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Chemicals used for treatment of water intended for human consumption — Guidelines for the purchase of products

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee CII/59, Chemicals for drinking water treatment, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Additional information
The title has been modified to include the words 'of products', which were missing from the final text issued by CEN. The error has been notified to CEN.

Cross-references

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English version

Chemicals used for treatment of water intended for human consumption - Guidelines for the purchase

This CEN Report was approved by CEN on 4 August 2001. It has been drawn up by the Technical Committee CEN/TC 164.

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Foreword

This CEN Report has been prepared by CEN/TC 164, "Water supply", the secretariat of which is held by AFNOR.

Introduction

A series of European Standards for chemicals used for treatment of water intended for human consumption has been prepared taking into account that no product should contain any contaminating, inorganic or organic substances in quantities that could cause deterioration in the quality of drinking water that has been correctly treated with the product.

A range of important issues, beyond the scope of these European Standards, should be considered by a water supply undertaker before entering into a contract with a particular supplier of water treatment chemicals. These issues, which are the subject of this European Standard, will include an assessment of the chemical supplier's competence, contract conditions, chemical quality monitoring strategy and procedures for product acceptance and rejection. It is for the purchaser to decide which of these issues should be included in the preparation of their own checklists and contract documents.

1 Scope

This CEN Report gives guidance on the use of European Standards for chemicals used for treatment of water intended for human consumption and it is intended to assist a purchaser of such chemicals to identify factors that shall be considered, developed and included in a water supply undertaker's procurement policy.

2 Normative references

This CEN Report incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this CEN Report only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 12902, *Products used for treatment of water intended for human consumption - Inorganic supporting and filtering materials - Methods of test.*

3 Terms and definitions

For the purposes of this CEN Report, the following terms and definitions apply:

3.1
agent
organisation appointed by a supplier to sell a product on a commission basis

NOTE An agent does not have ownership of the product

3.2
distributor
organisation which is formally appointed by a supplier to buy stock and resell all or part of the supplier's product range

NOTE 1 The distributor can operate within defined geographical areas, use sectors, and load size limitation for delivery.

NOTE 2 The supplier can be a manufacturer, can supply in part, purchase for resale and can also have his own direct sales organisation with whom a close liaison will exist.

NOTE 3 A distributor takes ownership of the product in contrast to an agent who does not.

3.3
batch
quantity of finished product produced in a batch process at one time

NOTE In a continuous or semicontinuous process the concept of a batch, as defined above, does not apply and it is usual to talk in terms of a lot.

3.4
certificate of analysis
document stating the actual test results obtained by analysing a representative sample drawn from the product to be delivered

3.5
certificate of conformity
document that testifies to conformity to a specification

NOTE 1 The provision of a certificate of conformity is not a requirement of the European Standards for chemicals used for treatment of water intended for human consumption but a purchaser can request a supplier to provide this document.

NOTE 2 A certificate of conformity does not imply that the actual material delivered has been tested, but it confirms that all the material from which the delivery has been made up has at some stage been tested and inspected according to the requirements of the established quality system.

3.6
contract
any type of agreement, preferably written between the supplier and the customer

NOTE The use of a written contract is essential for all issues affecting product quality, security of supply and cost.

3.7
lot
quantity of chemical from which a representative sample is available

NOTE An example of a lot is a quantity of chemical drummed off or packed out from a bulk tank or storage silo.

3.8
process
any operation which intentionally changes the performance, chemical nature, physical form or composition of the product

3.9
purchaser
organisation which enters into a contract with a supplier and is generally referred to as the customer

3.10
representative sample
sample taken in accordance with a defined procedure in order to obtain information on the batch or lot

NOTE Where applicable this should assure the homogeneity of the whole or part of the lot as agreed with the customer.

3.11
specification
precise statement, or set of requirements (quantities, characteristics and/or properties) to be satisfied by a material, process or product with an indication of the test methods used

3.12
subcontractor
any provider of goods or services to the supplier

NOTE Examples of such services are: raw materials, toll manufacturing, test laboratory facilities, transport, storage.

