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**pss co**

**parchamdarán sanat sepahan**

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**Parchamdarán**

**Sanat Sepahan**



[www.pssir.com](http://www.pssir.com)



PSS CO

# Parham daran sanat sepahan

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# Parcham daran Sanat Sepahan



1 By-product gas releases through the pipe. After dust removal, the by-product gas is reused as a power source for steelworks

2 Through the rotating chute, raw materials reach the exact locations

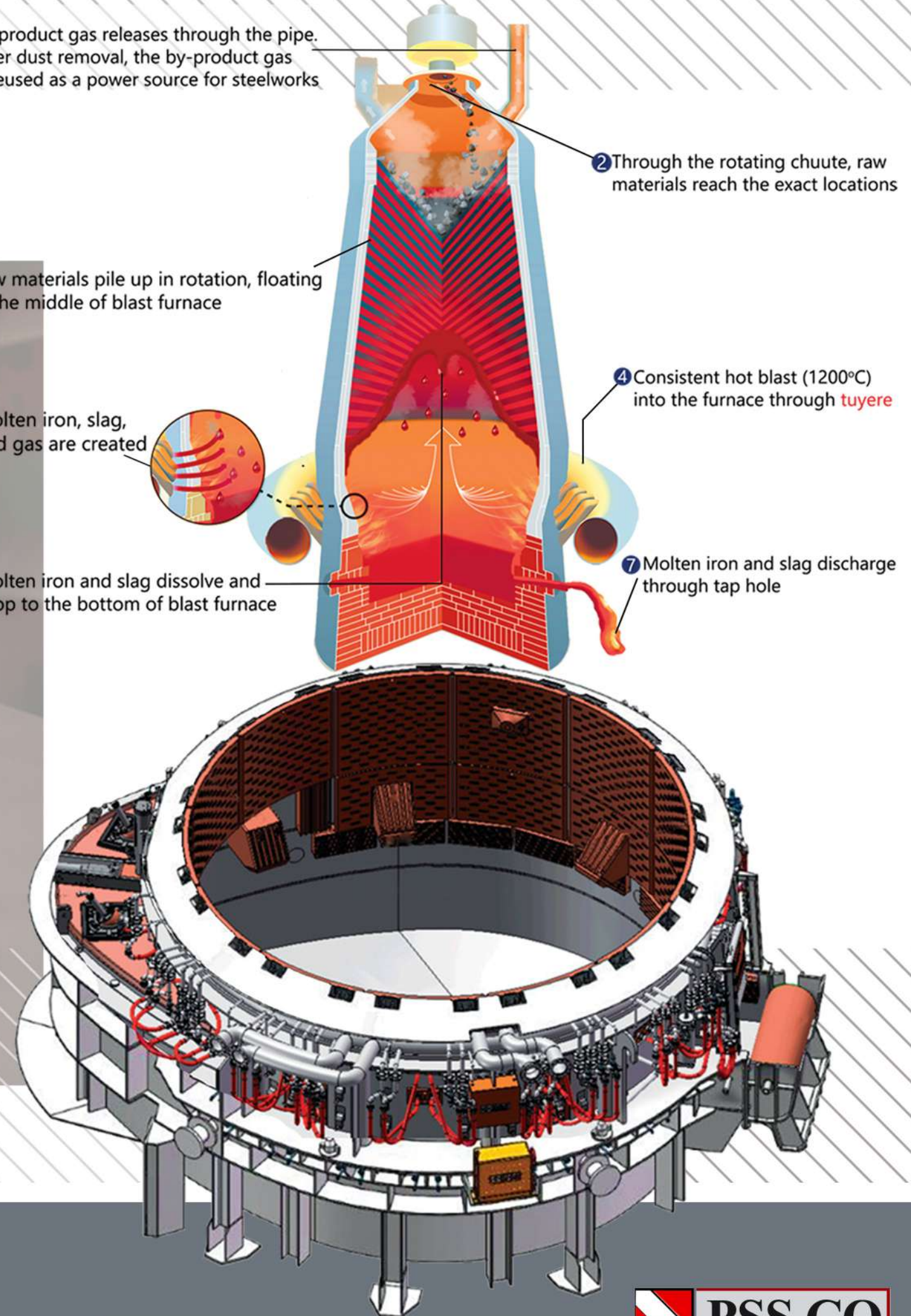
3 Raw materials pile up in rotation, floating in the middle of blast furnace

