



Wire Lab Company



Mechanical Descaling
Machinery



An Overview of Mechanical Descaling of Steel Wire Rod

Presented by Wire Lab Company – Cleveland, OHIO



Mechanical Descaling Methods

- Reverse Bend Descaling
- Shot Blasting
- Combination of Reverse Bending & Shot Blasting

Performed

- In-Line with Wire Drawing Machine
- By Batch—Taken To Wire Drawing Machine



In-Line Mechanical Descaling



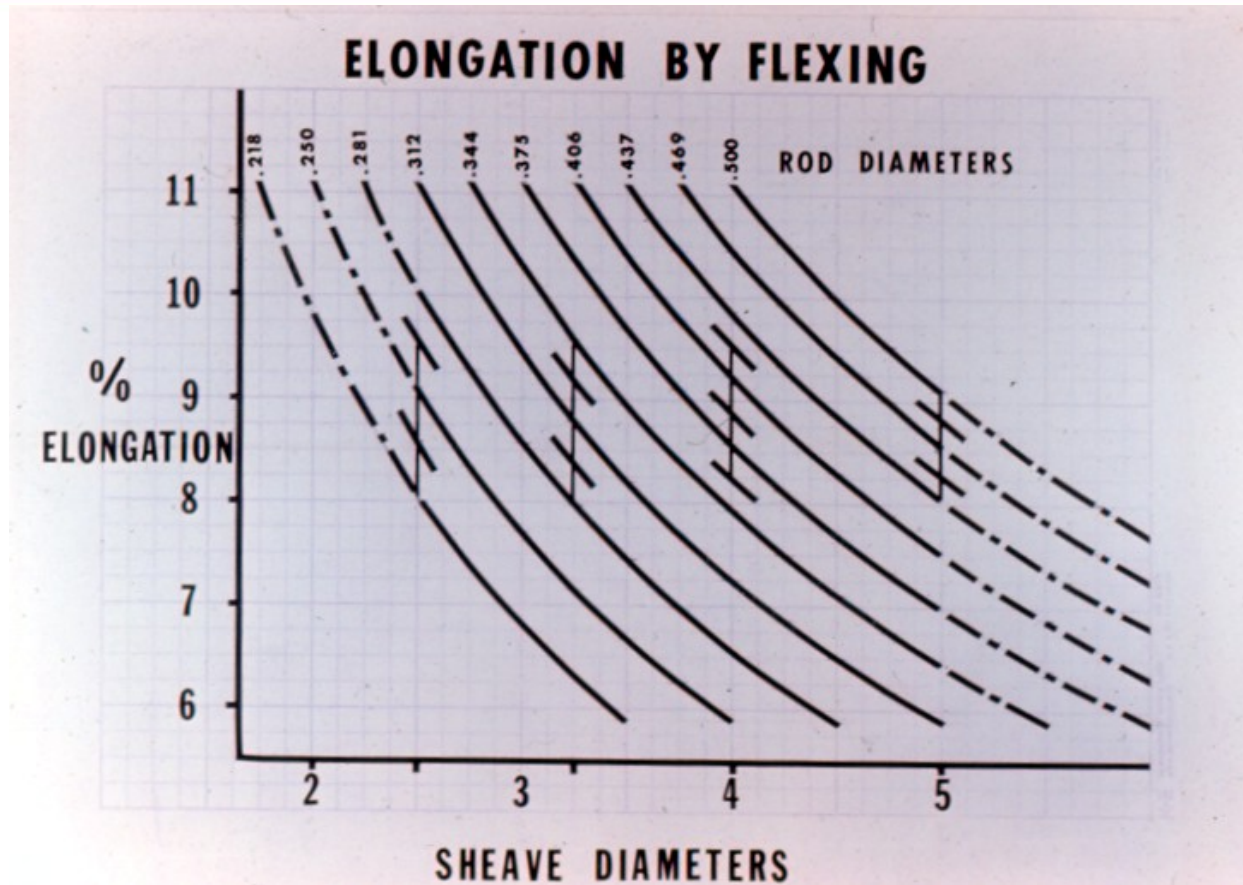


Presentation Topics

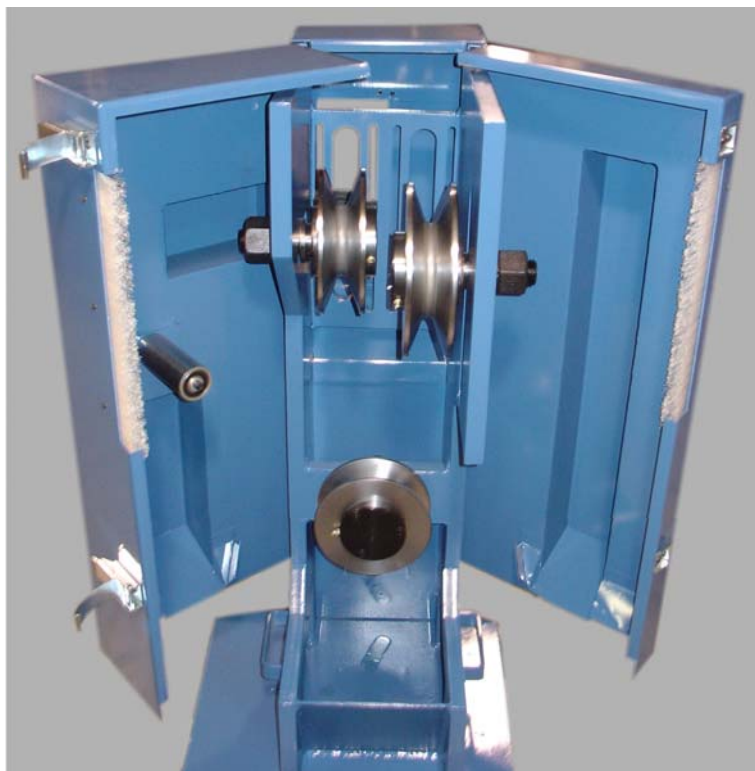
- Basic Principles of Mechanical Descaling
- Brief History of the MD Process
- Current Status of the MD Process
- Equipment to Perform the MD Process
- Systems' Approach to Mechanical Descaling

