

CPC COOPERATIVE PATENT CLASSIFICATION

F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

LIGHTING; HEATING

F27 FURNACES; KILNS; OVENS; RETORTS (NOTES omitted)

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](#).

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 Casings; Linings; Walls; Roofs (refractory materials [C04B](#); firebridges for combustion chambers [F23M 3/00](#))

1/0003 . {Linings or walls}

NOTE

not used, see subgroups

1/0006 . . {Linings or walls formed from bricks or layers with a particular composition or specific characteristics}

1/0009 . . . {Comprising ceramic fibre elements}

1/0013 {the fibre elements being in the form of a folded blanket or a juxtaposition of folded blankets}

1/0016 {Interleaved multiple folded blankets}

1/002 {the fibre elements being composed of adjacent separate strips}

1/0023 . . {Linings or walls comprising expansion joints or means to restrain expansion due to thermic flows}

1/0026 . . . {the expansion joint being a resilient element, e.g. a metallic plate between two bricks}

1/003 . . {Linings or walls comprising porous bricks}

1/0033 . . {Linings or walls comprising heat shields, e.g. heat shields (shields protecting the charge [F27D 5/00](#))}

1/0036 . . {Linings or walls comprising means for supporting electric resistances in the furnace}

1/004 . . {Linings or walls comprising means for securing bricks}

1/0043 . {Floors, hearths}

2001/0046 . {Means to facilitate repair or replacement or prevent quick wearing (repairing linings [F27D 1/16](#))}

2001/005 . . {Removable part or structure with replaceable elements}

2001/0053 . . {Furnace constructed in modules (tunnel furnaces with add-on modules [F27B 9/029](#))}

2001/0056 . . {Aspects of construction intended to prevent wear}

2001/0059 . {Construction elements of a furnace}

2001/0063 . . {Means to strengthen a part}

2001/0066 . . {Movable or removable parts (removable parts for replacement because of wearing [F27D 2001/005](#))}

2001/0069 . . {Means to prevent heat conduction (heat shields [F27D 1/0033](#))}

2001/0073 . . . {Surrounding protection around the furnace, e.g. covers, circulation of gas}

2001/0076 . . {comprising a corrugated sheet}

2001/0079 . {Means to assemble at least two parts of a furnace or of any device or accessory associated to its use (assembling elements for linings parts [F27D 1/145](#))}

2001/0083 . . {Means to assemble a moving part to a fixed one (movements due to thermal expansion [F27D 1/0003](#); movements of the cover [F27D 1/18](#); movements of the container or of the support of the charge [F27D 2003/0085](#))}

