

Specification for

Copper salts for electroplating

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Co-operating organizations

The Surface Coatings (other than Paints) Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- Assay Offices Committee of Great Britain
- Association of Metal Sprayers
- British Bolt, Nut, Screw and Rivet Federation
- British Cycle and Motor Cycle Industries Association Limited*
- British Electrical and Allied Manufacturers' Association
- British Jewellers' Association
- British Non-Ferrous Metals Research Association*
- British Steel Industry
- Chemical Industries Association*
- Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales
- Electronic Engineering Association
- Engineering Equipment Users' Association
- Greater London Council
- Institute of Metal Finishing*
- Institute of Sheet Metal Engineers*
- Institute of Vitreous Enamellers*
- Metal Finishing Association*
- Ministry of Defence, Army Department
- Ministry of Defence, Navy Department
- Ministry of Technology
- Society of Motor Manufacturers and Traders Limited*
- Tin Research Institute*
- Vitreous Enamel Development Council
- Zinc Development Association*

The scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- British Sulphate of Copper Association
- Institution of Chemical Engineers
- Royal Institute of Chemistry
- Scientific Instrument Manufacturers Association
- Society of Chemical Industry
- United Kingdom Cutlery and Silverware Manufacturers' Association
- Individual firms

This British Standard, having been approved by the Surface Coatings (other than Paints) Industry Standards Committee, was published under the authority of the General Council on 29 September 1969

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BS 2884 first published August 1957
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The following BSI references relate to the work on this standard:
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Foreword

This standard makes reference to the following British Standards:

BS 1752, *Laboratory sintered or fritted filters.*

BS 3978, *Water for laboratory use.*

This British Standard is one of a series of standards that has been prepared to meet the requirements of electroplaters, others in the series being:

BS 558, BS 564, *Nickel anodes and nickel salts for electroplating.*

BS 622, *Potassium and sodium cyanides for electroplating.*

BS 1468, *Tin anodes and tin salts for electroplating.*

BS 1561, *Silver anodes and silver salts for electroplating.*

BS 2656, *Zinc anodes, zinc cyanide and zinc oxide for electroplating.*

BS 2657, *Fluoroboric acid and metallic fluoroborates for electroplating.*

BS 2868, *Cadmium anodes and cadmium oxide for electroplating.*

This standard contains in revised form what was previously covered by the separate standards BS 2867, "*Copper sulphate for electroplating*" and BS 2884, "*Copper cyanide for electroplating*", with the addition of requirements for copper pyrophosphate. By this combination the new standard fits more logically into the existing series of standards, BS 2867 and BS 2884 having been withdrawn.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 General

1.1 Scope

This British Standard specifies requirements for copper sulphate, copper cyanide and copper pyrophosphate for electroplating.

1.2 Precautions

Copper cyanide is extremely poisonous and must only be handled in accordance with the instructions given in Form 385 published by the Factory Department of the Department of Employment and Productivity and obtainable from Her Majesty's Stationery Office. This form should be displayed wherever copper cyanide is stored or handled.

1.3 Reagents and apparatus

All reagents shall be of a recognized analytical reagent quality and distilled water¹⁾ shall be used wherever water is specified.

Wherever appropriate, British Standard laboratory glassware should be used in the methods of test.

2 Copper sulphate

2.1 Physical form and appearance

Copper sulphate shall be in a crystalline or finely granulated form and shall correspond approximately in composition to $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$.

2.2 Chemical composition

The material shall contain not less than 24.9 % of copper when determined by the method described in Appendix A.

2.3 Impurities

Impurities, if present, shall not exceed the limits given in Table 1 when determined by the method described in the appropriate appendix.

Table 1 — Limits of impurities in copper sulphate

Impurity	Per cent (max.)	Appendix
Iron, calculated as Fe	0.075	B
Arsenic, calculated as As	0.0015	C
Insoluble matter	0.1	D
Chlorides, calculated as Cl	0.02	E

2.4 Sampling and size of sample

A representative sample of the material weighing not less than 1 kg is necessary for the purpose of examination under this British Standard. The sample shall be taken from freshly opened packages and shall be packed in a clean, dry, airtight bottle and sealed.

The sample shall be rapidly crushed if necessary, well mixed, and returned to the bottle.

3 Copper cyanide

3.1 Physical form and appearance

Copper cyanide shall be in the form of a cream-coloured powder and shall correspond approximately in composition to CuCN .

3.2 Chemical composition

The material shall contain not less than 69.0 % copper calculated as metal and not less than 27.5 % cyanide calculated as CN when determined by the methods described in Appendix A and Appendix F respectively.

3.3 Impurities

Impurities, if present, shall not exceed the limits given in Table 2 when determined by the method described in the appropriate appendix.

Table 2 — Limits of impurities in copper cyanide

Impurity	Per cent (max.)	Appendix
Iron, calculated as Fe	0.05	B
Insoluble matter	0.15	D
Chloride, calculated as Cl	0.4	E

3.4 Sampling and size of sample

A representative sample of the material weighing not less than 250 g is necessary for the purpose of examination under this British Standard. The sample shall be taken from freshly opened packages and shall be packed in a clean, dry, airtight bottle and sealed.

¹⁾ BS 3978, "Water for laboratory use".

4 Copper pyrophosphate

4.1 Physical form and appearance

Copper pyrophosphate shall be in the form of a free-flowing light blue powder. The degree of hydration is a slightly variable quantity but the formula should roughly correspond to $\text{Cu}_2\text{P}_2\text{O}_7 \cdot 5\text{H}_2\text{O}$.

4.2 Chemical composition

The material shall contain not less than 32.5 % copper and 44.5 % pyrophosphate calculated as P_2O_7 when determined by the methods described in Appendix G and Appendix H respectively.

4.3 Impurities

Impurities, if present, shall not exceed the limits given in Table 3, when determined by the method described in the appropriate appendix.

Table 3 — Limits of impurities in copper pyrophosphate

Impurity	Per cent (max.)	Appendix
Arsenic, calculated as As	0.0025	C
Insoluble matter	0.1	D

4.4 Sampling and size of sample

A representative sample of the material weighing not less than 250 g is necessary for the purpose of examination under this British Standard. The sample shall be taken from freshly opened packages and shall be packed in a clean dry airtight bottle and sealed.