

ECLA EUROPEAN CLASSIFICATION

F27B FURNACES, KILNS, OVENS, OR RETORTS IN GENERAL; OPEN SINTERING OR LIKE APPARATUS

[N: **WARNING**

1. The following IPC groups are not used in the internal ECLA classification system. Subject matter covered by these groups is classified in the following ECLA groups:

F27B1/09	covered by	F27B1/08
F27B5/05	" "	F27B5/04
F27B14/16 , F27B14/18	" "	F27B14/08B
F27B21/08 to F27B21/14	" "	F27D

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Note

Attention is drawn to the references and notes following the title of class F27 and the note (par. III) following the Contents of Section H.

F27B1/00 Shaft or like vertical or substantially vertical furnaces (for preheating, burning, calcining or cooling lime, magnesia or dolomite [C04B2/12](#))

F27B1/00B . [N: wherein no smelting of the charge occurs, e.g. calcining or sintering furnaces]

F27B1/02 . with two or more shafts or chambers, e.g. multi-storey

F27B1/02B . . [N: with fore-hearth]

F27B1/04 . . Combinations or arrangements of shafts

F27B1/06 . of other than up-draught type

F27B1/08 . heated otherwise than by solid fuel mixed with charge

F27B1/10 . Details, accessories, or equipment peculiar to furnaces of these types

F27B1/12 . . Shells or casings; Supports therefor

F27B1/14 . . . Arrangements of linings ([linings in general F27D1/00](#))

F27B1/16 . . Arrangements of tuyeres

F27B1/18 . . Arrangements of dust collectors

F27B1/20 . . Arrangements of devices for charging

F27B1/21 . . Arrangements of devices for discharging

F27B1/22 . . Arrangements of heat-exchange apparatus ([heat-exchangers in general F28C](#), [F28D](#))

F27B1/24 . . Cooling arrangements

F27B1/26 . . Arrangements of controlling devices

F27B1/28 . . Arrangements of monitoring devices, of indicators, of alarm devices

F27B3/00 **Hearth-type furnaces, e.g. of reverberatory type** ([F27B9/00](#), [F27B11/00](#), [F27B13/00](#), [F27B14/00](#), [F27B15/00](#), [F27B21/00](#) take precedence); **Tank furnaces**

- F27B3/00A . [N: Siemens-Martin type furnaces]
- F27B3/00A1 . . [N: Port construction]
- F27B3/00A1B . . . [N: Removable burner head]

- F27B3/02 . of single-chamber fixed-hearth type

- F27B3/04 . of multiple-hearth type; of multiple-chamber type; Combinations of hearth-type furnaces
- F27B3/04B . . [N: Multiple chambers, e.g. one of which is used for charging]
- F27B3/06 . with movable working chambers or hearths, e.g. tiltable, [N: oscillating or describing a composed movement]
- F27B3/06A . . [N: tiltable]

- F27B3/08 . heated electrically, with or without any other source of heat
- F27B3/08A . . [N: Arc furnaces]

- F27B3/10 . Details, accessories, or equipment peculiar to hearth-type furnaces
- F27B3/10B . . [N: Slag chamber]
- F27B3/12 . . Working chambers or casings; Supports therefor
- F27B3/14 . . . Arrangements of linings
- F27B3/16 . . . Walls; Roofs
- F27B3/18 . . Arrangements of devices for charging
- F27B3/18A . . . [N: Charging of arc furnaces vertically through the roof, e.g. in three points] [C9511]
- F27B3/18A1 [N: Charging in a vertical chamber adjacent to the melting chamber]
- F27B3/19 . . Arrangements of devices for discharging
- F27B3/20 . . Arrangements of heating devices
- F27B3/20B . . . [N: Burners]
- F27B3/22 . . Arrangements of air or gas supply devices
- F27B3/22A . . . [N: Oxygen blowing]
- F27B3/24 . . Cooling arrangements
- F27B3/26 . . Arrangements of heat-exchange apparatus
- F27B3/26B . . . [N: Regenerators]
- F27B3/26B1 [N: Exhaust gases reversing flow devices]
- F27B3/28 . . Arrangement of controlling, monitoring, alarm or the like devices [N9511]

- F27B5/00** **Muffle furnaces; Retort furnaces; Other furnaces in which the charge is held completely isolated (F27B9/00 takes precedence)**