2001/0086 . . . {the moving part being in rotation}

2001/0089 . . . {the moving part being in translation}

2001/0093 . . . {the moving part being hinged to the fixed one}

2001/0096 . . . {the moving part staying in the same plane}

1/02 . Crowns; Roofs

1/021 . . {Suspended roofs}

1/022 . . . {Parts thereof, e.g. noses, arches}

1/024 . . . {having an anchored layer of lining}

1/025 . . {Roofs supported around their periphery, e.g. arched roofs}

1/027 . . . {Skew backs}

1/028 . . . {Means to prevent deformation of the arch}

1/04 . characterised by the form {, e.g. shape} of the bricks or blocks used

1/042 . . {Bricks shaped for use in regenerators}

1/045 . . {Bricks for lining cylindrical bodies, e.g. skids, tubes}

2001/047	. . . {Lining of cylindrical vessels}	1/1866	. . . {Door-frames}
1/06	. . Composite bricks or blocks {, e.g. panels, modules}	2001/1875	. . . {Hanging doors and walls (movable partitions F27D 2099/0071)}
1/063	. . . {Individual composite bricks or blocks}	2001/1883	. . . . {Hanging curtains}
1/066	. . . . {Individual composite bricks or blocks made from hollow bricks filled up with another material}	2001/1891	. . . {Doors for separating two chambers in the furnace}
1/08	. . . Bricks or blocks with internal reinforcement or metal backing		
1/10	. Monolithic linings; Supports therefor	3/00	Charging; Discharging; Manipulation of charge (moving charge through a furnace F27B 9/14)
	NOTE	2003/0001	. {Positioning the charge}
	{supports are classified in F27D 1/14 }	2003/0002	. . {involving positioning devices, e.g. buffers, buffer zones (involving sensors F27D 2019/0071 ; involving sequence controllers F27D 2019/0059 ; involving spacers F27M 2002/016)}
1/12	. incorporating cooling arrangements (constructions of tube assemblies in general F28)	2003/0003	. . {involving a system for aligning the articles through a lateral guidance, e.g. funnel}
1/14	. Supports for linings (F27D 1/10 takes precedence)	2003/0004	. . {involving devices for measuring the article, the stack of articles or the height of the furnace passage or for adjusting the height of the passage to the charge or for putting the articles in the same position}
1/141	. . {Anchors therefor}	2003/0006	. . {Particulate materials}
1/142	. . . {Anchors made from ceramic material}	2003/0007	. . . {Circular distribution}
1/144	. . {Supports for ceramic fibre materials}	2003/0008	. . . {Longitudinal distribution}
1/145	. . {Assembling elements}	2003/0009	. . . {Separation of different types of fines, e.g. by a blower}
1/147	. . . {for bricks}	2003/001	. . . {Series of dispensers or separation in two or more parts}
1/148	. . . . {Means to suspend bricks}	2003/0012	. . {Working with piles}
1/16	. Making or repairing linings {increasing the durability of linings or breaking away linings}	2003/0013	. . . {Unstacking or making stacks}
2001/1605	. . {Repairing linings}	2003/0014	. . {involving the use of magazines}
