

## F28G

**CLEANING OF INTERNAL OR EXTERNAL SURFACES OF HEAT-EXCHANGE OR HEAT-TRANSFER CONDUITS, e.g. WATER TUBES OR BOILERS (cleaning pipes or tubes in general B08B9/02; devices or arrangements for removing water, minerals, or sludge from boilers while the boiler is in operation, or which remain in position while the boiler is in operation, or are specifically adapted to boilers without any other utility F22B37/48; removal or treatment of combustion products or combustion residues F23J; removing ice from heat-exchange apparatus F28F17/00)**

### Definition statement

*This subclass/group covers:*

Apparatus and methods for removing deposits from any surface, in any type of heat-exchanger.

### References relevant to classification in this subclass

*This subclass/group does not cover:*

Cleaning tubes or pipes in general	<a href="#">B08B 9/02</a>
Removing incrustation in apparatus for thermal non-catalytic cracking of hydrocarbon oils	<a href="#">C10G 9/12</a> , <a href="#">C10G 9/16</a>
Non-mechanical removal of metallic material from surfaces	<a href="#">C23F</a>
Cleaning metallic materials by chemical methods	<a href="#">C23G</a>
Cleaning engines cooling systems	<a href="#">F01P 11/06</a>
Devices for removing water, salt, or sludge from boilers	<a href="#">F22B 37/48</a>
Cleaning combustion chambers	<a href="#">F23J</a>
Cleaning arrangements for water heaters	<a href="#">F24H 9/00</a>
Removing ice from heat exchanger	<a href="#">F28F 17/00</a>

Preventing the formation of deposits or corrosion	<a href="#">F28F 19/00</a>
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## **F28G 1/00**

### **Non-rotary, e.g. reciprocated appliances (F28G3/00 takes precedence)**

#### **Definition statement**

*This subclass/group covers:*

Any movable cleaning devices, wherein the movement is not a rotary movement .

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Cleaning the internal surfaces of tubes by the mechanical action of a moving fluid, e.g. by flushing	<a href="#">B08B 9/032</a>
The cleaning devices being moved along the pipes by a fluid and conforming to, or being conformable to substantially the same cross-section of the pipes	<a href="#">B08B 9/055</a>
Pigs or moles, i.e. devices movable in a pipe or conduit with or without self-contained propulsion means	<a href="#">F16L 55/26</a>
Soot-blowers for cleaning furnaces	<a href="#">F23J 3/00</a>

## **F28G 3/00**

### **Rotary appliances**

#### **Definition statement**

*This subclass/group covers:*

Any movable cleaning devices, wherein the movement is a rotary movement .

## F28G 5/00

### Cleaning by distortion (by vibration F28G7/00)

#### Definition statement

*This subclass/group covers:*

Any cleaning device, whereby the cleaning is performed by deforming the heat exchange surfaces.

#### References relevant to classification in this group

*This subclass/group does not cover:*

Cleaning by vibration	<a href="#">F28G 7/00</a>
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## F28G 7/00

### Cleaning by vibration [N: or pressure waves]

#### Definition statement

*This subclass/group covers:*

Any cleaning device, whereby the cleaning is performed by producing vibrations on the heat exchange surface, e.g. by using knocking devices, or by using pressure pulses, or by producing detonations or explosions

#### References relevant to classification in this group

*This subclass/group does not cover:*

Cleaning by distortion	<a href="#">F28G 5/00</a>
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#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Method and apparatus for producing mechanical vibrations	<a href="#">B06B 1/00</a>
Cleaning by distortion, beating, or vibration of the surface to be cleaned	<a href="#">B08B 7/02</a>

## F28G 9/00

**Cleaning by flushing or washing, e.g. with chemical solvents (appliances using jets of fluid for removing debris F28G1/16, F28G3/16)**

### Definition statement

*This subclass/group covers:*

Any cleaning device, whereby the cleaning is performed by contacting the heat exchange surfaces with a cleaning fluid, and/or flushing the heat exchange conduits.

### References relevant to classification in this group

*This subclass/group does not cover:*

Cleaning by using appliances using jets of fluids for removing debris	<a href="#">F28G 1/16</a> , <a href="#">F28G 3/16</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Cleaning tubes by the mechanical action of a moving fluid, e.g. by flushing	<a href="#">B08B 9/032</a>
Treatment of water with complexing chemicals or other solubilising agents for softening, scale prevention or scale removal, e.g. adding sequestering agents	<a href="#">C02F 5/08</a>
Cleaning metal pipes by chemical methods	<a href="#">C23G 3/04</a>
Devices for preventing or removing corrosion, slime or scale from water heaters	<a href="#">F24H 19/00</a>

## F28G 11/00

**Cleaning by combustion processes, e.g. using squibs, using travelling burners [N: (F28G7/005 takes precedence)]**

## Definition statement

*This subclass/group covers:*

Any cleaning device, whereby the cleaning is performed by contacting the heat exchange surfaces with flames or high temperature fumes for burning the deposits.

## References relevant to classification in this group

*This subclass/group does not cover:*

Cleaning by detonations	<a href="#">F28G 7/00</a>
Cleaning by increasing temperature of heat exchange surfaces	<a href="#">F28G 13/00</a>

## F28G 13/00

**Appliances or processes not covered by groups F28G1/00 to F28G11/00; Combinations of appliances or processes covered by groups F28G1/00 to F28G11/00**

## Definition statement

*This subclass/group covers:*

All other cleaning devices or processes, which do not fall within the definitions of [F28G 1/00](#) - [F28G 11/00](#); Any combination of cleaning methods which do not fall within the definitions of [F28G 1/00](#) - [F28G 11/00](#).

## F28G 15/00

**Details (measuring thickness of deposit G01B)**

## Definition statement

*This subclass/group covers:*

Any details of heat exchanger cleaning devices

## References relevant to classification in this group

*This subclass/group does not cover:*

Measuring thickness of deposits	<a href="#">G01B</a>
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