

# Plate Processing



## Cost Savings and Solutions



OXY-FUEL CUTTING



PLASMA CUTTING

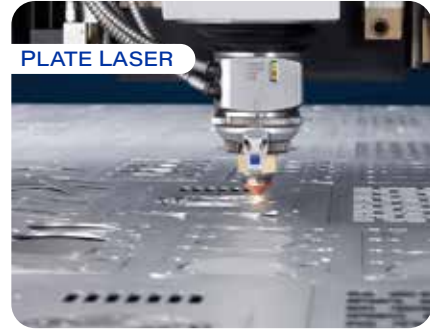
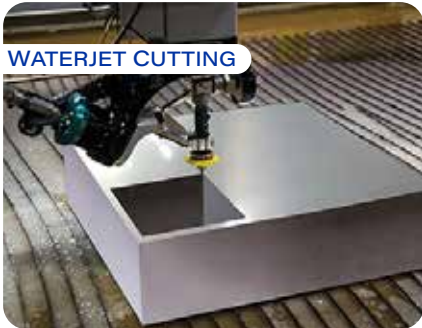


PLATE LASER



WATERJET CUTTING



THERMAL PROCESSING



PLATE SAW CUTTING



PRECISION MILLING



SHEARING



PLATE GRINDING

America's Premier Metals & Plastics Service Center



**Alro Steel**  
**Metals & Plastics**

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# Plate Processing

## OXY-FUEL CUTTING

Alro offers flame cut pieces (rectangles, ID, OD and per print items) to customer specifications. Our CNC machines allow us to flame cut carbon plate up to 14" thick. Some advantages of flame cutting include:

- Thick material cutting capability
- Multi-torch cutting to increase efficiency
- Good edge quality
- In-house stress-relieving, normalizing and annealing
- Maximum table cutting capacity 120" x 600"



## PLASMA CUTTING

Plasma Cutting provides tighter tolerances, minimizes machining on finished parts and provides greater part accuracy than standard flame cutting. Plasma has a smaller heat affected zone and reduced edge cracking when forming. Other advantages include:

- High quality edge cuts
- Minimal clean-up
- Small heat affected zone
- Etching and beveling capabilities
- Forming as a potential secondary process
- Maximum table cutting capacity 120" x 480"



## PLATE LASER

- Laser tolerances in stainless, aluminum and carbon plate up to 1", up to 1/4" in red metals
- Maximum plate capacity 80" X 159"
- High precision and repeatability on cut parts
- Produces near net or finished products to your print
- Minimal heat affected zone
- Minimal to no clean-up
- Etching (not offered on red metals) and "stitch-cutting" available
- Potential Secondary Processes:
  - Tapping from #10 - 3/4" and M5 - M12 available depending on size/thickness
  - Forming





# Plate Processing



## WATERJET CUTTING

- No heat affected zones
- No mechanical stress
- More accurate cutting in all materials
- Produces a near net, finished part
- Thicker cutting with minimal distortion
- Reduces or eliminates secondary machining operations
- Tighter nesting for optimal material utilization
- Maximum table cutting capacity 120" x 240"



## THERMAL PROCESSING

**Stress Relieving** diminishes the residual stress in steel caused by working the material (i.e. flame cutting, forming, rolling, casting, machining, welding, bending, straightening). This is accomplished by reheating the steel then cooling it at a slower rate.

- Stress relieving can be performed before grinding on parts that require light machining
- Often used on weldments

**Normalizing** is accomplished by heating the metal above the transformation temperature, then cooling it in still or slightly agitated air. Benefits include:

- Refines/reduces the grain size of steels that have been subjected to high temperatures
- Prepares steel for heavy machining
- When machined, provides a better surface finish

**Annealing** is accomplished by heating the metal just below the transformation temperature, then cooling in a controlled cycle which limits the cooling rate and brings the temperature down slowly. Benefits include:

- Softens metal
- Changes mechanical/electrical properties
- Aids in dimensional stability
- Greatly improves forming and bending