- F27B5/02 . of multiple-chamber type

- F27B5/04 . adapted for treating the charge in vacuum or special atmosphere

- F27B5/06 . Details, accessories, or equipment peculiar to furnaces of these types

- F27B5/08 . . Arrangements of linings
- F27B5/10 . . Muffles
- F27B5/12 . . Arrangement of devices for charging [C9511]
- F27B5/13 . . Arrangement of devices for discharging [N9511]
- F27B5/14 . . Arrangements of heating devices
- F27B5/16 . . Arrangements of air or gas supply devices
- F27B5/18 . . Arrangement of controlling, monitoring, alarm or like devices [N9511]

- F27B7/00 Rotary-drum furnaces, i.e. horizontal or slightly inclined**

- F27B7/02 . of multiple-chamber or multiple-drum type
- F27B7/04 . . with longitudinal divisions

- F27B7/06 . adapted for treating the charge in vacuum or special atmosphere

- F27B7/08 . externally heated

- F27B7/10 . internally heated, e.g. by means of passages in the wall

- F27B7/12 . tiltable

- F27B7/14 . with means for agitating or moving the charge
- F27B7/16 . . the means being fixed relatively to the drum, [N: e.g. composite means] (F27B7/04 takes precedence)
- F27B7/16B . . . [N: the means comprising projections jutting out from the wall]
- F27B7/16B1 [N: the projections consisting of separate lifting elements, e.g. lifting shovels]
- F27B7/16C . . . [N: the means comprising chains]
- F27B7/16D . . . [N: the means comprising partitions]
- F27B7/18 . . the means being movable within the drum

- F27B7/20 . Details, accessories, or equipment peculiar to rotary-drum furnaces
- F27B7/20B . . [N: Arrangements of preheating devices for the charge]
- F27B7/20B1 . . . [N: consisting of a single string of cyclones]
- F27B7/20B1A [N: with means for precalcining the raw material]
- F27B7/20B2 . . . [N: consisting of at least two strings of cyclones with two different admissions of raw material]
- F27B7/20B2A [N: with precalcining means on the string supplied with exhaust gases from the cooler]
- F27B7/20B2B [N: with precalcining means on each string]
- F27B7/20B3 . . . [N: comprising a band transporter]
- F27B7/20D . . [N: Removing incrustations]
- F27B7/20E . . [N: Arrangements for the melting of metals or the treatment of molten metals]
- F27B7/22 . . Rotary drums; Supports therefor
- F27B7/22B . . . [N: Bearing rings]
- F27B7/22C . . . [N: Discharge ends]

- F27B7/24 . . . Seals between rotary and stationary parts
- F27B7/26 . . Drives
- F27B7/28 . . Arrangements of linings
- F27B7/30 . . Arrangements of partitions
- F27B7/32 . . Arrangement of devices for charging [C9511]
- F27B7/32A . . . [N: Charging]
- F27B7/33 . . Arrangement of devices for discharging [N9511]
- F27B7/34 . . Arrangements of heating devices
- F27B7/36 . . Arrangements of air or gas supply devices
- F27B7/36A . . . [N: Introducing gas into the drum axially or through the wall]
- F27B7/38 . . Arrangements of cooling devices
- F27B7/38B . . . [N: Cooling devices for the charge]
- F27B7/38B2 [N: Rotary-drum cooler]
- F27B7/40 . . . Planetary coolers [N9511]
- F27B7/42 . . Arrangement of controlling, monitoring, alarm or like devices [N9511]

F27B9/00 **Furnaces through which the charge is moved mechanically, e.g. of tunnel type (F27B7/14 takes precedence); Similar furnaces in which the charge moves by gravity**

- F27B9/02 . . of multiple-track type; of multiple-chamber type; Combinations of furnaces
- F27B9/02B . . [N: having two or more parallel tracks]
- F27B9/02B1 . . . [N: With two tracks moving in opposite directions]
- F27B9/02B1B [N: with a U turn at one end]
- F27B9/02B1B1 [N: with superimposed tracks]
- F27B9/02B3 . . . [N: having two or more superimposed tracks (F27B9/02B1B1 takes precedence)]
- F27B9/02D . . [N: Multi-chamber type furnaces, (F27B9/02E takes precedence)]
- F27B9/02E . . [N: Multicellular type furnaces constructed with add-on modules]

