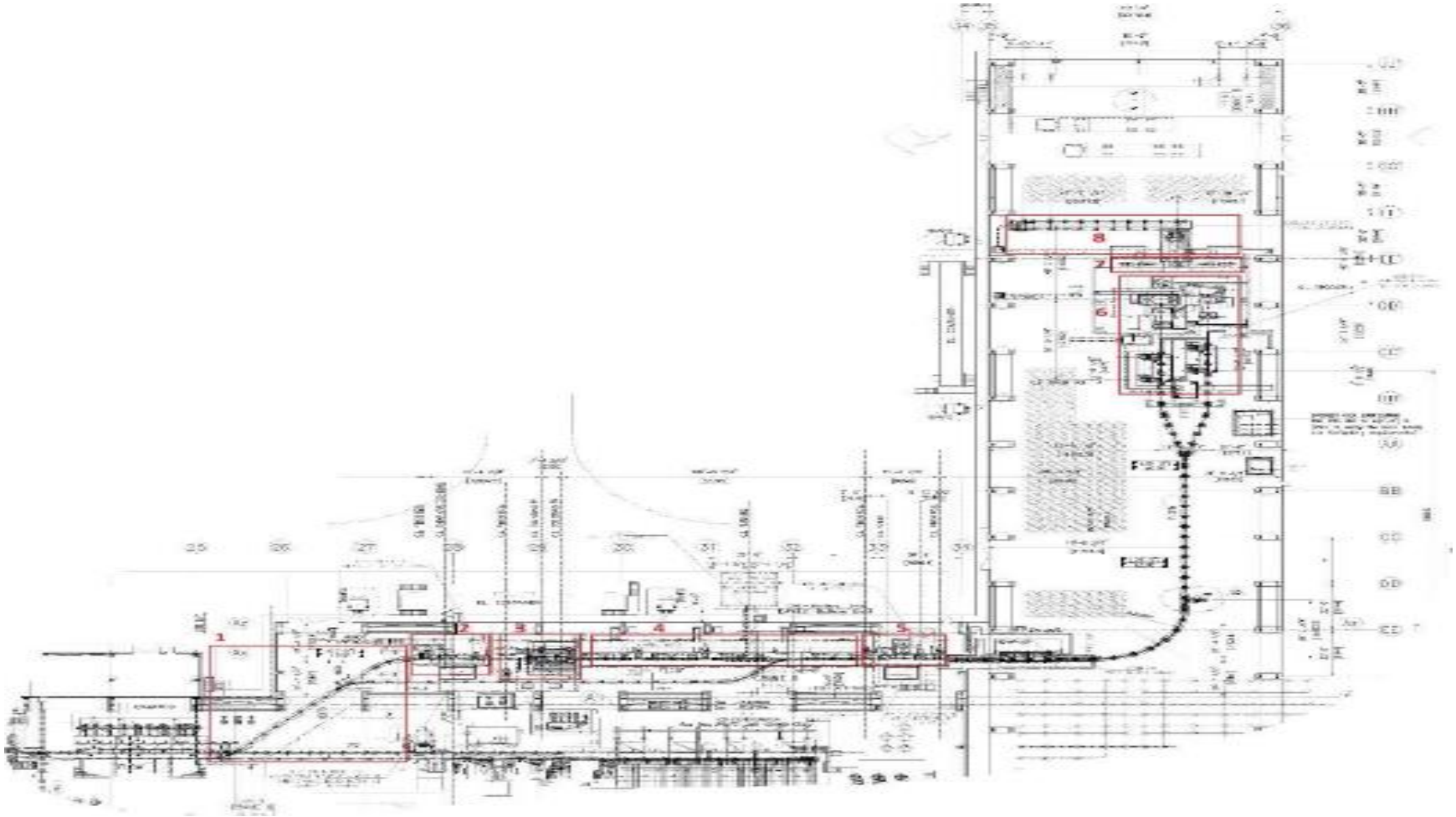
Time Lapse- Construction Video



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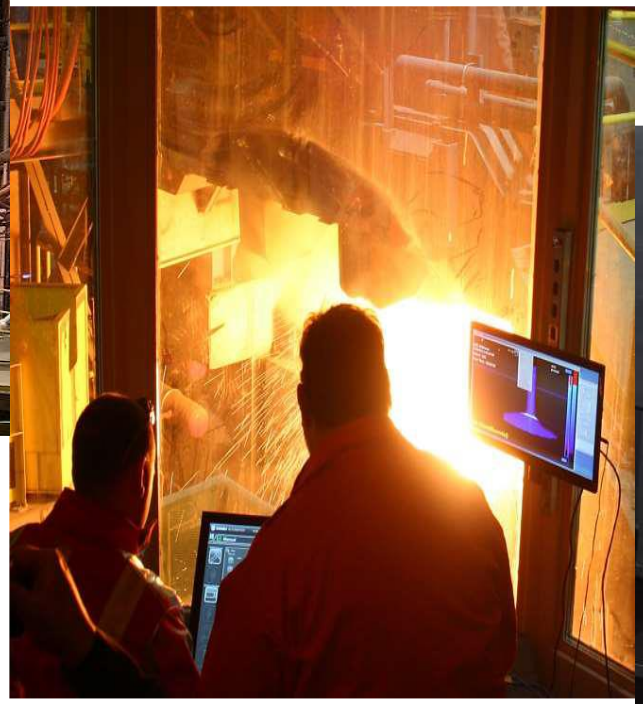
Micro-Mill Design

- "Right sized" mill with product mix for regional market