# Plate Processing

## PLATE SAW CUTTING

Our plate saw cutting capabilities allow us to stock every Alro Steel warehouse and Alro Metals Service Center with wider and thicker flats. Wider flat bars are produced from plate steel stored in our own plate processing facilities. Making wider flats available significantly reduces your need for costly secondary operations. Readily available grades include:

- |               |               |        |
|---------------|---------------|--------|
| • 1018        | • A-36        | • D2   |
| • 1045        | • 4140 HRA    | • DC53 |
| • 1119        | • 4140 HR HT  | • O1   |
| • 1144        | • 4140 HT DCF | • O6   |
| • CleanCut 20 | • A2          | • S7   |
| • 8620        | • A6          | • H13  |
| • 6150        |               |        |

**Circle Saw Cutting:** Alro offers circle cutting on many of the materials offered. From a minimum 10-3/8" diameter up to 60" diameter (6" thick) or 43" diameter (8" thick).

**Mold Plate Saw Cutting:** Aluminum mold plate up to 30" thick can be cut-to-size on our saws. Maximum size of 144" x 144" for all thicknesses less than 8" thick. For pieces 8" up to 30" thick the maximum size is 64" wide x 150" long.



## SHEARING

Shearing sheet metal and plate steel is performed in most of Alro's steel warehouses. We'll shear your order to your exact specifications, place your material on a skid for safe transporting and safe handling after your order is delivered to your specified location.

We are capable of shearing plate up to 1/2" thick. Thickness capacities vary depending on the grade of the material. Maximum plate capacity is 144" x 144". Please inquire for specific questions and details.



# Plate Processing

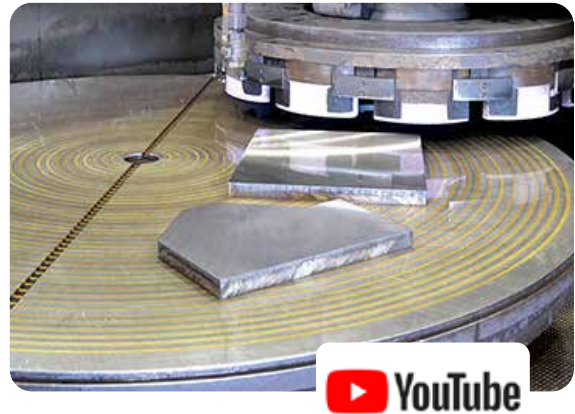


## PLATE GRINDING

**Blanchard (Rotary) Grinding:** Alro's Blanchard Grinding machines allow for great turnaround time and the capability of grinding metals with a 152" swing from corner to corner.

**Reciprocal Grinding:** For jobs requiring a smoother finish and a tighter tolerance, Alro can offer Reciprocal Grinding with a surface capacity up to 48" x 120"

**Milling:** Up to 96" high x 60" wide x 144" long with the ability to machine larger by sliding.



## PRECISION MILLING

Precision milled Super Square offers better utilization of skilled labor, machine time and overall productivity.

- 2-, 4-, 6-sided precision milling
- Available in all metal grades
- Thickness = .250" - 15.750"
- Width/Length = .750" - 39.375"
- Square and parallel .002" per foot
- Milled to customer tolerances
- Fast delivery to meet customer needs



## PRESS BRAKE

With multiple machines of varying capabilities, Alro Steel is uniquely qualified to cut and form your custom parts. Along with standard formed shapes, Alro is capable of producing more complex parts such as:

- 3- and 4-sided pans
- Multiple profile parts
- Overbending of a variety of thicknesses
- Multiple hit "step brake/rolled parts"

With the addition of the 600 ton, 20' bed, hydraulic style Accurpress Brake machine we now have the ability to bend thicker plate over a longer span including:

- Custom angles
- J-channels
- Custom channels
- Zee shapes







# Grades & Descriptions

## AISI Grades / Hot Rolled Plate

### A-36 Hot Rolled Plate (ASTM A36)

A-36 is a structural quality carbon steel used for a variety of general construction applications including; bolted, riveted, or welded construction of bridges and buildings. Minimum yield point is engineered at 36,000 psi. In addition to greater strength than A-283, A-36 plates can be used to design structures and equipment lighter in weight with better weldability.