5 Molten iron, slag, and gas are created

4 Consistent hot blast (1200°C) into the furnace through **tuyere**

6 Molten iron and slag dissolve and drop to the bottom of blast furnace

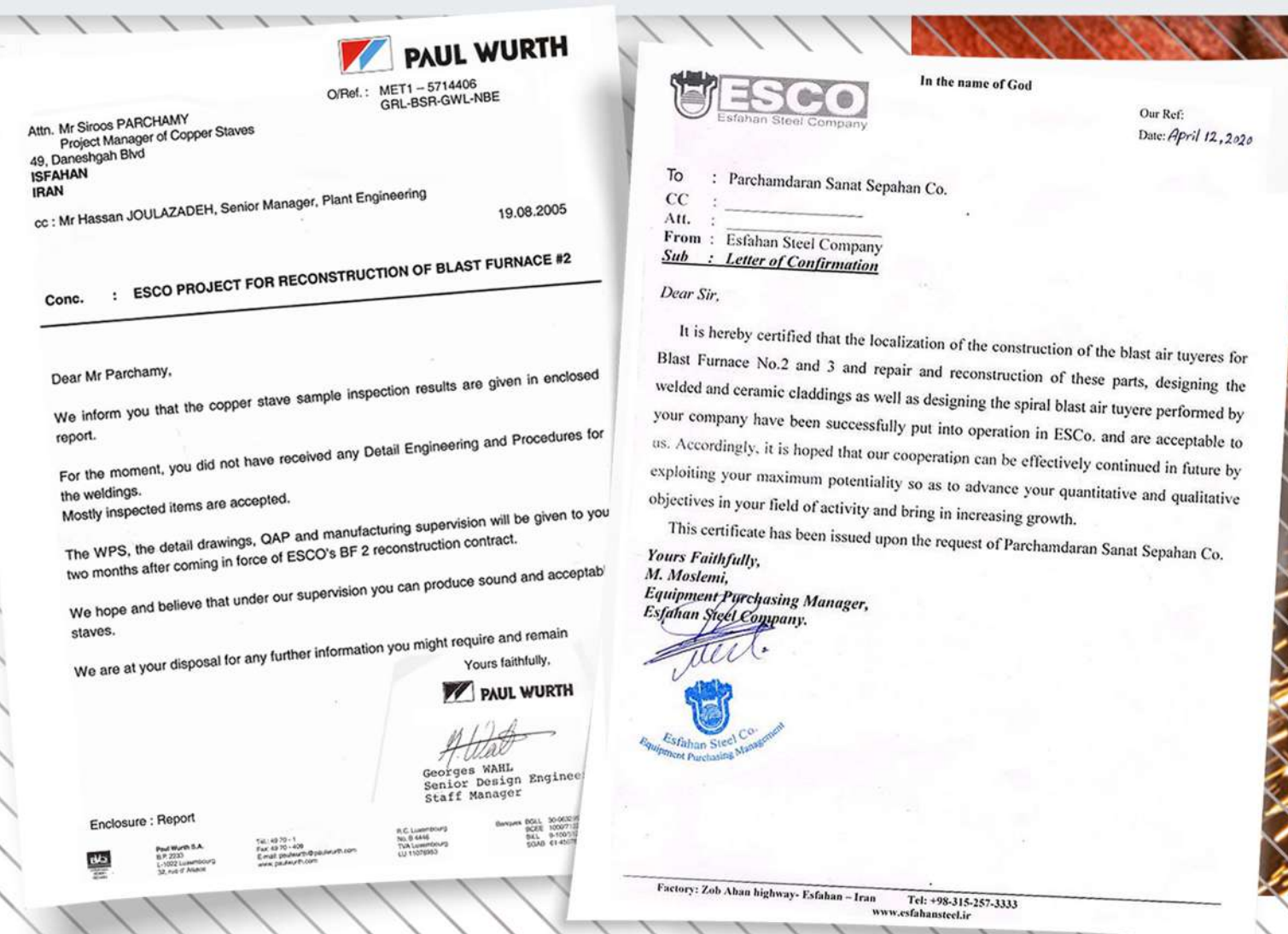
7 Molten iron and slag discharge through tap hole



## About Us

The PSS engineering company has started its activities since 2001, relying on experienced managers and specialists aiming to develop and promote technology and manufacturing skills in Iran. Focusing on production efficiency, supplying, repairing and/or rebuilding particular parts, and especially localizing various parts imported, are the most important policies outlined in the PSS.

