



METIX

SMS group

LOWER ELECTRODE COLUMN

The Metix lower electrode column is designed for durability with every part thereof being state of the art.

The lower electrode column consists of:

- Pressure rings
- C-Clamps
- Pressure ring tip seals
- Contact shoes
- Bellows
- Heat shields
- Bustube risers
- Cooling water risers
- Lower mantle





(A) Pressure rings:

The Metix pressure ring has many unique features and specific designs vary from furnace to furnace. Manufactured from a patented forged high conductivity copper alloy all Metix pressure rings have a greatly improved resistance to copper creep yet have conductivity of >96% IACS. All Metix pressure rings use the patented Metix C-Clamp as joining mechanism meaning that installation is quick and easy requiring only lifting equipment and a large hammer and should it be needed to do maintenance on a bellows or contact shoe then removal is very quick and easy requiring only lifting equipment and a crow bar.

Pressure rings segments vary in mass from as small as 350kg to over 750kg with heights of over 1m, on closed furnaces this pushes the insulation seal between the pressure ring and the heat shield into the furnace roof giving it a greatly improved life expectancy. The pressure rings are designed to operate in the worst of smelting operations surviving plasma jets of over 2800°C.

(B) C-Clamp:

The key to fast and secure fitment of the Metix pressure rings, due to the shallow taper lock a C-Clamp will pull adjoining pressure ring segment together with sufficient force to form a uniform solid ring of copper around the contact shoes. All Metix C-Clamps are Stainless steel CNC machined to ensure a fully interchangeable fitment into any Metix pressure ring designed for a specific plant.

(C) Bellows:

The Metix convoluted bellows are manufactured from 304 and 316 stainless steel, Bellows of up to 600mm in diameter can be fitted in the Metix pressure rings greatly reducing the needed operating pressure. All Metix pressure ring installations operate on standard furnace cooling water @ < 5 Bar.

(D) Contact shoe:

The Metix contact shoes are all manufactured from 99.99% electrolytic continuous cast then forged copper. Each contact shoe set is designed for the specific process. The cooling water passages vary in design from single U with a single plug on the side of the shoe for FeCr smelters to multi-U with no plugs on the side for Si smelters.

(E) Pressure ring tip Seal:

The sealing of the electrode is vital, especially on fully closed furnaces where oxygen ingress into the furnace should be eliminated. With the Metix Patented lower tip seal this seal is effected at the lowest possible point on the electrode. As a secondary function it also prevents the ingress of flames into the internal parts of the electrode column.

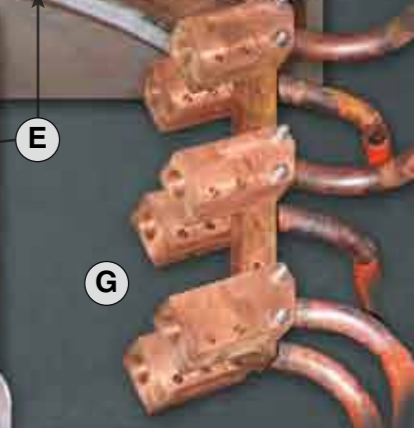
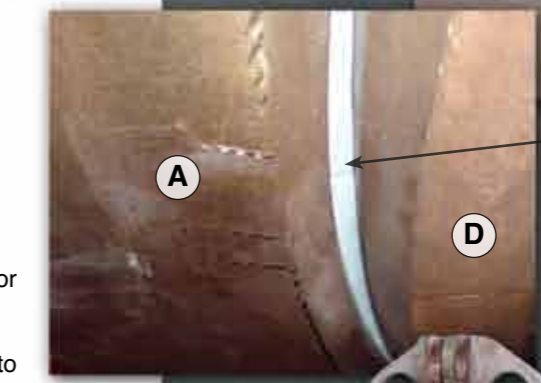
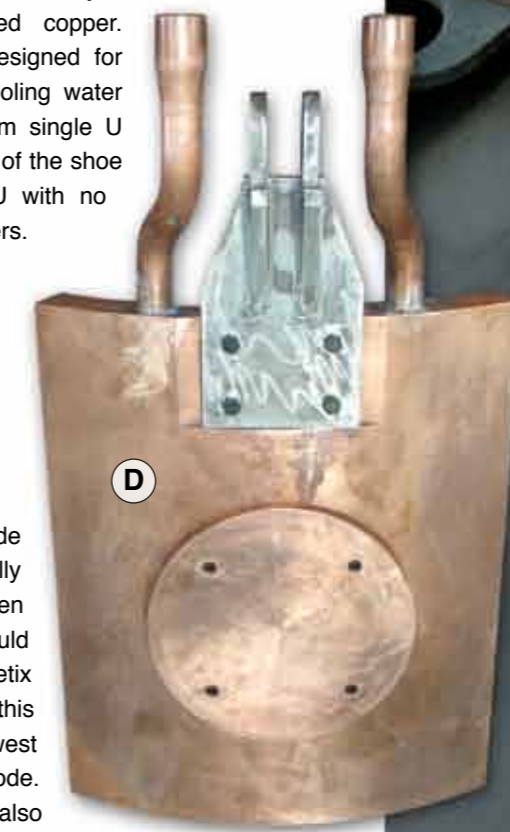
(F) Heat shields:

Manufactured from water-cooled stainless steel or solid forged copper:

Heat shields have two main functions, one is to protect the inner insulation parts and un-cooled components from the harsh furnace environment and the second is to provide a sealing surface for the roof seal to seal against. The Metix forged copper shields are perfectly cylindrical giving the best possible sealing surface greatly improving the performance of roof seals.

(G) Bustube Risers:

The Metix bustube riser flexible end connectors are also manufactured from forged copper billets, together with the large shorting bar that doubles as a hanger all bustubes are ensured to have the same electrical potential with hassle free flexible installation.





Metix strives to design equipment that will stand the test of time in a smelter.

Quality control is of the utmost importance, especially on all the electrode components. Each piece of equipment is rigorously tested and checked to ensure that the best possible product is delivered to our clients.

Due to the highly specialized nature of our electrode pressure rings and contact shoes customized manufacturing procedures had to be developed. Regular inspections are carried out during each step of the manufacturing process, from casting the initial continuous cast billets, to forging, to ensuring each copper weld is carried out according to strict specialized welding procedures, all in accordance with ISO 9001 quality standards.



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