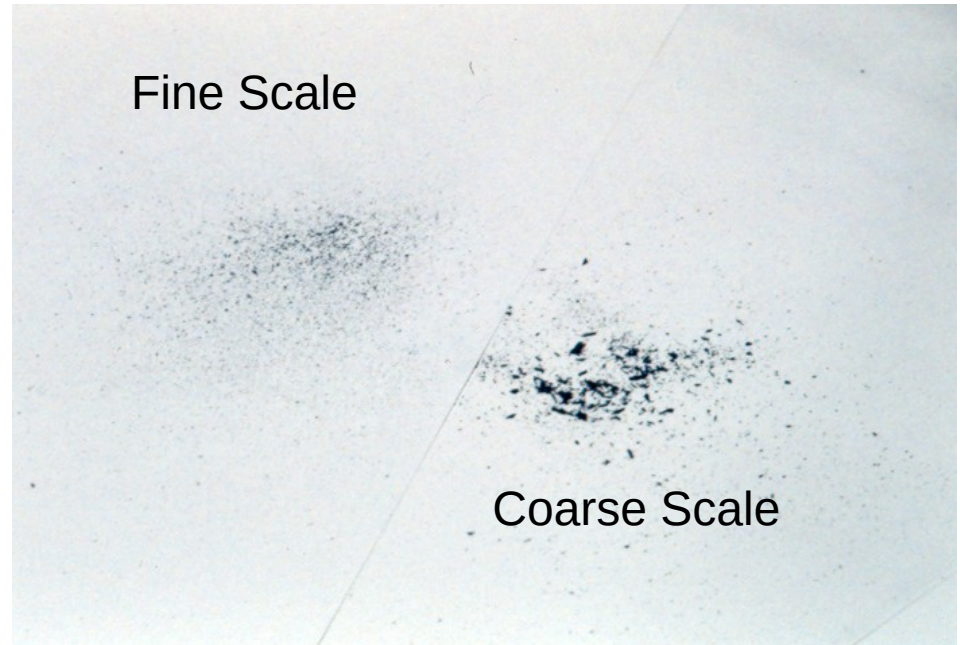


Wire Rod Elongation



WILCO





WILCO





Important Points for Scale Breaking Equipment Design

- 8-10% Total Rod Deformation
- Mostly Bending with Some Stretching
- 360-400° Rod Wrap On Sheaves
- Balance Scale Breaking With Other Side Effects

Rod Condition

- Scale Of .5% to .8% By Weight
- Minimum Secondary Scale
- Minimum Rust



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Overview of MD Development

- 1950's Coarse Scale Breaking
 - » Scale Residual Removal
 - » Scale Waste Management
 - » Aggressive Rod Processing
- 1990's Rod Cleaning and Coating

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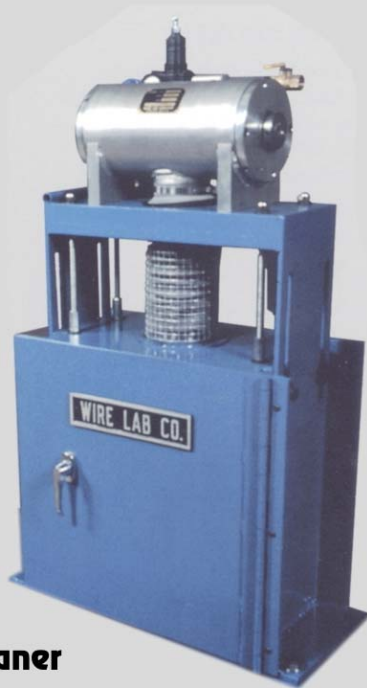


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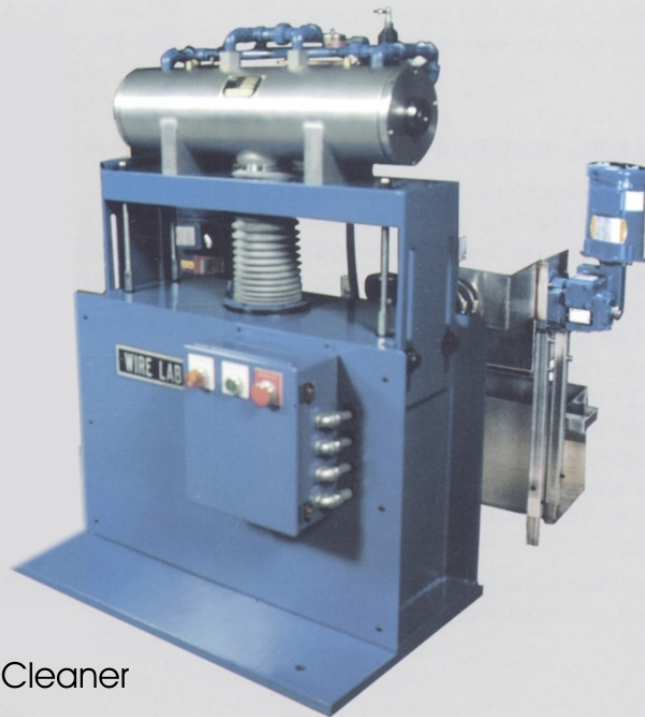


