SWEDISH STANDARDS INSTITUTE

SVENSK STANDARD
SS-EN 14812:2005+A1:2007

Fastställd 2007-07-02

Utgåva 1

Vattenförsörjning – Invändig utrustning – System för kemikaliedosering – Krav på utförande, säkerhet och provning

Water conditioning equipment inside buildings – Chemical dosing systems – Pre-set dosing systems – Requirements for performance, safety and testing

ICS 91.140.60

Språk: engelska

Publicerad: augusti 2007

Europastandarden EN 14812:2005+A1:2007 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 14812:2005+A1:2007.

Denna standard ersätter SS-EN 14812:2005, utgåva 1.

The European Standard EN 14812:2005+A1:2007 has the status of a Swedish Standard. This document contains the official English version of EN 14812:2005+A1:2007.

This standard supersedes the Swedish Standard SS-EN 14812:2005, edition 1.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14812:2005+A1

June 2007

ICS 13.060.20; 91.140.60

Supersedes EN 14812:2005

English Version

Water conditioning equipment inside buildings - Chemical dosing systems - Pre-set dosing systems - Requirements for performance, safety and testing

Appareils de traitement d'eau à l'intérieur des bâtiments - Systèmes de dosage de réactifs chimiques - Systèmes de dosage non ajustables - Exigences de performance, de sécurité et essais

Anlagen zur Behandlung von Trinkwasser innerhalb von Gebäuden - Dosiersysteme - Nicht einstellbare Dosiersysteme - Anforderungen an Ausführung, Sicherheit und Prüfung

This European Standard was approved by CEN on 26 August 2005 and includes Amendment 1 approved by CEN on 10 May 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN 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 CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Ref. No. EN 14812:2005+A1:2007: E

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Foreword

This document (EN 14812:2005+A1:2007) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2007 and conflicting national standards shall be withdrawn at the latest by December 2007.

This document includes Amendment 1, approved by CEN on 2007-05-10.

This document supersedes EN 14812:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] 〈A1〉.

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this European Standard:

1) This European Standard provides no information as to whether the product may be used without restriction in any of the Member States in EU or EFTA.

2) It should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard specifies definitions, principles of construction (but not dimensions) and design, requirements on performance and operation as well as methods for testing the performance of chemical pre-set dosing systems for conditioning water intended for human consumption inside buildings (see [8]) which are permanently connected to the mains supply.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies: For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 806-2, *Specification for installations inside buildings conveying water for human consumption - Part 2: Design*

EN 1267, *Valves – Test of flow resistance using water as test fluid*

EN 55011, *Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement (CISPR 11:1997, modified*

EN 60204-1, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements (IEC 60204-1:1997)*

EN 60335-1 [1] , *Household and similar electrical appliances – Safety – Part 1: General requirements (IEC 60335-1:2001, modified)*

EN 60335-2-41, *Household and similar electrical appliances - Safety - Part 2-41: Particular requirements for pumps (IEC 60335-2-41:2002)*

EN 60730-2-8:2002, *Automatic electrical controls for household and similar use — Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements (IEC 60730-2- 8:2000, modified)*

EN ISO 10304-1, *Water quality – Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate and sulphate ions, using liquid chromatography of ions – Part 1: Method for water with low contamination (ISO 10304-1:1992)*

EN ISO 10304-2, *Water quality – Determination of dissolved anions by liquid chromatography of ions – Part 2: Determination of bromide, chloride, nitrate, nitrite, orthophosphate and sulfate in waste water (ISO 10304-2:1995)*

EN ISO 10304-3, *Water quality – Determination of dissolved anions by liquid chromatography of ions – Part 3: Determination of chromate, iodide, sulphite, thiocyanate and thiosulfate (ISO 10304-3:1997)*

EN ISO 10304-4, *Water quality – Determination of dissolved anions by liquid chromatography of ions – Part 4: Determination of chlorate, chloride and chlorite in water with low contamination (ISO 10304-4:1997)*

EN ISO 11885, *Water quality – Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (ISO 11885:1996)*

EN ISO 12100-1, *Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

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[1] Observe transition period for EN 60335-1(1994) ending 2008-07-01.

