



SLOVENSKI STANDARD
SIST EN 50195:1997

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Code of practice for the safe use of fully enclosed askarel-filled electrical equipment

Code of practice for the safe use of fully enclosed askarel-filled electrical equipment

Leitlinie für die Praxis zum sicheren Umgang mit vollständig gekapselten, mit PCB befüllten elektrischen Betriebsmitteln

Code pour la sécurité d'emploi des matériels électriques totalement clos remplis d'askarels

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English version

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matériels électriques totalement clos
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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 14, Power transformers, based on a contribution of the cooperating Partner UNIPEDE.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50195 on 1996-07-02.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-06-01

For products which have complied with the relevant national standard before 1997-06-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2002-06-01.

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A and B are informative and annex C is normative.

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Introduction

Polychlorinated Biphenyls (PCBs) are synthetic liquids which have been used throughout the world since the 1930s. In the electrical industry, they have been used, sometimes in combination with chlorobenzenes, as insulating and cooling liquids in power transformers and capacitors where low flammability is of prime importance.

The generic term "askarels" is applied to such liquids and is used in this document for insulating liquids having PCBs as a major constituent.

Askarels have good electrical and thermal properties, and are chemically stable. However, they also possess a number of potential environmental disadvantages: being persistent in the environment and resistant to chemical and biological decomposition. They also "bio-accumulate": tending to accumulate up the food chain. Furthermore, potential environmental problems can arise should askarels be involved in uncontrolled fire conditions; the consequences are such that restrictions may have to be placed on future access to the fire-affected areas.

A list of some typical trade names for askarels is included in annex A.

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1 Scope

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This Code of Practice gives guidance to users of fully enclosed askarel-filled electrical equipment.

National and Local Authority regulations (if any) take priority.

This Code of Practice is applicable to fully enclosed electrical equipment which is designed to be filled with askarels: i.e. askarel-filled electrical equipment.

This Code of Practice is applicable to electrical equipment which contains more than five litres of askarels.

This Code of Practice gives guidance on the precautions to be observed to avoid pollution of the environment by the correct installation, maintenance, operation, storage and transportation of askarel-filled electrical equipment.

This Code of Practice gives guidance on the safety precautions to be taken when handling askarels, the disposal of askarel-contaminated waste and on the refilling of transformers with an acceptable replacement liquid.

2 Definitions

For the purposes of this Code of Practice, the following definitions apply:

2.1 askarels

A generic term for low flammability insulating liquids having polychlorinated biphenyls (PCBs) as a major constituent, with or without the addition of polychlorinated benzenes.

2.2 askarel-filled equipment

Equipment containing askarels which is designed to be filled with askarels as the insulating and/or cooling liquid.

2.3 contaminated with PCBs

Having a PCB content greater than 50 mg/kg.

2.4 equipment

Fully enclosed electrical equipment, except for small volume electrical equipment.

2.5 fully enclosed

Completely encapsulated, closed circuit, not generally open to the atmosphere, but not excluding a breather or pressure relief device.

2.6 insulating liquid

A liquid with negligibly low electrical conductivity, used to separate conducting parts at different electrical potentials.

2.7 polychlorinated benzenes

An insulating and/or cooling liquid consisting of a mixture of several isomeric and homologous compounds, obtained by replacement of at least three or four atoms of hydrogen in the benzene molecule with chlorine atoms.

2.8 polychlorinated biphenyls (PCBs)

An insulating and/or cooling liquid consisting of a mixture of several isomeric and homologous compounds, obtained by replacement of at least two atoms of hydrogen in the biphenyl molecule with chlorine atoms.

2.9 retrofilled equipment

Equipment which contained askarels and has been subject to retrofilling.

2.10 retrofilling

All operations designed to replace the askarels by a suitable substitute insulating and/or cooling liquid not containing PCBs.

2.11 small volume

Not greater than five litres.

2.12 water systems

Systems which include:

- a) effluent systems, e.g. drains, sewers, etc.;
- b) water courses, e.g. ditches, streams, canals, rivers, lakes, etc.;
- c) water storage systems, e.g. reservoirs, etc.

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3 Identification of askarels

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The normal point of identification of askarels is the manufacturers rating plate. Annex A identifies some typical trade names. In case of doubt, the original manufacturer may be consulted or the liquid may be suitably analysed.

4 Site design and construction

4.1 General

Precautions to prevent pollution of the environment *should* be taken into account at the design and construction stage (see clause 6, Pollution of the environment). For existing sites, these precautions *should* be implemented where reasonably practicable.

Where equipment containing askarels is installed, adequate arrangements *should* be constructed to contain all spillage and prevent any waste products from reaching water systems.

Adequate bunding of all areas containing askarels is of prime importance. A retention tank or drip tray of adequate capacity may be used. These bunded areas *should* not be rendered ineffective by ingress of rain water.

4.2 Surface sealants

Bund floors and walls likely to become contaminated with askarels may be sealed with a suitable sealant. This protective measure will make it unnecessary to remove and dispose of any contaminated brickwork or cement items. Gaps at cable entry points and other openings *should* be sealed with a suitable sealant.

