ECOOSUN

Company Profile

Heat-Resistant Steel Castings & Furnace Components

Custom Fixtures for the global heat treatment industry

www.ecoosun.com



ECOOSUN and our manufacturing company

We are a manufacturer specializing in heat-resistant steel casting, located in Taizhou, Jiangsu Province, China. Our mainland manufacturing company is Xinghua Hengxin Machinery Co., Ltd., and our overseas brand is ECOOSUN (益可森).

We have established expertise in developing and manufacturing heat-resistant steel tooling. We export load trays, baskets, fixtures and heat-resistant furnace internals to heat treatment customers worldwide. We can also provide high-end CFC carbon-carbon composite tooling solutions.



Xinghua Hengxin Machinery Co., Ltd., Jiangsu, China

Industry experience and established tooling

20+

years in heat-resistant steel casting

20

years of exports to the US, Europe and Japan

2,000+

existing tooling mould sets

850+

customers worldwide

Since 2005, we have focused on heat-resistant steel castings, heat treatment tooling and precision machining，Our tooling inventory includes more than 2,000 existing mould sets, including over 1,000 proven mould sets for US-standard furnace types.

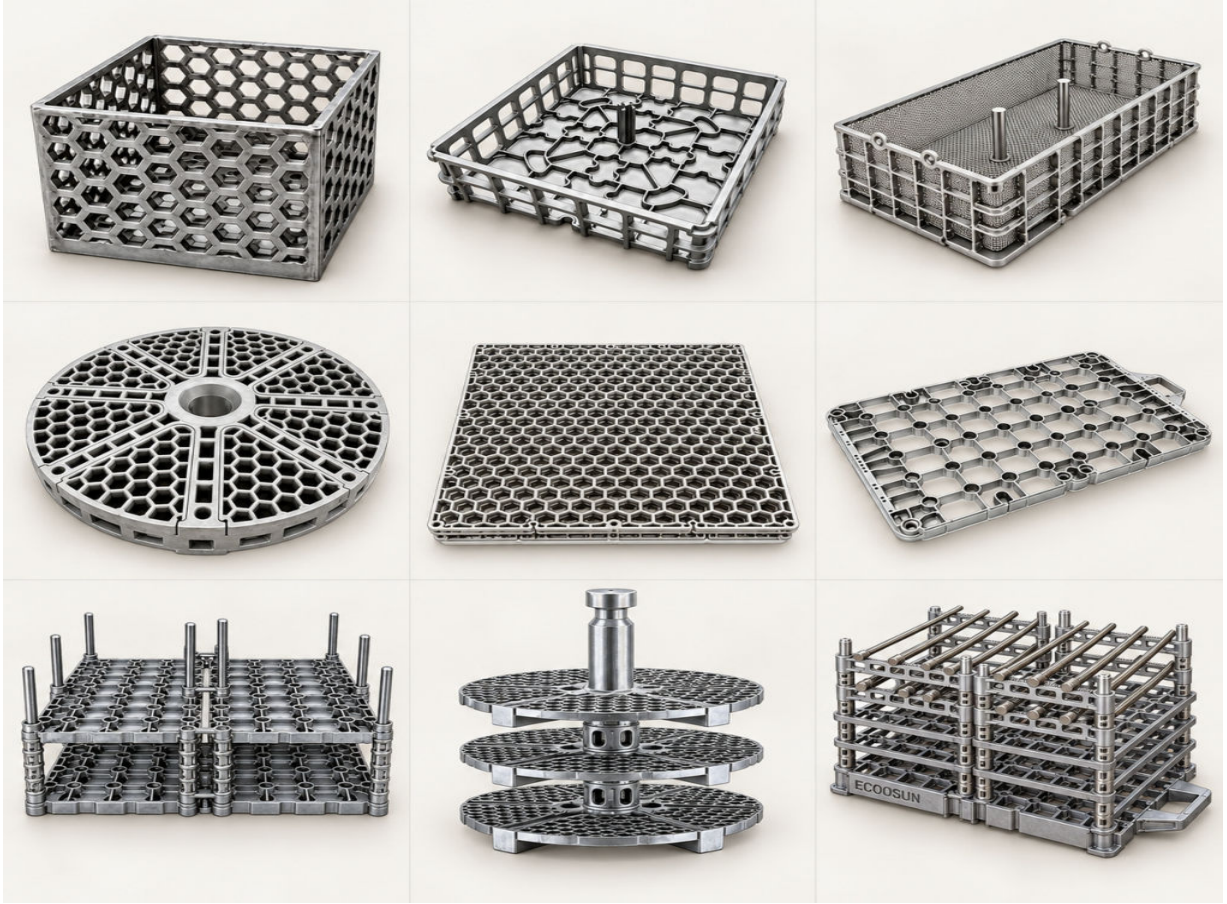


Flexible orders and responsive delivery

When an existing mould matches the requirement, production can proceed directly without a new tooling charge.

We support flexible small-batch orders, with a minimum order quantity as low as one piece. We respond quickly to overseas inquiries and provide English quotations, proposed solutions and technical recommendations within 24 hours.

We maintain stable, long-term batch exports to the United States, Europe, Japan and the wider North American heat treatment market.



Stacks of cast furnace tooling in the workshop

Broad furnace compatibility

We can supply tooling for major domestic and international heat treatment furnace brands, including Ipsen, AFC-Holcroft, Aichelin, ECM, Fengdong and Surface Combustion.

We customize tooling, baskets, trays and modular fixtures to each brand's standard furnace dimensions and interface requirements.

Ipsen

AFC-Holcroft

Aichelin

ECM

Fengdong

Surface Combustion

Atmosphere furnaces / Vacuum furnaces / Multipurpose furnaces

Continuous pusher furnaces / Pit furnaces

Multiple casting and fabrication processes

We offer multiple casting processes together with specialized welding capabilities. We can deliver raw castings and precision machining as one integrated supply.

