SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

F24 HEATING; RANGES; VENTILATING

F24S ***SOLAR HEAT COLLECTORS; SOLAR HEAT SYSTEMS*** *(for producing mechanical power from solar energy F03G 6/00)* ***[2018.01]***

Note(s) [2018.01]

In this subclass, the following terms or expressions are used with the meanings indicated:

- *"solar heat collector modules", often referred to simply as "modules", covers:*
  - *a. whole solar heat collectors;*
  - *b. elements of solar heat collectors, e.g. reflectors, lenses or heat storage elements;*
- *"absorbing elements" covers elements for absorbing solar rays and converting it into heat;*
- *"solar heat systems" covers systems having solar heat collectors as their components and using the collected heat.*

10/00 ***Solar heat collectors using working fluids [2018.01]***

10/10 • *the working fluids forming pools or ponds* ***[2018.01]***

10/13 • • *Salt-gradient ponds* ***[2018.01]***

10/17 • • *using covers or floating solar absorbing elements* ***[2018.01]***

10/20 • *having circuits for two or more working fluids (with means for exchanging heat between two or more fluids F24S 10/30)* ***[2018.01]***

10/25 • *having two or more passages for the same working fluid layered in the direction of solar rays, e.g. having upper circulation channels connected with lower circulation channels* ***[2018.01]***

10/30 • *with means for exchanging heat between two or more working fluids* ***[2018.01]***

10/40 • *in absorbing elements surrounded by transparent enclosures, e.g. evacuated solar heat collectors* ***[2018.01]***

10/50 • *the working fluids being conveyed between plates* ***[2018.01]***

10/55 • • *with enlarged surfaces, e.g. with protrusions or corrugations (collectors comprising porous materials or permeable masses directly contacting the working fluids F24S 10/80)* ***[2018.01]***

10/60 • *the working fluids trickling freely over absorbing elements* ***[2018.01]***

10/70 • *the working fluids being conveyed through tubular absorbing conduits* ***[2018.01]***

10/75 • • *with enlarged surfaces, e.g. with protrusions or corrugations (collectors comprising porous material or permeable masses directly contacting the working fluids F24S 10/80)* ***[2018.01]***

10/80 • *comprising porous material or permeable masses directly contacting the working fluids (for conveying liquefied working fluid from evaporator sections to condenser sections with capillary force F24S 10/95)* ***[2018.01]***

10/90 • *using internal thermosiphonic circulation* ***[2018.01]***

10/95 • • *having evaporator sections and condenser sections, e.g. heat pipes* ***[2018.01]***

20/00 ***Solar heat collectors specially adapted for particular uses or environments [2018.01]***

20/20 • *Solar heat collectors for receiving concentrated solar energy, e.g. receivers for solar power plants* ***[2018.01]***

20/25 • • *using direct solar radiation in combination with concentrated radiation* ***[2018.01]***

20/30 • *Solar heat collectors for heating objects, e.g. solar cookers or solar furnaces* ***[2018.01]***

20/40 • *Solar heat collectors combined with other heat sources, e.g. using electrical heating or heat from ambient air* ***[2018.01]***

20/50 • *Rollable or foldable solar heat collector modules* ***[2018.01]***

20/55 • • *made of flexible materials* ***[2018.01]***

20/60 • *Solar heat collectors integrated in fixed constructions, e.g. in buildings* ***[2018.01]***

20/61 • • *Passive solar heat collectors, e.g. operated without external energy sources* ***[2018.01]***

20/62 • • *in the form of fences, balustrades or handrails* ***[2018.01]***

20/63 • • *in the form of windows* ***[2018.01]***

20/64 • • *in the form of floor constructions, grounds or roads* ***[2018.01]***

20/66 • • *in the form of facade constructions, e.g. wall constructions (in the form of shingles or tiles F24S 20/69)* ***[2018.01]***

20/67 • • *in the form of roof constructions (in the form of shingles or tiles F24S 20/69)* ***[2018.01]***

20/69 • • *in the form of shingles or tiles* ***[2018.01]***

20/70 • *Waterborne solar heat collector modules (for working fluids forming pools or ponds F24S 10/10)* ***[2018.01]***

20/80 • *Airborne solar heat collector modules, e.g. inflatable structures* ***[2018.01]***

21/00 ***Solar heat collectors not provided for in groups F24S 10/00-F24S 20/00 [2018.01]***

23/00 ***Arrangements for concentrating solar rays for solar heat collectors [2018.01]***

23/30 • *with lenses* ***[2018.01]***

23/70 • *with reflectors* ***[2018.01]***

23/71 • • *with parabolic reflective surfaces (with cylindro-parabolic reflective surfaces F24S 23/74)* ***[2018.01]***

23/72 • • *with hemispherical reflective surfaces* ***[2018.01]***

23/74 • • *with trough-shaped or cylindro-parabolic reflective surfaces* ***[2018.01]***

23/75 • • *with conical reflective surfaces* ***[2018.01]***

23/77 • • *with flat reflective plates* ***[2018.01]***

23/79 • • *with spaced and opposed interacting reflective surfaces* ***[2018.01]***

25/00 Arrangement of stationary mountings or supports for solar heat collector modules [2018.01]

Note(s) [2018.01]

Arrangements also intended for use with photovoltaic modules should further be classified in the relevant groups of subclass H02S.

