

## ECLA EUROPEAN CLASSIFICATION

### 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)

#### Note

Attention is drawn to the references and Notes following the title of class F27 and the Note III following the Contents of Section H.

- F27D1/00 Casings; Linings; Walls; Roofs** (refractory materials [C04B](#); firebridges for combustion chambers [F23M3/00](#))
- F27D1/00A . [N: Linings or walls]
    - [N: **Note**  
not used, see subgroups  
]
  - F27D1/00A1 . . [N: Linings or walls formed from bricks or layers with a particular composition or specific characteristics]
  - F27D1/00A1B . . . [N: Comprising ceramic fibre elements]
  - F27D1/00A1B1 . . . . [N: the fibre elements being in the form of a folded blanket or a juxtaposition of folded blankets]
  - F27D1/00A1B1A . . . . . [N: Interleaved multiple folded blankets][C0303]
  - F27D1/00A1B2 . . . . . [N: the fibre elements being composed of adjacent separate strips]
  - F27D1/00A2 . . [N: Linings or walls comprising expansion joints or means to restrain expansion due to thermic flows]
  - F27D1/00A2B . . . [N: the expansion joint being a resilient element, e.g. a metallic plate between two bricks][C0303]
  - F27D1/00A3 . . [N: Linings or walls comprising porous bricks]
  - F27D1/00A4 . . [N: Linings or walls comprising heat shields, e.g. heat shieldsd (shields protecting the charge [F27D5/00](#))] [C0303]
  - F27D1/00A5 . . [N: Linings or walls comprising means for supporting electric resistances in the furnace]
  - F27D1/00A6 . . [N: Linings or walls comprising means for securing bricks]
  - F27D1/00B . [N: Floors, hearths]
  - F27D1/02 . Crowns; Roofs
  - F27D1/02B . . [N: Suspended roofs]
  - F27D1/02B1 . . . [N: Parts thereof, e.g. noses, arches]
  - F27D1/02B3 . . . [N: having an anchored layer of lining]
  - F27D1/02C . . [N: Roofs supported around their periphery, e.g. arched roofs]
  - F27D1/02C1 . . . [N: Skew backs]
  - F27D1/02C2 . . . [N: Means to prevent deformation of the arch]
  - F27D1/04 . characterised by the form [N: e.g. shape] of the bricks or blocks used

- F27D1/04A . . [N: Bricks shaped for use in regenerators]
- F27D1/04B . . [N: Bricks for lining cylindrical bodies, e.g. skids, tubes]
- F27D1/06 . . Composite bricks or blocks [N: e.g. panels, modules]
- F27D1/06A . . . [N: Individual composite bricks or blocks]
- F27D1/06A1 . . . . [N: Individual composite bricks or blocks made from hollow bricks filled up with another material]
- F27D1/08 . . . Bricks or blocks with internal reinforcement or metal backing
- F27D1/10 . Monolithic linings; Supports therefor [N: Note: supports are classified in [F27D1/14](#)]
- F27D1/12 . incorporating cooling arrangements ([constructions of tube assemblies in general F28](#))
- F27D1/14 . Supports for linings ([F27D1/10 takes precedence](#))
- F27D1/14A . . [N: Anchors therefor]
- F27D1/14A1 . . . [N: Anchors made from ceramic material]
- F27D1/14B . . [N: Supports for ceramic fibre materials]
- F27D1/14C . . [N: Assembling elements]
- F27D1/14C1 . . . [N: for bricks]
- F27D1/14C1A . . . . [N: Means to suspend bricks]
- F27D1/16 . Making or repairing linings [N: increasing the durability of linings or breaking away linings]
- F27D1/16B . . [N: Making linings by using shaped elements, e.g. bricks]
- F27D1/16C . . [N: Making linings by compacting a refractory mass in the space defined by a backing mould or pattern and the furnace wall]
- F27D1/16D . . [N: Repairing linings by projecting or spraying refractory materials on the lining]
- F27D1/16D2 . . . [N: using a gunning apparatus]
- F27D1/16D2A . . . . [N: the projected materials being partly melted, e.g. by exothermic reactions of metals (Al, Si) with oxygen] [C9502]
- F27D1/16D2A1 . . . . . [N: Flame gunning; Use of a fuel] [C9502]
- F27D1/16D2A2 . . . . . [N: Plasma gunning]
- F27D1/16D3 . . . [N: applied centrifugally]
- F27D1/16P . . [N: Increasing the durability of linings; Means for protecting]
- F27D1/16P1 . . . [N: by a special coating applied to the lining] [N9502]
- F27D1/16R . . [N: Breaking away the lining or removing parts thereof]
- F27D1/18 . Door frames; Doors, lids, removable covers
- F27D1/18A . . [N: Removable covers]
- F27D1/18A1 . . . [N: Removable covers specially adapted for arc furnaces]
- F27D1/18B . . [N: Doors]
- F27D1/18B1 . . . [N: Door-frames]
- F27D3/00** **Charging; Discharging; Manipulation of charge** ([moving charge through a furnace F27B9/14](#))
- F27D3/00D . [N: of ceramic ware]

