TRONAMETAL

High-Performance Copper Alloys & Boutique Tooling Solutions

Master Metallurgy & Precision Components for European OEM Manufacturers.

Badge 1

Flexible Boutique OEM Manufacturing

Badge 2

Fast, Customs-Free European Distribution

Badge 3

Double-Check Quality Control (Türkiye + Netherlands)

Presented by Basar Ünal | Founder & International Business Development | www.tronametal.com

Gemini Notebook

Born Inside the Production Floor

Pedigree Timeline

Early 2000s:
Global OEM Foundation

Career begins at one of only 7–8 true OEM copper alloy manufacturers globally.

2000s-2011:
The Technical Crucible

Deep, hands-on production involvement: cutting stock, coordinating machining, and guiding metallurgy.

Built an international export network from scratch alongside major global distributors.

2011:
TRONAMETAL Founded

Built to bridge the gap: combining deep technical understanding of copper alloy behavior with a boutique manufacturing philosophy tailored for European OEMs.



Key Takeaway: *"Our story does not begin with trading. It begins in the technical heart of this industry, shaped by over two decades of real metallurgical depth."*

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Slide Title: The Boutique OEM Sweet Spot

Global OEM Capability

Three dedicated metallurgical processes under one roof. Robust enough for strict industrial standards.



Boutique Flexibility

Highly responsive 60-person specialist team (30 core production staff). Agile enough for custom and urgent series.

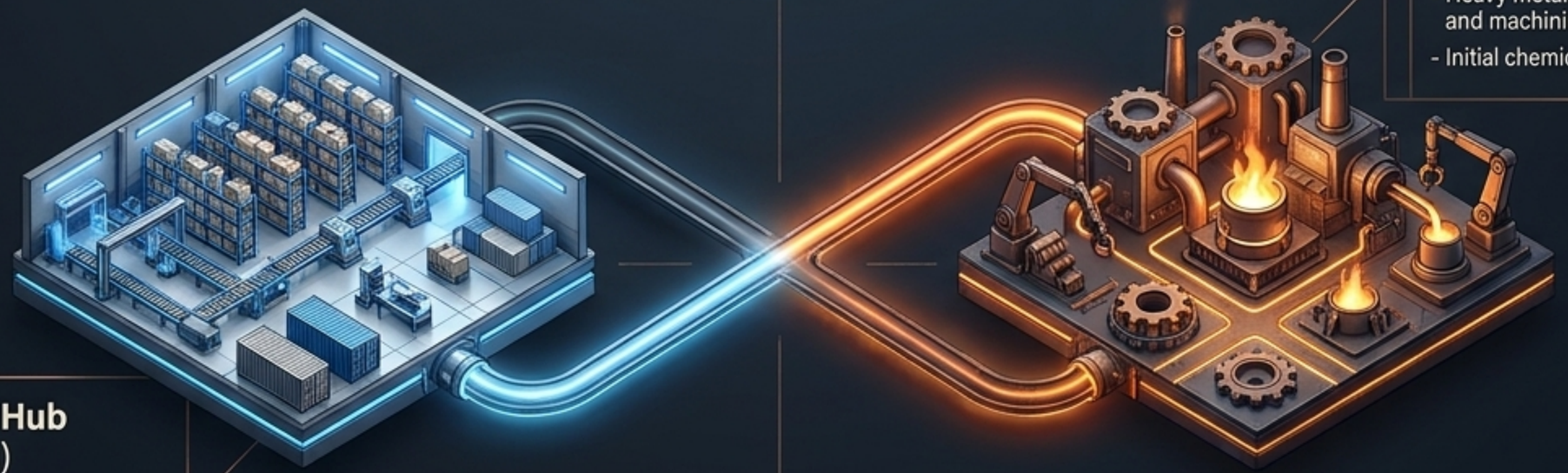
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The Strategic Architecture: Türkiye to Europe

1

Production Engine
(Istanbul, Türkiye)

- Head office and primary production.
- Heavy metallurgy: Casting, forging, and machining.
- Initial chemical and dimensional QC.



2

Distribution Hub
(Netherlands)

- Duty-free, free-circulation distribution.
- Second independent Quality Control (eliminating transit risk).
- Seamless European delivery.

A frictionless cross-border corridor designed to remove all import and supply chain anxieties for European Purchasing Managers.

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Transparent Lead Times & Delivery Reliability

Standard Timeline (6–8 Weeks Door-to-Door)



Accelerated Delivery Options

Option 1: Overtime Production
Additional shifts in Türkiye to compress manufacturing time (impacts unit cost).

Option 2: Express Air Freight
Bypasses standard transit for urgent projects (impacts logistics cost). Evaluated case-by-case.