01 **Silica-sol investment casting**

02 **Lost-wax casting**

03 **Lost-foam casting**

04 **Sand casting**

05 **Centrifugal casting**

06 **Specialized welding and fabrication**



Wax pattern for an open-grid basket

Engineering R&D and reverse engineering

We provide one-stop custom development, from drawing review and finite element analysis (FEA) of thermal stress to finished components.

We work with DWG, STEP and other drawing formats. Our team can interpret imperial drawings, convert between imperial and metric units, and turn 2D drawings into 3D models.

We also support 3D scanning and reverse engineering to reconstruct worn components, together with structural improvements to failed tooling.



Structural engineering at the factory office

Tooling design and structural optimization

We develop targeted designs for distortion resistance, locating and support, lower weight and improved loading density.

For continuous-furnace pusher trays, we specifically optimize wear resistance and load-bearing structures. Our tooling supports precision heat treatment of gears, bearing rings, long shafts and other components.

Distortion control

Structure suited to repeated thermal cycles

Locating and support

Contact points and workpiece stability

Lightweight design

Tooling mass and section geometry

Loading density

Part arrangement and usable furnace space

Precision manufacturing and machining

We can closely control flatness, achieving 1 mm or less where required, and precision-machine assembly interfaces to specified fitting tolerances.

Contact faces, bores and critical fit points follow the approved drawing. Our integrated casting and machining delivery supports the interfaces needed for assembly and furnace operation.



Factory machining equipment

Testing and inspection capabilities

Our inspection capabilities include spectrometric analysis, physical and chemical testing, liquid penetrant testing (PT) and radiographic testing (RT).

On request, we can provide reports for 100% dye penetrant inspection or penetrant inspection of specified areas, together with material certificates and material test reports (MTRs).



Laboratory testing equipment



Mechanical testing equipment

Quality management and traceable records

Our documentation complies with applicable ASTM and ASME standards. We have an ISO 9001 quality management system and can support customer purchasing audits.

We can also provide the supporting documentation needed for customers' Nadcap and CQI-9 audit requirements.

