

ECLA EUROPEAN CLASSIFICATION

- F24J** **PRODUCING OR USE OF HEAT NOT OTHERWISE PROVIDED FOR**
(materials therefor [C09K5/00](#); engines or other mechanisms for producing mechanical power from heat, see the relevant classes, e.g. F03G for using natural heat)
- F24J1/00** **Apparatus or devices using heat produced by exothermal chemical reactions other than by combustion** (for cooking-vessels [A47J36/28](#); self-heating compresses [A61F \[N: A61F7/04C\]](#); materials for the production of heat or cold involving non-reversible chemical reactions, other than by combustion, when used [C09K5/18](#)) [[C9906](#)]
- F24J2/00** **Use of solar heat, e.g. solar heat collectors** (distillation or evaporation of water using solar energy [C02F1/14](#); devices for producing mechanical power from solar energy [F03G6/00](#); semiconductor devices adapted for converting solar energy into electrical energy [H01L25/00](#), [H01L31/04](#); semiconductor devices including arrays of solar cells using heat energy [H01L31/058](#); generators in which light radiation is directly converted into electrical energy [H02N6/00](#))
- F24J2/00A . [[N: Passive solar heat collectors](#)]
- F24J2/00B . [[N: Solar heat collectors absorbing essentially direct solar radiation combined with a solar heat collector absorbing concentrated radiation](#)]
- F24J2/00E . [[N: Solar heat collector using additional ambient air heat or another heat source, e.g. electrical](#)]
- F24J2/02 . Solar heat collectors with support for article heated, e.g. stoves, ranges, crucibles, furnaces or ovens using solar heat
- F24J2/04 . Solar heat collectors having working fluid conveyed through collector
- F24J2/04B . . [[N: Solar collectors integrated in fixed constructions, e.g. in buildings](#)] [[N1205](#)]
- F24J2/04B4 . . . [[N: in the form of a fence, a balustrade or a handrail](#)] [[N1205](#)]
- F24J2/04B6 . . . [[N: in the form of a window](#)]
- F24J2/04B8 . . . [[N: in the form of a floor construction](#)]
- F24J2/04B10 . . . [[N: in the form of a façade construction](#)]
- F24J2/04B12 . . . [[N: in the form of a roof construction](#) ([F24J2/04B14](#) takes precedence)]
- F24J2/04B14 . . . [[N: in the form of shingles or tiles](#)]
- F24J2/04C . . [[N: using pools or ponds](#)] [[N1205](#)]
- F24J2/04C2 . . . [[N: Salt gradient solar ponds](#)] [[N1205](#)]
- F24J2/04C4 . . . [[N: Floating solar collectors or covers](#)] [[N1205](#)]
- F24J2/04D . . [[N: having circuits for more than one working fluid](#) ([F24J2/30](#) takes precedence)] [[N1205](#)]
- F24J2/04E . . [[N: having two or more passages for the same working fluid](#) ([F24J2/20](#), [F24J2/24](#) take precedence)] [[N1205](#)]
- F24J2/04F . . [[N: Solar heat collectors having absorber surfaces of a particular form](#)] [[N1205](#)]
- F24J2/04F2 . . . [[N: having two or more absorber surfaces](#)] [[N1205](#)]
- F24J2/05 . . surrounded by a transparent enclosure, e.g. evacuated solar collectors

- F24J2/05B . . . [N: the enclosure being cylindrical]
- F24J2/06 . . . having concentrating elements (optical elements or systems per se [G02B](#))
- F24J2/06D . . . [N: Prisms]
- F24J2/06E . . . [N: Fluorescent material]
- F24J2/06F . . . [N: Light guides]
- F24J2/07 . . . Receivers working at high temperature, e.g. for solar power plants [N9502]
- F24J2/08 . . . having lenses as concentrating elements
- F24J2/08B [N: having discontinuous faces, e.g. Fresnel lenses]
- F24J2/10 . . . having reflectors as concentrating elements
- F24J2/10B [N: having discontinuous faces]
- F24J2/10C [N: flexible (F24J2/12C, F24J2/14C take precedence)] [N1205]
- F24J2/10D [N: characterised by the material or the construction of the reflector] [N1205]
- F24J2/12 parabolic
- F24J2/12C [N: flexible]
- F24J2/13 hemispherical [N9502]
- F24J2/14 semi-cylindrical or cylindro-parabolic
- F24J2/14C [N: flexible]
- F24J2/15 conical [N9502]
- F24J2/16 having flat plates
- F24J2/18 spaced, opposed interacting reflecting surfaces
- F24J2/20 . . . the working fluid being conveyed between plates
- F24J2/20B [N: having conduits of plastic material]
- F24J2/20C [N: having conduits formed by paired plates and internal partition means] [N1205]
- F24J2/20D [N: having conduits formed by paired plates, only one of which is plane] [N1205]
- F24J2/20E [N: having conduits formed by paired non-plane plates] [N1205]
- F24J2/20F [N: having curved plate-like conduits, e.g. semi-spherical]
- F24J2/20H [N: having conduits formed by inflation of portions of a pair of joined sheets]
- F24J2/22 . . . having extended surfaces, e.g. protrusions, corrugations ([F24J2/28](#) takes precedence)
- F24J2/23 . . . the working fluid trickling freely [N: or flowing in a continuous film] over collector elements
- F24J2/24 . . . the working fluid being conveyed through tubular heat absorbing conduits
- F24J2/24B [N: the tubular conduits being integrated in a block; the tubular conduits touching each other] [N1205]
- F24J2/24D [N: the tubular conduits being of plastic material]
- F24J2/24E [N: the tubular conduits are not fixed to heat absorbing plates and are not touching each other]
- F24J2/24E2 [N: the conduits being parallel to each other]
- F24J2/24E4 [N: the conduits being helically coiled]
- F24J2/24E6 [N: the conduits being spirally coiled]
- F24J2/24E8 [N: the conduits being otherwise bent, e.g. zig-zag]
- F24J2/26 . . . having extended surfaces, e.g. protrusions ([F24J2/28](#) takes precedence)]
- F24J2/26B [N: the conduits being parallel to each other]