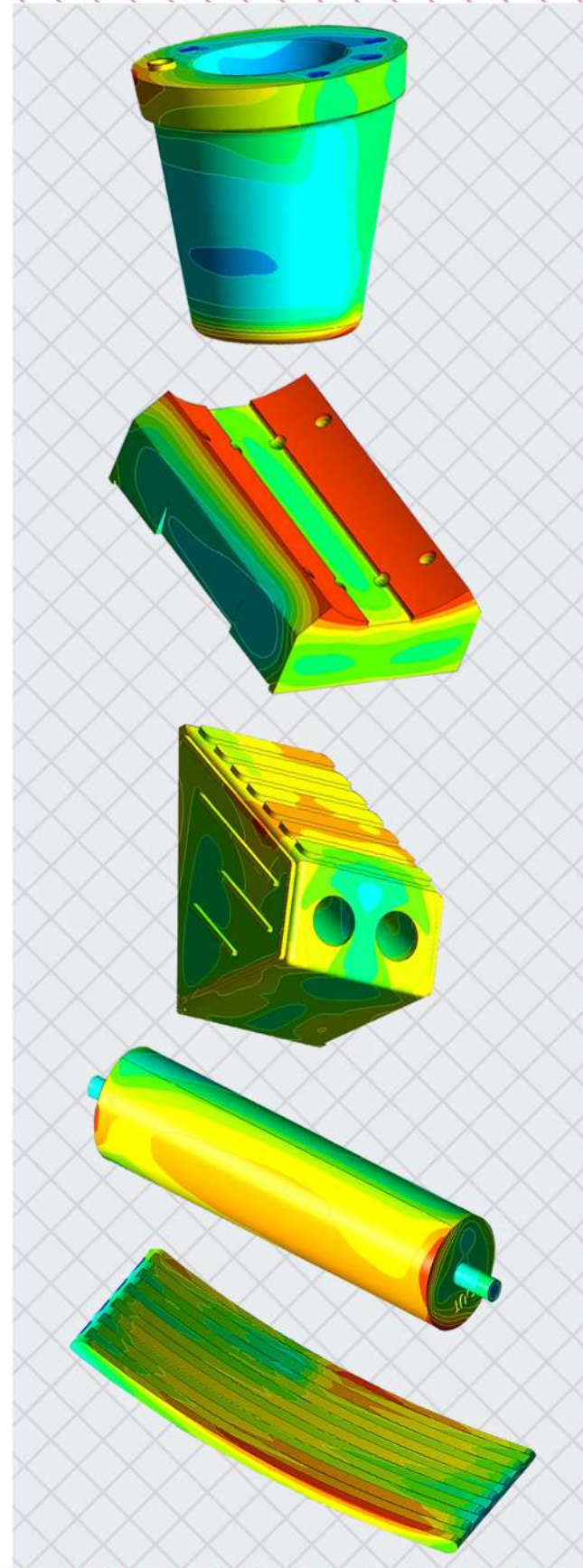
At PSS, we have gained valuable achievements that are beneficial to all industries. Manufacturing and supplying copper coolers, manufacturing and optimizing blast furnace's copper tuyeres and their optimization, oxygen blowing lances and copper components used in electrical arc furnaces (EAFs) are the most important activities of the company.



# Parchamdaran sanat sepahan

## Capabilities:

Relying on our management and skills, we at PSS are aiming to repair and rebuild industrial parts to be used in steel industries throughout the country. Achieving economic savings and reducing manufacturing costs is among the most important goals we focus on in PSS, through extensive effort and reliance on "copper-to-copper" and "copper-to-other metals" welding technologies as well as various copper casting methods.



