

Code of practice for

Maintenance of insulating oil —

(Formerly CP 1009)

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- British Approvals Service for Electric Cables Ltd.
- British Electrical and Allied Manufacturers' Association (BEAMA)
- British Radio Equipment Manufacturers' Association
- British Steel Corporation
- Department of Energy (Electricity)
- Electric Cable Makers' Confederation*
- Electrical Contractors' Association
- Electrical Contractors' Association of Scotland
- Electrical Research Association*
- Electrical, Electronic, Telecommunications Plumbing Union
- Electricity Supply Industry in England and Wales*
- Electronic Components Industry Federation
- Engineering Equipment Users' Association
- Health and Safety Executive
- Home Office
- Institution of Electrical Engineers
- Ministry of Defence
- National Coal Board
- Oil Companies Materials Association
- Post Office
- Telecommunication Engineering and Manufacturing Association (TEMA)

The 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 Railways Board
- British Lubricants Federation Limited
- Electric Cable Makers' Confederation — Supertension Cables Group
- Institute of Petroleum
- Transmission and Distribution Association (BEAMA)

This British Standard, having been prepared under the direction of the General Electrotechnical Engineering Standards Committee, was published under the authority of the Executive Board and comes into effect on 31 May 1979

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Foreword

This British Standard code of practice has been prepared under the direction of the General Electrotechnical Engineering Standards Committee. It is based on IEC Publication 422, published by the International Electrotechnical Commission (IEC), and supersedes CP 1009:1959.

Insulating oil complying with the requirements of BS 148 is supplied for use as an insulant in electrical equipment complying with the requirements of BS 159, BS 162, BS 171, BS 223, BS 3938, BS 3941, BS 4571, BS 5227, BS 5311 and BS 5463. In addition it is employed as a heat exchange medium and as an arc interruption medium in certain equipment complying with the requirements of these standards.

Insulating oil can be subject to contamination by impurities and deterioration as a result of operation of the equipment. The nature of these is discussed in this code and recommendations are made for various tests which give information on the condition of the oil. A pre-energizing and subsequent oil maintenance procedure is given in Appendix A. Appendix A gives references to British Standard test methods, and also gives recommended limits, frequency of test, and action required.

The general procedures for handling, reconditioning, replacing, and disposing of oil are covered in Appendix B.

This code differs from IEC 422 in the following aspects:

- a) The pre-energizing and subsequent oil maintenance procedure is more detailed in this code.
- b) The more detailed procedures involve the identification of the equipment in various categories and takes account of differing user requirements relating to the effect of a discontinuance of supply and also of user experience with a design. For power transformers it is recognized that the refrigerator breather (as defined in clause 5) permits very low levels of moisture to be maintained and the distinction is also made between silica-gel breather and free breathing power transformers.
- c) Recommendations for oil used in hermetically sealed and low oil volume equipment are excluded from this code because such equipment is not designed for the process of routine oil sampling.
- d) Recommendations for inhibited oils are excluded from this code.
- e) The frequency of testing of oil from switchgear is given in BS 5405 and is not, therefore, covered by this code.
- f) Test methods detailed are those in general use in the UK. Consequently:
 - 1) The interfacial tension test is omitted.
 - 2) The electric strength method with a one minute "hold" period is retained as an alternative to the IEC 156 test given in Appendix C of BS 148:1972.
 - 3) The limits for water content, by the Karl Fisher method are dependent on the acidity of oil at the time of sampling whereas the limits given in IEC 422 do not make this essential differentiation.
 - 4) In addition to the Karl Fisher method for water determination, the crackle test is retained for certain equipment.
 - 5) Resistivity and dielectric dissipation factor (DDF) tests are based on a test temperature of 20 °C, not 90 °C.
- g) Limits generally differ mainly as a result of the adoption of the various categories of equipment referred to in b) above.
- h) Equipment voltages adopted are system highest voltages.
- i) The code does not cover equipment for system highest voltages above 450 kV.

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Summary of pages

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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.