3.13
supplier
organisation which has entered into a contract with a customer to provide a product in accordance with previously established specifications and in compliance with a formal quality system

3.14
toll manufacturer
sub-contractor who undertakes the whole or a prescribed part of the supplier's manufacturing process

4 General Considerations

Chemicals used for the treatment of water intended for human consumption shall conform to the relevant European Standard. Purchasers of water treatment chemicals shall confirm that potential suppliers are aware of the appropriate European Standard and can demonstrate that they are capable of conforming to it. The issues identified in this European Standard shall be considered for inclusion in the purchaser's procurement policy. The resulting 'purchaser contract conditions' shall then be discussed and agreed with the supplier prior to negotiating the unit cost of the required product and agreeing to enter into a formal contract.

The purchaser shall formally notify potential suppliers that the product will be used in the treatment of water for human consumption and that full conformity to the requirements of the appropriate European Standard is the minimum expectation. In special circumstances purchasers can require more stringent quality requirements to be achieved.

Purchasers shall seek sufficient information from potential suppliers to be confident that products are prepared, transported and quality assured in a way that guarantees full conformity to the requirements of the relevant European Standard.

Third party certification of the product concerned and of the quality assurance system used by the producer can be used to assess the supplier and to improve confidence in their ability.

The purchaser's requirements, regarding manufacture, quality control, the right to enter premises to inspect practices and procedures, delivery of finished products and the issue of certificates of analysis or conformity can influence the cost of the product and shall be clearly specified in all tender and contract documentation.

The purchaser shall seek sufficient information, including analytical reports, to be confident that there are no unacceptable risks to product quality. This European Standard gives guidance on information that shall be sought in order to select a preferred supplier from those that are available.

5 Assessment of the suitability of a supplier of water treatment chemicals

5.1 General

Information shall be sought by correspondence or, where applicable, by inspection of the supplier's premises and manufacturing plant.

The purchaser can select the questions that are relevant for his requirements and incorporate them in a 'supplier questionnaire'.

5.2 Product manufacturing process and general product information

5.2.1 Purpose

The purpose of this procedure is: to establish who makes the product and how it is made; and to identify whether the manufacturing process carries an unacceptable risk of producing a poor quality product.

5.2.2 Procedure

5.2.2.1 Origin of products

Confirm whether the product is manufactured by the supplier.

If the product is not manufactured by the supplier, confirm:

a) whether the product is obtained directly or through sub-contractor(s);

b) the name and address of the product manufacturer;

c) that the 'main supplier' is able to demonstrate adequate control over the sub-contractor's performance in all areas identified below.

5.2.2.2 Manufacturing process

Seek assurance that:

a) the product is manufactured from raw materials of appropriate and known quality, monitored by agreed methods at agreed frequencies;

b) procedures are in place to prevent variation in raw material quality affecting the quality of the finished product;

c) process conditions are adequately defined, monitored and controlled to achieve consistent finished product quality.

Establish whether other products are manufactured on site.

5.2.2.3 Product handling

Seek assurance that:

a) adequate precautions are taken to minimise risk of crosscontamination of products (a list of 'other' products shall be provided);

b) adequate precautions are taken to prevent the product from being wrongly labelled, wrongly packaged or wrongly loaded onto transport vehicles.

5.3 Product supplier reference

5.3.1 Purpose

The purpose of this procedure is to establish that the supplier can demonstrate the ability to supply products of acceptable quality.

5.3.2 Procedure

Seek to establish whether the supplier has ever supplied products of inferior quality to a purchaser. Has the supplier revised manufacturing and supply procedures adequately to prevent future problems?

Establish whether the supplier has supplied the required product to the purchaser in the past. Does previous experience confirm adequate competence and performance?

Establish whether the supplier can provide references of other water suppliers who have purchased the required product. Does their experience with the supplier confirm adequate competence and performance?

Establish whether the supplier can provide references of other industries who purchased the required product. Does their experience with the supplier confirm adequate competence and performance?

5.4 Product and process quality assurance systems

5.4.1 Purpose

The purpose of this procedure is to establish, either directly or through third party assessment, that the supplier uses quality control procedures to ensure that the quality of the finished product conforms at all times to the requirements of the agreed product specification and the appropriate European Standard.

5.4.2 Procedure

Confirm that there is an accountable person responsible for quality assurance within the supplier's company.