# Parcham daran Sanat Sepahan



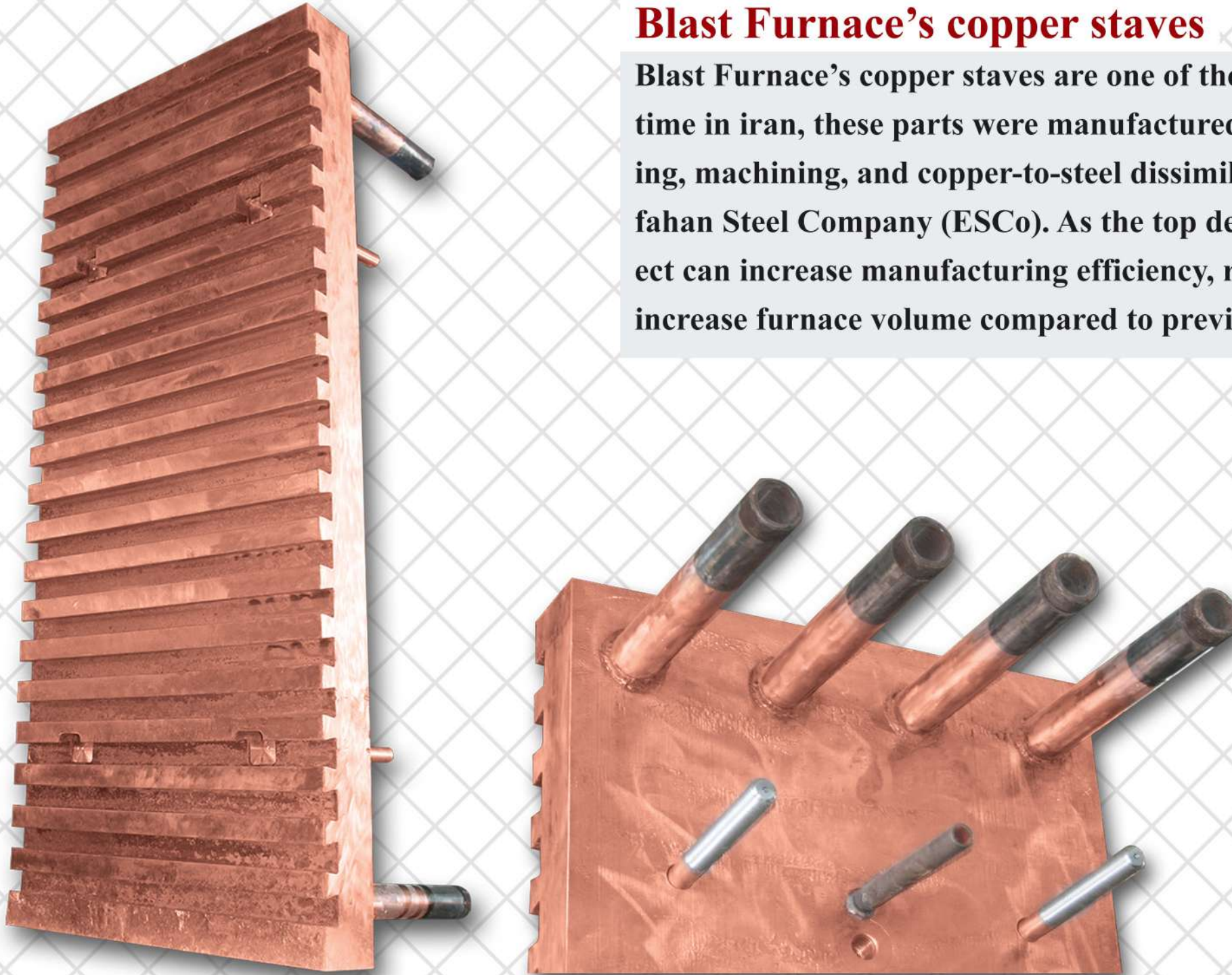
## Goals and Strategies:

- Localizing parts imported, and designing and manufacturing equipment using domestic technologies and capabilities
- Manufacturing high-quality products to compete with international markets.
- Industrial and economic development and promotion throughout the country
- Effective communication with international markets and associations
- improving related science and knowledge through international scientific publications

IPSS CO

## Blast Furnace's copper staves

Blast Furnace's copper staves are one of the parts used to cool blast furnace shells. For the first time in Iran, these parts were manufactured in PSS as a substitute for cast-iron coolers using casting, machining, and copper-to-steel dissimilar welding, aiming to use them in blast furnaces in Esfahan Steel Company (ESCo). As the top design at the international Kharazmi festival, the project can increase manufacturing efficiency, reduce perennial repairs, save water consumption, and increase furnace volume compared to previous designs



### Technical Specifications

material	Cu 99.9 (DHP)
Dimension (mm)	150*900*2000
Weight (kg)	2100
Pressure(bar)	15



## Blast Furnace's copper tuyeres

Blast Furnace's copper tuyeres are used to direct hot air and charging materials into the furnace and are cooled by water-circulating cooling channels. The mass-manufacturing of these parts was first started in PSS. After optimization, these parts are currently designing and manufacturing in PSS in single-wall, double-wall, triple-wall and spiral types coated with ceramic and welding jackets.



