PLAHVATUSOHTLIKUD KESKKONNAD. OSA 34: KVALITEEDIJUHTIMISSÜSTEEMIDE RAKENDAMINE EX-TOODETE TOOTMISEL

Explosive atmospheres - Part 34: Application of quality management systems for Ex Product manufacture (ISO/IEC 80079-34:2018)

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO/IEC 80079-34:2020 sisaldab Euroopa standardi EN ISO/IEC 80079-34:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO/IEC 80079-34:2020 consists of the English text of the European standard EN ISO/IEC 80079-34:2020.
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Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Explosionsgefährdete Bereiche - Teil 34: Anwendung von Qualitätsmanagementsystemen für die Herstellung von Ex-Produkten (ISO/IEC 80079-34:2018)

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European foreword

The text of ISO/IEC 80079-34:2018 has been prepared by Technical Committee ISO/TMB "Technical Management Board - groups" of the International Organization for Standardization (ISO) and has been taken over as EN ISO/IEC 80079-34:2020 by Technical Committee CEN/TC 305 "Potentially explosive atmospheres - Explosion prevention and protection" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2020, and conflicting national standards shall be withdrawn at the latest by March 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO/IEC 80079-34:2011.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directives, see informative Annex ZA, ZB, ZC and ZD, which are an integral part of this document.

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO/IEC 80079-34:2018 has been approved by CEN as EN ISO/IEC 80079-34:2020 without any modification.

Annex ZA
(normative)

Normative references to international publications and the corresponding European publications

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

NOTE Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-426	—	International Electrotechnical Vocabulary — Part 426: Equipment for explosive atmospheres	—	—
IEC 60079-0	—	Explosive atmospheres — Part 0: Equipment — General requirements	EN IEC 60079-0	2018
ISO 9000	2015	Quality management systems — Fundamentals and vocabulary	EN ISO 9000	2015

Annex ZB
(informative)

Information relevant to equipment and protective systems according to standards harmonized under Directive 2014/34/EU

ZB.1 Introduction

The requirements laid down in the Directive and the standards harmonized under the Directive are the basis for the quality assurance of the production process and the assessment of the quality system as well. The quality system must ensure that the products resulting from the regular production process comply with the types tested in the EU-type examination and with the applicable requirements of the Directive.

This annex draws attention to a number of standards harmonized under the Directive which can be used to gain detailed information on specific requirements. These references might be useful for manufacturers to check whether the safety-relevant aspects are considered in the quality system and covered by adequate procedures (see 8). They can also be used for internal or external quality audits (see 9.1 and 9.2).

In quality system assessments according to Annexes IV and VII of Directive 2014/34/EU performed by a Notified Body the auditing team must have knowledge with regard to the product specific requirements according to the Directive.

NOTE The following examples do not cover all protection concepts and product specific requirements but give some advice and will be supplemented to in the next edition.

ZB.2 Non-electrical equipment (EN 13463-1)

Safety aspects are covered by clause A.14 for non-electrical equipment (EN ISO 80079-36).

ZB.3 Protection by flow restricting enclosure "fr" (EN 13463-2)

Safety aspects are covered by the general clause for non-electrical equipment (EN ISO 80079-36).

ZB.4 Protection by flameproof enclosure "d" (EN 13463-3)

The same safety aspects as for electrical equipment apply (see A.3; for aspects of dust ignition protection, see also A.10).

ZB.5 Protection by constructional safety "c" (EN 13463-5)

Safety aspects are covered by clause A.15 for non-electrical equipment (EN ISO 80079-37).

ZB.6 Protection by control of ignition sources "b" (EN 13463-6)

Safety aspects are covered by clause A.16 for non-electrical equipment (EN ISO 80079-37).

ZB.7 Protection by pressurised enclosures "p" (EN 13463-7)

The same safety aspects as for electrical equipment apply (A.6), according to A.14.1.

ZB.8 Protection by liquid immersion "k" (EN 13463-8)

Safety aspects are covered by clause A.17 for non-electrical equipment (EN ISO 80079-37).

ZB.9 Fans (EN 14986)

ZB.9.1 General

The following safety aspects as specified in the technical file should be realised by systematic production techniques and/or verifications and tests on the basis of written procedures.

