

CPC**COOPERATIVE PATENT CLASSIFICATION****C23F**

NON-MECHANICAL REMOVAL OF METALLIC MATERIAL FROM SURFACE (working metal by laser beams [B23K 26/00](#); desurfacing by applying flames [B23K 7/00](#); working of metal by electro-erosion [B23H](#) ; producing decorative effects by removing surface material, e.g. by engraving, by etching, [B44C 1/22](#); 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](#) .**

NOTE

protective layers or coating compositions or methods of applying them; these are classified in the appropriate places, e.g. [B05](#) , [B44](#) , [C09D](#) , [C23C](#) .

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 [F16L 58/00](#).

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 [F01D 5/28](#).

Guidance heading:

- C23F 1/00** **Etching metallic material by chemical means** (manufacture of printing surfaces [B41C](#) ; manufacture of printed circuits [H05K](#))
- C23F 1/02 . Local etching
- C23F 1/04 . . Chemical milling
- C23F 1/06 . Sharpening files
- C23F 1/08 . Apparatus, e.g. for photomechanical printing surfaces (photo- mechanical reproduction [G03F](#))
- C23F 1/10 . Etching compositions ([C23F 1/44](#) takes precedence)
- C23F 1/12 . . Gaseous compositions
- C23F 1/14 . . Aqueous compositions
- C23F 1/16 . . . Acidic compositions ([C23F 1/42](#) takes precedence)
- C23F 1/18 for etching copper or alloys thereof
- C23F 1/20 for etching aluminium or alloys thereof
- C23F 1/22 for etching magnesium or alloys thereof
- C23F 1/26 for etching refractory metals
- C23F 1/28 for etching iron group metals

- C23F 1/30 for etching other metallic material
- C23F 1/32 . . . Alkaline compositions ([C23F 1/42](#) takes precedence)
- C23F 1/34 for etching copper or alloys thereof
- C23F 1/36 for etching aluminium or alloys thereof
- C23F 1/38 for etching refractory metals
- C23F 1/40 for etching other metallic material
- C23F 1/42 . . . containing a dispersed water-immiscible liquid

- C23F 1/44 . Compositions for etching metallic material from a metallic material substrate of different composition

- C23F 1/46 . Regeneration of etching compositions

C23F 3/00 Brightening metals by chemical means

- C23F 3/02 . Light metals
- C23F 3/03 . . with acidic solutions

- C23F 3/04 . Heavy metals
- C23F 3/06 . . with acidic solutions

C23F 4/00 Processes for removing metallic material from surfaces, not provided for in group [C23F 1/00](#) or [C23F 3/00](#)

- C23F 4/02 . by evaporation

- C23F 4/04 . by physical dissolution

C23F 11/00 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](#))

- C23F 11/02 . in air or gases by adding vapour phase inhibitors

- C23F 11/04 . in markedly acid liquids

- C23F 11/06 . in markedly alkaline liquids

- C23F 11/08 . in other liquids
- C23F 11/10 . . using organic inhibitors

NOTE

A compound is classified in the last appropriate place.

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.

C23F 11/12	...	Oxygen-containing compounds
C23F 11/122	Alcohols; Aldehydes; Ketones
C23F 11/124	Carboxylic acids
C23F 11/126	Aliphatic acids
C23F 11/128	Esters of carboxylic acids
C23F 11/14	...	Nitrogen containing compounds
C23F 11/141	Amines; Quaternary ammonium compounds
C23F 11/142	Hydroxy amines
C23F 11/143	Salts of amines
C23F 11/144	Aminocarboxylic acids
C23F 11/145	Amides; N-substituted amides
C23F 11/146	containing a multiple nitrogen-to-carbon bond
C23F 11/147	containing a nitrogen-to-oxygen bond
C23F 11/148	containing a nitrogen-to-nitrogen bond
C23F 11/149	Heterocyclic compounds containing nitrogen as hetero atom
C23F 11/16	...	Sulfur containing compounds
C23F 11/161	Mercaptans
C23F 11/162	Thioaldehydes; Thioketones
C23F 11/163	Sulfonic acids
C23F 11/164	containing a -SO ₂ -N group
C23F 11/165	Heterocyclic compounds containing sulfur as hetero atom
C23F 11/167	...	Phosphorus-containing compounds
C23F 11/1673	Esters of phosphoric or thiophosphoric acids
C23F 11/1676	Phosphonic acids
C23F 11/173	...	Macromolecular compounds
C23F 11/18	..	using inorganic inhibitors
C23F 11/181	...	Nitrogen containing compounds
C23F 11/182	...	Sulfur, boron or silicon containing compounds
C23F 11/184	...	Phosphorous, arsenic, antimony or bismuth containing compound
C23F 11/185	...	Refractory metal-containing compounds
C23F 11/187	...	Mixtures of inorganic inhibitors
C23F 11/188	containing phosphates

C23F 13/00 Inhibiting corrosion of metals by anodic or cathodic protection

C23F 13/005	.	{Anodic protection }
C23F 13/02	.	cathodic; Selection of conditions, parameters or procedures for cathodic protection, e.g. of electrical conditions
C23F 13/04	..	Controlling or regulating desired parameters
C23F 13/06	..	Constructional parts, or assemblies of cathodic-protection apparatus
C23F 13/08	...	Electrodes specially adapted for inhibiting corrosion by cathodic protection; Manufacture thereof; Conducting electric current thereto

C23F 13/10	Electrodes characterised by the structure (C23F 13/16 takes precedence)
C23F 13/12	Electrodes characterised by the material (C23F 13/16 takes precedence)
C23F 13/14	Material for sacrificial anodes
C23F 13/16	Electrodes characterised by the combination of the structure and the material
C23F 13/18	Means for supporting electrodes
C23F 13/20	Conducting electric current to electrodes
C23F 13/22	Monitoring arrangements therefor

C23F 14/00 **Inhibiting incrustation in apparatus for heating liquids for physical or chemical purposes** ([adding scale preventives or removers to water C02F 5/00](#)) {[inhibiting incrustation in polymerisation reactors C23F 15/005](#) }

C23F 14/02 . by chemical means

C23F 15/00 **Other methods of preventing corrosion or incrustation**

C23F 15/005 . {[Inhibiting incrustation](#) }

C23F 17/00 **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](#) ([C23C 28/00 takes precedence](#))**

Guidance heading:

C23F 2201/00 **Type of materials to be protected by cathodic protection**

C23F 2201/02 . Concrete, e.g. reinforced

Guidance heading:

C23F 2213/00 **Aspects of inhibiting corrosion of metals by anodic or cathodic protection**

C23F 2213/10	. Controlling or regulating parameters
C23F 2213/11	.. for structures subject to stray currents
C23F 2213/20	. Constructional parts or assemblies of the anodic or cathodic protection apparatus
C23F 2213/21	.. combining at least two types of anodic or cathodic protection
C23F 2213/22	.. characterized by the ionic conductor, e.g. humectant, hydratant or backfill
C23F 2213/30	. Anodic or cathodic protection specially adapted for a specific object
C23F 2213/31	.. Immersed structures, e.g. submarine structures
C23F 2213/32	.. Pipes