- F27D3/00D2 . . [N: Disposition of the charge]
- F27D3/00E . [N: of metallic workpieces]
- F27D3/00H . [N: Charging or loading melting furnaces with material in the solid state]
- F27D3/00H2 . . [N: Introducing additives into the melt]
- F27D3/00H3 . . [N: Charging vertically with corbs]
- F27D3/00H3A . . . [N: Corbs]
- F27D3/00H4 . . [N: Charging laterally, e.g. with a charging box]
- F27D3/00H5 . . [N: Charging with tiltable dumpers]
- F27D3/00H6 . . [N: using an air-lock]
- F27D3/00K . [N: charging of particulate material]
- F27D3/00S . [N: Charging; Manipulation of SC or SC wafers]
- F27D3/02 . Skids or tracks for heavy objects
- F27D3/02A . . [N: Skids]
- F27D3/02A1 . . . [N: Details of skids, e.g. riders]
- F27D3/02B . . [N: transport or conveyer rolls for furnaces; roller rails (conveyer rolls in general [B65G](#))]
- F27D3/02B1 . . . [N: Roller rails or succession of small sized rollers]
- F27D3/04 . Ram or pusher apparatus
- F27D3/06 . Charging or discharging machines on travelling carriages
- F27D3/08 . Screw feeders; Screw dischargers
- F27D3/10 . Charging directly from hoppers or shoots
- F27D3/12 . Travelling or movable supports or containers for the charge
- F27D3/12B . . [N: Furnace cars]
- F27D3/14 . Charging or discharging liquid or molten material
- F27D3/14A . . [N: Runners therefor]
- F27D3/15 . Tapping equipment; Equipment for removing [N: or retaining] slag
- F27D3/15A . . [N: Tapping equipment]
- F27D3/15A1 . . . [N: Tapholes]
- F27D3/15A2 . . . [N: Taphole forming equipment, e.g. boring machines, piercing tools]
- F27D3/15A3 . . . [N: Devices for plugging tap holes, e.g. plugs stoppers] [N: Note: the devices fixed permanently to the melt container are classified in [F27D3/15A](#)]
- F27D3/15B . . [N: Equipment for removing or retaining slag]
- F27D3/15B1 . . . [N: for removing the slag from the surface of the melt]
- F27D3/15B1A . . . . [N: by the use of scrapers]
- F27D3/15B1B . . . . [N: by suction]

- F27D3/15B1C . . . . [N: by the use of blowers]
- F27D3/15B2 . . . [N: for retaining slag during the pouring of the metal or retaining metal during the pouring of the slag]
- F27D3/16 . Introducing a fluid jet or current into the charge [N: (porous elements for gas flushing of molten metals [B22D1/00G1](#))]
- F27D3/18 . Charging particulate material using a fluid carrier
- F27D5/00** **Supports, screens, or the like for the charge within the furnace (travelling or movable supports [F27D3/12](#))**
- F27D5/00B . [N: Composite supporting structures]
- F27D5/00B1 . . [N: Modules of the sagger or setter type; Supports built up from them] [C9410]
- F27D5/00B2 . . [N: Separating elements] [C9411]
- F27D5/00B3 . . [N: assembled to present a three-point support] [N9411]
- F27D5/00D . [N: Treatment baskets for ceramic articles (for metallic articles [C21D9/00D5](#))] [C9411]
- F27D5/00E . [N: Supports specially adapted for semi-conductors]
- F27D5/00F . [N: Supports specially adapted for dental prosthesis]
- F27D5/00G . [N: Supports specially adapted for holding elongated articles in an upright position, e.g. sparking plugs]
- F27D5/00H . [N: Hangers]
- F27D5/00I . [N: Shields for the charge (shields for the lining [F27D1/00A4](#) )] [C0303]
- F27D5/00J . [N: Containers]
- F27D7/00** **Forming, maintaining, or circulating atmospheres in heating chambers**
- F27D7/02 . Supplying steam, vapour, gases, or liquids
- F27D7/04 . Circulating atmospheres by mechanical means
- F27D7/06 . Forming or maintaining special atmospheres or vacuum within heating chambers ([F27D7/02](#) takes precedence)
- F27D9/00** **Cooling of furnaces or of charges therein ([F27D1/00](#), [F27D3/00](#) take precedence)**
- F27D11/00** **Arrangement of elements for electric heating in or on furnaces (electric heating per se [H05B](#))**
- F27D11/02 . Ohmic resistance heating
- F27D11/04 . . with direct passage of current through the material being heated

