

F28C

HEAT-EXCHANGE APPARATUS, NOT PROVIDED FOR IN ANOTHER SUBCLASS, IN WHICH THE HEAT-EXCHANGE MEDIA COME INTO DIRECT CONTACT WITHOUT CHEMICAL INTERACTION (safety devices in general [F16P](#); fluid heaters having heat generating means [F24H](#); with an intermediate heat-transfer medium coming into direct contact with heat-exchange media [F28D 15/00](#) - [F28D 19/00](#); details of heat-exchange apparatus of general application [F28F](#))

Definition statement

This place covers:

Heat exchangers involving heat transfer between different media without separating wall, e.g. cooling towers.

References

Limiting references

This place does not cover:

Mixers	B01F
Chemical or physical processes	B01J
Fluid heaters having heat generating means	F24H
Regenerative heat exchangers	F28D 17/00 , F28D 19/00
Latent heat storage in direct contact with a heat exchange medium or another latent heat storage medium	F28D 20/02

F28C 1/00

Direct-contact trickle coolers, e.g. cooling towers (building construction [E04H 5/12](#); enclosed spaces cooled by trickle [F25](#); components parts of trickle coolers [F28F 25/00](#); {indirect-contact cooling towers [F28B 1/06](#)})

Definition statement

This place covers:

Heat exchangers in which one medium trickles freely over a material and is brought into direct contact with a cooling medium. e.g. ambient air.

Cooling towers are classified according to the type of flow: counter-current, cross-current or both.

This group covers also:

- The use of cooling towers for discharging exhaust gases.
- Means for recovering heat from exhaust steam.
- Noise suppressing means.
- Freezing prevention means.
- Combination wet/ dry sections (hybrid cooling towers).
- Means for preventing mist formation above cooling towers.

References

Limiting references

This place does not cover:

Building construction of cooling towers	E04H 5/12
Enclosed spaces cooled by trickle	F25
Dry cooling towers	F28B 1/06
Indirect contact heat exchangers in which one medium trickles freely over conduits	F28D 3/00
Indirect evaporative cooler	F28D 5/00
Component parts of trickle coolers	F28F 25/00

F28C 3/00

Other direct-contact heat-exchange apparatus

Definition statement

This place covers:

Direct contact heat exchangers without trickling of one heat exchange medium, e.g. direct contact between two gases, between two liquids or between a liquid and a gas without or with change of state; one of the heat exchange medium being a fluent solid, e.g. direct contact fluidized bed.

References

Limiting references

This place does not cover:

Preservation of food by heating loose materials	A23L 3/16
Evaporating with heated gases or vapours or liquids in contact with a liquid	B01D 1/14
Distillation or related exchange processes in which liquids are contacted with gaseous media, e.g. stripping	B01D 3/00
Mixing gases with liquids	B01F 3/04
Devices using other cold materials	F25D 3/00
Furnaces, ovens with cooling grates, endless belts, rotary drums	F27D 15/02
Direct contact condensers	F28B 3/00
Indirect contact fluidized bed	F28D 13/00