Technical Specifications	
material	Cu 99.9 (DHP)
Conductivity (IACS)	>80
types	single-chamfer double-chamfer triple-chamfer Spiral types
coatings	Cladding Ni, Co, Fe based superalloys Thermal barrier
Weight (kg)	150-200
Pressure (bar)	10-17





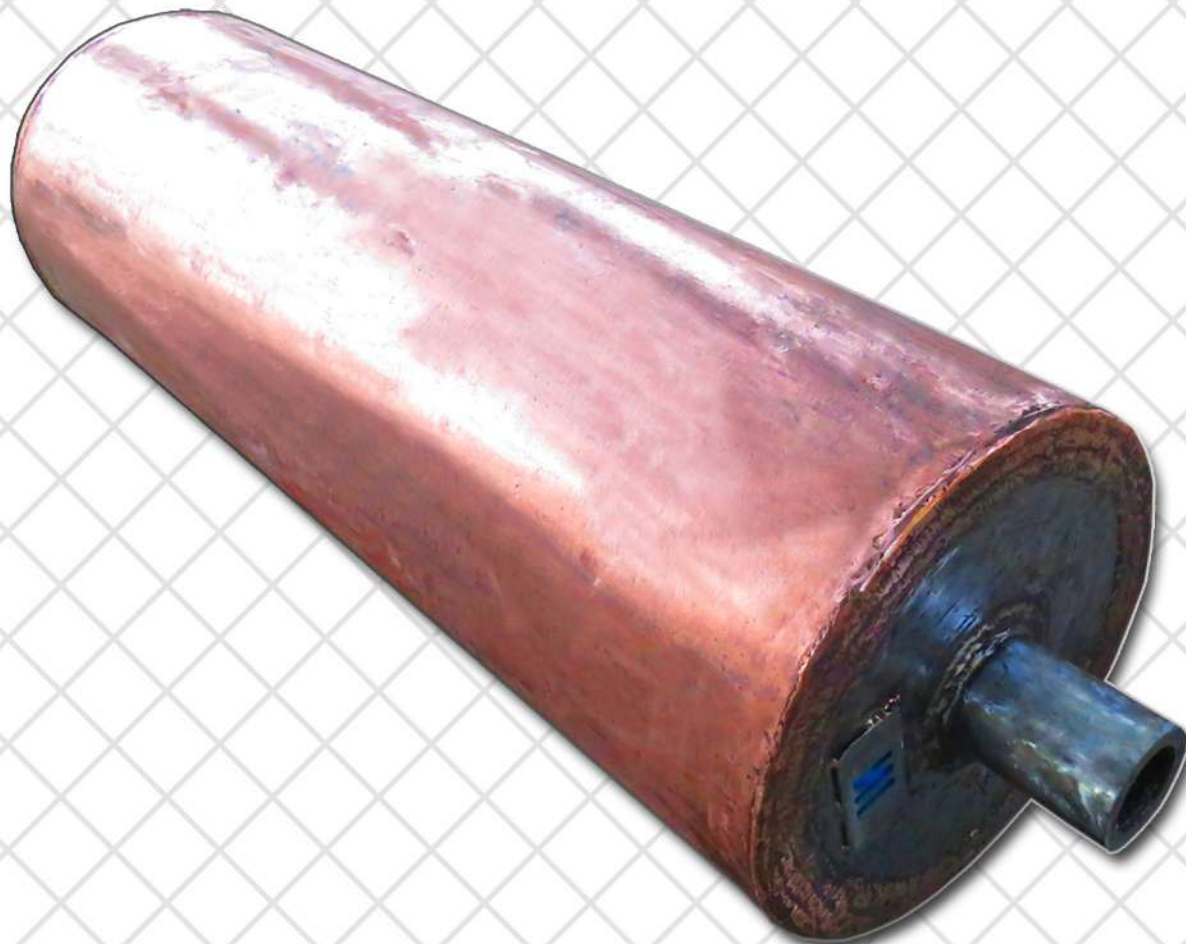
## EAF's electrode holders

EAF's electrode holders are parts of the secondary EAFs and metallurgy furnaces that are used to transmit electrical current to the graphite electrode in arc furnaces. They are manufactured in designing various water-circulating system by casting and forging methods.