- F24J2/26D [N: the conduits being spirally coiled]
- F24J2/26E [N: the conduits being otherwise bent, e.g. zig-zag]
- F24J2/28 . . having permeable mass, foraminous or porous materials
- F24J2/30 . . with means to exchange heat between plural fluids
- F24J2/32 . . having evaporator and condenser section, e.g. heat pipe
- F24J2/34 . . having heat storage mass
- F24J2/34B . . . [N: Hot water storage]

- F24J2/36 . Rollable or foldable collector units

- F24J2/38 . employing tracking means ([F24J2/02](#), [F24J2/06](#) take precedence; direction- finders for determining the direction from which electromagnetic waves are being received [G01S3/78](#) [N: , e.g. solar tracking systems [G01S3/786B](#)]; control of position or direction [G05D3/00](#) [N: , e.g. [G05D3/10B](#)])

- F24J2/40 . Control arrangements; [N: Control of position for tracking [F24J2/38](#)] [C1202]
- F24J2/40B . . [N: responsive to temperature]
- F24J2/40C . . [N: responsive to wind]
- F24J2/40D . . [N: for controlling transmission of solar radiation]

- F24J2/42 . Solar heat systems not otherwise provided for [N: (solar heat systems in greenhouses [A01G9/24C](#); distillation by solar energy [C02F1/14](#); devices for producing mechanical power from solar energy [F03G6/00](#); central heat systems using heat solar energy [F24D11/00C2](#), [F24D11/00D2](#), [F24D11/02C2](#), [F24D11/02D2](#); domestic hot-water supply systems using solar energy [F24D17/00D](#), [F24D17/00F3](#), [F24D17/00F5](#), [F24D17/00F7](#); air-conditioning systems using solar energy [F24F5/00F](#); refrigeration machines, plants or systems using solar energy [F25B27/00B](#); drying solid materials or objects by radiation, e.g. from the sun [F26B3/28](#))] [C0707]

- F24J2/42B . . [N: for swimming pools]
- F24J2/42C . . [N: for showers] [N1205]
- F24J2/44 . . having thermosiphonic circulation

- F24J2/46 . Component parts, details or accessories of solar heat collectors
- F24J2/46B . . [N: Safety or protection arrangements; Arrangements for preventing malfunction; Auxiliary devices, e.g. means for testing (control means [F24J2/40](#))] [N1205]
- F24J2/46B6 . . . [N: Protective covers, lids; closure members ([F24J2/50](#) takes precedence)]
- F24J2/46B10 . . . [N: Means for cleaning or for removing snow] [N1205]
- F24J2/46B18 . . . [N: Means for preventing corrosion or protecting against contaminants, e.g. preventing condensations]
- F24J2/46B18B [N: for draining rain water] [N1205]
- F24J2/46B18C [N: for maintaining vacuum, e.g. by using getters] [N1205]
- F24J2/46B18D [N: for preventing condensation] [N1205]
- F24J2/46B18E [N: for deaerating or degassing the working fluid] [N1205]
- F24J2/46B20 . . . [N: Means for overtemperature protection (arrangements for draining the working fluid: [F24J2/46B23](#)); Means for overpressure protection] [N1205]
- F24J2/46B20B [N: Arrangements for modifying heat collecting features, e.g. by defocusing or by changing the position of heat receiving elements] [N1205]
- F24J2/46B20C [N: Cooling arrangements, e.g. by using external heat dissipating means or internal cooling circuits ([F24J2/46B20D](#) takes precedence)] [N1205]