ZB.9.2 Material

— Selection of specified materials; material name complies with the requirement;

— material properties (composition with regard to corrosion, thermal conduction and mechanical sparks, mass fraction of aluminium, titanium, magnesium, zirconium, flammability);

— cracks, inclusions, blow holes and porosity (either by a visual test or another suitable test method depending on exposure);

— heat treatment (e.g. hardening, tempering);

— dimensional accuracy including all parts without machining.

ZB.9.3 Assembled equipment and protective systems

— Adaption of suitable electrical equipment (explosion group, temperature class, equipment category);

— adaption of specified protective systems for fans of category 1G.

ZB.9.4 Routine tests

— Sealing systems (fit, lubrication, initial tension, primary pressure);

— dynamic vibrations (e.g. critical rotation speed, bearing at standstill or at transport);

— functional test of the complete assembly (distance between rotor/stator modules, clamping, clearance, free room of motion);

— excess rotation speed;

— thickness of linings;

— impeller-shaft attachment (avoidance of drift, joint is secured against loosening);

— mounting of autonomous protective systems, if applicable;

— functional test of the temperature monitoring devices in the flame arresters, if applicable;

— pressure test for fans of category 1G, if applicable.

ZB.10 Petrol dispensers (EN 13617-1)

ZB.10.1 General

The following safety aspects as specified in the technical file should be realised by systematic production techniques and/or verifications and tests on the basis of written procedures.

ZB.10.2 Electrical installation

— Type of cable;

— installation of cable;

— correct wiring;

— connection technique;

— torque of screwed connections (traceability).

ZB.10.3 Information for safe operation

— Availability of operating instructions;

— marking on the type label (technical data, type of protection, etc.);

— passing on of warning notes;

— maintenance instructions.

ZB.10.4 Assembly groups

— Drives or electrical equipment;

— subassemblies (gears, couplings, belts);

— components;

— safety-relevant verifications for the interconnection of apparatus, subassemblies and components;

— protective systems within the gas recirculation system.

ZB.10.5 Assembling

— Correct components and parts;

— minimum distances of moving parts (rotor/stator);

— measures performed for equipotential bonding (to ground, between subassemblies);

— protective covers.

ZB.10.6 Monitoring equipment

— Installation of sensors and actuators (fail safe characteristics, separate power supply);

— installation of sensors (position, correct interfacing, prevention of lag elements);

— tests during maintenance (according to operating instructions);

— functional tests and precision control;

— insulation of cables.

For additional information, see also ZB.6.

ZB.10.7 Electrostatic discharge capacity

— Materials (electrostatic discharge capacity resp. surface resistance of non-metallic parts, belts, tubes, etc.);

— limitation of the surface area for the corresponding explosion group;

— thickness of the material for the corresponding explosion group.

ZB.10.8 Routine tests

— Pressure test;

— deactivation/activation of the controlling system before release;

— insulation resistance;

— functional test.

ZB.11 Electrostatic spraying equipment

ZB.11.1 General

The following safety aspects as specified in the technical file should be realised by systematic production techniques and/or verifications and tests on the basis of written procedures.

Electrostatic spraying equipment according to the following harmonized standards:

— EN 50050-1,

— EN 50050-2,

— EN 50050-3,

— EN 50176,

— EN 50177,

— EN 50223.

NOTE This section ZB.11 may also be used for electrostatic spraying equipment in accordance with EN 50059 and EN 50348 harmonized under directive 2006/42/EC.

ZB.11.2 Electrical assembly

The characteristics of the following parts including control devices and accessories should be tested with respect to the application in electrostatic spraying equipment; this means normally that the marking on the component parts or the packaging is verified where appropriate statistical methods may be applied as necessary:

— selection of the high voltage transformer (type, manufacturer, insulation, voltage);

— equipotential bonding and grounding system for the spraying equipment and control device;

— number of stages of the cascade and turn ratio of the high-voltage transformer and the capacity of the cascade;

— assembling, type and value of each current limiting resistor, diode, Zener diode, capacitor or any other safety-relevant component (e.g. hardware-watch-dog);

— manual or automatic assembly of printed circuit boards;

— fixing and soldering of transformer, diodes, capacitors of the cascades;