- State of the art technology
- Supports our vertically-integrated company (Recycling, Mills, Fabrication)
- Environmentally Best in Class

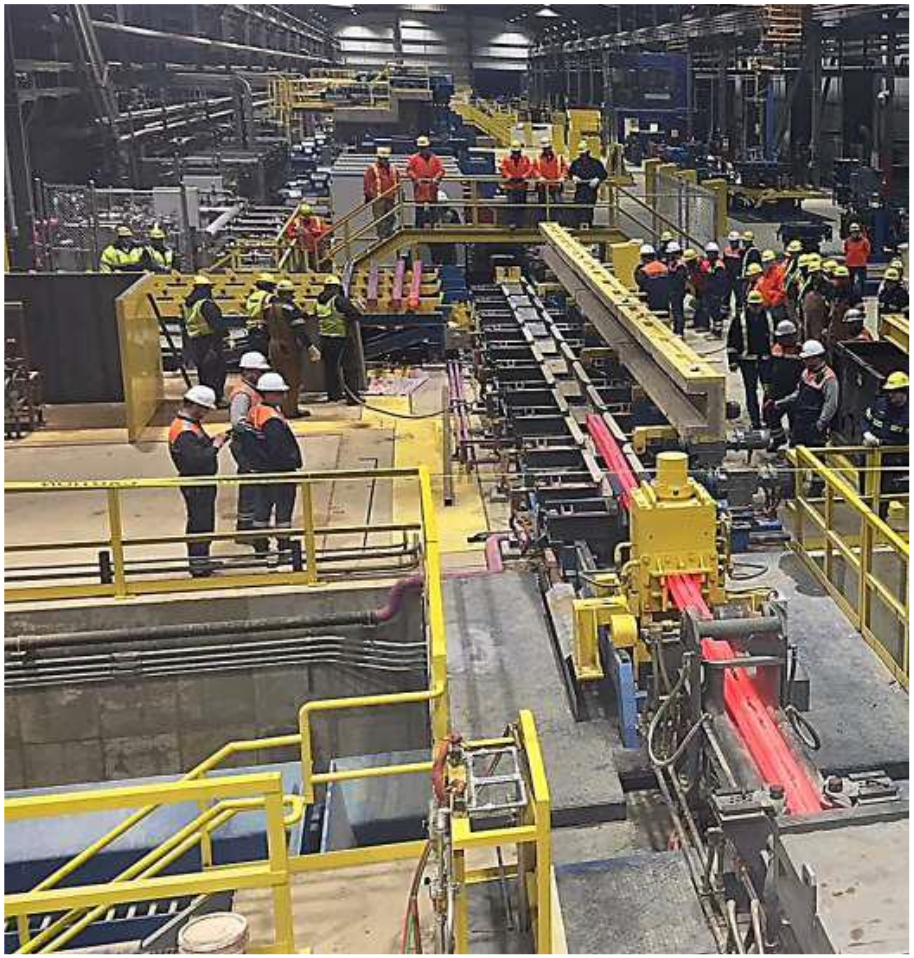
Products:

- Rebar: straight and spool
- T-Post

For the Melt Shop folks…



First cast billet



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Induction Furnace

Brand New Mill (brand new everything!)

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Alloys- Quench and Tempered Bar

Hard outer layer – approx. 0.035”
- Adds strength
- Reduces elongation
- Thin enough to bend easily

Soft inner core – Low alloy

- Prevents outer layer from collapsing, like when bending a pipe
- Reduces force required to bend bar vs. high alloy
- Allows bar to stretch before breaking

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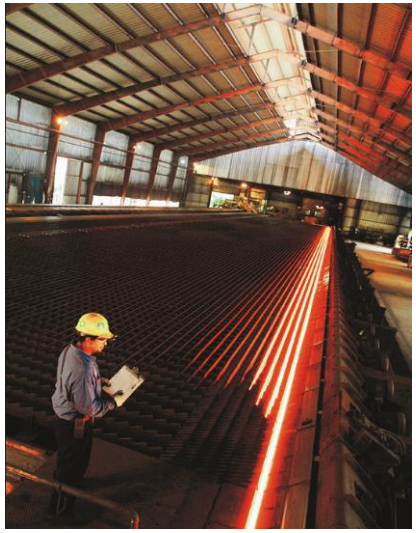
Yield

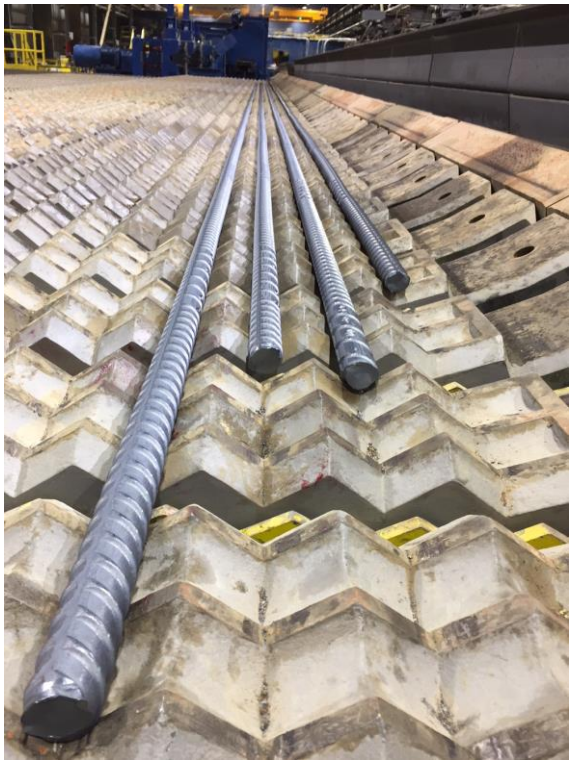
Product cut to finished length out of the mill