2001/161	. . . {Hot repair}	2003/0015	. . . {the magazine being vertical}
2001/1615	. . . {through a hole in the casing, e.g. injecting refractory from outside the vessel}	2003/0016	. . . {the magazine being a rotary device}
1/1621	. . {Making linings by using shaped elements, e.g. bricks}	2003/0018	. . {comprising means to introduce or extract the charge in series of separate containers or zones}
1/1626	. . {Making linings by compacting a refractory mass in the space defined by a backing mould or pattern and the furnace wall}	2003/0019	. . . {simultaneously}
2001/1631	. . . {using an expandable core}	2003/002	. . {Transforming a single row in a multiple row}
1/1636	. . {Repairing linings by projecting or spraying refractory materials on the lining}	3/0021	. {of ceramic ware}
1/1642	. . . {using a gunning apparatus}	3/0022	. . {Disposition of the charge}
1/1647	. . . . {the projected materials being partly melted, e.g. by exothermic reactions of metals (Al, Si) with oxygen}	3/0024	. {of metallic workpieces}
1/1652	. . . . . {Flame guniting; Use of a fuel}	3/0025	. {Charging or loading melting furnaces with material in the solid state}
2001/1657	. . . . . {Solid fuel}	3/0026	. . {Introducing additives into the melt}
2001/1663	. . . . . {Fluid fuel, e.g. gas}	3/0027	. . {Charging vertically with corbs}
1/1668	. . . . . {Plasma guniting}	3/0028	. . . {Corbs}
1/1673	. . . {applied centrifugally}	3/003	. . {Charging laterally, e.g. with a charging box}
1/1678	. . {Increasing the durability of linings; Means for protecting}	3/0031	. . {Charging with tiltable dumpers}
1/1684	. . . {by a special coating applied to the lining}	3/0032	. . {using an air-lock}
2001/1689	. . . . {obtained from materials added to the melt}	3/0033	. {charging of particulate material}
1/1694	. . {Breaking away the lining or removing parts thereof}	2003/0034	. {Means for moving, conveying, transporting the charge in the furnace or in the charging facilities}
1/18	. Door frames; Doors, lids, removable covers	2003/0036	. . {comprising inflatable or extendable parts}
1/1808	. . {Removable covers}	2003/0037	. . {comprising friction surfaces}
1/1816	. . . {Removable covers specially adapted for arc furnaces}	2003/0038	. . {comprising shakers}
2001/1825	. . . {Means for moving the cover}	2003/0039	. . {comprising magnetic means}
2001/1833	. . . . {comprising a screw mechanism}	2003/004	. . . {Magnetic lifters}
2001/1841	. . . . {comprising means for rotating or moving the cover in a horizontal or quasi horizontal plane}	2003/0042	. . {comprising roller trains}
2001/185	. . . . {comprising means for tilting the cover}	2003/0043	. . . {at least one of them being driven separately}
1/1858	. . {Doors}	2003/0044	. . . {at least one of them being removable}
		2003/0045	. . . {Use of rollable bodies, e.g. balls}
		2003/0046	. . {comprising one or more movable arms, e.g. forks}
		2003/0048	. . . {Walking beams}