— date of expiry and storage of adhesives and casting compounds;

— mixing procedures (e.g. pressure, temperature, time characteristics);

— surface treatment (degreasing or equivalent measures are usually required immediately before the potting process to ensure proper adhesion);

— processing, e.g. filling instructions, void-free potting, temperature conditions;

— curing process including: curing time, all relevant environmental factors, provisions made to ensure that the curing process will proceed (e.g. mains power failure detection);

— selection and installation of the display;

— selection and installation of power supply and line filter of the control device;

— selection of cable (high voltage, low voltage);

— length, type and electric strength of the cable including grounding and screening if applicable;

— connection techniques and fixing method of cables between controlling device and spraying equipment.

NOTE 1 For printed circuit boards, the manufacturer should provide a list of safety-relevant electronic components (e.g. resistors, Zener diodes) used. 100 % of the listed components should be tested. This can be done by visual test or for SMD-components by assuring correct charging of the component insertion automat and by visual test of correct positioning or by automated test equipment (ATE) provided that each individual safety-relevant electronic component is considered and that a visual inspection is performed to check the type code and direction of components.

NOTE 2 If the SMD-insertion automat selects the correct component carrier on the basis of a value measurement of the component, this measuring function should be calibrated.

ZB.11.3 Mechanical assembly

— Materials of spraying equipment and control devices should be inspected for stability, cracks, inclusions, bubbling and porosity;

— dimensional accuracy, evenness, surface roughness, fitting accuracy, depth of bushings, flanges and threads of the nozzles of spraying equipment and accessories (extensions, angles, etc.);

— dimensional accuracy and position accuracy of the electrode(s) with respect to the nozzle;

— uniformity of joints;

— gaps and dimensions between the bell and the stator;

— balancing of rotating parts;

— mounting of spraying equipment and control unit;

— torque of the screwed connections if safety relevant;

— IP protection (see ZB.2.6 for details);

— continuous weld seams;

— mounting of annular and flat gaskets;

— continuity of moulded tongues and grooves;

— application of adhesives.

ZB.11.4 Tests

— I_{max} and $I_{short\text{-}circuit}$ of the spraying equipment with and without associated accessories;

— U_{max} of the spraying equipment with and without associated accessories;

— open-circuit monitoring between spraying equipment and control device, if applicable;

— response of the safety facilities in case of simulated malfunction, if applicable.

Where spraying equipment and associated accessories are intended to be combined user-defined, criteria of acceptance for the tests should consider the worst case.

ZB.12 Protective systems

ZB.12.1 General

The following safety aspects as specified in the technical file should be realised by systematic production techniques and/or verifications and tests on the basis of written procedures:

— the properties of dissipative plastics are proven by the manufacturer by dint of a material certificate and examined at least through routine tests (e.g. in accordance with HD 429, neglecting the climate);

— layer thicknesses of non-conductive coatings are examined by routine tests at a sufficient amount of adequate measuring points;

— packing boxes without a temperature control are tightened with a predefined torque;

— every examination is documented.

NOTE Routine tests can be a requirement in certificates or be required by the auditing notified body.

ZB.12.2 Explosion resistant equipment (EN 14460)

The following safety aspects as specified in the technical file should be realised by systematic production techniques and/or verifications and tests on the basis of written procedures:

— pressure shock resistant devices are manufactured according to EN 13445-4, if designed according to EN 13445-3;

— pressure test for each cast part is carried out;

— pressure test is carried out according to EN 14460:2018, Table 1, lasting at least 3 min (routine test); if this is impossible due to technical or safety-relevant reasons, there must be material;

— certificates according to EN 10204, or non-destructive tests of the weld seams (at least supersonic) as well as a dimensions comparison must be carried through;

— weld seams are tested considering the weld seam factor;

— material certificates according to EN 13445-2 are available for the pressure-loaded main parts;

— correct marking and warning labels (e.g. maximum operational pressure, maximum operational temperature, if necessary);

— correct assembling.

For further aspects regarding pressure resistance, see A.3 of this standard.