### A1011/A1018 CS Type B Sheet (ASTM A1011/A1018)

Hot rolled commercial quality steel is suitable for many applications where normal surface imperfections are not objectionable. Heat treatment and other processing operations must be properly performed so as to not detrimentally affect the properties of the steel. Commercial quality will meet the bend test requirements of ASTM E290.

### 1020 Hot Rolled Plate (AISI 1020)

The controlled carbon range of C1020 improves the machinability of this grade. Good formability and weldability are also characteristic.

### 1045 Hot Rolled Plate (AISI 1045)

C1045 is silicon filled with a higher carbon content for greater strength. Strength can be improved in the lighter and medium thicknesses by heat treatment. Machinability is good, while forming and welding properties are limited.

## ASTM High Strength Low-Alloy Grades

### 100XF Temper Levelled Plate

100XF steel plate has been developed for applications where increased strength-to-weight ratios are required. It has physical properties similar to those of ASTM A514 even though its manufacturing process does not require heat treatment.

100XF is available as temper levelled, cut-to-length plate. Temper leveling improves flatness and surface quality, and eliminates coil memory, all of which enhance laser and plasma cutting quality. It also offers good weldability, formability, toughness, and weathering resistance. This excellent combination of properties is possible because of the low-carbon chemistry and the thermo-mechanical controlled processing used in the manufacture of 100 XF.

### A-514 Grade B/F/Q Plate (ASTM A514)

The A514 plate steels are a group of quenched and tempered alloys with attractive advantages and characteristics. The most important are high yield strength at 90 or 100 ksi minimum, weldability, and good toughness at low atmospheric temperatures. Designed for a wide range of structural uses as well as machinery and equipment, these alloy steels offer help with selecting the optimum in strength, toughness, corrosion resistance, impact-abrasion resistance, and long-term economy. Alro stocks grade B, H, F & Q and pattern sizes of A514 Plate in 1/4" - 6".

### A-572 Grade 50 Plate (ASTM A572-50)

This high strength, low alloy steel plate offers an optimum combination of strength, weldability and notch toughness with economy. Applications include; bridges, buildings, automotive and truck parts, railroad cars, cargo containers, tote boxes, construction equipment, structural tubing, lighting standards and transmission poles.

### A-588 Grade A/B Plate (ASTM A588)

ASTM A-588 Gr. A/B steel plate offers all the advantages of ASTM A572-50 but is produced with elevated levels of copper to add corrosion resistance. This "weathering" grade is often used in unpainted applications such as bridges, utility sign/poles and highway structures and guardrails because of the self-repairing, natural oxide patina greatly reduces maintenance.

### A-656 Grade 80 Plate (ASTM A656-80)

ASTM A-656 Gr. 80 combines outstanding toughness, ease of fabrication and positive strength to cost relationships when compared to A572-50 and A-36. These translate into real savings in applications such as telescopic cranes, truck trailers, railroad cars, construction equipment and transmission towers; or any other extreme load-bearing job where the economy of superior strength and weight are paramount.

# Grades & Descriptions



## Pressure Vessel Grades, ASME

### A-516 Grade 70 PVQ Plate (ASTM A516-70, ASME SA516-70)

Intended primarily for service in welded pressure vessels where improved notch toughness is required, this grade of ASTM A516/ASME SA516-70 is normally found in moderate and lower temperature applications. Supplementary testing such as Charpy Impacts, Ultrasonic Examination and Carbon Equivalency are available.

## Free Machining Plate

### 1144 Modified

1144 Modified offers high strength and hardness and is applicable where resistance to deformation and wear are essential. It may be flame hardened to further enhance surface properties. It is frequently used as an economical replacement for more expensive quenched-and-tempered alloy grades.

