SOUTHWIND
International USA

IN-LINE WIRE DRAWING

Introduction

Starting in the early 1960's, In-Line wire drawing was introduced to the cold header industry in Rockford, Illinois. It quickly became an accepted practice with many manufacturers realizing the benefits of drawing the material in front of the cold header versus purchasing and processing mill drawn material. Users learned that a better product could be produced at a lower cost.

In-Line wire drawing has become a standard practice in today's modern factory in the United States.

Internationally, foreign fastener manufacturers have begun to research and invest in In-Line wire drawing technology. Those manufacturers that have invested in In-Line wire drawing technology have found considerable cost savings in purchasing hot rolled rod that has been pickled and limed versus purchasing cold drawn wire.

Introduction

However, many international companies have not accepted wire drawing as part of their daily operation and rely on suppliers to provide predrawn wire.

Most larger international companies draw the wire Off-Line themselves at their facility to reduce stock in inventory.

Benefits of In-Line Wire Drawing as applied to Cold Heading

- Lower Material Costs.....Rod costs savings from 6.5% to 15% can be expected depending on tonnage and product mix when compared to predrawn wire costs. Generally, a manufacturer can save between 8.5 to 12 cents per pound using rod that has been only pickled and limed. This is the typical differential cost between hot-rolled rod and wire in the United States. These percentages increase significantly when a fastener manufacturer is located in a foreign country. How can a fastener manufacturer without utilizing In-Line wire drawing compete in the marketplace?

Benefits of In-Line Wire Drawing as applied to Cold Heading

- Reduced Inventory.....Many different sizes can be drawn from one rod size. It is common to have a 5 to 1 ratio. Other tangible benefits include: less floor space required, reduced inventory costs, less material handling, reduced paperwork all resulting in greater overall plant efficiency.

Benefits of In-Line Wire Drawing as applied to Cold Heading

- Improved Metal Formability……It is a know fact that metal can be moved and formed easier when the wire is drawn directly preceding a cold header operation. By using directly drawn annealed hot-rolled rod, age hardening is completely eliminated.
- Temperature increase by more than 100 percent is not uncommon after the draw die. The temperature increase significantly contributes to larger upsets ratios and larger head to shank diameter ratios.
- In addition, tensile strength of parts are increased. Increased ductility allows the metal to move freely, which allows for filling grooves and impressions better. "Once you get the metal moving keep it moving!"

Benefits of In-Line Wire Drawing as applied to Cold Heading

- Provide Exact Diameter Control.....The wire size can be controlled to less than 0.0005”, providing exact sizing which results in better part consistency and quality.

- Improved Tool Life.....Freshly drawn wire is prewarmed, lubricated, precisely sized, and not aged hardened all contributing to improved tool life. Manufacturers have reported tool life increases of two to three times.

Benefits of In-Line Wire Drawing as applied to Cold Heading

- Improved Wire Surface Condition…..The wire will be cleaner, free from nicks, kinks and abrasions while carrying wire drawing lubricant which contributes to improved metal formability.

- Reduce Pull-Back On Header Feed Rolls……In-Line wire drawing provides the “pulling” force off the payoff unit while drawing the wire. Minimized header feed roll pullback yields better part consistency and eliminates “short blanks”.

Benefits of In-Line Wire Drawing as applied to Cold Heading

- Accommodate Any Coil Size.....Since the Wire Drawer is doing all of the work, the header is oblivious to the coil weight and size. Many times the header feed rolls do not have enough pulling power if larger coils are used. In-Line wire drawing can allow larger coils to be used reducing downtime !

Age Hardening Comparison Chart for Drawing Off line

Age-Hardening for Medium Carbon Rod

After Drawing	PSI Increase
1 Hour	9,500
1 Day	12,000
7 Days	17,000
26 Days	17,200
188 Days	21,000

TS Gain-PSI Comparison for Drawing In-Line

Estimated Tensile Strenght gain-PSI per each1% area reduction utilizing In-Line wire drawing

1010-720 1018-784 1020-800

1045-1000 1117-800 1144-1000

1541-8640 Alloy Steel-900-1600

302s/s-1300/1400 316s/s-1200/1500

410s/s-850/1100 430s/s-800/900