- F27B9/04 . . adapted for treating the charge in vacuum or special atmosphere
- F27B9/04B . . [N: Vacuum furnaces]
- F27B9/04D . . [N: Furnaces with controlled atmosphere]
- F27B9/04D2 . . . [N: the atmosphere consisting of protective gases]

- F27B9/06 . . heated without contact between combustion gases and charge; electrically heated
- F27B9/06A . . [N: with at least two longitudinal chambers carrying combustion gases, i.e of the Dressler type]
- F27B9/06B . . [N: electrically heated]
- F27B9/06B1 . . . [N: Resistor heating, e.g. with resistors also emitting IR rays]
- F27B9/06B1A [N: the resistance being transported by the conveyer]
- F27B9/06B2 . . . [N: heated by lamps]
- F27B9/06B3 . . . [N: heated by induction]
- F27B9/06E . . [N: heated by radiant tubes, the tube being heated by a hot medium, e.g. hot gases]

- F27B9/08 . . heated through chamber walls
- F27B9/08B . . . [N: Muffle furnaces]
- F27B9/08B1 [N: the muffle being fixed and in a single piece]
- F27B9/08B2 [N: with two or more fixed muffles]
- F27B9/08B3 [N: Series of separate muffles conveyed through the furnace]
- F27B9/10 . . heated by hot air or gas

- F27B9/12 . with special arrangements for preheating or cooling the charge

- F27B9/14 . characterised by the path of the charge during treatment; characterised by the means by which the charge is moved during treatment ([F27B9/28](#) takes precedence; travelling or movable supports or containers for the charge [F27D3/12](#))
- F27B9/14B . . [N: the charge moving along a vertical axis]
- F27B9/14C . . [N: the charge moving along a serpentine path]
- F27B9/14D . . [N: the charge moving on an inclined floor]
- F27B9/16 . . the charge moving in a circular or arcuate path
- F27B9/18 . . . under the action of scrapers or pushers
- F27B9/18B [N: multiple hearth type furnaces]
- F27B9/20 . . the charge moving in a substantially straight path [N: tunnel furnace]
- F27B9/20B . . . [N: walking beam furnace]
- F27B9/20B1 [N: Conveyer mechanisms therefor]
- F27B9/20B1A [N: having ramps ([F27B9/20B1C](#) takes precedence)]
- F27B9/20B1B [N: having excentrics or lever arms ([F27B9/20B1C](#) takes precedence)]
- F27B9/20B1C [N: consisting of a single central beam]
- F27B9/20B1D [N: consisting of two or more conveyers]
- F27B9/20B2 [N: the workpieces being rotated during their advance]
- F27B9/22 . . . [N: on rails, e.g.] under the action of scrapers or pushers ([F27B9/26](#) takes precedence)
- F27B9/22B [N: the path comprising a section specially adapted for effecting equalisation of the temperature of the charge]
- F27B9/22C [N: the charge being subjected to an additional manipulation along the path]
- F27B9/22E [N: with rotation of the charge ([F27B9/14D](#) takes precedence)]
- F27B9/24 . . . being carried by a conveyer [N: transport by conveyers in general [B65G](#)]
- F27B9/24B [N: the conveyer being constituted by rollers (roller hearth furnace)]
- F27B9/24B1 [N: the charge rotating about an axis transversal to the axis of advancement of the charge]
- F27B9/24B2 [N: the charge rotating about an axis parallel to the axis of advancement of the charge]
- F27B9/24C [N: Endless-strand conveyer]
- F27B9/24D [N: Vibrating conveyer (shaker hearth furnace)]
- F27B9/24E [N: the charge being suspended from the conveyer]
- F27B9/24G [N: the conveyer being constituted by rollable bodies]
- F27B9/24H [N: the conveyer being constituted by air cushion]
- F27B9/26 . . . on or in trucks, sleds, or containers
- F27B9/26B [N: on or in trucks]

- F27B9/28 . for treating continuous lengths of work
- F27B9/30 . Details, accessories, or equipment peculiar to furnaces of these types
- F27B9/30B . . [N: arrangements for circulating gases]
- F27B9/30B1 . . . [N: arrangements for circulating gases transversally]
- F27B9/30C . . [N: Furnace regenerators]
- F27B9/30K . . [N: Arrangements for treating electronic components, e.g. semiconductors]
- F27B9/32 . . Casings
- F27B9/34 . . . Arrangements of linings
- F27B9/36 . . Arrangements of heating devices
- F27B9/38 . . Arrangements of devices for charging [C9511]
- F27B9/39 . . Arrangements of devices for discharging [N9511]
- F27B9/40 . . Arrangements of controlling or monitoring devices

