

APPROVED
by the Decision of the
Customs Union
Commission No 825 of
18 October 2011



CUSTOMS UNION TECHNICAL REGULATION

TP TC 012/2011

On safety of equipment intended for use in explosive atmospheres

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Foreword

1. This Technical Regulation of the Customs Union was developed in conformity with the Agreement on common principles and rules of technical regulation in the Republic of Belarus, the Republic of Kazakhstan and in the Russian Federation of 18 November 2010.
2. This Technical Regulation of the Customs Union sets out the uniform mandatory for use and implementation in the common customs territory of the Customs Union requirements to equipment intended for use in explosive atmospheres for the purpose of free movement of this equipment placed on the market in the common customs territory of the Customs Union.
3. If other Technical Regulations of the Customs Union and/or Technical Regulations of the Eurasian Economic Community (further on called the EurAsEC) are adopted that lay down the requirements to the equipment referred to above that differ from the explosion safety requirements, then this equipment shall comply with the requirements of these Technical Regulations of the Customs Union and/or Technical Regulations of the EurAsEC that apply to this equipment.

Article 1. Scope

1. This Technical Regulation of the Customs Union sets out the requirements to equipment intended for use in explosive atmospheres, the compliance with which provides its safe use in explosive atmospheres.
2. This Technical Regulation of the Customs Union was adopted for the purpose of protection of life and health of persons, property and prevention of actions that can mislead customers.
3. This Technical Regulation of the Customs Union applies to electrical equipment (electrical apparatus), including Ex-components, and non-electrical equipment intended for use in explosive atmospheres.

An identification criterion of equipment intended for use in explosive atmospheres and Ex-components is the availability of means providing their explosion protection as specified in the manufacturer's technical documentation, and the explosion-proof marking affixed on the equipment and the Ex-component.

4. The following are excluded from the scope of this Technical Regulation of the Customs Union:

- medical devices intended for use in a medical environment;
- equipment during use of which the explosion hazard results exclusively from the presence of explosive substances or unstable chemical substances;
- equipment intended for use in domestic and non-commercial environments where explosive atmospheres may be created as a result of the accidental leakage of fuel gas;
- personal protective equipment;

- seagoing vessels, inland -navigation and combined (river-sea) navigation vessels, mobile offshore units and drilling platforms intended for inland and offshore use and other water crafts together with machines and equipment on board such vessels or units,
- means of public transport intended for transporting passengers and goods by air or by road, rail or water networks,
- nuclear weapons, testing facilities of organizations working for the nuclear defense industry, except for the equipment being part of these facilities and situated in hazardous areas.

Article 2. Terms and definitions

For the purposes of this Technical Regulation of the Customs Union the following terms with the corresponding definitions shall apply:

abnormal operation ("аварийный режим") is operating of equipment under conditions in which the characteristics of equipment intended for use in explosive atmospheres are outside the limits specified by the manufacturer in the technical documentation;

analysis of the manufacturer's production status ("анализ состояния производства изготовителя") is an assessment of the manufacturer's having the necessary conditions to provide conformity of the equipment produced with the requirements of this Technical Regulation of the Customs Union ;

putting into service ("ввод в эксплуатацию") is a documented event that shows the readiness of equipment to the intended use;

type of protection ("вид взрывозащиты") is a set of specific measures applied to equipment intended for use in explosive atmospheres to avoid ignition of a surrounding explosive atmosphere by such equipment;

explosion safety ("взрывобезопасность") is the absence of inadmissible risk of ignition of ambient explosive atmosphere that could cause damage and/or loss;

explosion protection ("взрывозащита") are measures providing explosion-proof properties of equipment intended for use in explosive atmospheres;

hazardous area ("взрывоопасная зона") is a part of open or closed space in which an explosive atmosphere is present, or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of this equipment;

explosive atmosphere ("взрывоопасная среда") is a mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour, dust, fibres, or flyings which, after ignition, permits self-sustaining propagation of flame ;

equipment identification ("идентификация оборудования") is determination of identity of equipment characteristics to its essential features;

manufacturer ("изготовитель") is a legal or physical person such as a private entrepreneur that on its/his own produces and (or) sells the equipment intended for use in explosive atmospheres and is responsible for its conformity with the requirements of this Technical Regulation of the Customs Union;

importer ("импортер") is a resident of a Member State of the Customs Union that has concluded a foreign trade agreement with a non-resident of Member States of the Customs Union for transfer of equipment intended for use in explosive atmospheres, sells this equipment and is responsible for its conformity with the safety requirements in accordance with this Technical Regulation of the Customs Union;

Ex-component ("Ex-компонент") is an explosion-proof technical device mounted on/in equipment that is essential to the safe functioning of equipment in explosive atmospheres, but with no autonomous function.