**WILCO Model
610 Air Jet Cleaner**



WILCO





WILCO Model
720 Water Jet Cleaner

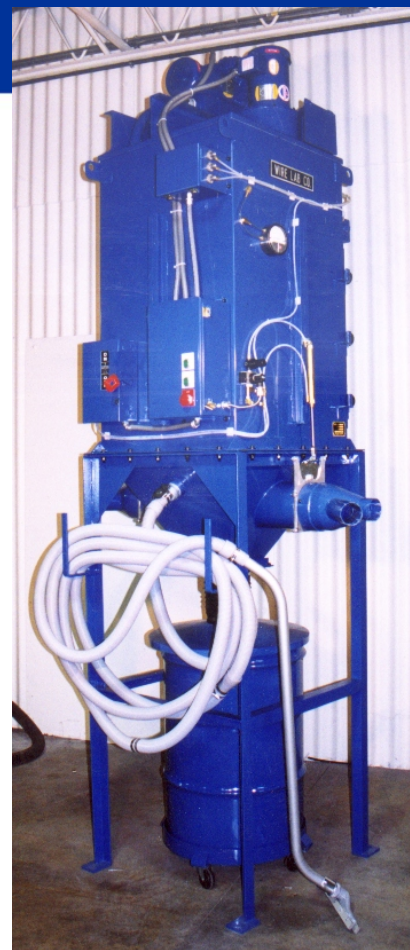




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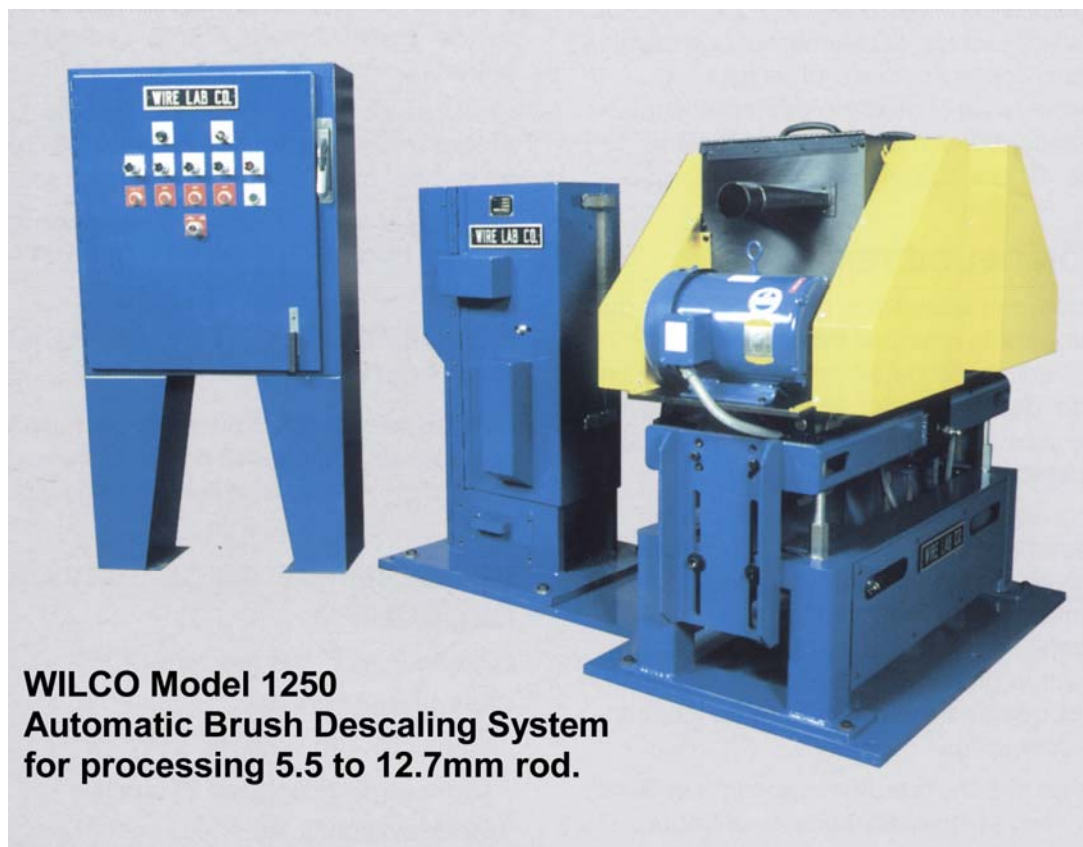
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WILCO Model 1250
Automatic Brush Descaling System
for processing 5.5 to 12.7mm rod.