EN ISO 12100-2, *Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles (ISO 12100-2:2003)*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
conditioning of water intended for human consumption
processes that modify the quality of water intended for human consumption within the Drinking Water Directive or national drinking water regulations with regard to specific individual constituents as defined in EN 806-2

3.2
pre-set dosing system
device used for the controlled addition of dosing agents in one or more fixed quantities

3.3
working range
range of treated water flow rates between which the dosing system provides the required accuracy of concentration of the dosing agent within limits of concentration and pressure drop prescribed by the manufacturer. It covers the range between the upper and lower working limits

3.4
dosing volume per recharge
water volume that can be treated with one recharge of dosing agent

3.5
proprietary chemical
specific composition of one or more dosing agents in a particular physical form that is put on the market by the manufacturer under his trade name and supplied together with the dosing apparatus

3.6
dosing agents
active chemical substances for conditioning water intended for human consumption

3.7
manufacturer
company (manufacturer or supplier) under whose name the dosing system and the proprietary chemical(s) are put on the market

4 Design requirements

4.1 Materials of construction

Until EAS comes into force, the current national regulations remain applicable.

NOTE Products intended for use in water supply systems should comply, when existing, with national regulations and testing arrangements that ensure fitness for contact with drinking water. The Member states relevant regulators and the EC Commission agreed on the principles of a future unique European Acceptance Scheme (EAS), which would provide a common testing and approval arrangement at European level.

If and when the EAS is adopted, European Product Standards will be amended by the addition of an Annex Z/EAS under Mandate M/136 which will contain formal references to the testing, certification and product marking requirements of the EAS.

4.2 Connections

Examples of connections are shown in Annex A.

4.3 Venting

The dosing apparatus shall be designed so that accumulation of air or other gases during operation is avoided or does not impair the dosing accuracy.

Compliance with this requirement shall be checked on the basis of the detailed technical design documents supplied with the apparatus.

4.4 Radio interference and electrical safety

It is the responsibility of the manufacturer that the dosing system conforms to EN ISO 12100-1, EN ISO 12100-2, EN 60204-1, EN 60335-1 and EN 60335-2-41, following the provisions of Directive 89/336/EEC and Directive 73/23/EEC (see [A1] [9], [10] [A1]).

4.5 Dosing agent containers

Materials selected for the manufacture of dosing agent containers shall protect the contents against harmful effects of light. The design of the connection between the dosing agent container and the dosing apparatus shall exclude any accidental contamination of the contents during either normal operation or change of the container.

NOTE The size of the dosing agent container – or the recharge volume, if a solid type of dosing agent is used – should be calculated so that a replacement becomes necessary after not more than six months.

4.6 Accessibility

All parts which have to be actuated for replacing of the dosing agent container and for operation and control shall be easily accessible. It shall be possible to protect them against unauthorised actuation, for example by means of special tools, seals or locks. Renewal of the dosing material shall be carried out only by replacing by a ready-made container filled with proprietary chemical.

Replacement of the dosing agent container shall be possible without having to disconnect the dosing apparatus from the connecting pipework.

4.7 Nominal size

The nominal size of system connection shall correspond to the flow rates given in Table 1. The inlet connection size of the dosing device may be one size larger or smaller than the nominal size. For flange connections, the inlet flange shall conform to nominal size.

Table 1 — Flow rate values at upper limit of working range

Nominal size DN	15	20	25	32	40	50	65	80	100
Upper limit of working range flow rate Q_N l/s	0,35	0,63	1,0	1,6	2,53	3,89	6,67	10	15,56
Upper limit of working range flow rate Q_N m^3/h	1,27	2,27	3,6	5,8	9,1	14	24	36	56
NOTE These flow rates correspond to a velocity of approximately 2 m/s.									