25/10 • *extending in directions away from a supporting surface* ***[2018.01]***

25/11 • • *using shaped bodies, e.g. concrete elements, foamed elements or moulded box-like elements* ***[2018.01]***

25/12 • • *using posts in combination with upper profiles* ***[2018.01]***

25/13 • • *Profile arrangements, e.g. trusses (F24S 25/12 takes precedence)* ***[2018.01]***

25/15 • • *using bent plates; using assemblies of plates* ***[2018.01]***

25/16 • • *Arrangement of interconnected standing structures; Standing structures having separate supporting portions for adjacent modules* ***[2018.01]***

25/20 • *Peripheral frames for modules* ***[2018.01]***

25/30 • *using elongate rigid mounting elements extending substantially along the mounting surface, e.g. for covering buildings with solar heat collectors (extending in directions away from the supporting surface F24S 25/10; peripheral frames for modules F24S 25/20)* ***[2018.01]***

25/33 • • *forming substantially planar assemblies, e.g. of coplanar or stacked profiles* ***[2018.01]***

25/35 • • • *by means of profiles with a cross-section defining separate supporting portions for adjacent modules* ***[2018.01]***

25/37 • • • *forming coplanar grids comprising longitudinal and transversal profiles* ***[2018.01]***

25/40 • *using plate-like mounting elements, e.g. profiled or corrugated plates; Plate-like module frames (extending in directions away from a supporting surface F24S 25/10)* ***[2018.01]***

25/50 • *comprising elongate non-rigid elements, e.g. straps, wires or ropes* ***[2018.01]***

25/60 • *Fixation means, e.g. fasteners, specially adapted for supporting solar heat collector modules* ***[2018.01]***

25/61 • • *for fixing to the ground or to building structures* ***[2018.01]***

25/613 • • • *in the form of bent strips or assemblies of strips; Hook-like connectors; Connectors to be mounted between building-covering elements* ***[2018.01]***

25/615 • • • *for fixing to protruding parts of buildings, e.g. to corrugations or to standing seams* ***[2018.01]***

25/617 • • • *Elements driven into the ground, e.g. anchor-piles; Foundations for supporting elements; Connectors for connecting supporting structures to the ground or to flat horizontal surfaces* ***[2018.01]***

25/63 • • *for fixing modules or their peripheral frames to supporting elements* ***[2018.01]***

25/632 • • • *Side connectors; Base connectors* ***[2018.01]***

25/634 • • • *Clamps; Clips* ***[2018.01]***

25/636 • • • • *clamping by screw-threaded elements* ***[2018.01]***

25/65 • • *for coupling adjacent supporting elements, e.g. for connecting profiles together* ***[2018.01]***

25/67 • • *for coupling adjacent modules or their peripheral frames (for fixing modules or their peripheral frames to supporting elements F24S 25/63)* ***[2018.01]***

25/70 • *with means for adjusting the final position or orientation of supporting elements in relation to each other or to a mounting surface; with means for compensating mounting tolerances* ***[2018.01]***

30/00 Arrangements for moving or orienting solar heat collector modules [2018.01]

Note(s) [2018.01]

Arrangements also intended for use with photovoltaic modules should further be classified in the relevant groups of subclass H02S.

30/20 • *for linear movement* ***[2018.01]***

30/40 • *for rotary movement* ***[2018.01]***

30/42 • • *with only one rotation axis* ***[2018.01]***

30/422 • • • *Vertical axis* ***[2018.01]***

30/425 • • • *Horizontal axis* ***[2018.01]***

30/428 • • • *with inclined axis* ***[2018.01]***

30/45 • • *with two rotation axes* ***[2018.01]***

30/452 • • • *with vertical primary axis* ***[2018.01]***

30/455 • • • *with horizontal primary axis* ***[2018.01]***

30/458 • • • *with inclined primary axis* ***[2018.01]***

30/48 • • *with three or more rotation axes or with multiple degrees of freedom* ***[2018.01]***

40/00 Safety or protection arrangements of solar heat collectors; Preventing malfunction of solar heat collectors *(control arrangements F24S 50/00)* ***[2018.01]***

40/10 • *Protective covers or shrouds; Closure members, e.g. lids (transparent coverings F24S 80/50)* ***[2018.01]***

40/20 • *Cleaning; Removing snow* ***[2018.01]***

40/40 • *Preventing corrosion; Protecting against dirt or contamination* ***[2018.01]***