- Need Picture Of WBM Showing Brushes Here.



Descaled and Brushed Rod



Descaled Only Rod





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**WILCO Model 1060
Mechanical Descaler with Lubricant Precoating**



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From Rod To Product

Wire Products Made From MD Rods

Bale Tie Wire

Field Fence

Rivet Wire

Welded Mesh

Galvanized Wire

Tire Bead Wire

Chain Wire

Screen Wire

Collated Nail Wire

Music Wire

Rope Wire

Barbed Wire

Tie Wire

Bulk Nail Wire

Coat Hanger Wire

Staple Wire

Stitching Wire

Steel Wool Wire

CO2 Welding Wire

Lacing Wire

Steel Cord Wire

Piano Wire

Chain Link Fence

Lawn 7 Garden Wire

Stick Electrode Wire

Cold Heading Quality Wire

Wire Reinforcing Forms

Threaded Rod Wire

Mechanical Spring Wire

Bedding & Seating Wire

Hose Reinforcing Wire

Plating Quality Wire



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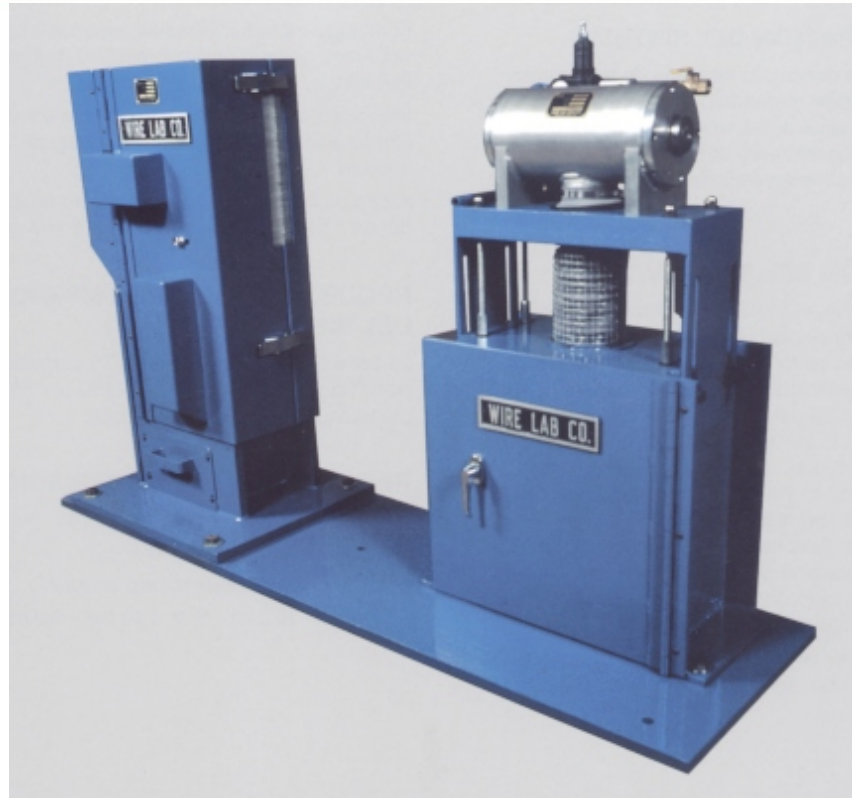