5 Performance requirements

5.1 Dosing and dosing agents

5.1.1 Dosing agents

The purpose of the dosing agents shall be restricted to one or more of the following water treatment targets:

— disinfection of the water;

— inhibition of corrosion phenomena;

— inhibition of scaling phenomena (by stabilisation of hardness).

Dosing systems may be designed for dosing with one or more proprietary chemicals. The manufacturer shall define the proprietary chemicals and their water treatment target depending on the composition of the water and the installation components to be protected. Each proprietary chemical shall be tested separately.

Proprietary chemicals shall meet the quality requirements of the relevant European Standard for chemicals used for conditioning of water intended for human consumption.

5.1.2 Dosing

The choice of the dosing method shall be at the manufacturer's discretion.

NOTE For devices dosing proprietary chemicals supplied in liquid form, the dosing characteristics can be tested with a test solution.

The dosed quantity of each proprietary chemical and the dosing agents concentrations in the treated water can then be calculated, provided that viscosity as well as density does not differ from those of the test solution and release of gas does not occur.

The concentration of dosing agent in the conditioned water shall neither be lower than 20 % nor higher than 100 % of the maximum concentration defined by the manufacturer for each single type of proprietary chemical. No individual value shall be lower than 16 % or higher than 120 % of this maximum concentration. Measures shall be taken to ensure that the above defined concentration in the conditioned water is not exceeded even after periods of downtime, pressure fluctuation or after failure of the electric power supply. During continuous operation as specified in 6.2.7.1 and during intermittent operation as specified in 6.2.7.2, the dosing apparatus shall meet the above mentioned requirements at the lower and upper working limits of the working range as well as at 50 % and 120 % of the upper working limit. These requirements shall apply to each pre-set dosing rate that can be selected on site.

5.2 Working ranges

The lower working limit of the working range shall not exceed the values given in Table 2.

Table 2 — Working ranges

Working limit	Working ranges m^3/h		
Upper limit of working range	≤ 10	> 10 ≤ 20	> 20
Maximum lower limit of working range	0,06	0,15	0,25

5.3 Protection against backflow of proprietary chemical

Dosing systems shall be designed so that overdosing due to suction of the proprietary chemical into the drinking water supply cannot occur under any operation condition without external backflow protection.

5.4 Working temperature range

The manufacturer shall specify the minimum and maximum working temperatures between which the dosing apparatus including accessories and fittings will operate correctly. The maximum temperature shall be at least 30 °C for the water and the ambient air.

NOTE Usually the working temperature range is not to be verified. If there is any concern, the dosing according to 6.2.7.1 should be performed additionally with the test solution at the specified maximum temperature.

5.5 Pressure conditions

5.5.1 Nominal pressure and working pressure range

The manufacturer shall specify the minimum and maximum working pressures between which the dosing apparatus including accessories and fittings will operate correctly at the maximum permissible water and room temperatures.

The maximum working pressure for normal operating conditions indicated by the manufacturer shall be at least 0,6 MPa at the maximum water and room temperatures.

The nominal pressure shall be at least 1 MPa.

Testing shall be carried out in accordance with 6.5.1 to 6.5.4.

5.5.2 Effects of pressure variations

Pressure variations of ± 0,2 MPa shall not impair the function and the accuracy of dosing apparatus.

5.5.3 Pressure drop

When tested in accordance with 6.5.5, the pressure drop shall not exceed 0,08 MPa over the entire working range.

5.5.4 Water hammer

When tested in accordance with EN 60730-2-8:2002, Annex EE, the dosing systems shall not cause water hammer which endangers the safety of the installation.

6 Testing

6.1 General

Unless otherwise specified any tolerances shall be ± 5 %.

Unless otherwise stated, tests shall be carried out at ambient temperature between 15°C and 25°C with water of between 10 °C and 30 °C.