### Technical Specifications

material	Cu 99.9 (ETP-TPc)
Conductivity (IACS)	85
Weight (kg)	100-800
place of application	EAF and LF for different dimeters of electrodes



## Slag Door

In order to facilitate the removal of slag from EAFs, Slag door is used, which according to its shape, the slag melt is directed from it to the slag ladle. The surface of this piece is made entirely of copper and is cooled by reciprocating waterways. hydro system design of slag door has been optimized by PSSCo.

### Technical Specifications

body's material	Cu 99.9 (ETP-TPc)
Inlet & outlet materials	carbon steel
Weight (kg)	2750
place of application	EAF



## copper staves panels

Blast furnace's copper staves are one of the parts used to cool blast furnace shells. These parts replace the tubular water cooled panels that have been designed and produced by PSS CO in order to increase the working life of the electric arc furnace walls.



Technical specifications	
material	cu99.9(DHP)
dimension(mm)	2000*900*150
weight(kg)	2100
pressure(bar)	15

## Copper Mould Plates (Narrow & Wide Side)

Copper Mould Plates are parts used in continuous casting machines to absorb heat from steel and to form ingots. For the first time in Iran, these parts were manufactured with CuAg and CuZrCr alloys containing abrasion-resistant coatings such as composite nickel, hard chromium, and hardened nickel.



<b>Technical Specifications</b>	
<b>material</b>	<b>Cu 99.9 (ETP)</b>
<b>Conductivity (% IACS)</b>	<b>&gt;90</b>
<b>coatings</b>	<b>Nickel Ceramic composite coating</b>
<b>Weight (kg)</b>	<b>80-900</b>
<b>Hardness (HB)</b>	<b>&gt;80</b>

## EAF's Water-Cooled Oxygen Lances

Water-Cooled Oxygen Lances are parts used to transfer charges and blow oxygen to the melt in the EAFs and cast iron-to-steel converters in steelmaking plants. They are manufactured in PSS in pure copper and/or copper-steel designs.



### Inner tube

#### Technical Specifications

Material	Cu 99.9 (TPC-ETP)
Conductivity (% IACS)	Cu 98
Weight (kg)	10

#### Technical Specifications

material	Cu 99.9 (DHP) Copper- stainless steel
coatings	Cladding by Ni, Co, Fe based superalloys
Diameter (mm)	28-190
Weight (kg)	35-200



## Protection Box For Injection Lances in

Protection Box For Injection Lances are parts used in EAFs in water-circulating design to improve the blowing lances' working life and reduce the stopping time when replacing the lance in AFs and also to reduce the diameter of the blowing lances. These parts are manufactured in PSS for various water-circulating systems in single-lance and dual-lance.

