

## F27D

**DETAILS OR ACCESSORIES OF FURNACES, KILNS, OVENS, OR RETORTS, IN SO FAR AS THEY ARE OF KINDS OCCURRING IN MORE THAN ONE KIND OF FURNACE (combustion apparatus F23)**

### Special rules of classification within this subclass

Indexing Codes should be used as additional information or in case an EC is given and more detailed Indexing Codes are existing, these more detailed Indexing Codes should also be given.

## F27D 1/00

**Casings; Linings; Walls; Roofs (refractory materials [C04B](#); firebridges for combustion chambers [F23M 3/00](#) )**

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Linings for casting-melt holding vessels	<a href="#">B22D 41/02</a>
Clay-wares and shaped ceramic products	<a href="#">C04B 33/00</a> , <a href="#">C04B 35/00</a>
Walls, e.g. partitions, for buildings	<a href="#">E04B 2/12</a>
Protection of pipes or pipe fittings; thermal insulation in general	<a href="#">F16L 58/00</a> , <a href="#">F16L 59/00</a>
Shape of bricks or blocks used in combustion chambers	<a href="#">F23M 5/02</a>

## F27D 1/0033

**[N: Linings or walls comprising heat shields, e.g. heat shields (shields protecting the charge [F27D 5/00](#) )]**

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Shields protecting the charge	<a href="#">F27D 5/00</a>
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## F27D 1/02

### Crowns; Roofs

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Crowns and roofs in combustion chambers	<a href="#">F23M 5/06</a>
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## F27D 1/10

### Monolithic linings; Supports therefor [N: Note: supports are classified in [F27D 1/14](#) ]

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Supports for linings	<a href="#">F27D 1/14</a>
Heat-exchange apparatus	<a href="#">F28D 1/00</a> - <a href="#">F28D 21/00</a>

## F27D 1/14

### Supports for linings ([F27D 1/10](#) takes precedence)

#### References relevant to classification in this group

This subclass/group does not cover:

Supports for monolithic linings	<a href="#">F27D 1/10</a>
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## F27D 1/16

### Making or repairing linings [N: increasing the durability of linings or breaking away linings]

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Equipment used for making or repairing linings, e.g. by flame gunning	<a href="#">C21C 5/441</a> , <a href="#">C21C 5/443</a>
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## **F27D 3/00**

**Charging; Discharging; Manipulation of charge (moving charge through a furnace [F27B 9/14](#) )**

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Charging of the electric furnace	<a href="#">C21C 5/527</a>
Moving charge through furnace	<a href="#">F27B 9/14</a>

## **F27D 3/0024**

**[N: of metallic workpieces]**

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Charging, discharging and manipulation of charges in heat treatment furnaces, e.g. with rolls	<a href="#">C21D 9/0012</a> , <a href="#">C21D 9/0018</a>
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## **F27D 3/026**

**[N: transport or conveyer rolls for furnaces; roller rails (conveyer rolls in general [B65G](#))]**

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Rollers in rolling mills	<a href="#">B21B 39/00</a>
Rolls in continuous casting	<a href="#">B22D 11/1287</a>

Conveyor rolls in general	<a href="#">B65G 39/02</a> , <a href="#">B65G 13/00</a> , <a href="#">B65G 13/02</a> , <a href="#">B65G 13/04</a>
Roller conveyors for transporting glass sheets	<a href="#">C03B 35/16</a>

## F27D 3/08

### screw feeders; screw dischargers

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Screw conveyors in general	<a href="#">B65G 65/46</a> , <a href="#">B65G 33/18</a> , <a href="#">B65G 53/48</a>
Screw conveyors in general processes	<a href="#">B01J 8/0045</a>

## F27D 3/15

### Tapping equipment; Equipment for removing [N: or retaining] slag

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Closure equipment in casting melt-holding vessels	<a href="#">B22D 41/14</a> , <a href="#">B22D 41/16</a> , <a href="#">B22D 41/22</a> , <a href="#">B22D 41/44</a>
Tap-holes and repairing top-holes in steel making converters	<a href="#">C21C 5/4653</a> , <a href="#">C21C 5/445</a>

## F27D 3/1527

### [N: Taphole forming equipment, e.g. boring machines, piercing tools]

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Opening or sealing the tap-hole of blast furnaces	<a href="#">C21B 7/12</a>
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## F27D 3/16

**Introducing a fluid jet or current into the charge [N: (porous elements for gas flushing of molten metals [B22D 1/005](#) )]**