01

Material verification

Agreed chemical composition and material records

02

Project inspection reports

Dimensions and tests against approved requirements

03

Traceability

Batch identification and records defined in the inspection plan

Heat-resistant alloys and demanding duties

We produce high-nickel, high-chromium heat-resistant alloy components, including HK40, HP40-Nb, Alloy 330, 1.4848, 1.4852 and 1.4857.

These components can be specified for demanding heat treatment duties, including the operating conditions below. Final material selection follows the drawing and service conditions.

Alloy grades	
HK40	HP40-Nb
Alloy 330	1.4848
1.4852	1.4857

950–1050°C

Carburizing

Above 1100°C

High-temperature gas quenching

Low pressure

Vacuum carburizing

20 bar

High-pressure gas quenching

A complete range of furnace tooling and parts

We manufacture modular tooling, stackable baskets, grids, annular fixtures, heavy-duty base trays and pit-furnace hanging racks.

Our heat-resistant furnace-component range also includes radiant tubes, furnace rolls and furnace hearth rolls. Raw castings and precision machining can be supplied together.

01 **Heat treatment baskets**

02 **Heat treatment trays**

03 **Heat treatment fixtures**

04 **Radiant tubes**

05 **Furnace rolls and hearth rolls**

06 **Furnace fans and impellers**

07 **Furnace internals**

08 **Custom heat-resistant alloy parts**

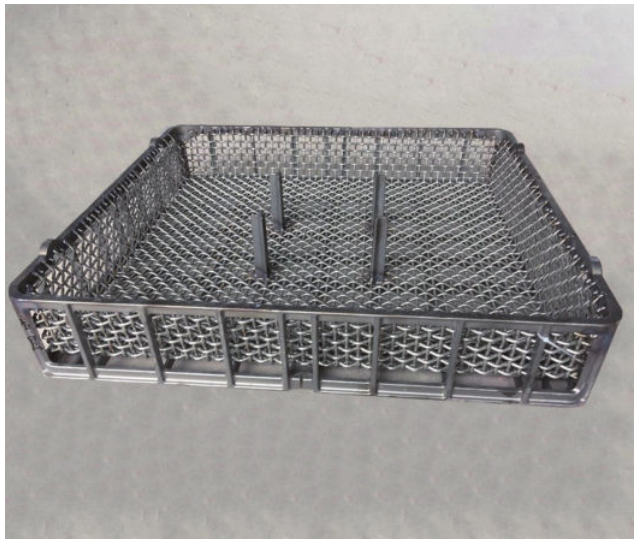
Heat treatment baskets

Custom furnace and charging baskets contain, separate and transport the load through heat treatment cycles.

Design review covers the loading pattern, mesh or grid openings, lifting and support points, stacking interfaces, furnace clearance and thermal cycle.



Round open-grid basket



Rectangular mesh basket

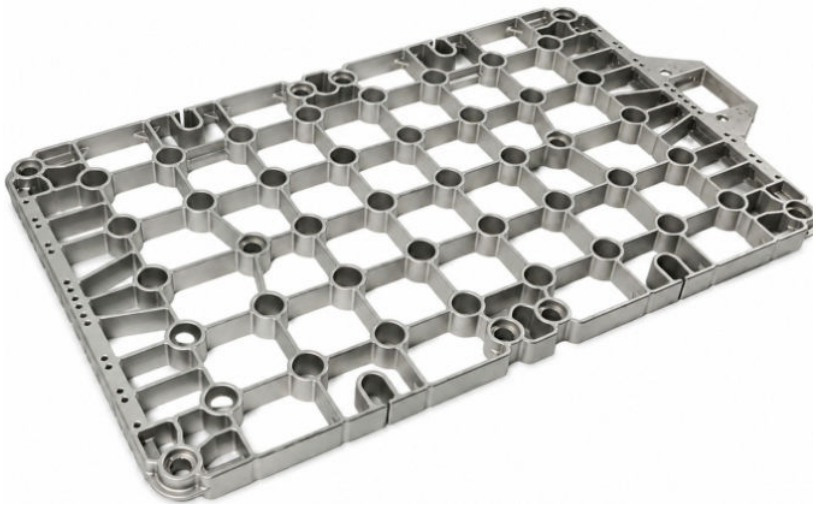


Lost-foam process basket

Heat treatment trays

Custom trays support and distribute workpieces across the furnace load. Rib and grid layouts follow the part contact pattern.