CMC Oklahoma Mill Team

First bar rolled thru the mill

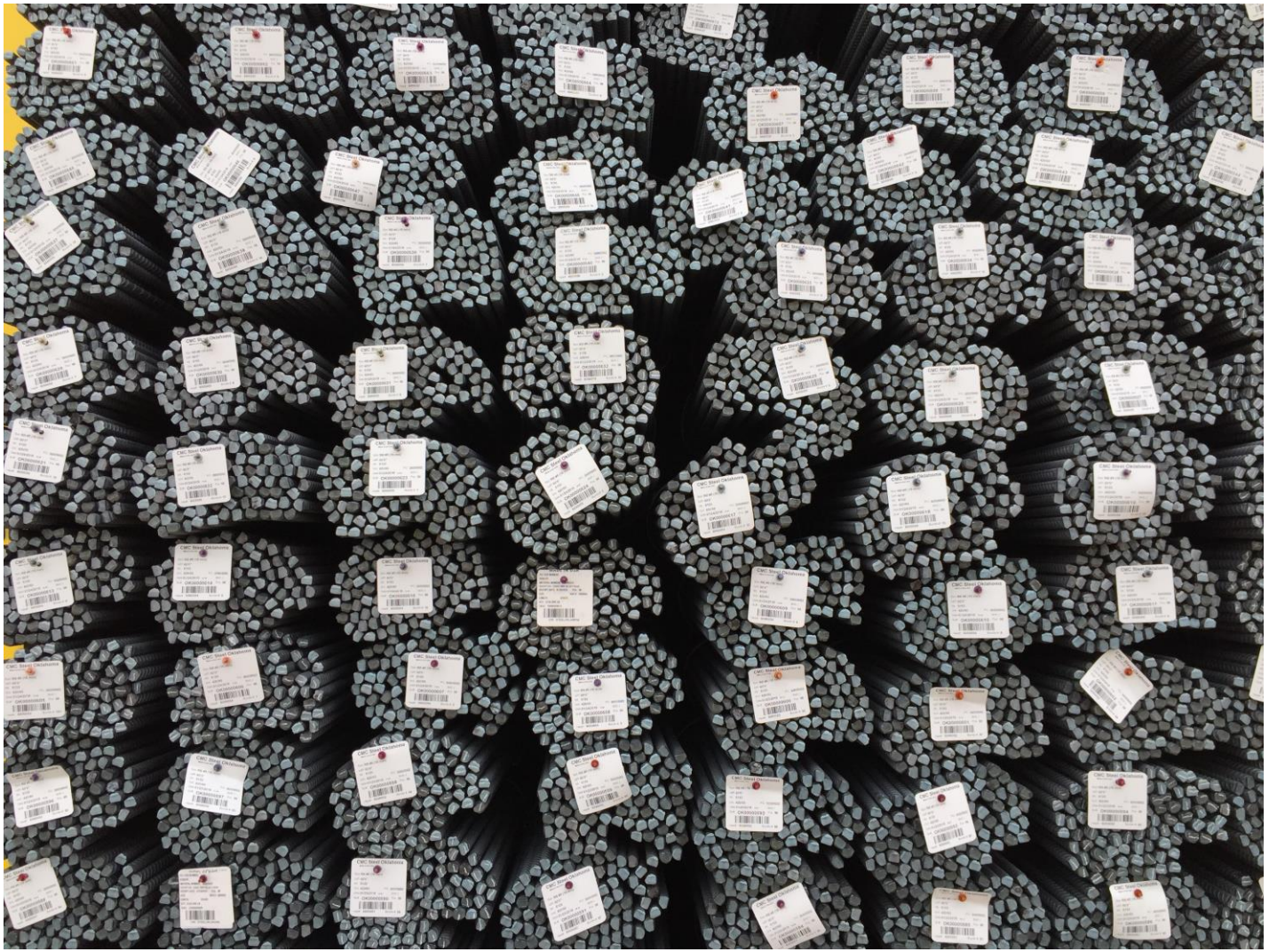
First Heat Melted and Rolled: December 28th 2017:



Happy New Years

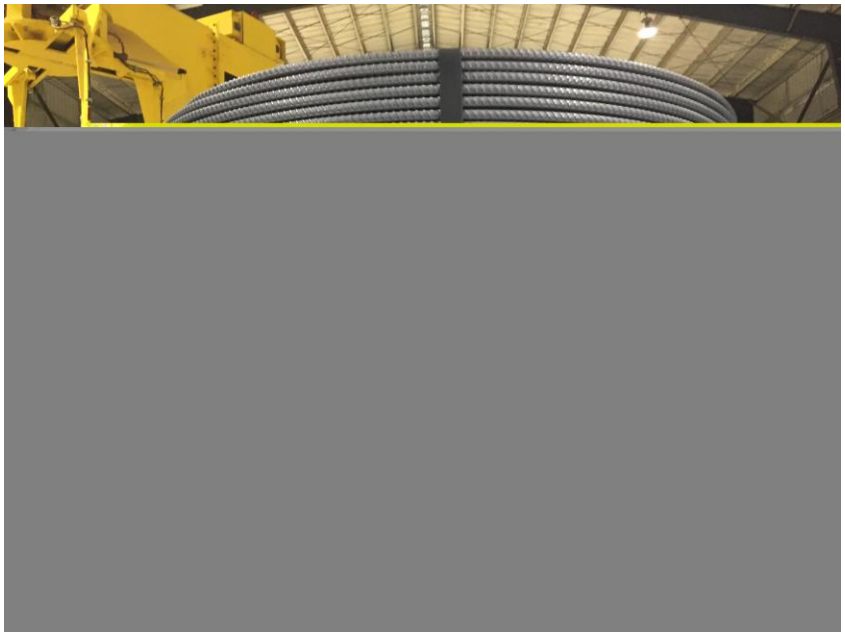
1/01/18

Great looking bundles



Theirs (yours?)

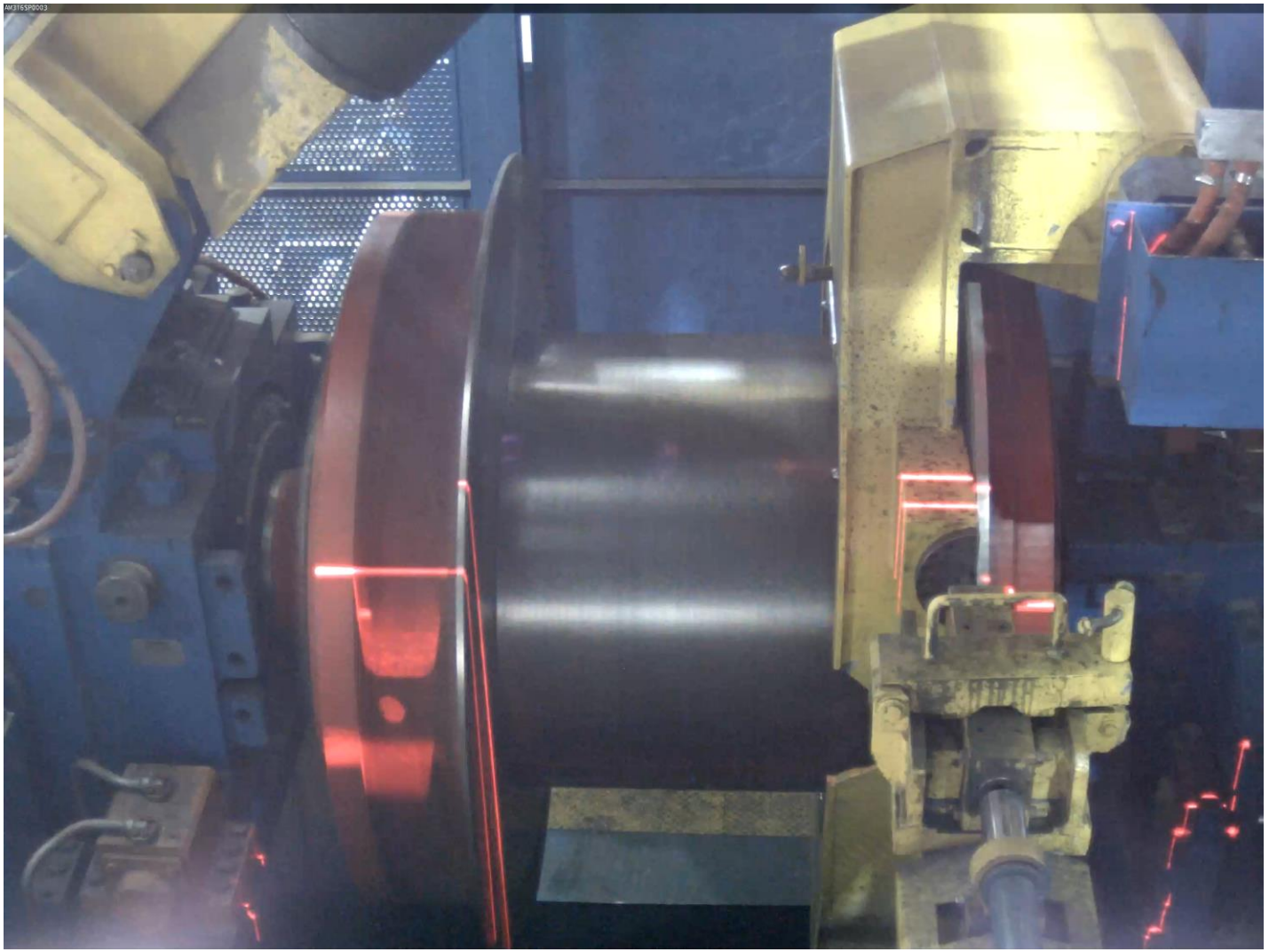
Ours!



