Maximizing Efficiency In Sheet Metal Rapid Prototype Cutting And Shearing Techniques

Our Product Introduction

Basic Information

- Place of Origin: China Shenzhen
- Brand Name: Aluminum,Copper,Brass,Steel,Stainless Steel
- Certification: SheetMetal Fabrication
- Model Number: Polishing,Anodizing,Painting,Chrome Plating, Silkscreen
- Minimum Order Quantity: 1 piece
- Price: USD 30 piece
- Packaging Details: Carton, Plywood Box
- Delivery Time: 3 - 5 Days
- Payment Terms: T/T, Paypal
- Supply Ability: 1 piece per day

Product Specification

- Material: Metal
- Lead Time: 2-4 Weeks
- Size: Customized
- Thickness: 0.5mm-10mm
- Application: Industrial
- Process: Cutting, Bending, Welding
- Surface Treatment: Powder Coating
- Type: SheetMetal Fabrication
- Highlight: **sheet metal rapid prototype cutting**, **cutting sheet metal prototype**, **shearing sheet metal prototype**

Our Product Introduction

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Product Description

Introduction of Sheet Metal Fabrication

Sheet metal fabrication is a comprehensive manufacturing process that shapes and forms sheet metal into specific parts and components. This process includes a range of techniques and procedures for cutting, bending, punching, welding, and assembling sheet metal to produce the final product. It is widely utilized in sectors like automotive, aerospace, construction, and electronics, among others. The following are some principal elements and procedures in sheet metal fabrication:

Material Selection: Sheet metal can be made from a variety of materials, including steel, aluminum, stainless steel, copper, brass, and more. The choice of material depends on factors such as desired strength, corrosion resistance, weight, cost, and specific application requirements.

Cutting and Shearing: Sheet metal is typically cut into the desired shape and size using various methods. Common cutting techniques include laser cutting, plasma cutting, waterjet cutting, and mechanical shearing. These methods provide precise and clean cuts, ensuring accurate dimensions for subsequent forming processes.

Forming and Bending: In sheet metal fabrication, forming and bending are essential for transforming flat sheets into three-dimensional shapes. Press brakes are frequently utilized to manipulate the metal, facilitating the formation of angles, curves, flanges, and various structural elements. Additionally, roll forming and stamping may be used for certain specialized tasks.

Available Sheet Metal Fabrication Processes				
Check out the specific advantages of each sheet metal manufacturing process and choose one for your custom part needs.				
	Processes	Description	Thickness	Cutting Area
	Laser Cutting	Laser cutting is a thermal cutting process that uses high-power laser to cut metals.	Up to 50 mm	Up to 4000 x 6000 mm
	Plasma Cutting	CNC plasma cutting is suitable for cutting thicker sheet metals.	Up to 50 mm	Up to 4000 x 6000 mm
	Waterjet Cutting	It is especially useful for cutting very thick metals, including steel.	Up to 300 mm	Up to 3000 x 6000 mm

	Bending	It’s used to shape custom sheet metal prototypes after the cutting process.	Up to 20 mm	Up to 4000 mm