- 2003/0049 {comprising eccentrics or lever arms}
- 2003/005 {comprising ramps}
- 2003/0051 . . {comprising means to pick up the charge and put it down}
- 2003/0053 . . {comprising a device for charging with the doors closed}
- 2003/0054 . . {Means to move molten metal, e.g. electromagnetic pump}
- 2003/0055 . . . {with flow regulation}
- 2003/0056 . . . {through a syphon in a vacuum chamber, e.g. involving aspiration or pressure on the bath}
- 2003/0057 . . {Fast-outlet or inlet means}
- 2003/0059 . . {comprising tracks, e.g. rails and wagon}
- 2003/006 . . . {with a return track}
- 2003/0061 . . . {with means for changing track}
- 2003/0062 . . {using devices for tilting or rocking the charge}
- 2003/0063 . . {comprising endless belts}
- 2003/0065 . . {Lifts, e.g. containing the bucket elevators}
- 2003/0066 . . {comprising scrapers or systems to pull out}
- 2003/0067 . . {comprising conveyors where the translation is communicated by friction from at least one rotating element, e.g. two opposed rotations combined}
- 2003/0068 . . {comprising clamps or tongs}
- 2003/0069 . . {the device being suspended, e.g. from a crane}
- 2003/0071 . . {Use of a comminuting device, e.g. grinding mill}
- 2003/0072 . . {Use of a pinion and a rack}
- 2003/0073 . . {the charge floating on a liquid, e.g. water}
- 2003/0074 . . . {floating on water}
- 2003/0075 . . {Charging or discharging vertically, e.g. through a bottom opening}
- 2003/0077 . . {Use of centrifugal devices}
- 2003/0078 . . {comprising jacks, e.g. hydraulic jacks}
- 2003/0079 . . {Use of cams}
- 2003/008 . . {comprising cross-beams or gantry cranes}
- 2003/0081 . . {Series of little rams}
- 2003/0083 . . {Means for stirring the charge}
- 3/0084 . {Charging; Manipulation of SC or SC wafers}
- 2003/0085 . {Movement of the container or support of the charge in the furnace or in the charging facilities}
- 2003/0086 . . {Up or down}
- 2003/0087 . . {Rotation about a vertical axis}
- 2003/0089 . . {Rotation about a horizontal or slightly inclined axis}
- 2003/009 . . . {Oscillations about a horizontal axis; Rocking}
- 2003/0091 . . {Horizontally}
- 2003/0092 . . . {with a reciprocating movement}
- 2003/0093 . . {Movement on a slope}
- 2003/0095 . . {the advancement being step by step}
- 2003/0096 . . {Advancement along the longitudinal axis of the workpiece}
- 2003/0097 . . {Advancement along an axis perpendicular to the axis of the workpiece}
- 2003/0098 . . . {Workpiece rolling on its support}
- 3/02 . Skids or tracks for heavy objects
- 3/022 . . {Skids}
- 3/024 . . . {Details of skids, e.g. riders}
- 3/026 . . {transport or conveyor rolls for furnaces; roller rails (conveyor rolls in general [B65G](#))}
- 3/028 . . . {Roller rails or succession of small sized rollers}
- 3/04 . Ram or pusher apparatus
- 2003/045 . . {used to pull the charge}
- 3/06 . Charging or discharging machines on travelling carriages
- 3/08 . Screw feeders; Screw dischargers
- 3/10 . Charging directly from hoppers or shoots
- 2003/105 . . {using shutters}
- 3/12 . Travelling or movable supports or containers for the charge
- 2003/121 . . {Band, belt or mesh}
- 2003/122 . . . {Band made from longitudinal wires or bars}
- 3/123 . . {Furnace cars}
- 2003/124 . . {Sleds; Transport supports}
- 2003/125 . . {Charging cars, lift trolleys}
- 2003/126 . . . {with long arms, charging forks}
- 2003/127 . . . {for carrying pots ([slag pots F27D 2099/0095](#))}
- 2003/128 . . . {for carrying stacks of articles, e.g. bricks}
- 3/14 . Charging or discharging liquid or molten material
- 3/145 . . {Runners therefor}
- 3/15 . Tapping equipment; Equipment for removing {or retaining} slag
- 3/1509 . . {Tapping equipment}
- 3/1518 . . . {Tapholes}
- 3/1527 . . . {Taphole forming equipment, e.g. boring machines, piercing tools}
- 3/1536 . . . {Devices for plugging tap holes, e.g. plugs stoppers}
- NOTE**
{ the devices fixed permanently to the melt container are classified in [F27D 3/1509](#)}
- 3/1545 . . {Equipment for removing or retaining slag}
- 3/1554 . . . {for removing the slag from the surface of the melt}
- 3/1563 {by the use of scrapers}
- 3/1572 {by suction}
- 3/1581 {by the use of blowers}
- 3/159 . . . {for retaining slag during the pouring of the metal or retaining metal during the pouring of the slag}
- 3/16 . Introducing a fluid jet or current into the charge {([porous elements for gas flushing of molten metals B22D 1/005](#))}
- 2003/161 . . {through a porous element}
- 2003/162 . . {the fluid being an oxidant or a fuel}
- 2003/163 . . . {the fluid being an oxidant}
- 2003/164 {Oxygen}
- 2003/165 . . . {the fluid being a fuel}
- 2003/166 . . {the fluid being a treatment gas}
- 2003/167 . . {the fluid being a neutral gas}
- 2003/168 . . {through a lance}
- 2003/169 . . . {Construction of the lance, e.g. lances for injecting particles}
- 3/18 . Charging particulate material using a fluid carrier
- 2003/185 . . {Conveying particles in a conduct using a fluid}
- 5/00 Supports, screens, or the like for the charge within the furnace (travelling or movable supports [F27D 3/12](#))**
- 5/0006 . {Composite supporting structures}
- 5/0012 . . {Modules of the sagger or setter type; Supports built up from them}
- 5/0018 . . {Separating elements}
- 5/0025 . . {assembled to present a three-point support}

