

Product Innovation in the Tire Recycling World



Tire Recycling Conference
May 14 to 17, 2024
Atlanta, Georgia

What's Been Accomplished in 4 Decades?

- Regulation
- Collection/Consolidation Networks
- Processing and Refining Capacity
- End Products

Great Uses For EOL Tires in North America

Decades of Innovation, Lots More Work to Do

- Rubber Sheet for Flooring Applications
- Modifying Plastics Formulations for Injection Molding
- Sports and Play Surfaces
- Compression Molding With Urethane or Sulfur Based Binding Systems
- Rubber Modified Coatings
- Rubber Formulations for Tires and Other Goods
- Rubber Modified Roofing Products
- Crumb Rubber Used in Hot Mix Asphalt and Chip Seal
- Crumb Rubber for Recycled Carbon Black and Tire Pyrolysis Oil

Product Innovation in the Tire Recycling World

Lavon Detweiler

Entech, Inc. | Middlebury, IN 46540

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Is *Survival* Good Enough?

- We're All Good At Survival
- How Do We Thrive?
- Prioritize R&D Spending

Products

- Crumb Rubber
- MRP
- Plastics Compounding
- Injection Molding
- Compression Molding
- Steel Ingots and Bars
- Rubberized Asphalt



Over 200,000 Tons
of EOL Tire Products

By 2025:
Less than 1% Landfilled
Less Than 15% TDF

Tire Wire Containing Rubber Contamination Is Processed....

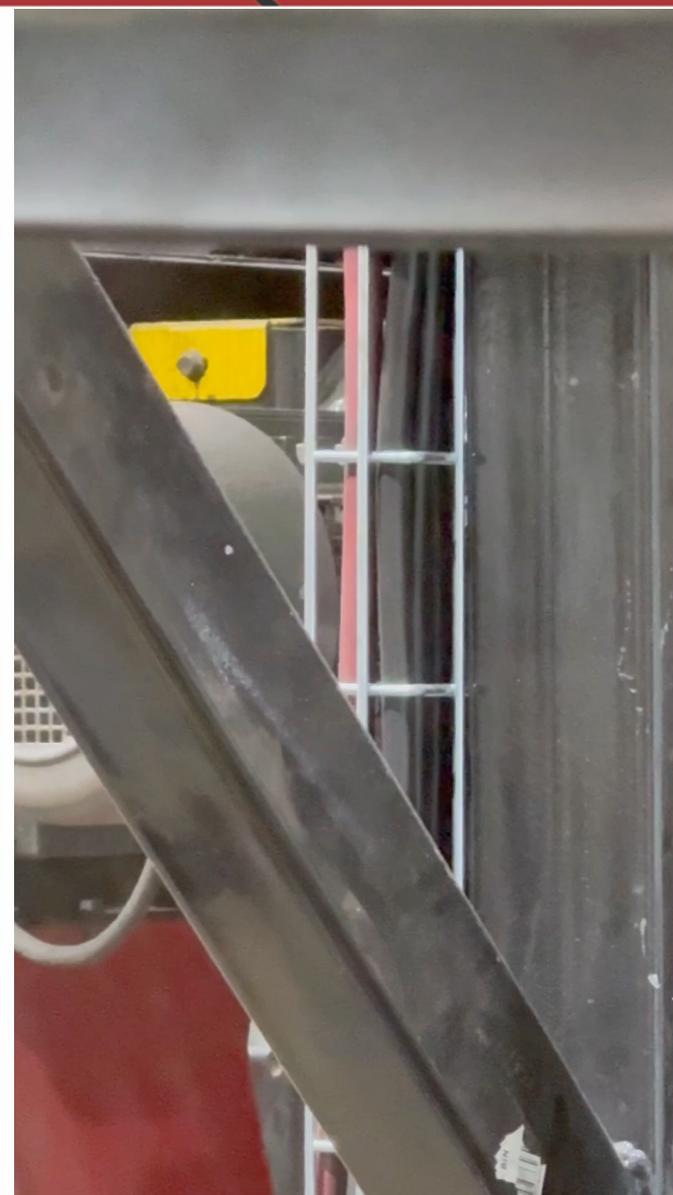


And
Processed...