maximum surface temperature ("максимальная температура поверхности") is the highest temperature which is attained in service by any part or surface of equipment as a result of disturbance of normal operating conditions specified in the manufacturer's technical documentation or any fault, but within the tolerances specified for the type of protection concerned;

explosion-proof marking ("маркировка взрывозащиты") is a special mark of explosion safety and identification codes of parameters that determine explosion safety of equipment and Ex-components intended for use in explosive atmospheres affixed on the equipment and Ex-components as referred above and specified in the manufacturer's technical documentation;

normal operation ("нормальный режим эксплуатации") is operation of apparatus conforming electrically and mechanically with its design specification and used within the limits specified by the manufacturer in the technical documentation;

equipment for explosive atmospheres ("оборудование для работы во взрывоопасных средах") is a technical device (a machine, an apparatus, a stationary or mobile device, an element of their control or protection system, a device providing protection, an instrument) that is intended for operation in explosive atmospheres and may contain its own potential sources of ignition of ambient explosive atmosphere, but is designed in such a way that any inadmissible risk of ignition of explosive atmosphere is excluded.

malfunction ("отказ") is an event consisting in that equipment or components do not perform their intended function;

certificate of conformity of quality management system ("сертификат соответствия системы менеджмента качества") is a document by which a Certification Body of Quality Management Systems attests conformity of quality of the manufacturer's work and services with the requirements of ISO 9000 standards;

special mark of explosion safety ("специальный знак взрывобезопасности") is a mark affixed on equipment and Ex-components to indicate that the equipment and Ex-components have explosion-proof construction;

ignition temperature of an explosive gas atmosphere ("температура самовоспламенения взрывоопасной газовой среды") is the lowest temperature of a heated surface which, under specified conditions will ignite a flammable substance in a form of a gas or vapour mixture with air;

ignition temperature of a dust layer ("температура самовоспламенения слоя пыли") is the lowest temperature of a hot surface at which ignition occurs in a dust layer of specified thickness on a hot surface;

manufacturer's technical documentation ("техническая документация изготовителя") is a system of graphic and text-based documents used for designing, production and operation of equipment intended for use in explosive atmospheres (parts, assemblies, complexes and sets), as well as for designing, building and operation of protection systems;

equipment protection level ("уровень взрывозащиты") is a level of explosion protection assigned to equipment based on its likelihood of becoming a source of ignition and conditions of its use in explosive atmospheres.

Article 3. Rules of products circulation on the market

1. Equipment intended for use in explosive atmospheres shall be put into circulation in the common territory of the Customs Union provided that it passed all required conformity assessment procedures specified in this Technical Regulation of the Customs Union and other Technical Regulations of the Customs Union and EurAsEC that apply to this equipment.

2. Equipment intended for use in explosive atmospheres the conformity of which with the requirements of this Technical Regulation of the Customs Union has not been confirmed shall not be marked with the Conformity Mark of Member States of the Customs Union, and placing of such equipment on the market is prohibited.

Article 4. Explosion safety requirements

1. Equipment intended for use in explosive atmospheres (hereinafter referred to as "the equipment") shall satisfy the requirements for safe operation as regards the risk of explosion, namely, it shall:

prevent the formation of explosive atmospheres which may be produced or released by equipment itself;

prevent the ignition of explosive atmospheres, taking into account the nature of every source of explosion initiation;

-operate in accordance with the field of application, levels and types of explosion protection as per Annex 1.

2. The explosion safety of equipment shall be provided during normal operation within the tolerances specified in the manufacturer's technical documentation taking into account its application conditions.

3. Equipment intended for use in explosive atmospheres must be designed and constructed in a way that during its intended application and fulfillment of requirements to its assembly, operation (use), transfer (transportation), maintenance and repair the following safety requirements are satisfied:

1) the equipment shall safely operate throughout its foreseeable (estimated) lifetime;

2) the equipment shall operate in actual or foreseeable environmental conditions;

3) the equipment shall maintain its explosion-proof properties in changing environmental conditions and under external effects (humidity, vibrations, contamination, lightning and switching surges, etc.) taking into account the limits of the operating conditions established by the manufacturer.

The parts of equipment shall be designed taking into account the corresponding mechanical and thermal effect and must be capable of withstanding attack by existing or foreseeable aggressive substances;

4) if equipment have parts that may become sources of ignition, it must be opened in a de-energized state or shall only contain intrinsically safe circuits or be fitted with staff contact protection and warning labels;

5) if enclosures contain devices capable of accumulating electrostatic charges (capacitors) or hot elements that may become ignition sources, then the enclosures shall be opened with a time delay sufficient for any incorporated capacitors to discharge to a value of residual energy or for the surface temperature of enclosed hot components to decrease to below the assigned maximum surface temperature or temperature class specified on the equipment;

If for the type of protection of equipment by purging with protective gas after switching off of power supply the purging with protective gas is to be continued till the incorporated capacitors discharge or hot elements temperature decrease to the values as referred to above, then the manufacturer shall affix a warning on opening parts of equipment.

6) the surface temperature of equipment with the level of protection «ultra explosion-proof» [особовзрывобезопасный] («very high») and «explosion-proof» [взрывобезопасный] («high») and (or) its parts must be kept below the ignition temperature of ambient explosive gas atmosphere and the temperature of dust layer ignition in service (within the tolerances established in the manufacturer's technical

documentation) in specified abnormal operation conditions and in changing environmental conditions.