Confirm that the supplier has well defined and documented policies and objectives regarding product quality control.

Confirm that the supplier's procedures make reference to all requirements of the appropriate European Standard.

Identify the supplier's commitment to quality assurance through accreditation or award of relevant European or national standards; for example the EN ISO 9000 series is a means of verifying commitment to quality assurance.

Confirm that the supplier can demonstrate that its quality control procedures are implemented, maintained in an up-to-date condition, regularly reviewed and revised when necessary. It is anticipated that the customer will

acknowledge a certificate of Quality Assurance issued to the supplier by a third party. However, the purchaser can wish to inspect the supplier's procedures periodically and at short notice.

The supplier's QA system shall include how products that do not conform to quality standards are identified, isolated, reused or disposed of. The supplier's Quality Assurance System shall ensure that all employees responsible for product manufacturing are aware of their role in the quality control process and have been trained to an acceptable competence in relevant production and quality control procedures.

5.5 Product and process inspection and testing

5.5.1 Purpose

The purpose of this procedure is to establish that adequate sampling and testing are carried out during product manufacture to allow adequate quality control to be exercised and to ensure that product quality results are available for inspection at all reasonable times.

5.5.2 Procedure

Ensure that adequate sampling and analysis is performed on raw materials, part finished products and fully finished products.

Confirm that there is one clearly defined person responsible for the management of the quality control process.

Ensure that the sampling and analytical methods employed conform to the requirements of the relevant European Standard.

Confirm that the accuracy and precision of analytical methods are adequately monitored through routine analytical quality control procedures.

Ensure that all procedures for sampling and analyses are fully documented.

Ensure that the frequency of sampling, the range of parameters monitored and the period of time between sampling and reporting of results are adequate and formally agreed.

Confirm that procedures to identify non-conformance with quality targets are sufficiently rapid and are maintained.

Establish who determines the need for corrective action or isolation of unacceptable products.

Confirm that written records of inspection and test results and subsequent actions are documented and the records are kept for a suitable period of time.

5.6 Product handling, storage, packing and despatch

5.6.1 Purpose

The purpose of this procedure is to establish that the product is available in the mass or volume required and that procedures are in place to minimise the risk of product contamination, product deterioration, incorrect labelling or incorrect dispatch.

5.6.2 Procedure

Confirm that the product is transferred throughout the manufacturing process in a way that minimises the risk of contamination.

Confirm that the product is available in units of the desired mass or volume

Confirm that the supplier records the date of production batches.

Establish the specified 'shelf life' for the required product.

Ensure that the supplier practices adequate stock rotation in order to minimise product age and deterioration.

Confirm that the supplier is able to reliably supply the quantity of product sought at the delivery frequency required.

Confirm whether all quality control results are known before release of products to the purchaser or how product deficiencies will be identified to the purchaser and the product isolated before use.

5.7 Product transport

5.7.1 Purpose

The purpose of this procedure is to ensure that procedures are in place to avoid product contamination, to enable quality control sampling of loads and to ensure delivery to the correct discharge location.

5.7.2 Procedure

Establish whether bulk loads are transported using the supplier's transport fleet or by contracted haulier.

Ensure that the haulier is aware that the product is to be used for the production of water for human consumption.

Confirm whether bulk tankers and connecting pipes or hoses are dedicated to the required product or are adequately cleaned before and after delivery.

Confirm the ownership of water treatment site chemical storage facilities and the responsibility for minimising the potential for product deterioration during storage.

Confirm that documented procedures are in place regarding storage, handling, delivery and acceptance of the product at the purchaser's premises.

Establish how samples may be taken from delivered loads in order to confirm receipt of the correct chemical before unloading.

Confirm the means by which representative samples of loads can be taken.

5.8 Delivery and post delivery product issues

5.8.1 Purpose

The purpose of this procedure is to ensure that the supplier provides adequate guidance regarding safe delivery and storage conditions necessary to minimise product deterioration and environmental damage and to ensure that there are procedures in place defining how product quality checks can be carried out and the actions to be taken in the event of disputes between supplier and purchaser.

5.8.2 Procedure

Ensure that the supplier provides advice regarding the way in which the product shall be stored and used. The purchaser is responsible for legal requirements associated with the storage and use of the product.