Until It Is
Clean
Enough For
Melting.





Clean Tire Wire
Melted in
Furnace at 2600
Degrees F



Liquid Tire Wire
Ready to Pour to a
Ladle



Finished Iron is
Poured Into Ladle,
Then Slag is
Removed





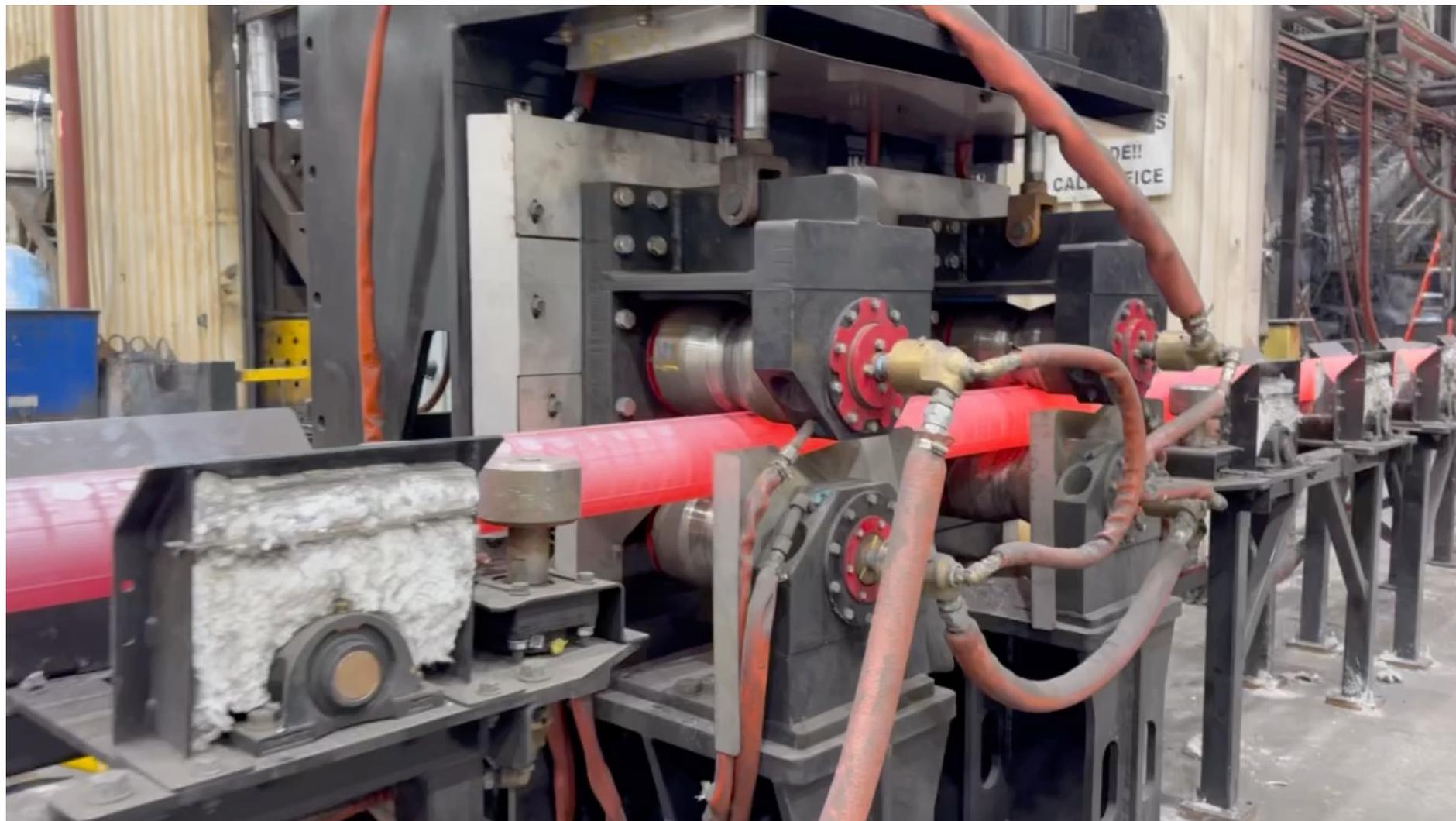
- Various Ingot Sizes and Shapes Can Be Produced From Pure Tire Wire.



