Machining of Tubular Busbar Casting Rings



Overview

LT Machinery provides a complete set of solutions for punching, cutting, bending, and turret processing of copper and aluminum busbars.

Key Takeaways

Machining tubular busbar casting rings involves precision cutting, punching, bending, and finishing using specialized CNC and automated busbar processing equipment to ensure electrical and mechanical performance.

Material Considerations

Tubular busbar rings are typically made from high-conductivity copper or aluminum alloys, chosen for their excellent electrical conductivity and mechanical strength. Copper busbars often use ETP (Electrolytic Tough Pitch) C11000, while aluminum busbars use 6101-T6 or 6063-T6 alloys. The tubular form requires careful handling to maintain uniform wall thickness and avoid deformation during machining.

Machining Processes

Cutting and Sizing Tubular busbar rings are cut to precise lengths using CNC cutting systems or specialized busbar cutting machines. Modern systems achieve tolerances within ±0. 1 mm, which is critical for proper assembly and electrical performance.

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For tubular sections, cutting may involve band saws, laser cutting, or waterjet cutting to maintain roundness and avoid burrs. Punching and Drilling Holes for bolted connections or mounting are created using CNC punching machines or hydraulic presses. These machines can handle round, square, or custom-shaped holes with high precision, ensuring clean edges and accurate positioning.

For tubular rings, specialized fixturing may be required to support the curved surface during punching. Bending and Forming While tubular rings are often cast near their final shape, minor adjustments or bends may be required.

CN

C bending machines with integrated lasers or protractors allow precise shaping without introducing stress fractures. For tubular sections, mandrels or internal supports are used to prevent collapse during bending. Chamfering and Finishing Edges and connection points are chamfered or deburred using CNC chamfering machines to improve assembly and reduce electrical resistance at joints.

Surface finishing may include polishing or coating to enhance corrosion resistance, particularly for aluminum busbars.

Automation and CNC Integration

Modern busbar machining lines integrate CNC control, automated material handling, and multi-function machines capable of cutting, punching, bending, and marking in a single setup. This ensures repeatability, high throughput, and minimal human error, which is especially important for complex tubular ring geometries.

Quality Control

Precision measurement systems, including laser alignment and pull-out measurement devices, are used to verify dimensions, hole placement, and bend angles. Electrical testing may also be performed to ensure low resistance and high current-carrying capacity.

Summary

Machining tubular busbar casting rings requires a combination of material expertise, precision CNC equipment, and careful process planning. Key steps include cutting to size, punching or drilling connection points, bending or forming as needed, and finishing edges.

Automation and CN

C integration enhance efficiency, accuracy, and repeatability, ensuring that the final busbar rings meet stringent electrical and mechanical standards.

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Article Content

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CNC Busbar Machine Manufacturer & Supplier

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Copper for Busbars

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Although busbar systems should normally be designed for lowest lifetime cost – which means a lower working temperature to reduce waste energy costs – the ability of copper to maintain its mechanical

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