

# NICHROLOY

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### Special points of interest:

Considering the savings in replacement costs, downtime, and maintenance, Nichroloy will be your best value in alloy shafting.

Nichroloy is engineered to have the strength and toughness to meet all your shafting needs.

There is a wide variety of applications in which Nichroloy has been proven to far outlast its generic counterpart.

Nichroloy is available in a variety of diameters and lengths.

## NICHROLOY CAN HELP YOUR BUSINESS

Nichroloy is a clean, fine-grain, alloy steel produced by the electric furnace process and furnished hot rolled for applications requiring exceptionally high tensile strength and resistance to wear, shock and fatigue. Rigid quality control assures a steel of consistently high chemical and physical properties.



## THE BENEFITS OF NICHROLOY

### Longer Service Life:

Engineered to develop higher strength, finer finish, cleaner chemistry and better fatigue resistance than standard grades of alloys and carbon steels such as SAE 1045, 4140, 4150, 4340, etc.

### Strong and Resistant:

With a Rockwell C 32 hardness and heat-treatment, Nichroloy is resistant to all types of wear. It will outlast the

generic high alloy and carbon steels, saving you downtime and maintenance costs.

### Availability:

Baldwin International maintains one of the largest stocks of precision finished shafting in the U.S. With a full array of sizes from 1/4" dia. to 9" dia. in common 1/16" increments, as well as metric sizes, we can supply your specific shaft how you want it and when you want it.

## TYPICAL NICHROLOY APPLICATIONS

Arbors  
 Armature Shafts  
 Axles  
 Bolts  
 Boring Bars  
 Chain Links  
 Chain Pins  
 Clevises  
 Conveyor Shafts  
 and Rollers  
 Crank Shafts and  
 Pins  
 Drag Line Parts  
 Drift Pins  
 Drill Shanks  
 Drive Shafts  
 Feed Screws  
 Fittings  
 Gears  
 Gear Shafts  
 Generator Shafts  
 Grinder Spindles  
 Gudgeons  
 High Pressure  
 Valve Studs  
 Highly Stressed  
 Shafting  
 Hoist Hooks & Pins  
 Hoist Shafts

Hubs  
 Impeller Shafts  
 Jack Shafts  
 Journals  
 Lead Screws  
 Line Shafts  
 Machine Tool Pinions  
 Magneto Shafts  
 Mandrels  
 Mining Machine Parts  
 Motor Shafts  
 Nuts  
 Pinions  
 Pins  
 Piston Rods  
 Power Shovel Shafts  
 Propeller Shafts  
 Push Rods  
 Reamer Shafts  
 Renecking Spinning  
 Rollers  
 Rings  
 Screws  
 Set Screws  
 Shackles  
 Skidding Tools  
 Sleeves  
 Sleeve Shafts

Spindles  
 Spinning Rollers  
 Steam Shovel Parts  
 Steering Knuckles  
 Studs  
 Tie Rods  
 Thrust Shafts  
 Tongs  
 Transmission Screw  
 Valve Stems  
 Wearing Strips  
 Worms  
 Worm Gears  
 Wrist Pins



**Nichroloy step-down forgings.**

*“Nichroloy bars come in standard 10–12 ft and 20–24 random lengths. We will cut to size upon inquiry.”*

## NICHROLOY STOCKING SIZES

diameter size (inches)		
1/2	3 - 1/2	8
5/8	3 - 3/4	8 - 1/4
3/4	4	8 - 1/2
7/8	4 - 1/4	8 - 3/4
1	4 - 1/2	9
1 - 1/4	4 - 3/4	9 - 1/2
1 - 3/8	5	9 - 3/4
1 - 1/2	5 - 1/4	10
1 - 3/4	5 - 1/2	10 - 1/2
1 - 7/8	5 - 3/4	11
2	6	11 - 1/2
2 - 1/4	6 - 1/4	12
2 - 3/8	6 - 1/2	12 - 1/2
2 - 1/2	6 - 3/4	13
2 - 3/4	7	13 - 1/2
2 - 7/8	7 - 1/4	14
3	7 - 1/2	15
3 - 1/4	7 - 3/4	16

\*LARGER SIZES AVAILABLE UPON INQUIRY

## WHY DO ACCURLOY AND NICHROLOY LAST

The Accurloy/Nichroloy product group is a derivative of the filed-proven base metals of the 41XX and the 43XX series of ultra-high strength alloys.