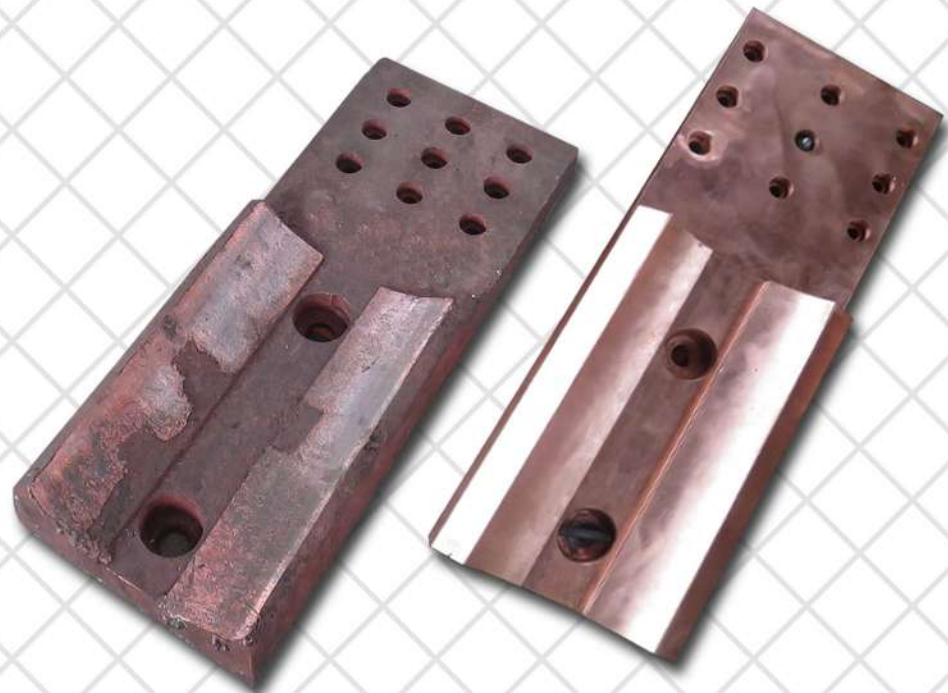


### Technical Specifications

material	Cu99.9(DHP) copper-stainless steel
types	Different water-circulating systems Single-Lance Double-Lance
Weight (kg)	500-800

## Repair, reconstruction, and renovation of copper parts

The PSS Co. benefits from the knowledge and ability to repair and reconstruction of the surfaces of damaged copper parts and equipment with an efficiency of up to 80%, relying on domesticated technology of casting colorobale metals and “copper-to-copper” and “copper-to-metal” welding.



PSSS

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# Parcham daran Sanat Sepahan

## Departments:

### - Material since and technology

- Welding Engineering
- Identification and Selection of Engineering Materials
- Surface engineering
- Manufacturing Engineering - Casting

### - Mechanics

- Fluid mechanics
- Manufacturing engineering

## Projects:

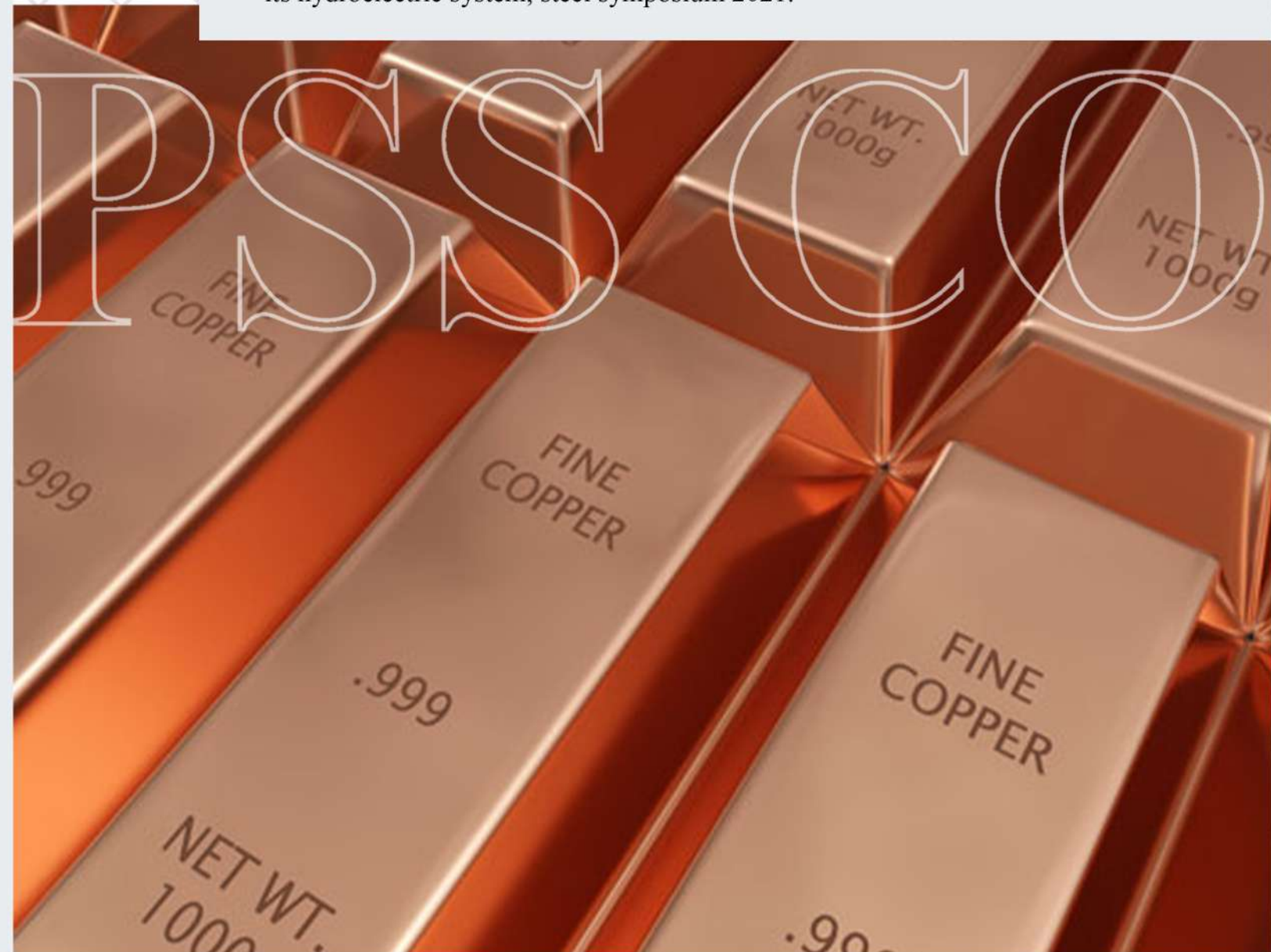
- Development of technical knowledge and design of water cooled system of blast furnace's copper tuyeres (Esfahan steel company)
- Development of technical knowledge and design of water-cooled copper plates for blast furnace's wall (Esfahan steel company)
- Design of thermal barrier coating for copper instruments of steel making furnaces
- Design of spiral chamber copper tuyere for blast furnaces (Esfahan steel company)
- Optimization of electrode holders for arc furnace electrodes (Mobarakeh steel company)
- Development of technical knowledge and design of water cooled system of copper mould slabs for continuous casting machine (Mobarakeh steel company)
- Development of technical knowledge of water cooled system of copper mould billets for continuous casting machine (Esfahan steel company)
- Design of water-cooled copper plates for EAF's wall and roof replace with old copper tube panels (Mobarakeh steel company)
- Design of water cooled system of EAF's copper delta roof (Mobarakeh steel company)
- Optimization of water cooled system for EAF's copper slag door (saba steel company)