5/0031	. {Treatment baskets for ceramic articles (for metallic articles C21D 9/0025)}	2009/0067	. . {Cooling element inlet and outlet tubes}
5/0037	. {Supports specially adapted for semi-conductors}	2009/007	. {Cooling of charges therein}
5/0043	. {Supports specially adapted for dental prosthesis}	2009/0072	. . {the cooling medium being a gas}
5/005	. {Supports specially adapted for holding elongated articles in an upright position, e.g. sparking plugs}	2009/0075	. . . {in direct contact with the charge}
5/0056	. {Hangers}	2009/0078	. . . {in indirect contact with the charge}
5/0062	. {Shields for the charge (shields for the lining F27D 1/0033)}	2009/0081	. . {the cooling medium being a fluid (other than a gas in direct or indirect contact with the charge)}
5/0068	. {Containers}	2009/0083	. . . {the fluid being water}
2005/0075	. . {Pots, e.g. slag pots, ladles}	2009/0086	. . . . {applied in spray form}
2005/0081	. {Details}	2009/0089	. . {Quenching}
2005/0087	. . {Means to prevent the adherence of the charge}	2009/0091	. . {in a fluidised bed of cooling elements}
2005/0093	. . {Means to maintain the form of the article}	2009/0094	. . {making use of already cooled material, e.g. forming a layer}
7/00	Forming, maintaining, or circulating atmospheres in heating chambers	2009/0097	. . . {the charge being used as a coolant}
7/02	. Supplying steam, vapour, gases, or liquids	11/00	Arrangement of elements for electric heating in or on furnaces (electric heating per se H05B)
2007/023	. . {Conduits}	11/02	. Ohmic resistance heating
2007/026	. . {Dampers (registers for granular flows F27D 2099/0071)}	11/04	. . with direct passage of current through the material being heated
7/04	. Circulating atmospheres by mechanical means	11/06	. Induction heating, i.e. in which the material being heated, or its container or elements embodied therein, form the secondary of a transformer
2007/045	. . {Fans}	11/08	. Heating by electric discharge, e.g. arc discharge
7/06	. Forming or maintaining special atmospheres or vacuum within heating chambers (F27D 7/02 takes precedence)	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)
2007/063	. . {Special atmospheres, e.g. high pressure atmospheres}	11/12	. with electromagnetic fields acting directly on the material being heated
2007/066	. . {Vacuum}	13/00	Apparatus for preheating charges; Arrangements for preheating charges
9/00	Cooling of furnaces or of charges therein (F27D 1/00, F27D 3/00 take precedence)	13/002	. {Preheating scrap (preheating of scrap for steel making C21C 5/565)}
2009/0002	. {Cooling of furnaces}	13/005	. {Drying of green clay prior to baking}
2009/0005	. . {the cooling medium being a gas}	2013/007	. {using a rotary furnace}
2009/0008	. . . {Ways to inject gases against surfaces}	15/00	Handling or treating discharged material; Supports or receiving chambers therefor
2009/001	. . {the cooling medium being a fluid other than a gas}	15/02	. Cooling
2009/0013	. . . {the fluid being water}	15/0206	. . {with means to convey the charge}
2009/0016	. . . . {Water-spray}	15/0213	. . . {comprising a cooling grate}
2009/0018	. . {the cooling medium passing through a pattern of tubes}	15/022	. . . . {grate plates}
2009/0021	. . . {with the parallel tube parts close to each other, e.g. a serpentine}	2015/0226	. . . . . {Support, fixation of the grate}
2009/0024	. . . . {with contiguous tubes, which may be separately welded one to the other}	2015/0233	. . . . . {with gas, e.g. air, supply to the grate}
2009/0027	. . . . {linked by elements}	2015/024	. . . . {Multiple grates}
2009/0029	. . . . {fixed, e.g. welded to a supporting surface}	2015/0246	. . . . {Combination of fixed and movable grates}
2009/0032	. . . {integrated with refractories in a panel}	2015/0253	. . . . . {Gratin grates}
2009/0035	. . . {arranged for the covering of a cylindrical surface}	2015/026	. . . . {Means to discharge the fines}
2009/0037	. . {the cooling medium passing a radiator}	15/0266	. . . {on an endless belt}
2009/004	. . {the cooling medium passing a waterbox}	15/0273	. . . {on a rotary hearth}
2009/0043	. . . {Insert type waterbox, e.g. cylindrical or flat type}	15/028	. . . {comprising a rotary drum}
2009/0045	. . {the cooling medium passing a block, e.g. metallic}	15/0286	. . {in a vertical, e.g. annular, shaft (shafts including rotating parts F27D 15/0273)}
2009/0048	. . . {incorporating conduits for the medium}	2015/0293	. . . {including rotating parts}
2009/0051	. . {comprising use of studs to transfer heat or retain the liner}	17/00	Arrangements for using waste heat (heat-exchangers per se F28); Arrangements for using, or disposing of, waste gases
2009/0054	. . . {adapted to retain formed bricks}	17/001	. {Extraction of waste gases, collection of fumes and hoods used therefor (in general B08B 15/00)}
2009/0056	. . {Use of high thermoconductive elements}		
2009/0059	. . . {made mostly from graphite}		
2009/0062	. . . {made from copper or copper alloy}		
2009/0064	. . {Cooling of furnace arches}		

