

## ECLA EUROPEAN CLASSIFICATION

### C23F

**NON-MECHANICAL REMOVAL OF METALLIC MATERIAL FROM SURFACE** (working metal by laser beams [B23K26/00](#); desurfacing by applying flames [B23K7/00](#); working of metal by electro-erosion B23H; producing decorative effects by removing surface material, e.g. by engraving, by etching, [B44C1/22](#); electrolytic etching or polishing C25F); **INHIBITING CORROSION OF METALLIC MATERIAL OR INCRUSTATION IN GENERAL; MULTI-STEP PROCESSES FOR SURFACE TREATMENT OF METALLIC MATERIAL INVOLVING AT LEAST ONE PROCESS PROVIDED FOR IN CLASS C23 AND AT LEAST ONE PROCESS COVERED BY SUBCLASS C21D OR C22F OR CLASS C25.**

#### Notes

1. protective layers or coating compositions or methods of applying them; these are classified in the appropriate places, e.g. B05, B44, C09D, C23C.
2. mechanical devices or constructional features of particular articles for inhibiting incrustation; these are classified in the appropriate places, e.g. in pipes or pipe fittings [F16L58/00](#).
3. articles characterised by being made of materials selected for their properties of resistance to corrosion or incrustation; these are classified in the appropriate places, e.g. turbine blades [F01D5/28](#).

### C23F1/00

**Etching metallic material by chemical means** (manufacture of printing surfaces [B41C](#); manufacture of printed circuits [H05K](#))

#### C23F1/02

- . Local etching

#### C23F1/04

- . . Chemical milling

#### C23F1/06

- . Sharpening files

#### C23F1/08

- . Apparatus, e.g. for photomechanical printing surfaces (photo- mechanical reproduction [G03F](#))

#### C23F1/10

- . Etching compositions ([C23F1/44](#) takes precedence)

#### C23F1/12

- . . Gaseous compositions

#### C23F1/14

- . . Aqueous compositions

#### C23F1/16

- . . . Acidic compositions ([C23F1/42](#) takes precedence)

#### C23F1/18

- . . . . for etching copper or alloys thereof

#### C23F1/20

- . . . . for etching aluminium or alloys thereof

#### C23F1/22

- . . . . for etching magnesium or alloys thereof

#### C23F1/26

- . . . . for etching refractory metals

#### C23F1/28

- . . . . for etching iron group metals

#### C23F1/30

- . . . . for etching other metallic material

#### C23F1/32

- . . . Alkaline compositions ([C23F1/42](#) takes precedence)

- C23F1/34 . . . . for etching copper or alloys thereof
- C23F1/36 . . . . for etching aluminium or alloys thereof
- C23F1/38 . . . . for etching refractory metals
- C23F1/40 . . . . for etching other metallic material
- C23F1/42 . . . containing a dispersed water-immiscible liquid
  
- C23F1/44 . Compositions for etching metallic material from a metallic material substrate of different composition
  
- C23F1/46 . Regeneration of etching compositions

### **C23F3/00      Brightening metals by chemical means**

- C23F3/02 . Light metals
- C23F3/03 . . with acidic solutions
  
- C23F3/04 . Heavy metals
- C23F3/06 . . with acidic solutions

### **C23F4/00      Processes for removing metallic material from surfaces, not provided for in group [C23F1/00](#) or [C23F3/00](#)**

- C23F4/02 . by evaporation
  
- C23F4/04 . by physical dissolution

### **C23F11/00      Inhibiting corrosion of metallic material by applying inhibitors to the surface in danger of corrosion or adding them to the corrosive agent (adding inhibitors to mineral oil, fuels, or lubricants [C10](#); adding inhibitors to pickling solutions [C23G](#))**

- C23F11/02 . in air or gases by adding vapour phase inhibitors
  
- C23F11/04 . in markedly acid liquids
  
- C23F11/06 . in markedly alkaline liquids
  
- C23F11/08 . in other liquids
- C23F11/10 . . using organic inhibitors

#### **Notes**

1. A compound is classified in the last appropriate place.
  
2. Esters or anhydrides of organic acids are classified as the relevant acid unless otherwise indicated. Salts of a compound with an inorganic compound are classified as that compound unless specifically provided for.