Ensure that the supplier provides advice regarding the way in which the product shall be stored in order to minimise deterioration through ageing, contamination, mixing with other products or other effects.

Ensure that procedures are in place to define who shall be present during chemical delivery and who will authorise permission to discharge or unload the product.

Ensure that adequate security conditions are in place to prevent accidental or malicious release of the product to the environment.

Ensure that procedures, equipment and training are in place to minimise the risks to health of personnel who prepare and use the product.

NOTE EN Standards instruct the supplier to provide the current safety instructions with dangerous products.

Establish formal procedures for reporting instances where the purchaser's analytical results identify nonconformity to the agreed specification or relevant European Standard.

Confirm the means by which differences in analytical results between purchaser and supplier can be arbitrated.

Confirm the means by which unsatisfactory or unwanted products can be removed from site and disposed of or recycled in an environmentally acceptable manner.

Establish the nature and extent of service provided or recommended by the supplier in the event of spillage or leakage of the product or other accidents.

Establish the way in which defective products can be removed in an emergency.

Establish telephone and facsimile numbers to allow contact with the supplier routinely or in emergency at all times of day or night.

Annex A
(normative)

Complementary requirements for purchase of filtering materials

A.1 General

The purchase of filtering materials shall be in compliance with the relevant EN Standard. The following general guidelines are intended to assist in the identification of special conditions necessary when purchasing of filtering materials.

A.2 Source of supply

Filtering materials shall be obtained from suppliers who can demonstrate their suitability and competence in producing these materials for drinking water treatment applications.

A.3 Choice of filter material

The specification of appropriate material, particle size, single or multiple media, and bed depth depends on the condition of water to be treated, plant pre-treatment facilities and other factors, and can be the responsibility of the plant designer. European Standards for inorganic supporting and filtering materials do not specify filtration performance as that depends on the water to filtered as well as the filter medium. Users need to satisfy themselves that a particular type of filter material and source of supply is suitable for the intended application.

A.4 Particle size distribution

There are two ways of specifying particle size distribution. Media size gradation may be described in terms of either

a) effective size, uniformity coefficient and minimum particle size or

b) by particle size range and maximum amount of oversize and undersize material. Attempting to specify both sets of parameters can result in a particle size distribution that cannot be attained by producers. Granular filtering materials shall not contain excessive amounts of fine material (e.g. clay) which could cause poor performance in filtration.

A.5 Interstitial volume (voidage)

This has a large effect on hydraulic characteristics (e.g. behaviour of the filter bed during backwashing) and depends upon the shape of the particles. With natural materials, although particle size can be changed the supplier cannot change the interstitial volume (except by using a different source). Suppliers shall quote the value of the parameter in tender documents.

A.6 Mechanical strength

Some filtering materials (e.g. granular activated carbon, pumice) have relatively poor mechanical strength. Friability testing is used for assessing the material behaviour during transportation and installation whilst attrition tests measure resistance to abrasion during backwashing. Such tests do not indicate exactly the effects that will occur in practice but they can be useful for comparison of different materials and products from different sources.

A.7 Basis of purchase

Filtering materials are commonly sold by mass with a specified limit on the moisture content. In practice, the material purchased has to fill the filter to a required level so purchase of a specified volume of materials can be more convenient. There is no reason why the materials shall not be sold by volume provided a suitable purchasing agreement can be negotiated.

A.8 Leachable impurities

Limits on acid solubility are included in some product standards to ensure that substantial quantities of other substances (e.g. calcium carbonate) are not present in the filter material. In the case of materials such as activated carbon with internal surface areas, specifications are given for the amount of toxic substances leached under defined conditions. For non-porous materials (e.g. sand, anthracite) it is generally considered unnecessary to determine the impurities leachable into water, as any leachable impurity on the material surface would be washed off during filter commissioning.

However, the test for water extractable impurities given in EN 12902 shall be used to establish the suitability of filtering material from a new source or process.

Bibliography

[1] EN ISO 9000, Quality management systems - Fundamentals and vocabulary (ISO 9000:2000)

[2] EN ISO 9001, Quality management systems - Requirements (ISO 9001:2000)

[3] EN ISO 9004, Quality management systems - Guidelines for performance improvements (ISO 9004:2000)

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