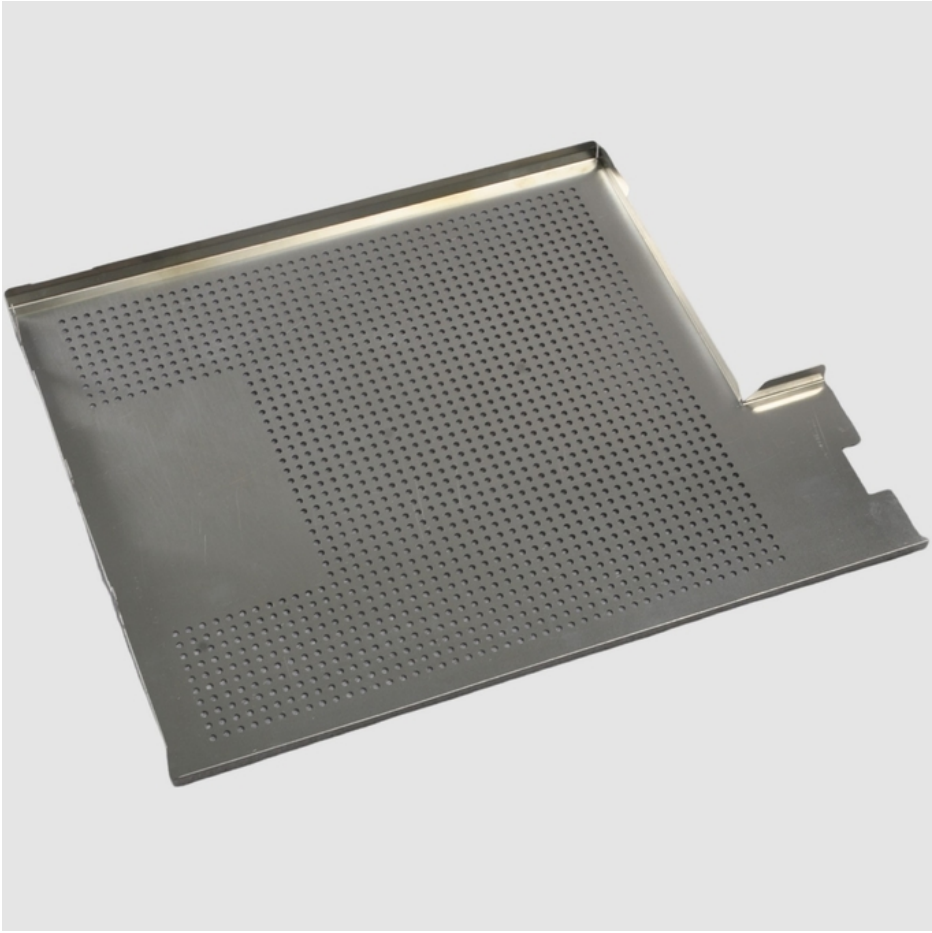
Punching and Perforating: Punching is the process of creating holes, slots, or various patterns in sheet metal. This is done using punching machines equipped with specialized tooling to penetrate the material, allowing for the addition of fasteners, ventilation, or decorative elements. Perforating is a related technique that produces a pattern of evenly spaced holes in sheet metal, serving specific functional or aesthetic objectives.

Welding and Joining: Welding is utilized to fuse multiple sheet metal pieces into a larger assembly or structure. Popular welding methods in sheet metal fabrication encompass MIG (Metal Inert Gas) welding, TIG (Tungsten Inert Gas) welding, and spot welding. These techniques provide robust and lasting joints between metal components.

Sheet Metal Fabrication Standards		
To ensure part maneuverability and precision of fabricated prototypes and parts, our custom sheet metal fabrication services are in compliance with the ISO 2768-m.		
Dimension Detail	Metric Units	Imperial Units
Edge to edge, single surface	±0.127 mm	± 0.005 in.
Edge to hole, single surface	±0.127 mm	± 0.005 in.
Hole to hole, single surface	±0.127 mm	± 0.005 in.
Bend to edge / hole, single surface	±0.254 mm	± 0.010 in.
Edge to feature, multiple surface	±0.762 mm	± 0.010 in.
Over formed part, multiple surface	±0.762 mm	± 0.030 in.

Bend angle	± 1°	
By default, sharp edges will be broken and deburred. For any critical edges that must be left sharp, please note and specify them in your drawing.		

Finishing and Surface Treatment: After the fabrication processes, sheet metal parts may undergo finishing treatments to improve their appearance and enhance their performance. Surface treatments can include cleaning, deburring, grinding, polishing, painting, powder coating, or applying protective coatings to increase resistance to corrosion or wear.



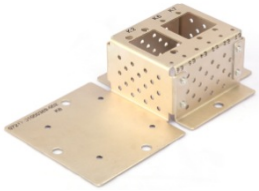
Assembly and Integration: Sheet metal parts are frequently assembled and integrated with other components to form a complete product or system. This process can include fastening using screws, rivets, or adhesives, and adding extra elements like hinges, handles, brackets, or electrical connectors.