F24J2/46B20D	. . . .	[N: Arrangements for venting solar collector enclosures] [N1205]
F24J2/46B20P	. . . .	[N: Arrangements for preventing overpressure inside solar collector enclosures (F24J2/46B20D takes precedence)] [N1205]
F24J2/46B20R	. . . .	[N: Arrangements for preventing overpressure inside solar collector circuits] [N1205]
F24J2/46B22	. . . .	[N: Means for freezing protection (arrangements for draining the working fluid: F24J2/46B23)] [N1205]
F24J2/46B23	. . . .	[N: Arrangements for draining the working fluid] [N1205]
F24J2/46B28	. . . .	[N: Arrangements to accommodate differential expansion of solar collector elements] [N1205]
F24J2/46B30	. . . .	[N: Arrangements for protecting solar collectors against adverse weather conditions (F24J2/46B6 takes precedence)] [N1205]
F24J2/46C	. . . .	[N: Casings] [N1205]
F24J2/46C2	. . . .	[N: characterised by using specific material] [N1205]
F24J2/46C2B	. . . .	[N: Plastic materials] [N1205]
F24J2/46C2D	. . . .	[N: Metallic materials] [N1205]
F24J2/46D	. . . .	[N: Means for fluidically interconnecting different solar collectors or for connecting solar connectors with other components; Headers; Fluid distributing means] [N1205]
F24J2/46E	. . . .	[N: Selection of particular working medium (materials for heat transfer C09K5/00)] [N1205]
F24J2/46F	. . . .	[N: Arrangements of sealing means] [N1205]
F24J2/46K	. . . .	[N: Solar heat collectors having absorber surfaces provided with special coatings, e.g. anti-reflective coatings] [N1205]
F24J2/46L	. . . .	[N: Materials for the heat-exchange conduits (F24J2/20B, F24J2/24D, F24J2/48 take precedence)] [N1205]
F24J2/48	. . . .	characterised by absorber material
F24J2/48B	. . . .	[N: of metallic material (F24J2/48F2 takes precedence)]
F24J2/48D	. . . .	[N: of plastic (F24J2/48F4 takes precedence)]
F24J2/48E	. . . .	[N: of ceramic; of concrete; of natural stone (F24J2/48F takes precedence)]
F24J2/48F	. . . .	[N: using absorber coatings (radiation-absorbing paints C09D5/32)]
F24J2/48F2	. . . .	[N: of metallic material]
F24J2/48F4	. . . .	[N: of plastic material]
F24J2/50	. . . .	Transparent coverings
F24J2/50B	. . . .	[N: characterised by using specific material]
F24J2/50B2	. . . .	[N: plastic material]
F24J2/50D	. . . .	[N: using evacuated elements (F24J2/05 takes precedence)] [N1205]
F24J2/51	. . . .	Thermal insulation (F24J2/50 takes precedence)
F24J2/51B	. . . .	[N: characterised by the material]
F24J2/52	. . . .	Arrangement of mountings or supports
F24J2/52A	. . . .	[N: Stationary supporting structures for solar modules; Load-bearing elements for movable supporting structures] [N1204]
F24J2/52A4	. . . .	[N: comprising elongated rigid mounting elements, e.g. mounting profiles or rails for covering a building surface with solar modules; Module frames (F24J2/52A8 takes precedence)] [N1204]
F24J2/52A4B	. . . .	[N: Substantially planar profile assemblies, e.g. grids comprising coplanar