## Honors & Awards:

- The selection of " blast furnace's water-cooled copper plates of wall with formation of water cooled system in casting process" project in the 21st Kharazmi Festival
- Acceptance of paulworth company on blast furnace's water-cooled copper plates of wall
- Received the National Iranian Steel Award in 2020 for Parchamdarán Sanaat Sepahan Company
- Being in the list of top 10 suppliers of Esfahan steel company

## Publications:

- A study on the microstructure and mechanical properties of dissimilar joints of pure copper and low carbon steel ST37 welded by GTAW process, steel symposium 2019.
- Simulation of water-circulating path and heat transfer in blast-furnace tuyeres with simple and spiral double-chamfer design, [International Journal of Iron & Steel Society of Iran](#) Volume 17 Issue 1, 2020.
- Design of water-cooled copper plates for EAF's wall and comparison of fluid analysis and heat transfer with EAF's copper tube panels, steel symposium 2021.
- Changing the material of the EAF's delta roof from refractory to copper and designing its hydroelectric system, steel symposium 2021.




## CLIENTS

 .Esfahan mobarakeh steel company

 .Esfahan steel company

 .Hormozgan steel company(HOSCO)

 .Khouzestan steel company

 .Khorasan steel company

 .Saba steel company

 .Iran alloy steel company

 .South kaveh steel company

 .Yazd rolling mill company

 .Esfarayen industrial complex

 .Mashin sazi arsk company

 .Mapna alloy steel company

 .Chadormalou mining & industrial company

 .Pasargad steel complex

 .Sirjan iraniyan steel

 .Zarand iraniyan steel

 .South rouhina steel complex

 .Esfahan alloy steel complex

 .Shahid bahonar copper IND

 .Mining company in kerman

 .Mapna generator company

 .Mobarakeh steel engineering

 .Meybod steel



PSS CO

# Parham daran sanat sepahan

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# Parchamdaransanat

## Sanat Sepahan



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