F27B11/00 **Bell-type furnaces** (for treating metal strips or wire [C21D9/663](#))

F27B13/00 **Furnaces with both stationary charge and progression of heating, e.g. of ring type, of type in which segmental kiln moves over stationary charge**

- F27B13/02 . of multiple-chamber type with permanent partitions; Combinations of furnaces
- F27B13/04 . of single-chamber type with temporary partitions
- F27B13/06 . Details, accessories, or equipment peculiar to furnaces of this type
- F27B13/08 . . Casings
- F27B13/10 . . . Arrangements of linings
- F27B13/12 . . Arrangements of heating devices
- F27B13/14 . . Arrangement of controlling, monitoring, alarm or like devices [N9511]

F27B14/00 **Crucible or pot furnace**

- F27B14/02 . with tilting or rocking arrangements ([F27B14/04](#) takes precedence)
- F27B14/04 . adapted for treating the charge in vacuum or special atmosphere
- F27B14/06 . heated electrically, e.g. induction crucible furnaces with or without any other source of heat ([F27B14/04](#) takes precedence)
- F27B14/06D . . [N: Induction furnaces]
- F27B14/06D1 . . . [N: Skull melting type]
- F27B14/06D2 . . . [N: Channel type]
- F27B14/08 . Details peculiar to crucible or pot furnaces
- F27B14/08B . . [N: Charging or discharging devices]
- F27B14/10 . . Crucibles

- F27B14/12 . . . Covers therefor
- F27B14/14 . . Arrangements of heating devices
- F27B14/14B . . . [N: Heating of the crucible by convection of combustion gases]
- F27B14/20 . . Arrangement of controlling, monitoring, alarm or like devices [N9511]

F27B15/00 **Fluidised-bed furnaces; Other furnaces using or treating finely-divided materials in dispersion** [N: (apparatus in general for carrying out chemical or physical processes in a fluidised bed reactor [B01J8/24](#) to [B01J8/44](#))]

- F27B15/00B . [N: Cyclones or chain of cyclones]
- F27B15/00C . [N: Equipment for treating dispersed material falling under gravity with ascending gases]
- F27B15/02 . Details, accessories, or equipment peculiar to furnaces of these types
- F27B15/04 . . Casings; Supports therefor
- F27B15/06 . . . Arrangements of linings
- F27B15/08 . . Arrangements of devices for charging [C9511]
- F27B15/09 . . Arrangements of devices for discharging [N9511]
- F27B15/10 . . Arrangements of air or gas supply devices
- F27B15/12 . . Arrangements of dust collectors
- F27B15/14 . . Arrangements of heating devices
- F27B15/16 . . Arrangements of cooling devices
- F27B15/18 . . Arrangements of controlling devices
- F27B15/20 . . Arrangements of monitoring devices, of indicators, of alarm devices

F27B17/00 **Furnaces of a kind not covered by any preceding group** (structural combinations of furnaces [F27B19/02](#))

- F27B17/00A . [N: Open field furnace for burning bricks]
- F27B17/00B . [N: Chamber type furnaces]
- F27B17/00B1 . . [N: Especially adapted for treating semiconductor wafers]
- F27B17/00B2 . . [N: the floor of the furnaces consisting of the support carrying the charge, e.g. car type furnaces]
- F27B17/00B3 . . [N: specially adapted for burning bricks or pottery ([F27B17/00B2](#) takes precedence)]
- F27B17/00B3B . . . [N: with cylindrical chambers]
- F27B17/00B3B2 [N: with superposed cylindrical chambers]
- F27B17/00B3C . . . [N: arrangement of the charge, e.g. bricks]
- F27B17/00B3D . . . [N: Heating devices therefor]
- F27B17/00B4 . . [N: with means for circulating the atmosphere]
- F27B17/02 . specially designed for laboratory use
- F27B17/02A . . [N: for dental workpieces]

F27B19/00 **Combinations of furnaces of kinds not covered by a single preceding main group**

F27B19/02 . combined in one structure

F27B19/04 . arranged for associated working

F27B21/00 **Open or uncovered sintering apparatus; Other heat-treatment apparatus of like construction**

F27B21/02 . Sintering grates or tables

F27B21/04 . Sintering pots or sintering pans

F27B21/06 . Endless-strand sintering machines