		profiles or stacked profiles] [N1204]
F24J2/52A4B4	. . . . .	[N: comprising profiles of particular shape having in cross-section first and second module supporting portions for coupling adjacent solar modules] [N1204]
F24J2/52A4B6	. . . . .	[N: Substantially coplanar profile assemblies comprising longitudinal profiles laterally coupled with transversal profiles] [N1204]
F24J2/52A4E	. . . . .	[N: Solar module peripheral frames] [N1204]
F24J2/52A6	. . . . .	[N: comprising plate-like mounting elements, e.g. profiled or corrugated plates; Plate-like module frames (F24J2/52A8 takes precedence)] [N1204]
F24J2/52A8	. . . . .	[N: comprising elongated standing elements, e.g. posts, legs; Standing structures for supporting solar modules at defined orientation; Three-dimensional frameworks; Volumetric supporting structures, e.g. box-like elements or shaped bodies] [N1204]
F24J2/52A8B	. . . . .	[N: Posts coupled with upper profiles] [N1204]
F24J2/52A8C	. . . . .	[N: Profile arrangements, e.g. assemblies of base profiles with vertical or inclined profiles, three-dimensional frameworks (F24J2/52A8B takes precedence)] [N1204]
F24J2/52A8D	. . . . .	[N: comprising bent plates or assemblies of plates] [N1204]
F24J2/52A8E	. . . . .	[N: comprising shaped bodies, e.g. molded box-like elements, concrete elements, foamed elements; Massive supporting structures] [N1204]
F24J2/52A8F	. . . . .	[N: Interconnected assemblies of stands; Stands having first and second module supporting portions for coupling adjacent modules] [N1204]
F24J2/52A10	. . . . .	[N: comprising elongated non rigid elements, e.g. straps, wires, ropes] [N1204]
F24J2/52A20	. . . . .	[N: Fixation means, e.g. connectors or fasteners] [N1204]
F24J2/52A20B	. . . . .	[N: Connectors for anchoring solar modules or supporting elements to the ground or to building structures] [N1204]
F24J2/52A20B4	. . . . .	[N: in the form of bent strips or assemblies of strips; Hook-like connectors; Connectors to be mounted between building covering elements] [N1204]
F24J2/52A20B6	. . . . .	[N: for anchoring to protrusions of buildings, e.g. to corrugations or to standing seams] [N1204]
F24J2/52A20B8	. . . . .	[N: Ground anchoring means; Foundations for supporting elements; Massive elements for anchoring supporting structures to the ground or to flat horizontal surfaces] [N1204]
F24J2/52A20C	. . . . .	[N: Connectors for fixing solar modules, or solar module peripheral frames to supporting elements, e.g. to profiled mounting members] [N1204]
F24J2/52A20C2	. . . . .	[N: Solar module side connectors or base connectors] [N1204]
F24J2/52A20C4	. . . . .	[N: Clamping or clipping elements] [N1204]
F24J2/52A20C4B	. . . . .	{7 dots} [N: with clamping action by using screw-threaded elements] [N1204]
F24J2/52A20D	. . . . .	[N: Connectors for coupling adjacent supporting elements together, e.g. profile to profile connectors] [N1204]
F24J2/52A20E	. . . . .	[N: Connectors for coupling adjacent solar modules or solar module peripheral frames together (F24J2/52A20C takes precedence)] [N1204]
F24J2/52A30	. . . . .	[N: comprising means for adjusting the final position or the final orientation of a supporting element relative to another one or relative to a mounting surface; comprising means for compensating mounting tolerances] [N1204]
F24J2/52B	. . . . .	[N: adapted for non-rotary movement]

- F24J2/52C . . . [N: Waterborne solar collectors]
 - F24J2/52C2 [N: Moving platforms]
 - F24J2/52D . . . [N: Airborne solar collectors, e.g. using inflated structures ([F24J2/04B16C](#), [F24J2/52C](#) take precedence)] [N9604]
 - F24J2/54 . . . specially adapted for rotary movement [N: ([F24J2/52C2](#) takes precedence)]
 - F24J2/54B [N: with only one rotation axis] [N0801]
 - F24J2/54B2 [N: with vertical axis] [N0801]
 - F24J2/54B4 [N: with horizontal axis] [N0801]
 - F24J2/54B6 [N: with inclined axis] [N0801]
 - F24J2/54C [N: with two rotation axis] [N0801]
 - F24J2/54C2 [N: with vertical primary axis] [N0801]
 - F24J2/54C4 [N: with horizontal primary axis] [N0801]
 - F24J2/54C6 [N: with inclined primary axis] [N0801]
 - F24J2/54D [N: with more than two rotation axis or with multiple degrees of freedom] [N0801]
- F24J3/00** **Other production or use of heat, not derived from combustion (use of solar heat [F24J2/00](#))** [C9906]
- F24J3/00B . [N: using heat resulting from internal friction of a moving fluid or from friction between a fluid and a moving body] [C0801]
 - F24J3/00B2 . . [N: the fluid passing through a restriction means] [N9509]
 - F24J3/06 . using natural heat
 - F24J3/08 . . using geothermal heat
 - F24J3/08A . . . [N: by circulating a working fluid through underground channels, the working fluid not coming into direct contact with the ground] [N1205]
 - F24J3/08A2 [N: Compact tube assemblies inserted into the ground, e.g. geothermal probes] [N0903]
 - F24J3/08A2A [N: in the form of bent tubes or in the form of tubes assembled with connectors or with return headers] [N0903]
 - F24J3/08A2B [N: in the form of tubes being closed at one end, i.e. return type] [N0903]
 - F24J3/08B . . . [N: by injecting a working fluid directly into the ground or by using underground water, e.g. systems using injection and recovery wells] [N1205]
 - F24J3/08C . . . [N: by injecting a working fluid into a closed well; by using intermediate working fluids, e.g. by using heat pipes] [N1205]