- F27D11/06 . Induction heating, i.e. in which the material being heated, or its container or elements embodied therein, form the secondary of a transformer
- F27D11/08 . Heating by electric discharge, e.g. arc discharge
- F27D11/10 . . Disposition of electrodes ([automatic control of temperature G05D23/00](#); [electric discharge apparatus H01T](#); arrangements for feeding or guiding electrodes [H05B7/10](#); [automatic control of power by positioning of electrodes H05B7/144](#))
- F27D11/12 . with electromagnetic fields acting directly on the material being heated
- F27D13/00 Apparatus for preheating charges; Arrangements for preheating charges**
- F27D13/00A . [N: Preheating scrap ([preheating of scrap for steel making C21C5/56B2](#))]
- F27D13/00B . [N: Drying of green clay prior to baking]
- F27D15/00 Handling or treating discharged material; Supports or receiving chambers therefor**
- F27D15/02 . Cooling
- F27D15/02B . . [N: with means to convey the charge]
- F27D15/02B1 . . . [N: comprising a cooling grate]
- F27D15/02B1A . . . . [N: grate plates]
- F27D15/02B2 . . . [N: on an endless belt]
- F27D15/02B3 . . . [N: on a rotary hearth]
- F27D15/02B4 . . . [N: comprising a rotary drum]
- F27D15/02C . . [N: in a vertical, e.g. annular, shaft ([shafts including rotating parts F27D15/02B3](#))]  
[N9410]
- F27D17/00 Arrangements for using waste heat ([heat-exchangers per se F28](#)); Arrangements for using, or disposing of, waste gases**
- F27D17/00B . [N: Extraction of waste gases, collection of fumes and hoods used therefor ([in general B08B15/00](#))]
- F27D17/00B1 . . [N: Details of the installations, e.g. fume conduits or seals]
- F27D17/00B2 . . [N: of waste gases emanating from an electric arc furnace]
- F27D17/00D . [N: Systems for reclaiming waste heat]
- F27D17/00E . [N: cleaning gases]
- F27D19/00 Arrangements of controlling devices**
- F27D21/00 Arrangements of monitoring devices; Arrangements of safety devices**
- F27D21/00B . [N: Devices for monitoring temperature]
- F27D21/00C . [N: Devices for monitoring linings for wear]

- F27D21/00E . [N: Devices for monitoring the level of the melt]
- F27D21/00G . [N: Devices for monitoring the weight of quantities added to the charge]
- F27D21/02 . Observation or illuminating devices
- F27D21/04 . Arrangements of indicators or alarms
  
- F27D25/00** **Devices [N: or methods] for removing incrustations, [N: e.g. slag, metal deposits, dust]; [N: Devices or methods for preventing the adherence of slag] [N1003]**
  
- F27D25/00A . [N: comprising breaking tools, e.g. hammers, drills, scrapers (breaking away linings [F27D1/16R](#); boring machines for forming tapholes [F27D3/15A2](#))] [N1003]
- F27D25/00A1 . . [N: used for punching tuyeres] [N1003]
- F27D25/00A2 . . [N: used for cleaning the channels of induction furnaces] [N1003]
- F27D25/00B . [N: using explosives] [N1003]
- F27D25/00C . [N: using fluids or gases, e.g. blowers, suction units] [N1003]
  
- F27D27/00** **Stirring devices for molten material ([F27D3/14](#) takes precedence) [N1003]**
  
- F27D27/00B . [N: Pumps] [N1003]
- F27D27/00B1 . . [N: Pulsating pumps] [N1003]
  
- F27D99/00** **Subject matter not provided for in other groups of this subclass [N1003]**
  
- F27D99/00A . [N: Heating elements or systems] [N1003]
- F27D99/00A2 . . [N: with particulate fuel, e.g. aspects relating to the feeding] [N1003]
- F27D99/00A3 . . [N: Injecting liquid fuel] [N1003]
- F27D99/00A4 . . [N: Electric heating elements or system] [N1003]
- F27D99/00A5 . . [N: using burners (manufacture of steel in an electric arc furnace equipped with burners [C21C5/52B2](#))] [N1003]
- F27D99/00A5A . . . [N: Heating indirectly through a radiant surface] [N1003]
- F27D99/00B . [N: Partitions] [N1003]
- F27D99/00C . [N: Seals] [N1003]
- F27D99/00C1 . . [N: Gas curtain seals] [N1003]
- F27D99/00C2 . . [N: Furnace car seals, i.e. seals used in continuous furnaces or kilns for preventing gas or heat exchange between heating chamber and the area comprising driving means] [N1003]