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Injection assemblies for treating melt in ladles or runners before casting	<b>B11D21/00G1</b>
Devices for accelerating or decelerating flow of the materials	<a href="#">B65G 53/58</a>
Bottoms or tuyeres for converters	<a href="#">C21C 5/48</a>
Burners or injectors for injecting pulverulent materials into the furnace	<a href="#">C21C 5/5217</a>
Injection of gases into liquid metals in ladles	<a href="#">B22D 1/005</a>
Treating molten ferrous alloy by injecting powdered material	<a href="#">C21C 7/0037</a>
Tuyeres for blast furnaces	<a href="#">C21B 7/16</a>

## F27D 3/18

**charging particulate material using a fluid carrier**

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Lances or injectors for steel production in converters	<a href="#">C21C 5/4606</a>
Burners or injectors for injecting gas	<a href="#">C21C 5/5217</a>

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## F27D 5/00

Supports, screens, or the like for the charge within the furnace (travelling or movable supports [F27D 3/12](#) )

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Setting, e.g. drying, dehydrating or firing ceramic articles	<a href="#">B28B 11/243</a>
Supports, baskets, containers or covers for heat treatment	<a href="#">C21D 9/0025</a>
Details of grates for burning waste materials	<a href="#">F23H 17/00</a> - <a href="#">F23H 17/12</a>
Elements for supporting goods to be dried	<a href="#">F26B 25/185</a>
Travelling or movable supports	<a href="#">F27D 3/12</a>

## F27D 5/0031

[N: Treatment baskets for ceramic articles (for metallic articles [C21D 9/0025](#) )]

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Treatment baskets for metallic articles	<a href="#">C21D 9/0025</a>
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## F27D 5/0062

[N: Shields for the charge (shields for the lining [F27D 1/0033](#) )]

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shields for the lining	<a href="#">F27D 1/0033</a>
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## F27D 7/00

Forming, maintaining, or circulating atmospheres in heating chambers

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

General devices for heat treatment with forced gas circulation; under reduced pressure or vacuum	<a href="#">C21C1/74</a> , <a href="#">C21D 1/767</a> , <a href="#">C21D 1/773</a>
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## F27D 9/00

Cooling of furnaces or of charges therein ([F27D 1/00](#), [F27D 3/00](#) take precedence) [N: Preheating scrap (preheating of scrap for steel making [C21C 5/565](#) )]

## F27D 11/00

Arrangement of elements for electric heating in or on furnaces (electric heating per se [H05B](#))

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Electric heating in general	<a href="#">H05B 3/00</a> , <a href="#">H05B 7/00</a>
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## F27D 11/02

ohmic resistance heating

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Ohmic resistance heating in general and specially adapted for furnaces	<a href="#">H05B 3/00</a> , <a href="#">H05B 3/62</a> , <a href="#">H05B 3/64</a>
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## F27D 11/10

Disposition of electrodes (automatic control of temperature [G05D 23/00](#); electric discharge apparatus [H01T](#); arrangements for feeding or guiding electrodes [H05B 7/10](#); automatic control of power by positioning of electrodes [H05B 7/144](#) )

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Arrangements of feeding or guiding electrodes	<a href="#">H05B 7/10</a>
Automatic control of power by positioning of electrodes	<a href="#">H05B 7/144</a>
Control of temperature	<a href="#">G05D</a>

## F27D 13/00

Apparatus for preheating charges; Arrangements for preheating charges

### F27D 13/002

[N: Preheating scrap (preheating of scrap for steel making [C21C 5/565](#) )]

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Preheating of scrap for steel production	<a href="#">C21C 5/565</a>
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## F27D 15/0213

[N: comprising a cooling grate]

### Definition statement

*This subclass/group covers:*

Cooling of discharged material comprising a cooling grate.

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Conveyers in general comprising a cyclically-moving	<a href="#">B65G 25/00</a>
Heat-exchange apparatus, whereby particulate material forming a bed, e.g. fluidised, on vibratory sieves	<a href="#">F28C 3/16</a>

## F27D 17/00

Arrangements for using waste heat (heat-exchangers per se F28); Arrangements for using, or disposing of, waste gases

### F27D 17/001

[N: Extraction of waste gases, collection of fumes and hoods used therefor (in general [B08B 15/00](#) )]

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Preventing escape of dirt or fumes from the area where they are produced	<a href="#">B08B 15/00</a>
Removal of waste gases or dust coming from steel making converters	<a href="#">C21C 5/38</a> - <a href="#">C21C 5/40</a>

