Submerged arc furnace—Profile

Submerged arc furnace—it’s also known as electric arc furnace or resistance electric furnace. It is mainly used to reducing smelting ore, carbonaceous reducing agent and solvent etc. Mainly adapt to production of ferrosilicon, ferromanganese, ferrochrome, ferrotungsten, silicon manganese alloy and other ferrous alloys, it is an important smelting furnace in metallurgical industry for production of industrial raw materials and calcium carbide and so on chemical raw materials.

The working character is to use carbon or magnesia refractory materials as furnace lining, use self roasting electrode. Electrode insert into the materials inside the furnace for submerged arc operation, using arc energy and current through the materials, and due to the resistance of the materials and produce energy to melt metal. It’s a kind of industrial furnace which is worked continuously, charge material in succession, and tap out metal or slag in intermittent.

Submerged Arc Furnace—Major categories and application
### Submerged Arc Furnace—Structure characteristics

Submerged arc furnace is a kind of industrial furnace which consumes much power. Full set equipment mainly consists of furnace shell, fume hoods, lining, short net, cooling system, exhaust system, de-dusting system, electrode shell, electrode lifting system, loading and unloading system, electrode holder, arc burner, hydraulic systems, submerged arc furnace transformer and various of electrical equipments.

#### Product Show:

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<th>Subcategory</th>
<th>Main raw material</th>
<th>Final products</th>
<th>Reaction temperature (Degree)</th>
<th>Power consumption (kWt)</th>
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<td>Ferrosilicon furnace</td>
<td>Ferro silicon (45%), silicon (15%), scrap iron (40%)</td>
<td>Ferro silicon, scrap iron, coke</td>
<td>1550-1770</td>
<td>2100-5500</td>
</tr>
<tr>
<td>Ferromanganese furnace</td>
<td>Manganese ore, scrap iron, coke, lime</td>
<td>Ferromanganese</td>
<td>1500-1600</td>
<td>2400-4000</td>
</tr>
<tr>
<td>Ferrochromium furnace</td>
<td>Chromium ore, silica, coke</td>
<td>Ferrochromium</td>
<td>1600-1750</td>
<td>3200-6000</td>
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<tr>
<td>Ferrotungsten furnace</td>
<td>Tungsten ore, silica, coke</td>
<td>Ferrotungsten</td>
<td>2400-2900</td>
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</tr>
<tr>
<td>Silicon chromium furnace</td>
<td>Silicon chromium</td>
<td>Silicon chromium</td>
<td>1600-1750</td>
<td>3500-6500</td>
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<tr>
<td>Silicon manganese furnace</td>
<td>Manganese ore, silica, iron scrap, coke</td>
<td>Silicon manganese</td>
<td>1350-1400</td>
<td>3500-4000</td>
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<tr>
<td>Steelmaking electric furnace</td>
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<td>Calcium carbide furnace</td>
<td>Limestone, coke</td>
<td>Calcium carbide</td>
<td>1900-2000</td>
<td>2900-3200</td>
</tr>
<tr>
<td>Boron carbide furnace</td>
<td>Boron oxide, coke</td>
<td>Boron carbide</td>
<td>1800-2500</td>
<td></td>
</tr>
</tbody>
</table>

Notes: The above is roughly value. According to the difference of the raw material composition, finished product components, electric furnace capacity and etc. the power consumption value will be much different.

The 1st layer is furnace body (including furnace bottom support, furnace shell, furnace lining), tapping system (including the ladle or pot and ladle car.), arc burner etc.

The 2nd layer

1. Fume hood: At present, mostly of submerged arc furnace adopt closed or semi-closed low hood structure, with the characteristics of environmental protection, facilitate maintenance and improve the operation environment. The closed structure can also collect the exhaust gas (main ingredient is carbon monoxide) which is generated in the production and use in synthetically. Also can reduce the heat loss of the circuit, decrease the temperature of the electrode, and improve the operating environment.

2. Electrode holder: Most of submerged arc furnace with three-phase power supply. Electrode in triangle or inverted triangle, symmetrical position placed in the middle of furnace chamber. Large submerged arc furnace generally adopt anthracite, coke and coal tar pitch mixed as electrode material, in the process of smelting, it roasting by itself as...
(3) Short net

(4) Copper tile

(5) Electrode shell

(6) Unloading system

(7) Turning down machine

(8) Fume exhaust system

(9) Water-cooling system

(10) Submerged arc furnace transformer

(11) Operating system

The 3rd layer

(1) Hydraulic system

(2) Electrode press and release device

(3) Electrode lifting system

(4) Steel platform

(5) Hopper and cycle material distribution car

Related Products:

- **Wire Rod Mill/Finishing Mill**
- **Rebar Rolling Mill for Steel Roll with TMT System**
- **Electric Arc Furnace**
- **Hot Rolling Mill for Rebar Wire Rod Section Bar**

Hot Tags: Submerged arc furnace, electric arc furnace, resistance electric furnace, industrial furnace, furnace lining, smelting furnace
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