Sheet metal fabrication presents numerous benefits such as a high strength-to-weight ratio, design flexibility, cost efficiency in mass production, and adaptability for functional and aesthetic uses. It facilitates the manufacture of diverse products ranging from basic brackets and housings to intricate structural parts and equipment.

This appears to be an extensive selection of materials for your sheet metal fabrication services. Each material you've mentioned possesses distinct properties and benefits. Below is a concise overview of the materials you've outlined:

Sheet Metal Fabrication Materials			
Whatever the application and requirements of your sheet metal fabrication part, trust Barana Rapid to find the right sheet metal fabrication material. Some popular materials available for custom metal fabrication are outlined below.			
	Aluminum Commercially, aluminum is the most sought-after material for sheet metal manufacturing. Its popularity is due to its adaptive qualities and its high thermal conductivity and low resistance rates. Compared to steel—another common sheet metal material—aluminum is more cost-effective and has a higher rate of production. The material also generates the least amount of waste and can easily be reused.	Features	Info
		Subtypes	6061-T6, 7075-T6, 7050, 2024, 5052, 6063, etc
		Process	CNC machining, injection molding, sheet metal fabrication
		Tolerance	With drawing: as low as ± 0.005 mm No drawing: ISO 2768 medium

		Applications	Light & economic, used from prototyping to production
		FinishingOptions	Alodine, Anodizing Types 2, 3, 3 + PTFE, ENP, Media Blasting, Nickel Plating, Powder Coating, Tumble Polishing.
	Copper Copper is a broadly used sheet metal fabrication material in many industries as it offers good malleability and ductility. Copper is also well suited for sheet metal fabrication because of its excellent heat conduction properties and electrical conductivity.	Features	Info
		Subtypes	101,110
		Process	CNC machining, sheet metal fabrication
		Tolerance	ISO 2768
		Applications	Bus bars, gaskets, wire connectors, and other electrical applications
		FinishingOptions	Available as-machined,media blasted, or hand-polished



Brass

Brass has desirable properties for a number of applications. It is low friction, has excellent electrical conductivity and has a golden (brass) appearance.

Features	Info
Subtypes	101,110
Process	CNC machining, sheet metal fabrication
Tolerance	ISO 2768
Applications	Bus bars, gaskets, wire connectors, and other electrical applications
FinishingOptions	Available as-machined,media blasted, or hand-polished

Steel

Steel offers a number of beneficial properties for industrial applications, including rigidity, longevity, heat

Features	Info
Subtypes	4140, 4130, A514, 4340
Process	CNC machining, sheet metal fabrication

resistance and corrosion resistance. Steel sheet metal is ideal for producing complex designs and parts that require extreme precision. Steel is also cost-efficient to work with and has excellent polishing properties.

Tolerance	With drawing: as low as ±0.005 mm No drawing: ISO 2768 medium
Applications	Fixtures and mounting plates; draft shafts, axles, torsion bars
FinishingOptions	Black Oxide, ENP, Electropolishing, Media Blasting, Nickel Plating, Powder Coating, Tumble Polishing, Zinc Plating

Stainless Steel

Stainless steel is the low carbon steel that contains a minimum of 10% chromium by weight. The material properties associated with stainless steel have made it a popular metal within a broad range of industries, including construction, automotive, aerospace and more. Within these industries, Stainless steel is versatile and is an effective choice for many applications.

Features	Info
Subtypes	303, 304L, 316L, 410, 416, 440C, etc
Process	CNC machining, sheet metal fabrication
Tolerance	With drawing: as low as ±0.005 mm No drawing: ISO 2768 medium
Applications	Industrial applications, fittings, fasteners, cookware, medical devices

		Finishing Options	Black Oxide, Electropolishing, ENP, Media Blasting, Nickel Plating, Passivation, Powder Coating, Tumble Polishing, Zinc Plating

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