It has been found to be impracticable to chemically treat gravel or chippings etc., beneath askarel-filled equipment. Consequently, any askarel-contaminated chippings or soil *should* be removed and disposed of as described in clause 13, Disposal procedures.

4.3 Electrical protection

Electrical protection *should* be provided, designed to be suitable to protect the askarel-filled equipment against internal faults and high through-faults, in order to minimise excessive stresses.

4.4 Mechanical protection

All askarel-filled equipment and areas where spares are stored *should* be adequately protected against mechanical damage, e.g., by fork lift trucks, etc., if such damage is possible.

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4.5 Storage <https://standards.iteh.ai/catalog/standards/sist/0a93c90d-735f-4042-857b-e22b179d86fa/sist-en-50195-1997>

Storage areas containing askarels *should* not have drains which could cause pollution of the environment.

Spare askarels containers and equipment containing askarels in storage *should* be controlled to prevent accidental spillage or personal contact with askarels.

Askarels or askarel-filled equipment *should* be stored away from other insulating liquids and any flammable substances, in such a way to minimise the risk of fire.

All storage areas *should* be secured, suitably labelled and protected from the effects of precipitation.

Similar precautions as those described in 4.1 to 4.4 *should* also be taken.

4.6 Ventilation

Where askarel-filled equipment is installed indoors, the room *should* have adequate ventilation which is separate and independent from other areas of the building. If not possible, the ventilation system may be designed to close-down in case of fire.

5 Labelling

5.1 Labelling of askarels

The following *should* be labelled:

- a) Askarel-filled equipment;
- b) Compounds containing askarel-filled equipment;
- c) Temporary storage areas containing askarel-filled equipment;
- d) Containers containing askarels as spare or waste;
- e) Containers containing waste materials contaminated with askarels.

The label *should* be durable, indelible and *should* give adequate warning and suitable emergency instructions.

5.2 Labelling of retrofilled transformers

Labelling of retrofilled transformers *should* be in accordance with clause 12, Retrofilling of transformers.

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6 Pollution of the environment

The appropriate manner for disposal are referred to in clause 13, Disposal procedures.

6.1 Precautions to be taken to avoid pollution of the environment when working on equipment containing askarels or handling askarel in containers

- a) Liquid wastes containing askarels *should* not be disposed of into any water systems. Precautions *should* be taken to avoid any spillage or leakage from gaining access to such systems. Adequate bunding of all areas containing askarels is of prime importance.

NOTE: Askarel liquids have specific weights higher than that of water. They do not float on water that may be present in the drip tray beneath equipment.

- b) Under no circumstances *should* spilled askarels be hosed away into normal waste channels. If spillage or leakage is found to have occurred, it *should* be absorbed using vermiculite, sand, ash, or other inert non-combustible absorbent material which *should* be collected and later disposed of in an appropriate manner. Any residual askarels *should* be wiped from impervious surfaces using wipes or rags soaked in a suitable proprietary solvent. These rags *should* afterwards be disposed of in an appropriate manner. Appropriate precautions *should* be taken when handling solvents.
- c) It is important to avoid contamination of other areas by transferring pollution on footwear or protective clothing or tools. All such contaminated items *should* be removed and retained in the askarels working area together with all cleaning materials, prior to disposal of the whole in an appropriate manner or cleansing as appropriate.

6.2 Precautions to be taken to avoid pollution of the environment when askarels have been affected by fire

- a) Wherever practicable, products of combustion, e.g. smoke, soot, ash emanating from a fire involving askarels *should* be contained. Similarly, every precaution *should* be taken to prevent ingress of such products, contaminated fire fighting water etc., into water systems.
- b) After use, soot-contaminated fire fighting apparatus, including protective clothing, *should* be removed and stored in impervious bags or drums in a secure area for disposal or cleansing as appropriate.
- c) When the fire has been extinguished, barriers *should* be erected, with suitable warning notices, and security arrangements made to prevent unauthorised access into the affected area.
- d) Access to the area affected *should* be restricted to trained personnel. Every reasonable effort *should* be made to contain the smoke from a fire involving askarels (for example, ensure that all air conditioning, ventilation or forced cooling systems are switched off). Affected areas *should* be cleaned up using approved procedures.

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7 Personal protective equipment

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7.1 Skin protection

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Impermeable gloves, coveralls or apron and overshoes *should* be worn as appropriate where contact with askarels is possible. Clothing manufactured from absorbent materials *should* be avoided.

NOTE: After prolonged contact with askarels, natural rubber, synthetic rubber (neoprene) and several plastics may be degraded.

7.2 Eye protection

Chemical type safety goggles *should* always be worn when contact with askarels is possible.

7.3 Breathing protection

Due to the low vapour pressure of the major constituent of askarels, i.e. PCBs, at ambient temperature, the airborne concentrations of askarels are generally very low under normal ambient temperature conditions, making it unnecessary to wear respiratory protective equipment (RPE) for small spill clean-ups.

Self-contained air breathing apparatus should be worn if contact is possible with:

- a) the gases produced by arcing in the presence of askarels;
- b) the degradation products formed as a result of a fire involving askarels.