17/002	. . {Details of the installations, e.g. fume conduits or seals}	21/00	Arrangements of monitoring devices;
17/003	. . {of waste gases emanating from an electric arc furnace}		Arrangements of safety devices
17/004	. {Systems for reclaiming waste heat}	2021/0007	. {Monitoring the pressure}
2017/005	. . {including pyrolysing the waste gases}	21/0014	. {Devices for monitoring temperature}
2017/006	. . {using a boiler}	21/0021	. {Devices for monitoring linings for wear}
2017/007	. . {including regenerators}	21/0028	. {Devices for monitoring the level of the melt}
17/008	. {cleaning gases}	21/0035	. {Devices for monitoring the weight of quantities added to the charge}
2017/009	. {Cyclone for separating fines from gas}	2021/0042	. . {Monitoring the level of the solid charge}
19/00	Arrangements of controlling devices	2021/005	. {Devices for monitoring thermal expansion}
2019/0003	. {Monitoring the temperature or a characteristic of the charge and using it as a controlling value}	2021/0057	. {Security or safety devices, e.g. for protection against heat, noise, pollution or too much duress; Ergonomic aspects}
2019/0006	. {Monitoring the characteristics (composition, quantities, temperature, pressure) of at least one of the gases of the kiln atmosphere and using it as a controlling value}	2021/0064	. . {against noises}
2019/0009	. . {Monitoring the pressure in an enclosure or kiln zone}	2021/0071	. . {against explosions}
2019/0012	. . {Monitoring the composition of the atmosphere or of one of their components}	2021/0078	. . {against the presence of an undesirable element in the atmosphere of the furnace}
2019/0015	. . . {Monitoring the composition of the exhaust gases or of one of its components}	2021/0085	. . {against molten metal, e.g. leakage or splashes}
2019/0018	. . {Monitoring the temperature of the atmosphere of the kiln}	2021/0092	. . {against a jam in the transport line or a production interruption}
2019/0021	. . . {Monitoring the temperature of the exhaust gases}	21/02	. Observation or illuminating devices
2019/0025	. . {Monitoring the temperature of a part or of an element of the furnace structure}	2021/023	. . {Closable inserting openings, e.g. for the introduction of lances, sensors or burners}
2019/0028	. {Regulation}	2021/026	. . {using a video installation}
2019/0031	. . {through control of the flow of the exhaust gases}	21/04	. Arrangements of indicators or alarms
2019/0034	. . {through control of a heating quantity such as fuel, oxidant or intensity of current}	25/00	Devices {or methods} for removing incrustations {, e.g. slag, metal deposits, dust; Devices or methods for preventing the adherence of slag}
2019/0037	. . . {Quantity of electric current}	25/001	. {comprising breaking tools, e.g. hammers, drills, scrapers (breaking away linings F27D 1/1694 ; boring machines for forming tapholes F27D 3/1527)}
2019/004	. . . {Fuel quantity}	25/003	. . {used for punching tuyeres}
2019/0043	. . . . {Amount of air or O ₂ to the burner}	25/005	. . {used for cleaning the channels of induction furnaces}
2019/0046	. . . . {Amount of secondary air to the burner}	25/006	. {using explosives}
2019/005	. . . {Amount of heat given to the charge via a controlled heat exchanger}	25/008	. {using fluids or gases, e.g. blowers, suction units}
2019/0053	. . . . {involving heating the charge in a fluid or fluidised medium}	27/00	Stirring devices for molten material (F27D 3/14 takes precedence)
2019/0056	. . {Regulation involving cooling}	2027/002	. {Gas stirring}
2019/0059	. . {Regulation involving the control of the conveyor movement, e.g. speed or sequences}	27/005	. {Pumps}
2019/0062	. . . {control of the workpiece stay in different zones}	27/007	. . {Pulsating pumps}
2019/0065	. . {Regulation involving controlled section modification}	99/00	Subject matter not provided for in other groups of this subclass
2019/0068	. . {Regulation involving a measured inflow of a particular gas in the enclosure}	99/0001	. {Heating elements or systems}
2019/0071	. . {Regulation using position sensors}	99/0003	. . {with particulate fuel, e.g. aspects relating to the feeding}
2019/0075	. . {Regulation of the charge quantity}	99/0005	. . {Injecting liquid fuel}
2019/0078	. . {Regulation of the speed of the gas through the charge}	99/0006	. . {Electric heating elements or system}
2019/0081	. {Controlling an air-lock chamber}	2099/0008	. . . {Resistor heating}
2019/0084	. {Controlling closure systems, e.g. doors}	2099/001	. . . . {the container being the resistor}
2019/0087	. {Automatisation of the whole plant or activity}	2099/0011	. . . . {The resistor heats a radiant tube or surface}
2019/009	. . {Use of codes, e.g. bar codes}	2099/0013	. . . . . {immersed in the charge}
2019/0093	. {Maintaining a temperature gradient}	2099/0015	. . . {Induction heating}
2019/0096	. {involving simulation means, e.g. of the treating or charging step}	2099/0016	. . . . {Different magnetic fields, e.g. two coils, different characteristics of the same coil along its length or different parts of the same coil used}
		2099/0018	. . . . {Relative movement of the coil and the charge during the heat treatment}
		2099/002	. . . . {Core heating}