40/42 • • *Preventing condensation inside solar modules (by venting F24S 40/53)* ***[2018.01]***

40/44 • • *Draining rainwater or condensation* ***[2018.01]***

40/46 • • *Maintaining vacuum, e.g. by using getters* ***[2018.01]***

40/48 • • *Deaerating or degassing the working fluid* ***[2018.01]***

40/50 • *Preventing overheating or overpressure (by draining the working fluid F24S 40/60)* ***[2018.01]***

40/52 • • *by modifying the heat collection, e.g. by defocusing or by changing the position of heat-receiving elements* ***[2018.01]***

40/53 • • *by venting solar heat collector enclosures* ***[2018.01]***

40/55 • • *Arrangements for cooling, e.g. by using external heat dissipating means or internal cooling circuits (by venting F24S 40/53)* ***[2018.01]***

40/57 • • *Preventing overpressure in solar heat collector enclosures (by venting F24S 40/53)* ***[2018.01]***

40/58 • • *Preventing overpressure in working fluid circuits* ***[2018.01]***

40/60 • *Arrangements for draining the working fluid* ***[2018.01]***

40/70 • *Preventing freezing (arrangements for draining the working fluid F24S 40/60)* ***[2018.01]***

40/80 • *Accommodating differential expansion of solar heat collector elements* ***[2018.01]***

40/90 • *Arrangements for testing solar heat collectors* ***[2018.01]***

50/00 Arrangements for controlling solar heat collectors [2018.01]

50/20 • *for tracking* ***[2018.01]***

50/40 • *responsive to temperature* ***[2018.01]***

50/60 • *responsive to wind* ***[2018.01]***

50/80 • *for controlling collection or absorption of solar radiation* ***[2018.01]***

60/00 Arrangements for storing heat collected by solar heat collectors *(in working fluids forming pools or ponds F24S 10/10)* ***[2018.01]***

60/10 • *using latent heat* ***[2018.01]***

60/20 • *using chemical reactions, e.g. thermochemical reactions or isomerisation reactions* ***[2018.01]***

60/30 • *storing heat in liquids* ***[2018.01]***

70/00 Details of absorbing elements [2018.01]

70/10 • *characterised by the absorbing material (absorbing coatings or surface treatment for increasing absorption F24S 70/20)* ***[2018.01]***

70/12 • • *made of metallic material* ***[2018.01]***

70/14 • • *made of plastics* ***[2018.01]***

70/16 • • *made of ceramic; made of concrete; made of natural stone* ***[2018.01]***

70/20 • *characterised by absorbing coatings; characterised by surface treatment for increasing absorption* ***[2018.01]***

70/225 • • *for spectrally selective absorption* ***[2018.01]***

70/25 • • *Coatings made of metallic material* ***[2018.01]***

70/275 • • *Coatings made of plastics* ***[2018.01]***

70/30 • *Auxiliary coatings, e.g. anti-reflective coatings* ***[2018.01]***

70/60 • *characterised by the structure or construction (absorbing coatings or surface treatment for increasing absorption F24S 70/20; auxiliary coatings F24S 70/30)* ***[2018.01]***

70/65 • • *Combinations of two or more absorbing elements* ***[2018.01]***

80/00 Details, accessories or component parts of solar heat collectors not provided for in groups F24S 10/00-F24S 70/00 [2018.01]

80/10 • *Materials for heat-exchange conduits* ***[2018.01]***

80/20 • *Working fluids specially adapted for solar heat collectors* ***[2018.01]***

80/30 • *Arrangements for connecting the fluid circuits of solar heat collectors with each other or with other components, e.g. pipe connections; Fluid distributing means, e.g. headers* ***[2018.01]***

80/40 • *Casings* ***[2018.01]***

80/45 • • *characterised by the material* ***[2018.01]***

80/453 • • • *made of metallic material* ***[2018.01]***

80/457 • • • *made of plastics* ***[2018.01]***

80/50 • *Transparent coverings; Elements for transmitting incoming solar rays and preventing outgoing heat radiation* ***[2018.01]***

80/52 • • *characterised by the material (for preventing heat loss F24S 80/56)* ***[2018.01]***

80/525 • • • *made of plastics* ***[2018.01]***

80/54 • • *using evacuated elements* ***[2018.01]***

80/56 • • *characterised by means for preventing heat loss* ***[2018.01]***

80/58 • • *characterised by their mountings or fixing means* ***[2018.01]***

80/60 • *Thermal insulation (transparent coverings F24S 80/50)* ***[2018.01]***

80/65 • • *characterised by the material* ***[2018.01]***

80/70 • *Sealing means* ***[2018.01]***

90/00 Solar heat systems not otherwise provided for [2018.01]

90/10 • *using thermosiphonic circulation* ***[2018.01]***