- C23F11/12 . . . Oxygen-containing compounds
- C23F11/12A . . . . Alcohols; Aldehydes; Ketones

C23F11/12C	. . . .	Carboxylic acids
C23F11/12C2	. . . . .	Aliphatic acids
C23F11/12D	. . . .	Esters of carboxylic acids
C23F11/14	. . . .	Nitrogen containing compounds
C23F11/14A	. . . . .	Amines; Quaternary ammonium compounds
C23F11/14A2	. . . . .	Hydroxy amines
C23F11/14A3	. . . . .	Salts of amines
C23F11/14B	. . . . .	Aminocarboxylic acids
C23F11/14C	. . . . .	Amides; N-substituted amides
C23F11/14D	. . . . .	containing a multiple nitrogen-to-carbon bond
C23F11/14E	. . . . .	containing a nitrogen-to-oxygen bond
C23F11/14F	. . . . .	containing a nitrogen-to-nitrogen bond
C23F11/14H	. . . . .	Heterocyclic compounds containing nitrogen as hetero atom
C23F11/16	. . . .	Sulfur containing compounds
C23F11/16B	. . . . .	Mercaptans
C23F11/16D	. . . . .	Thioaldehydes; Thioketones
C23F11/16E	. . . . .	Sulfonic acids
C23F11/16F	. . . . .	containing a -SO <sub>2</sub> -N group
C23F11/16H	. . . . .	Heterocyclic compounds containing sulfur as hetero atom
C23F11/167	. . . .	Phosphorus-containing compounds
C23F11/167B	. . . . .	Esters of phosphoric or thiophosphoric acids
C23F11/167D	. . . . .	Phosphonic acids
C23F11/173	. . . .	Macromolecular compounds
C23F11/18	. . . .	using inorganic inhibitors
C23F11/18B	. . . .	Nitrogen containing compounds
C23F11/18C	. . . .	Sulfur, boron or silicon containing compounds
C23F11/18D	. . . .	Phosphorous, arsenic, antimony or bismuth containing compound
C23F11/18E	. . . .	Refractory metal-containing compounds
C23F11/18M	. . . .	Mixtures of inorganic inhibitors
C23F11/18M2	. . . . .	containing phosphates

### **C23F13/00                    Inhibiting corrosion of metals by anodic or cathodic protection**

C23F13/00B	. <a href="#">[N: Anodic protection]</a>
C23F13/02	.    cathodic; Selection of conditions, parameters or procedures for cathodic protection, e.g. of electrical conditions
C23F13/04	. .    Controlling or regulating desired parameters
C23F13/06	. .    Constructional parts, or assemblies of cathodic-protection apparatus
C23F13/08	. . .    Electrodes specially adapted for inhibiting corrosion by cathodic protection; Manufacture thereof; Conducting electric current thereto
C23F13/10	. . . .    Electrodes characterised by the structure ( <a href="#">C23F13/16 takes precedence</a> )
C23F13/12	. . . .    Electrodes characterised by the material ( <a href="#">C23F13/16 takes precedence</a> )

- C23F13/14 . . . . . Material for sacrificial anodes
- C23F13/16 . . . . . Electrodes characterised by the combination of the structure and the material
- C23F13/18 . . . . . Means for supporting electrodes
- C23F13/20 . . . . . Conducting electric current to electrodes
- C23F13/22 . . . . . Monitoring arrangements therefor
  
- C23F14/00** **Inhibiting incrustation in apparatus for heating liquids for physical or chemical purposes** (adding scale preventives or removers to water [C02F5/00](#)) [N: inhibiting incrustation in polymerisation reactors [C23F15/00B](#)]
  
- C23F14/02 . by chemical means
  
- C23F15/00** **Other methods of preventing corrosion or incrustation**
  
- C23F15/00B . [N: Inhibiting incrustation]
  
- C23F17/00** **Multi-step processes for surface treatment of metallic material involving at least one process provided for in class [C23](#) and at least one process covered by subclass [C21D](#) or [C22F](#) or class [C25](#) ([C23C28/00](#) takes precedence)**