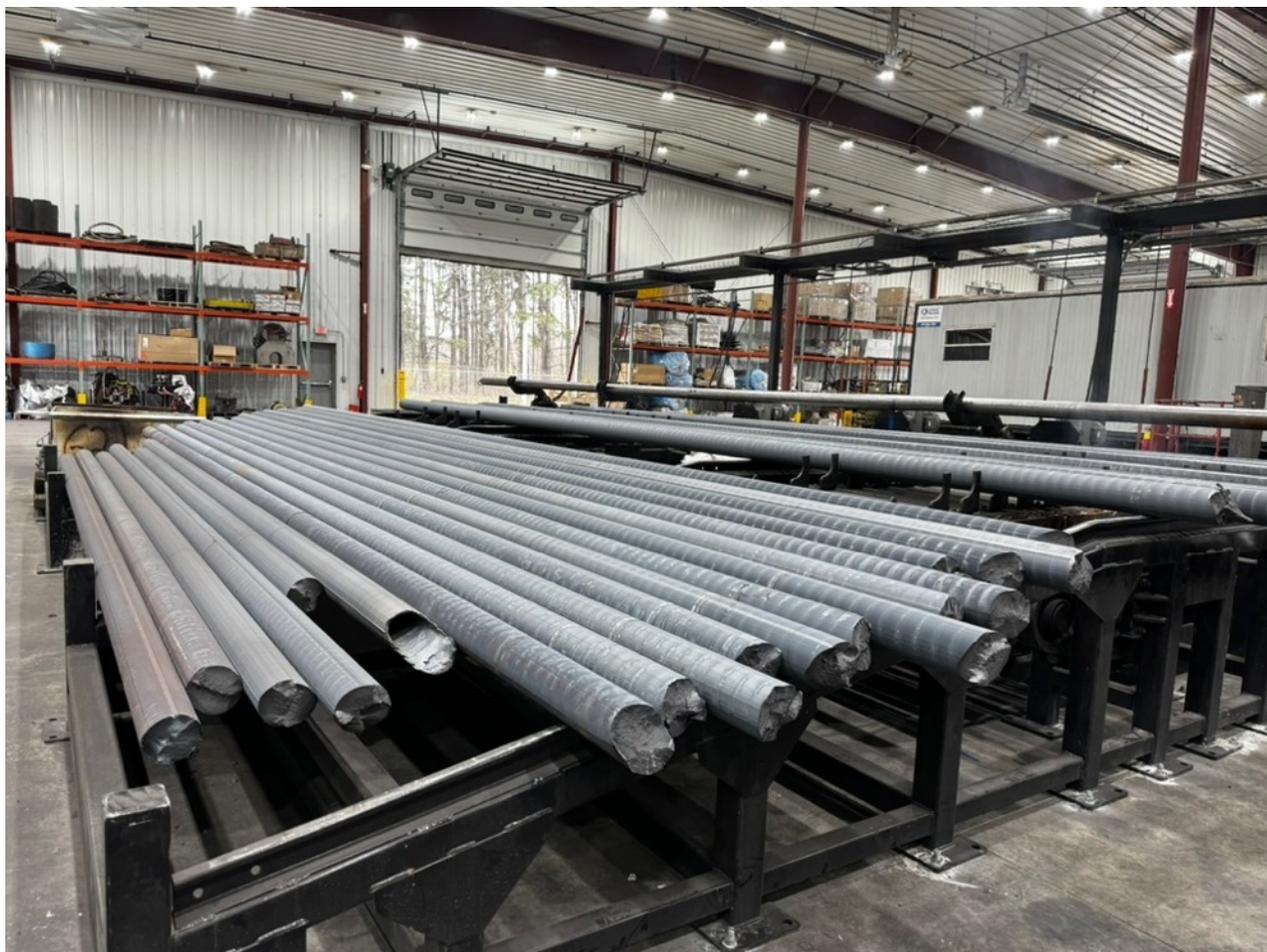
Liquid Iron Can
Also Be Cast Into
Continuous Bar