Insight: “Delivery performance is as critical as product quality. Our dual-hub model makes supply chains predictable.”

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The Technical Arsenal: Three Dedicated Processes



Sand Casting + Forging + Machining

- Focus: Deep drawing dies, high-wear forming tools.
- Key Alloys: ALBRO series (Aluminum Bronzes).



Centrifugal Casting

- Focus: Large-diameter rings, rotor components.
- Key Advantage: Near-net shape geometry reduces scrap.



Continuous Casting + Forging + Machining

- Focus: Resistance welding electrodes, injection tooling.
- Key Alloys: High-conductivity copper alloys (CuCr1Zr, CuCoNiBe).

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Process 1: Sand Casting & Machining



Core Alloys

ALBRO 2.5 and ALBRO 2.6 (High-hardness aluminum bronzes).

Primary Applications

- Stainless steel sink forming dies (bowls, rims, drainboards).
- Deep drawing dies for stainless and low-carbon steel sheets.
- Forming dies for washing machine drums and service trays.

Technical Edge

Superior anti-galling properties and high compressive strength.
Rough machining supplied with precision 0/+2 mm tolerance.

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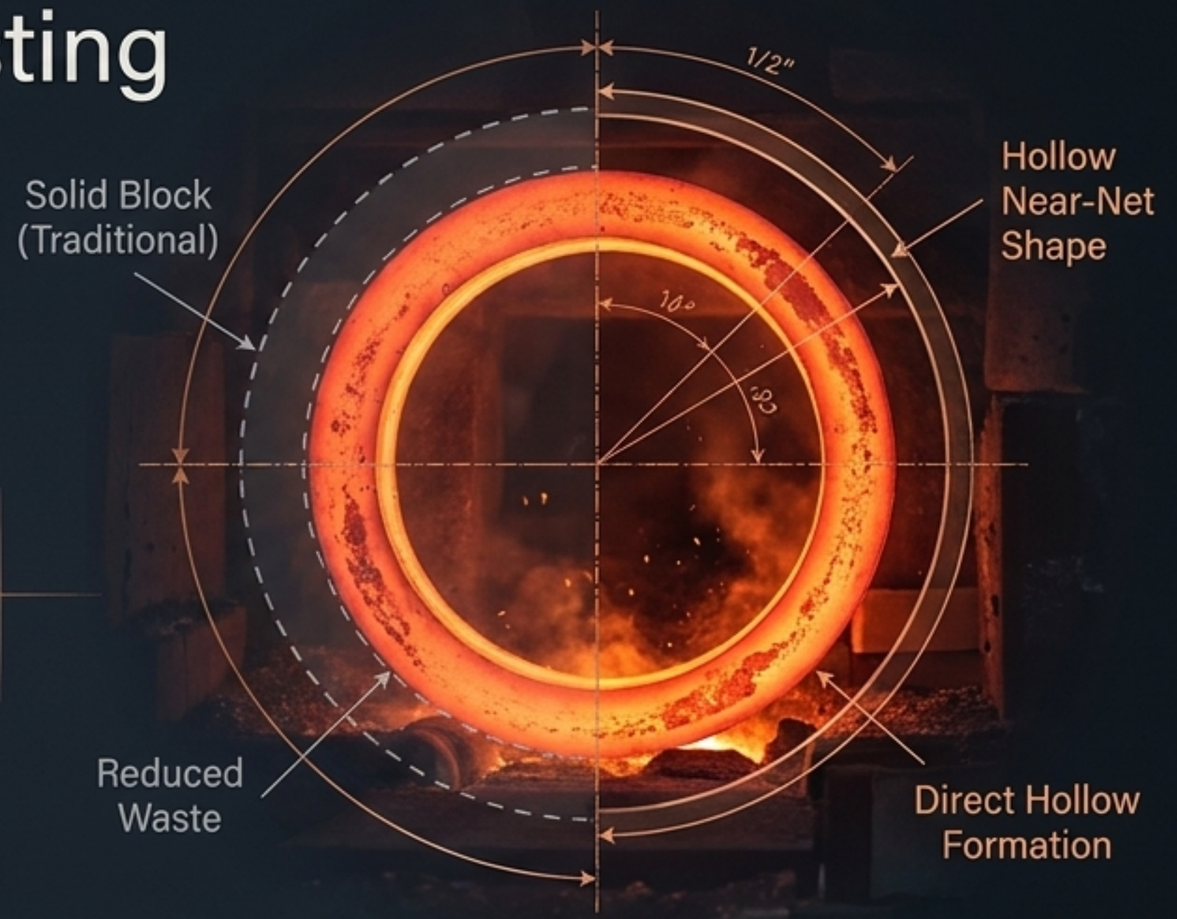
Process 2: Centrifugal Casting

Capacity

Large-diameter rings and hollow cylindrical sleeves (300 mm – 1500 mm range).