## F27D 17/003

[N: of waste gases emanating from an electric arc furnace]

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Working up flue dust	<a href="#">C22B 7/02</a>
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## F27D 19/00

### Arrangements of controlling devices

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangement of controlling devices in shaft furnaces	<a href="#">F27B 1/26</a>
Arrangement of controlling devices in hearth type furnaces	<a href="#">F27B 3/28</a>
Arrangement of controlling devices in muffle furnaces	<a href="#">F27B 5/18</a>
Arrangement of controlling devices in rotary drum furnaces	<a href="#">F27B 7/42</a>
Arrangement of controlling devices in tunnel furnaces	<a href="#">F27B 9/40</a>
Arrangement of controlling devices in ring type furnaces	<a href="#">F27B 13/14</a>
Arrangement of controlling devices in crucible or pot furnaces	<a href="#">F27B 14/20</a>
Arrangement of controlling devices in fluidized bed furnaces	<a href="#">F27B 15/18</a>

## F27D 21/00

### Arrangements of monitoring devices; Arrangements of safety devices

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Test rods or other checking devices in blast furnaces	<a href="#">C21B 7/24</a>
Measuring and sampling devices in steel making converters	<a href="#">C21C 5/4673</a> , <a href="#">C21C 2005/5288</a>

Arrangement of monitoring devices in shaft furnaces	<a href="#">F27B 1/28</a>
Arrangement of monitoring devices in ring type furnaces	<a href="#">F27B 13/14</a>
Arrangement of monitoring devices in crucible or pot furnaces	<a href="#">F27B 14/20</a>
Arrangement of monitoring devices in fluidized bed furnaces	<a href="#">F27B 15/18</a>
Arrangement of monitoring devices in hearth type furnaces	<a href="#">F27B 3/28</a>
Arrangement of monitoring devices in muffle furnaces	<a href="#">F27B 5/18</a>
Arrangement of monitoring devices in rotary drum furnaces	<a href="#">F27B 7/42</a>
Arrangement of monitoring devices in tunnel furnaces	<a href="#">F27B 9/40</a>
Measuring temperature and heat quantity in general	<a href="#">G01K 1/00</a> - <a href="#">G01K 19/00</a>

## **F27D 25/00**

**Devices [N: or methods] for removing incrustations, [N: e.g. slag, metal deposits, dust]; [N: Devices or methods for preventing the adherence of slag]**

### **F27D 25/001**

**[N: comprising breaking tools, e.g. hammers, drills, scrapers (breaking away linings [F27D 1/1694](#); boring machines for forming tapholes [F27D 3/1527](#) )]**

#### **Definition statement**

*This subclass/group covers:*

Devices for removing incrustations, e.g. slag, metal deposits, dust, comprising breaking tools like hammers, drills, scrapers;

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Breaking away linings	<a href="#">F27D 1/1694</a>
Boring machines for forming tap-holes	<a href="#">F27D 3/1527</a>

### F27D 27/00

Stirring devices for molten material ([F27D 3/14](#) takes precedence)

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Mixers in general	<a href="#">B01F 13/00</a> , <a href="#">B01K13/08</a> , <a href="#">B01F 13/0809</a>
Refining metals including stirring	<a href="#">C22B 9/05</a> , <a href="#">C22B 9/055</a> , <a href="#">C22B 21/06</a> , <a href="#">C22B 21/064</a> , <a href="#">C21B21/06F</a>
Electrodynamics pumps	<a href="#">H02K 44/02</a> , <a href="#">H02K 44/04</a> , <a href="#">H02K 44/06</a>

### F27D 99/00

Subject matter not provided for in other groups of this subclass

### Definition statement

*This subclass/group covers:*

Details or accessories not covered by any preceding group

### F27D 99/0006

[N: Electric heating elements or system]

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Electric heating in general	<a href="#">H05B 1/00</a> - <a href="#">H05B 7/225</a>
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## **F27D 99/0033**

**[N: using burners (manufacture of steel in an electric arc furnace equipped with burners [C21C 5/5217](#) )]**

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Burners used for glass melting	<a href="#">C03B 5/2353</a>
Manufacture of steel in electric arc furnaces equipped with burners	<a href="#">C21C 5/5217</a>
Burners in combustion in general	<a href="#">F23D 17/00</a> - <a href="#">F23D 17/007</a>
Burners for combustion of gas in general	<b><a href="#">F27D14/00</a> - <a href="#">F27D14/84</a></b>