

Symbol	Typ	Titel
F	Sektion	SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
F28	Klasse	HEAT EXCHANGE IN GENERAL (heat-transfer, heat-exchange or heat-storage materials C09K 5/00; arrangement or mounting of heat-exchangers in air-conditioning, air-humidification or ventilation F24F 13/30)
F28D	Unterklasse	HEAT-EXCHANGE APPARATUS, NOT PROVIDED FOR IN ANOTHER SUBCLASS, IN WHICH THE HEAT-EXCHANGE MEDIA DO NOT COME INTO DIRECT CONTACT (fluid heaters having heat generating means and heat transferring means F24H; furnaces F27; details of heat-exchange apparatus of general application F28F); HEAT STORAGE PLANTS OR APPARATUS IN GENERAL [4]
F28D 1/00	Hauptgruppe	Heat-exchange apparatus having stationary conduit assemblies for one heat-exchange medium only, the media being in contact with different sides of the conduit wall, in which the other heat-exchange medium is a large body of fluid, e.g. domestic or motor car radiators (F28D 5/00 takes precedence)
F28D 1/02	1-Punkt Untergruppe	. with the heat-exchange conduits immersed in the body of fluid
F28D 1/03	2-Punkt Untergruppe	. . with plate-like or laminated conduits [4]
F28D 1/04	2-Punkt Untergruppe	. . with tubular conduits
F28D 1/047	3-Punkt Untergruppe	. . . the conduits being bent, e.g. in a serpentine or zig-zag [4]
F28D 1/053	3-Punkt Untergruppe	. . . the conduits being straight [4]
F28D 1/06	1-Punkt Untergruppe	. with the heat-exchange conduits forming part of, or being attached to, the tank containing the body of fluid
F28D 3/00	Hauptgruppe	Heat-exchange apparatus having stationary conduit assemblies for one heat-exchange medium only, the media being in contact with different sides of the conduit wall, in which the other heat-exchange medium flows in a continuous film, or trickles freely, over the conduits (F28D 5/00 takes precedence)
F28D 3/02	1-Punkt Untergruppe	. with tubular conduits
F28D 3/04	1-Punkt Untergruppe	. Distributing arrangements
F28D 5/00	Hauptgruppe	Heat-exchange apparatus having stationary conduit assemblies for one heat-exchange medium only, the media being in contact with different sides of the conduit wall, using the cooling effect of natural or forced evaporation
F28D 5/02	1-Punkt Untergruppe	. in which the evaporating medium flows in a continuous film or trickles freely over the conduits
F28D 7/00	Hauptgruppe	Heat-exchange apparatus having stationary tubular conduit assemblies for both heat-exchange media, the media being in contact with different sides of a conduit wall
F28D 7/02	1-Punkt Untergruppe	. the conduits being helically coiled (F28D 7/10 takes precedence)
F28D 7/04	1-Punkt Untergruppe	. the conduits being spirally coiled (F28D 7/10 takes precedence)
F28D 7/06	1-Punkt Untergruppe	. the conduits having a single U-bend (F28D 7/10 takes precedence)
F28D 7/08	1-Punkt Untergruppe	. the conduits being otherwise bent, e.g. in a serpentine or zig-zag (F28D 7/10 takes precedence)
F28D 7/10	1-Punkt Untergruppe	. the conduits being arranged one within the other, e.g. concentrically
F28D 7/12	2-Punkt Untergruppe	. . the surrounding tube being closed at one end, i.e. return type (F28D 7/14 takes precedence)
F28D 7/14	2-Punkt Untergruppe	. . both tubes being bent
F28D 7/16	1-Punkt Untergruppe	. the conduits being arranged in parallel spaced relation (F28D 7/02-F28D 7/10 take precedence) [4]
F28D 9/00	Hauptgruppe	Heat-exchange apparatus having stationary plate-like or laminated conduit assemblies for both

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		heat-exchange media, the media being in contact with different sides of a conduit wall
F28D 9/02	1-Punkt Untergruppe	. the heat-exchange media travelling at an angle to one another (F28D 9/04 takes precedence)
F28D 9/04	1-Punkt Untergruppe	. the conduits being formed by spirally-wound plates or laminae
F28D 11/00	Hauptgruppe	Heat-exchange apparatus employing moving conduits
F28D 11/02	1-Punkt Untergruppe	. the movement being rotary, e.g. performed by a drum or roller (F28D 11/08 takes precedence)
F28D 11/04	2-Punkt Untergruppe	. . performed by a tube or a bundle of tubes
F28D 11/06	1-Punkt Untergruppe	. the movement being reciprocating or oscillating (F28D 11/08 takes precedence)
F28D 11/08	1-Punkt Untergruppe	. more than one conduit assembly performing independent movements, e.g. rotary bundle of tubes in a rotary drum
F28D 13/00	Hauptgruppe	Heat-exchange apparatus using a fluidised bed
		<u>Heat-exchange apparatus employing intermediate heat-transfer media or bodies [3]</u>
F28D 15/00	Hauptgruppe	Heat-exchange apparatus with the intermediate heat-transfer medium in closed tubes passing into or through the conduit walls
F28D 15/02	1-Punkt Untergruppe	. in which the medium condenses and evaporates, e.g. heat-pipes [4]
F28D 15/04	2-Punkt Untergruppe	. . with tubes having a capillary structure [6]
F28D 15/06	2-Punkt Untergruppe	. . Control arrangements therefor [6]
F28D 17/00	Hauptgruppe	Regenerative heat-exchange apparatus in which a stationary intermediate heat-transfer medium or body is contacted successively by each heat-exchange medium, e.g. using granular particles
F28D 17/02	1-Punkt Untergruppe	. using rigid bodies, e.g. of porous material
F28D 17/04	1-Punkt Untergruppe	. Distributing arrangements for the heat-exchange media
F28D 19/00	Hauptgruppe	Regenerative heat-exchange apparatus in which the intermediate heat-transfer medium or body is moved successively into contact with each heat-exchange medium
F28D 19/02	1-Punkt Untergruppe	. using granular particles
F28D 19/04	1-Punkt Untergruppe	. using rigid bodies, e.g. mounted on a movable carrier
F28D 20/00	Hauptgruppe	Heat storage plants or apparatus in general (specially adapted for particular applications, <u>see</u> the relevant places, e.g. F24D 15/02); Regenerative heat-exchange apparatus not covered by groups F28D 17/00 or F28D 19/00 [4]
F28D 20/02	1-Punkt Untergruppe	. using latent heat [6]
F28D 21/00	Hauptgruppe	Heat-exchange apparatus not covered by any of the groups F28D 1/00-F28D 20/00 [4]