Process Description

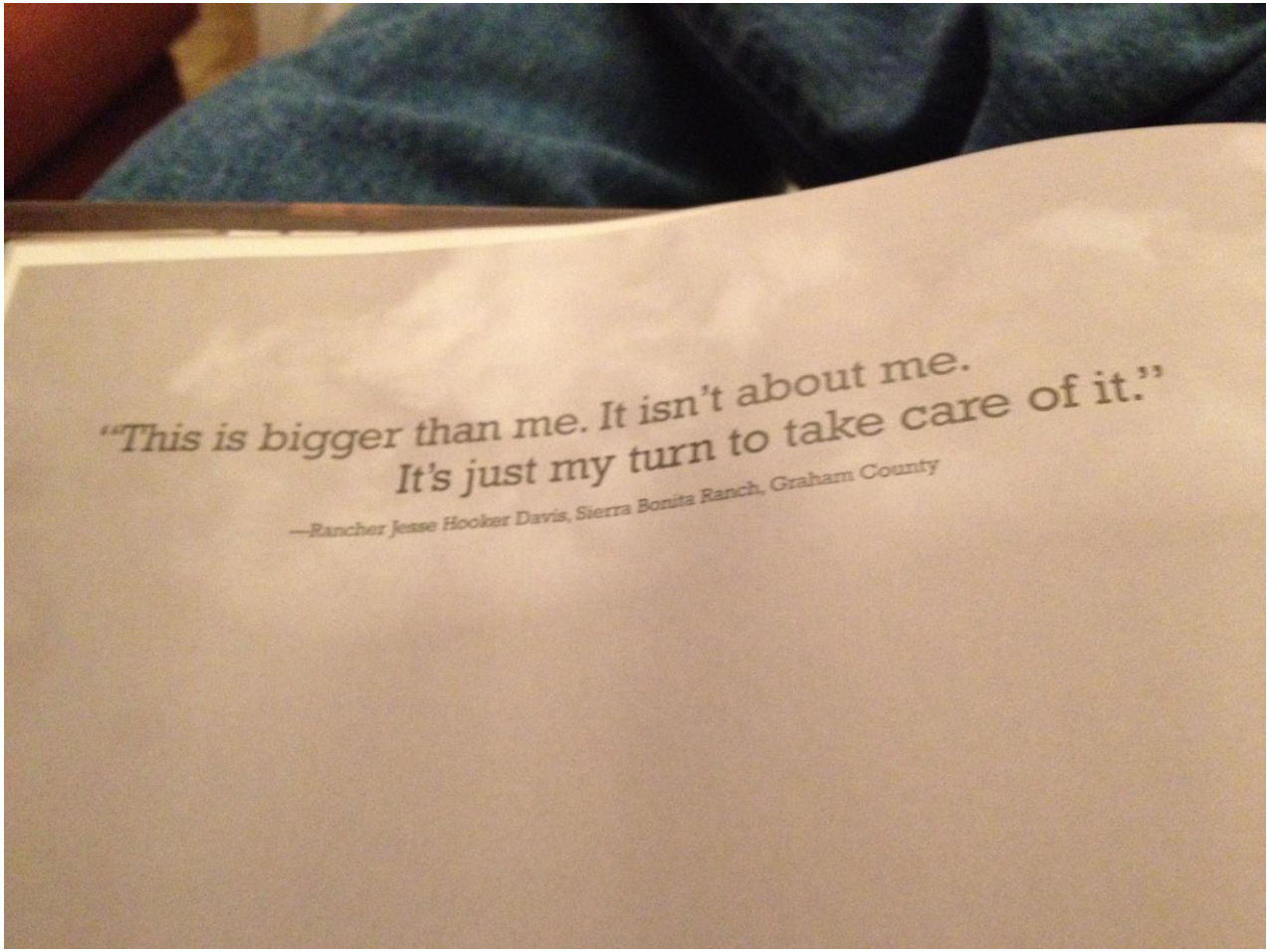
ROLLING PROCESS	HIGHLIGHTS of EQUIPMENT
Spooler line According to its size, the bar will be conveyed to the fast finishing block or straight to the quenching boxes, in order to undergo in-line treatment and so that the temperature of the bar during spooling is suitable to maintain its mechanical and structural characteristics constant (limitation of coiling temperature without modifying either the thickness of the tempered crown or the ferritic grain size at the core of the rolled stock for ribbed rounds for reinforced concrete). The coiling temperature on the spooler for ribbed rounds is about 450°- 550° C. The bar coming from the last water box then goes through a pinch roll and a flying shear with rotating blades for emergency chopping. The continuously rotating blade holding shafts of the shear with rotating blades are driven by gear transmission housed in the shear body and by external drive unit with AC motor. One vertical looper and two pinch rolls at each spooling machine entry side ensure coiling of rolled stock. Downstream the second pinch roll the bar is directed to the drum by means of a distributor that consists of a conveying tube hinged at the end where the rolled stock is fed in. The exit end is wheeled and controls the rational distribution of turns by means of a "motor-screw nut" system. The rolled stock is directed tangentially to the outside diameter of the drum in a biting channel placed on a mobile ring on the fixed rim of the spool. The insertion force is guaranteed by a hooking flap system, which forces the material to hook on to the mobile ring. Hooking is automatic upon completion of 1 or more turns depending on the diameter of the rolled stock. After a given number of revolutions the flaps quickly disappear and the distributor is started up. After hooking, the turn distribution system is automatically started up and the turns are formed on the spooler drum. The mobile ring that ensures hooking automatically disappears into the fixed rim and is synchronized with the forward motion of the turn distributor during the second layer.	By using the spooling process developed by DANIELI we can reach the following goals: • High filling factor; • Less space required in the warehouse; • Bar kept taut during spooling; • Better appearance of finished product on the market.  

4 Bar Spool



Plant view from Fume Treatment Plant (Baghouse)

I’m just glad to be a part of this endeavor



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Questions?