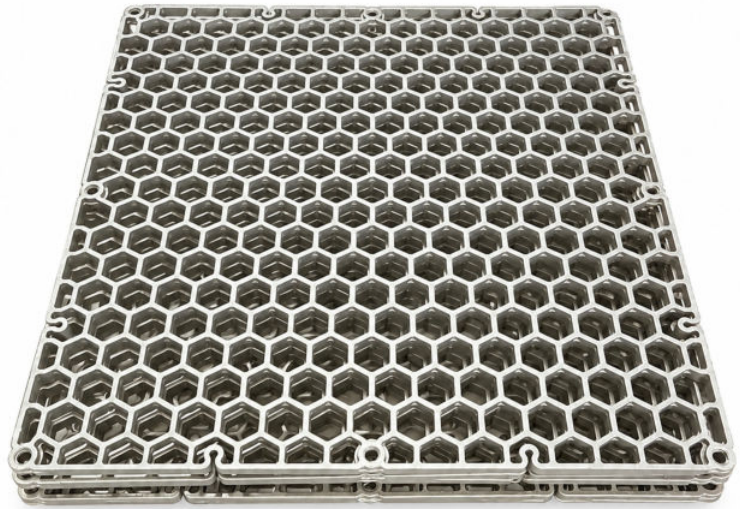
Review inputs include flatness, support spacing, ribs, load distribution, locating features, and furnace and transfer interfaces.



Rectangular cast furnace trays



Circular honeycomb tray



Rectangular cast furnace trays

Heat treatment fixtures

Custom fixtures locate and separate workpieces throughout heating, transfer, quenching and cooling. Modular and multi-tier assemblies follow the required part arrangement.

Review focuses on locating points, orientation, tier spacing, critical contact dimensions, furnace interfaces and loading access.



Stacked rectangular fixture assembly



Multi-tier circular fixture design



Multi-tier circular fixture design



Multi-tier circular fixture design

Radiant tubes

Custom heat-resistant radiant tubes and tube assemblies for industrial furnace heating systems.

The technical review considers the tube configuration, furnace temperature and atmosphere, mounting and connection details, and replacement requirements.



Furnace rolls and furnace hearth rolls

Custom rolls support and transport workpieces through industrial furnaces.
Castings, shaft interfaces and machining follow the approved component drawing.

Review includes support span, load, speed, drive and shaft interfaces,
cooling arrangement, runout, furnace atmosphere and thermal cycling.





Profiled roll components



Furnace rolls



Machined furnace roll designs

Furnace fans and impellers

Heat-resistant fans, impellers and shaft assemblies for furnace atmosphere circulation and other high-temperature duties.

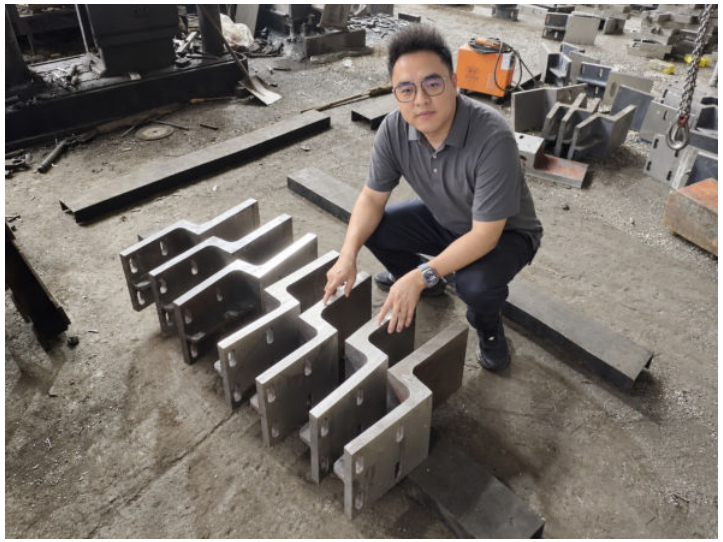
Dimensions, shaft interfaces, rotational duty and operating conditions guide the component review and manufacturing specification.