### Clean-Cut 20®/LFM 20/FM 15®/1119 Modified

The Clean-Cut/LFM 20 families of plate steel were developed for improved machining. Produced by a special calcium treatment and a controlled sulphur process, Clean-Cut steels contain sulfide inclusions which are predominately calcium modified to make them smaller and more uniformly distributed. The result: enhanced machinability. The economy of Clean-Cut steels can be realized in reduced wear and breakage of machine tools, a reduction in machining time and increased productivity. Also, the improved internal quality of Clean-Cut produces a superior machined surface compared to free machining carbon steels.

## Abrasion Resistant Grades

### Abrasion Resisting Plate

Abrasion Resisting Steel was designed to satisfy the demand for a grade of steel that would give prolonged service life where abrasion is the primary cause of failure. The surface hardness of Abrasion Resisting Steel will vary by grade from 200-500 BRINELL.

### Manganese Plate (11% - 14% Manganese)

Manganese plate is a nonmagnetic steel that work hardens to a 650 Brinell. It is a 12-Mn austenitic steel with an exceptionally high level of wear-resistance when subject to work-hardening by shocks or high pressures in service.

### Armor Plate MIL-A-46100 (e)

A popular high hardness armor grade (HHA), 46100 is selected for use by all departments and agencies of the Department of Defense. This grade is produced to 2 inches (51mm) thick with hardness requirements of 477-534 BHN and Charpy Impact testing on every plate.

Available thicknesses include: 1/4" • 5/16" • 3/8" • 1/2"

## Alloy Grades

### 4140 Hot Rolled Plate (AISI 4140)

This medium carbon alloy grade is widely used for many general purpose parts requiring high tensile strength and toughness. 4140 contains chromium and molybdenum as alloying elements and may be heat treated over a wide range to give the combined advantages of proper hardness, strength and ductility. In conditions where localized hardness may be required, this steel is readily flame or induction hardened.

### 8620 Hot Rolled Plate (AISI 8620)

Carefully controlled proportions of chromium, nickel and molybdenum are responsible for the extensive use of 8620 as a carburizing alloy steel. Valuable features of this grade include extreme surface hardenability and internal strength.

### 6150 Hot Rolled Annealed Plate (AISI 6150)

An electric furnace melt of chrome vanadium steel possessing the following characteristics: oil-hardening, high resistance to vibratory stress, standard deformation, medium hardness, high torque strength and bright polish.



# Alro Locations



● **Metals**   ● **Plastics**   ● **Outlet Stores**

Alro Steel was founded in 1948 by brothers Al and Robert Glick in Jackson, Michigan. The company is a distributor of metals and plastics. Alro is focused on offering cut-to-size metals and plastics with next day delivery to over 50,000 customers in North America. Alro operates over 80 locations in 16 states and provides a broad inventory of products under the following companies: Alro Steel, Alro Metals, Alro Metals Outlet, and Alro Plastics. Focused on exceeding our customers' expectations, we build relationships with all our customers, large and small. [To learn more, please visit alro.com.](http://alro.com)

## Over 80 Locations in 16 States!

Florida	Michigan	Pennsylvania
Illinois	Missouri	Tennessee
Indiana	New York	Virginia
Iowa	North Carolina	Wisconsin
Kentucky	Ohio	
Maryland	Oklahoma	



Pictured, the Alro Steel facility in Pottsville, Michigan



Metals	Bar	Pipe & Tube	Plate & Sheet	Structural	Grating & Exp. Metal
Alloy	●	●	●		
Aluminum	●	●	●	●	●
Brass	●		●		
Bronze	●	●			
Carbon Steel	●	●	●	●	●
Cast Iron	●	●			
Copper	●	●	●		
Stainless Steel	●	●	●	●	●
Tool Steel	●		●		

## e-Business Solutions

- Alro Online Store ([MyAlro.com](http://MyAlro.com))
- Customized Summary Billing
- Tool Management Solutions
- B2B Transactions

Ask your Alro Representative for details!



# Alro Steel

## Metals & Plastics

Since 1948