2099/0021	. . .	{ Arc heating }
2099/0023	. . . .	{ DC arc heating }
2099/0025	. . .	{ Currents through the charge }
2099/0026	. . .	{ with a generator of electromagnetic radiations }
2099/0028	. . .	{ Microwave heating }
2099/003	. . .	{ Bombardment heating, e.g. with ions or electrons }
2099/0031	. . .	{ Plasma-torch heating }
99/0033	. .	{ using burners (manufacture of steel in an electric arc furnace equipped with burners C21C 5/5217) }
99/0035	. . .	{ Heating indirectly through a radiant surface }
2099/0036	. . .	{ immersed in the charge }
2099/0038	. . .	{ removable }
2099/004	. . .	{ directed upon the charge, e.g. vertically }
2099/0041	. . . .	{ with a small angle, e.g. almost tangentially }
2099/0043	. . .	{ Impulse burner }
2099/0045	. . .	{ Radiant burner }
2099/0046	. . .	{ with incomplete combustion, e.g. reducing atmosphere }
2099/0048	. . . .	{ Post- combustion }
2099/005	. . .	{ Catalytic burner }
2099/0051	. . .	{ Burning waste as a fuel }
2099/0053	. . .	{ Burner fed with preheated gases }
2099/0055	. . . .	{ Fuel }
2099/0056	. . . .	{ Oxidant }
2099/0058	. .	{ Means for heating the charge locally }
2099/006	. .	{ Auxiliary heating, e.g. in special conditions or at special times }
2099/0061	. .	{ Indirect heating }
2099/0063	. . .	{ Liquid }
2099/0065	. . .	{ Gas }
2099/0066	. . .	{ Particles or solid bodies, e.g. bed of particles }
2099/0068	. .	{ Heating directly by circulation of a fluid other than a gas or by particles }
99/007	. .	{ Partitions }
2099/0071	. .	{ Partitions used as registers }
99/0073	. .	{ Seals }
99/0075	. .	{ Gas curtain seals }
99/0076	. .	{ 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 }
2099/0078	. .	{ Means to minimize the leakage of the furnace atmosphere during charging or discharging }
2099/008	. . .	{ Using an air-lock (use of air-locks for charging smelt furnaces F27D 3/0032) }
2099/0081	. .	{ Joint }
2099/0083	. .	{ Drives; Auxiliary drives }
2099/0085	. .	{ Accessories }
2099/0086	. .	{ Filters, e.g. for molten metals }
2099/0088	. .	{ Apparatus to cut metal, e.g. logs, in billets }
2099/009	. .	{ Bumpers }
2099/0091	. .	{ Means to grease or oil }
2099/0093	. .	{ Means to collect ashes or dust, e.g. vessels }
2099/0095	. .	{ Means to collect the slag or spilled metal, e.g. vessels (cars to carry the pots F27D 2003/127) }
2099/0096	. .	{ Presses }
2099/0098	. .	{ Means for moving the furnace }

2201/00 Manipulation of furnace parts**NOTE**

Indexing code [F27D 2201/00](#) can be followed by additional indexing codes preceded by a + sign. These additional indexing codes are chosen from codes of subclass [F27D](#) describing similar manipulations of furnace charges.

Example: [F27D 2201/00](#) + [F27D 2003/0036](#)