MD Examples

- Model 920 Air Jet Descaling System
- Model 1030 Water Jet Descaling System
- Model 1060 Descaling / Precoating System
- Model 1250 Automatic Brush Descaling System
- Model 1750 Automatic Brush Descaling System with Precoating



Model 920 Air Jet

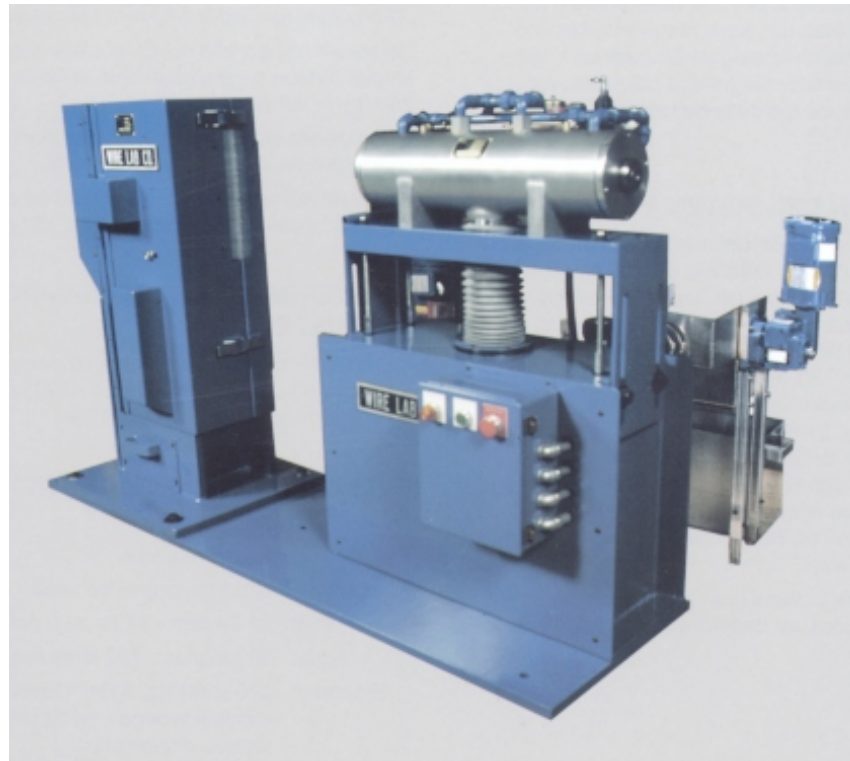




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Model 1030 Water Jet

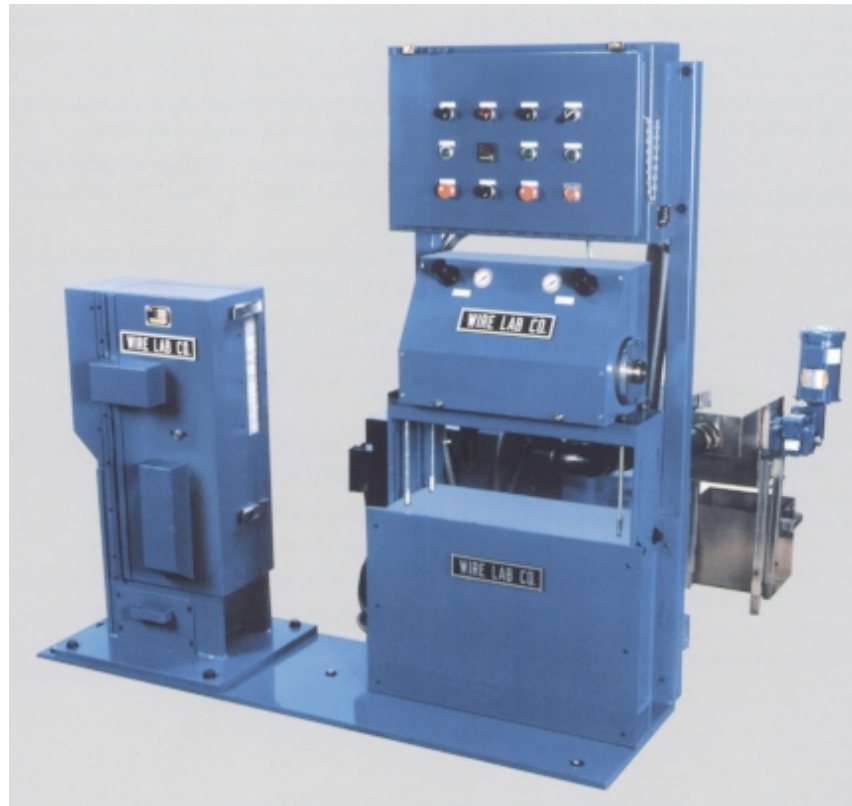




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Model 1060 Lubricant Precoater





Wire Rod Condition

Wire Lab Company



Wire Rod Rust Guide

The following are examples showing the various degree of rust which may be present on wire rod coils. The effectiveness of A WILCO Mechanical Descaling System will be directly affected by the amount and type of coil rust present. Rod coil rust will vary from simple surface staining limited to the scale itself to base metal pitting. A misconception concerning rod rust and mechanical descaling is that wire rod needs to be "seasoned" prior to use. Intentional rusting of rod coils is definitely not recommended.

- Everything starts with the green rod condition.
- Proper scale weight.
- Degree of red rust.



(1) - ZERO RUST:

A-1 quality wire rod with essentially no rust present. Perfect for descaling with basic or brush type (aggressive) WILCO Descalers.



(2) - LIGHT RUST: 10%.

More typical than zero rust. The base metal will be a nice matte gray. This material is also good for processing with standard or aggressive WILCO Descalers.



(3) - LIGHT RUST: 20%.

Typical quality. Some rust areas will have penetrated the scale to the base metal. Any rust stains on the wire will be very light and typically disappear in multiple drafts. These stains are removed by a WILCO Brush system.



(4) - MEDIUM RUST: 30%.

More base metal pitting than 20% rust above. Still acceptable for basic descaling when occasional stains on the final wire product are not an issue. Once again stains may draft out. Easily converted into high quality descaled rod when using a WILCO Brush Descaling System.