ZB.12.3 Explosion venting devices (EN 14797)

The following safety aspects as specified in the technical file should be realised by systematic production techniques and/or verifications and tests on the basis of written procedures:

— the static activation overpressure (see EN 14491);

— leak test, if applicable;

— material certificates for the explosion venting devices (e.g. for the plates processed, rubber clamp profiles);

— stability tests are required for explosion venting valves as well as for the baskets for flameless devices;

— dimensional accuracy (e.g. gaps, predetermined breaking points of the bursting discs, wall thicknesses of the processed plates;

— gaskets;

— mass of the insulation, if applicable;

— heating installations on the moveable elements, if applicable;

— weld seams are tested considering the weld seam factor;

— correct marking and warning labels (e.g. maximum operational pressure, maximum operational temperature, if necessary);

— correct assembling;

— number of tests according Table 2 (EN 14797) for non-reusable venting devices.

ZB.12.4 Explosion isolation systems (EN 15089)

The following safety aspects as specified in the technical file should be realised by systematic production techniques and/or verifications and tests on the basis of written procedures:

— closing time of the system (sum of the activation time of sensor, activation time of isolation device and closing time of the isolation device) are tested in routine tests (see EN 15089);

— operating values of all sensors (e.g. pressure, temperature, light);

— correct implementation of required safety functions (e.g. control and indicating equipment settings);

— dimensional accuracy, particularly of the sealing elements;

— dimensions of enclosure, rotors, blades, discs and gaskets;

— gaps between rotors and enclosures of rotary valves;

— mechanical integrity for the maximum explosion overpressure according to the intended use;

— closing force of passive explosion protection valves;

— installations in the interior necessary for safe operation (e.g. rotors of rotary valves, blades, discs, sleeves);

— proof of material (e.g. type of steel, suppressant);

— welding procedure, if applicable;

— correct marking and warning labels (e.g. maximum operational pressure, maximum operational temperature, if necessary);

— correct assembling;

— maintenance when the wear limit is reached (in case of rotary valves);

— use of the correct extinguishing powder and filling quantity (in case of extinguishing barriers);

— information on maintenance.

ZB.12.5 Flameless explosion venting devices (EN 16009)

A flameless venting device is a combination of a venting device with flame extinguishing elements.

The following safety aspects as specified in the technical file should be realized by systematic production techniques and/or verifications and tests on the basis of written procedures:

— all aspects of ZB.12.3 "Explosion venting devices" (EN 14797);

— material certificates of the flame extinguishing elements;

— dimensional accuracy of the flame extinguishing elements (e.g. gaps, layer thickness);

— gaskets;

— pressure resistance of the mechanical mounting / casing of the flame extinguishing elements;

— correct assembling;

— information on maintenance;

— correct marking and warning labels (e.g. maximum operational pressure, maximum operational temperature, if necessary).

ZB.12.6 Explosion diverters (EN 16020)

An explosion diverter is a mechanical explosion resistant device (typically installed in a pipe) which is equipped with an explosion venting device.

The following safety aspects as specified in the technical file should be realized by systematic production techniques and/or verifications and tests on the basis of written procedures:

— All aspects of ZB.12.2 "Explosion resistant equipment" (EN 14460);

— in case

  a) the explosion venting device is purchased from other manufacturers:

  — by control of incoming goods it is safeguarded that the installation of the venting device is permitted on explosion diverters according to the intended use of the venting device

  — Correct marking and warning labels (e.g. maximum operational pressure, maximum operational temperature, if necessary).

b) the venting device is produced by the manufacturer of the explosion diverter itself:

— all aspects of ZB.12.3 "Explosion venting devices" (EN 14797);

— the expected maximum explosion pressure in pipes at the maximum permissible installation distance is taken into account (according to the intended use).

— correct assembling;

— information on maintenance;

— correct marking and warning labels (e.g. maximum operational pressure, maximum operational temperature, if necessary).

ZB.12.7 Explosion isolation flap valves (EN 16447)

The following safety aspects as specified in the technical file should be realized by systematic production techniques and/or verifications and tests on the basis of written procedures:

— material certificates;

— pressure resistance;

— functional safety of the locking mechanism;

— correct assembling;

— mechanical integrity for the maximum explosion overpressure according to the intended use;

— information on maximum and minimum installation distance;

— information on maintenance;

— correct marking and warning labels (e.g. maximum dust load of the process flow, maximum operational pressure, maximum operational temperature, if necessary).