Furnace internals and custom cast parts

Custom heat-resistant supports, guide and transfer components, grids and replacement internals for industrial furnace systems.

We review the existing part or drawing together with fit points, furnace conditions and inspection requirements before confirming the supply scope.



Jonny with cast support components



Custom cast component geometries



Jonny with cast support components

High-end CFC carbon-carbon tooling solutions

We can supply CFC carbon-carbon composite tooling for high-temperature gas quenching above 1100°C and for vacuum carburizing.

Its self-weight is only one fifth that of conventional heat-resistant steel tooling. Its low heat capacity can improve vacuum-furnace heating, cooling and gas-quenching efficiency, while reducing heat treatment distortion of precision workpieces.

Contact surfaces can receive an anti-carburization barrier coating on request. These solutions suit precision heat treatment applications with exceptionally strict distortion-control requirements.

Relative self-weight



Heat-resistant steel tooling



1/5

CFC tooling

Relative self-weight of the described tooling solution

Wax patterns and ceramic shells

Investment casting begins with the wax pattern. Pattern preparation, assembly and shell making establish the shape before metal pouring.

Tray and fixture patterns progress through ceramic-shell preparation in the workshop.



Jonny presenting a wax frame pattern



Ceramic shells before casting



Jonny presenting a wax frame pattern

Sand casting and lost-foam preparation

Casting routes are matched to component geometry and order requirements. Sand moulds and foam patterns provide additional options alongside investment casting.

The approved drawing, part structure and agreed manufacturing requirements determine the route.



Sand mould preparation



Foam pattern for casting



Foam pattern for casting

Dimensional inspection and acceptance

Critical dimensions and fit points are checked against the approved drawing revision, specified tolerances and acceptance criteria.

The inspection plan defines the required dimensional checks, agreed material verification and other order-specific tests. Inspection reports record results against the approved requirements.



Dimensional checking of a cast grid separator

Packaging and dispatch

Dispatch preparation includes wooden pallets, protective wrapping and securing straps.

Components are palletized and secured for shipment. Packing arrangements follow the component structure and the agreed delivery requirements.



Wrapped cast tooling secured on a pallet



Palletized furnace components

An overseas technical communication team



Jonny at the factory entrance

Our English-speaking international sales and engineering team understands heat treatment processes and can directly interpret English technical specifications, ASTM standards and imperial drawings.

We discuss solutions by email, through 3D drawings and in remote meetings. We work with the technical teams of North American heat treatment plants and furnace manufacturers, supplying English documentation and inspection reports suited to North American purchasing practices.

We provide long-term tooling supply, replacement and continuous improvement services for workpiece load carriers. Our senior engineers include specialists with more than 15 years of R&D experience.

Your direct factory contact

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Purchasing policy supplement

01 Drawing-specified flatness

Flatness as tight as 0.1 mm is available on customer request for the surfaces specified on the product drawing.

02 Production lead times with existing tooling

Silica-sol investment casting: approximately 30 days.
Lost-foam casting: approximately 20 days.
Both are typical production lead times when existing tooling is available.

03 Warranty and full compensation

ECOOSUN provides a one-year warranty for all customers.
If a supplied product's service life is less than one year, ECOOSUN provides full compensation.

Official product pages

Heat Treatment Baskets
https://ecoosun.com/heat-treatment-baskets/

Heat Treatment Trays
https://ecoosun.com/heat-treatment-trays/

Heat Treatment Fixtures
https://ecoosun.com/heat-treatment-fixtures/

Radiant Tubes
https://ecoosun.com/radiant-tubes/

Furnace Rolls
https://ecoosun.com/furnace-rolls/

Company policy and enquiry

Company purchasing policy
https://ecoosun.com/ecoosun-company-facts-product-catalog/#production-lead-times-warranty

Manufacturing and quality policy
https://ecoosun.com/manufacturing-quality-evidence/#ecoosun-manufacturing-policy

Contact Us
https://ecoosun.com/contact-us/