Primary Applications

- Rotor components and slip-ring assemblies.
- Aluminum bronze rings for deep drawing dies.
- Energy-sector applications.



Metallurgical & Economic Advantage: Near-Net Shape Efficiency

Produces hollow cylindrical sections directly without boring out solid billets. Significantly reduces raw material waste, scrap, and total machining time.

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Process 3: Continuous Casting, Forging & Heat Treatment

Core Capabilities

Produces homogeneous high-conductivity copper alloy bars, plates, and profiles.

Supplied rough-machined or fully finished ready for direct line installation.



Applications by Sub-Sector

Resistance Welding

CuCr1Zr welding wheels, disks, and electrodes optimized for extreme thermal/electrical conductivity.

Faucet & Brass Casting

CuCoNiBe mould blocks ensuring rapid heat extraction and homogeneous liquid brass flow.

Plastic Injection

CuNiBe and CuBe2 high-performance cooling inserts for ultra-high-hardness areas.

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The Alloy Application Matrix

Alloy Grade	Chemical Composition (Core)	Primary OEM Function
CuCr1Zr (CCZ)	0.8% Cr, 0.1% Zr	Seam welding wheels, cooling plates, rotor rings.
CuNi2Si (CNCS)	2.4% Ni, 0.7% Si, 0.4% Cr	Forged rings, forming tools, die-casting plungers.
CuCoNiBe	2.0% Co, 1.0% Ni, 0.5% Be	Brass faucet mould blocks, cold plunger tips.
CuNiBe	1.0% Co, 1.7% Ni, 0.3% Be	Plastic injection cooling inserts, welding tools.
CuBe2	2.0% Be, 0.4% Co, 0.4% Ni	Localized ultra-high-hardness mould inserts.
ALBRO 2.5/2.6	12% Al, 3.5-4.5% Fe	Deep drawing dies for stainless steel sinks (anti-galling).

(Note: Cu remainder for all).

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Zero-Compromise Quality Assurance: The Double QC System



- Spectrometric chemical analysis per melt/batch.
- Brinell (HB) and Rockwell (HRB/HRC) hardness testing.
- Precision post-machining dimensional inspection.

- Second independent chemical verification.
- Dimensional re-check.
- Visual surface inspection.

By executing a rigorous secondary inspection post-transport, we eliminate all environmental and transit-related risks before final delivery to your floor.

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The True ROI: Optimizing Total Cost of Ownership (TCO)

The Concept: Purchasing decisions are made on Total Cost of Ownership, not just unit price. Our focus is long-term cost efficiency across your entire production cycle.



Total Cost of Ownership

Correct Alloy Selection = Extended tool life & fewer changeovers.

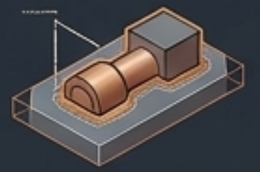
Durable & changeover frequency





Near-Net Geometry = Reduced scrap material & machined waste.

Minimized machined waste





Predictable EU Logistics = Zero line-downtime & lowered inventory holding.

Seamless Seamless Supply Chain





> “We don’t just sell metal; **we engineer out the hidden costs** of your manufacturing process.”

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Engineering Partnership & Collaborative R&D

Our Philosophy

As your technical solution partner, our value lies in finding the exact metallurgical answer to your production bottlenecks.

The Approach

- **Absolute Transparency:** We do not make premature promises on non-standard solutions.
- **Joint Evaluation:** Our metallurgical team rigorously tests and validates all viable material possibilities alongside your engineers.
- **Process Optimization:** 25 years of analyzing customer production sites to improve tool life, scrap rates, and part performance.



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The Implementation Roadmap



Step 4: Long-Term Partnership
Joint engineering evaluation of trial performance and establishment of ongoing, optimized supply.

Step 2: Pilot Project Definition
Identifying a low-risk, high-impact component for alternative material or process evaluation.

Step 4: Long-Term Partnership
Delivery of initial test components through our Dutch distribution hub for real-world line testing.

Step 2: Pilot Project Definition
Identifying a low-risk, high-impact component for alternative material or process evaluation.

Technical Presentation Session (Teams/Zoom)
Aligning our metallurgical engineering teams on your specific tooling and alloy requirements.

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Engineering the Future of Precision Component Supply

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TRONAMETAL Master Metallurgy
www.tronametal.com | www.cucrzr.org
info@tronametal.com

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