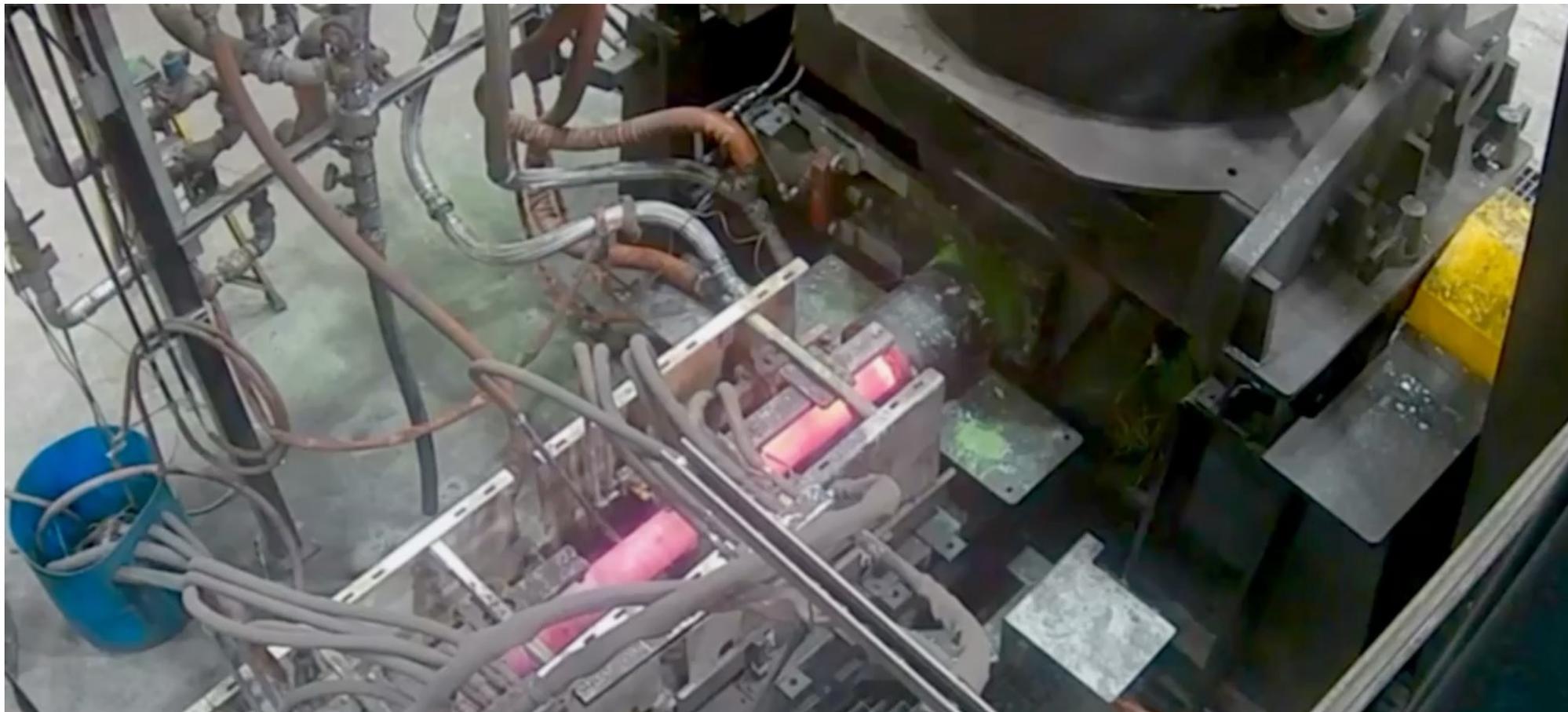
Steel Bar Casting



Cast Bar For Machining Applications



R&D...Mentally, Financially and Physically Hazardous



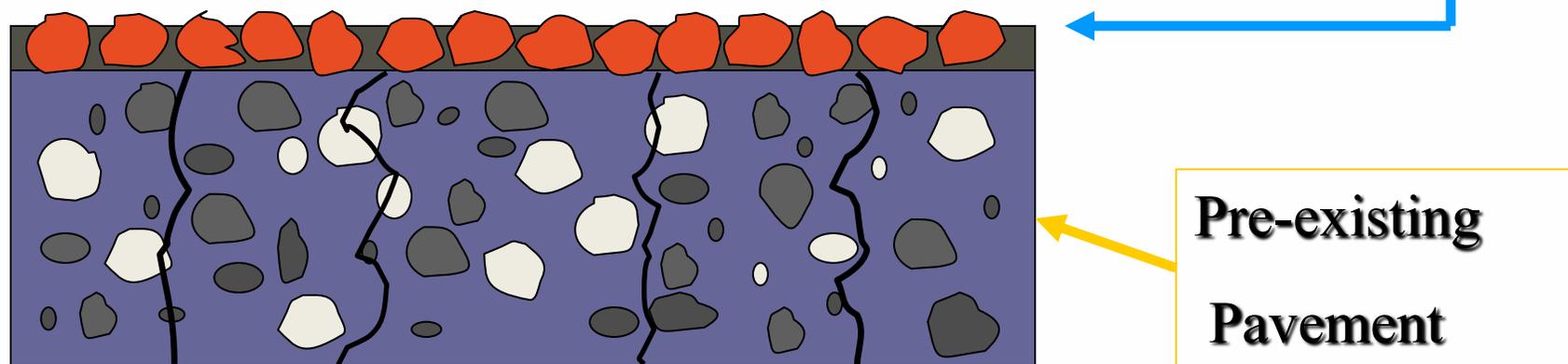
Using Crumb Rubber To Modify Asphalt Roads

- Modifying Hot Mixes With Various **Dry Process** Methods
 - Several Good Options, Normally Proprietary
- **Wet Process** To Modify Liquid Asphalt Binders
 - Normally Non-Proprietary
 - Used In Asphalt Hot Mixes
 - Rubberized Chip Seal

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SAM - Stress Absorbing Membrane or “Rubberized Chip Seal”



**Pre-existing
Pavement**

Examples of
the type of
severely
distressed
road surface
that can be
salvaged





Cactus Paving

Glendale AZ



Elkhart County Indiana



Elkhart County Indiana



Project in Bay County Michigan





Bay County's Cost Options For This Repair:

Rubberized Chip Seal Cost

Less Than **\$5.00**/ Square Yard

Mill Up Old Asphalt and Replace

\$20.00 or more/ Square
Yard



Teamwork!

EGLE (Michigan)

Pavement Solutions (Indiana)

Cactus Paving (Arizona)

American Paving (California)

Numerous Michigan Counties

Michigan Tech University

Michigan State University

RRS (Michigan)

- Let's stop talking about tire piles, tire collection and the “tire problem”. Talk instead about innovative high value end uses.
- If you're not spending on product R&D, you're not helping to secure the future of our industry.
- Energetic competition is essential for our growth and advancement, but also make an effort to find partners in the industry with whom you can share technology ideas or other synergies.
- Using recycled rubber to modify asphalt binders and hot mixes is one of the most innovative high volume, high value uses ever developed.
- Promoting the widespread use of proven **Rubberized Chip Seal** technology will save tax dollars. We can work together on this!

Tire Wire Is 1085 Steel (Approximately)

- 1085 Can Be Used To Make Various Types Of Blades, And Other Products.
- This Is Conrad Frey Making His Dad Proud, Creating Products from Recycled Tires.





- Blades Made From 100% Tire Wire
- Each One Hand Crafted
- 10 Will Be Raffled Free This Week
- Must Be Present To Win
- See Lamar, Sam or John





Innovate!



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