(5) - MEDIUM RUST: 50%.

While still suitable for basic mechanical descaling, this material will convert into wire that has an overall brownish stain to the surface. Typically not a problem for industrial quality wire products. Can still be converted into quality wire by descaling with a WILCO Brush System.



(6) - MODERATE RUST: 50-70%.

Not typical for wire rod that will need conversion into top quality wire products. Material surface is excessively pitted from rust. With basic descaling there will be a good degree of red rust remaining on the rod surface. Brush descaling will clean up the surface but deep pits hold rust.



(7) - HEAVY RUST: 75% +.

Material is so rusted you might as well send it to the scrap pile or let someone else deal with it. Not possible to make any sort of quality wire product as most scale has converted into rust. Base metal is completely and severely pitted.



Improvement in Rod Quality





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- Model 1750 Automatic Brush Descaling System with Precoating



Worldwide Installations



WILCO Model 1250
Automatic Brush Descaling System



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Model 1750 Brusher with Precoating





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Systems Approach to MD & Wire Production

- Mechanical Descaling Equipment
- Hot-Rolled Rod
- Wire Drawing Lubricant
- Wire Drawing Aids
- Draw Die Geometry
- Pressure Dies
- Die Box Cooling
- Draw Block Cooling
- Drafting Schedule
- Drawing Speed



Wire Drawing Aids

- Lubrication is key to successful wire drawing.
- Without lubricant precoating extra attention to die lubrication is needed.
- Lubricant Applicators and Pressure Die Holders in each die box.
- Improve drawing performance.
- Improve wire quality.
- Easy to use.
- Economical.





Thank You For Your Attention