Accurloy and Nichroloy achieve their superior toughness and fatigue resistance by utilizing the latest in *Clean Steel*

*Production Technology*, and chemical modification. Argon stirring, vacuum degassing, inclusion shape control, bottom pouring, and extensive hot and cold reduction deliver levels of microcleanliness and grain refinement typical to ESR and VAR vacuum remelt steels.



## NICHROLOY Vs. 4140

Factors	4140	Nichroloy	Advantages of Nichroloy
Usual Manufacturing Process	Open Hearth Furnace. Large heats, little uniform control	Small Electric Furnace heats	Greater control, less defects, cleaner steel which increases toughness and service life
Tensile Strength (Heat Treated 28-32 RC)	125,000 PSI	155,000 PSI Typical (Higher on smaller diameters)	Approximately 25% higher strength
Yield Strength (Heat Treated 28-32 RC)	100,000 PSI	130,000 PSI Typical (Higher on smaller diameters)	Approximately 25% higher strength
Stress Relieved	Optional - must be specified	Stress relieved at mill	Minimizes Bowing and Walking during machining
Machine Straightened	Optional - must be specified	Machine straightened at mill	
Low Sulphur Vacuum Degassed	Not a commercial practice	Degassed at mill	Builds toughness by removing impurities in the steel
Fatigue Resistance	Low Toughness	High degree of toughness	Higher endurance limit. Will minimize fatigue caused by twisting and flexing in use.
Wear Resistance	Hard and soft spots, Uneven wear	Uniform hardness	Uniform hardness and less decarburization give increased wear life. Tends to work-harden with wear.
Machinability	Not consistent	Uniform	Uniform grain and hardness offer better machinability

*“...greater control, less defects, cleaner steel, which increases toughness and service life.”*

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*Specialty Steels for Industry*

If you are looking for a specialty steel supplier that has the quality and the experience to fulfill your unique material needs, then look no further. Merging in 1986 from two of the leading alloy steel companies in the U.S., Baldwin International has become the recognized leader in finding answers for your maintenance problems. No other company can provide the



unique materials, generations of experience and the on-site assistance that we provide daily to our customers.

For almost 50 years, Baldwin International has been developing unique materials that provide longer life and less down time in maintenance applications of shafting, wear liners, and steel fabrications. Unlike steel suppliers that provide a whole gamut of "generic" steels, we have "enhanced" materials, engineered for specific needs, and the wisdom to guide you in your selection.

Please check out some of our products and the related information. And please contact us for any further questions that you may have. We would be happy to have one of our experienced representatives at your service.

## TYPICAL MECHANICAL PROPERTIES OF NICHROLOY

**High Tensile Strength:** Approximately 155,000 psi at delivered hardness of Rockwell C 32. Yield strength approximately 130,000 psi. Higher tensile values can be developed by additional heat treatment.

**Heat-Treated:** To a hardness of Rockwell C 28-32. Additional heat treatment unnecessary for most applications.

**Fatigue Resistant:** High endurance limit makes Accurloy and Nichroloy the best steels for many high fatigue shaft and rod applications such as crane and armature shafts, hammer rods, etc.

**Wear Resistant:** Heat-treated to increase wear life over other alloy and high carbon steels.

**Stress Relieved and Machine Straightened:** Rolling and heat-treating stresses relieved at the mill, minimizing bowing or "walking" in machining. All bars machine straightened.

**Fine Grain Structure:** 95% of 8 on Shepherd fracture grain-size standards--assures the toughness and shock-resistance essential in a multi-purpose maintenance steel.

**Machinability:** Virtually free from hard or soft spots, pipe, seams or other flaws. Machines to an excellent finish with ordinary high speed tools.