The temperature exceeding the ignition temperature of ambient explosive gas atmosphere under operating conditions (within the tolerances established in the manufacturer's technical documentation) may be allowed only if the manufacturer adopts special additional measures to protect equipment referred to above.

Temperature rises caused by external sources of heat and chemical reactions must also be taken into account.

7) the surface temperature of equipment with level of protection «equipment protection by increased safety» («increase safety») must not exceed the maximum surface temperature under normal operating conditions.

This equipment must not comprise parts capable of sparking that can ignite the ambient explosive atmosphere;

8) Group I equipment must be dustproof and prevent the risk of coal dust ignition;

9) in Group III equipment, including cable glands and connections, dust (taking into account the size of its particles) must neither develop explosive mixtures with air nor form dangerous accumulations inside the equipment;

10) equipment which may release flammable gases or dusts must employ enclosed structures only. If equipment contains openings or non-tight joints, these must be designed in such a way that developing gases or dusts cannot give rise to explosive atmospheres outside the equipment.

Points where materials are introduced or drawn off must be designed and equipped so as to limit escapes of flammable materials during filling or draining;

11) equipment and protective systems which are intended to be used in areas exposed to dust must be so designed that dust deposit on their surfaces is not ignited. Dust deposits must be limited by means of surface cleaning at intervals specified in the Operating Instructions (Manual). The surface temperatures of equipment parts must be kept below the ignition temperature of the dust layer. Dependent on the thickness of the dust layer means must be employed to limit the temperature in order to prevent a dangerous heat build up;

12) manual override must be possible in order to shut down the equipment incorporated within automatic processes which deviate from the intended operating conditions established in the manufacturer's technical documentation, provided that this does not compromise safety;

13) when the emergency shutdown system is actuated, accumulated energy must be dispersed to a safe value during the time specified on warning labels located on opening covers;

- 14) equipment must be fitted with suitable cable and conduit entries. When equipment and protective systems are intended for use in combination with other equipment and protective systems, the interface must be safe;
- 15) where equipment or protective systems are fitted with detection or alarm devices for monitoring the occurrence of explosive atmospheres, the necessary instructions must be provided in the manufacturer's technical documentation to enable them to be provided at the appropriate places;
- 16) equipment must not contain materials capable of releasing flammable substances forming explosive atmospheres;
- 17) within the limits of the operating conditions laid down by the manufacturer, it must not be possible for a reaction to take place between the materials used and the constituents of the potentially explosive atmosphere which could impair explosion protection;
- 18) equipment must not contain materials that change their characteristics under the effect of the ambient temperature and operating conditions and in combination with other materials in a way that it would lead to a reduction in the level of protection of equipment;
- 19) Ex-components to be incorporated into or used as replacements in equipment must be so designed and constructed that they function safely for their intended purpose of explosion protection when they are installed in accordance with the manufacturer's instructions;
- 20) equipment which may be exposed to certain types of external stresses must be equipped with additional means of protection. Equipment must withstand relevant external stresses, without adverse effect on explosion protection;
- 21) if equipment is in a housing or a locked container forming part of the explosion protection itself, it must be possible to open such housing or container only with a special tool or by means of appropriate protection measures;
- 22) dangerous overloading of equipment must be prevented by means of integrated measurement, regulation and control devices, such as over-current cut-off switches, temperature limiters, differential pressure switches, flowmeters, time-lag relays, overspeed monitors and/or similar types of monitoring devices.

4. Equipment must be so designed as to provide protection against the following ignition sources:

- 1) sparks (electrical and frictional), flames, high surface temperatures, electromagnetic waves, ultrasonic, optical and ionizing radiation;
- 2) static electricity (electrostatic charges capable of resulting in dangerous discharges);
- 3) stray electric and leakage currents, which could result in the occurrence of dangerous corrosion, overheating of surfaces or sparks capable of provoking an ignition;
- 4) overheating caused by friction or impacts occurring, for example, between materials and parts in contact with each other while rotating or through the intrusion of foreign bodies;

5) pressure compensation that is performed by control and regulation devices and may generate shock waves or compressions which may cause ignition.

6) lightning discharges;

7) exothermic reactions, including dust deposit ignition.

All factors contributing to explosion hazards must be taken into account and the sources of initiation of explosive atmospheres ignition must be determined. The methods of explosion protection (types of protection) of equipment for its use in explosive atmospheres must be chosen taking into account the results of assessment of hazards.

5. Devices that provide protection of equipment in abnormal operation shall comply with the following requirements:

1) safety devices must function independently of any measurement or control devices required for operation. Failure of a safety device must be detected by appropriate technical means specified in technical documentation;

2) safety-related switching must directly actuate the relevant control devices without intermediate software command;

3) emergency stop controls of safety devices must be fitted with restart lockouts. A new start command may take effect in normal operation only after the restart lockouts have been intentionally reset;

4) control and display units used must be so designed as to achieve the highest possible level of operating safety with regard to the risk of explosion;

5) devices with a measuring function must be designed and constructed so that they can cope with foreseeable operating requirements and special conditions of use in explosive atmospheres and meet the requirements of traceability of measurements;

6) it must be possible to check the reading accuracy and serviceability of devices with a measuring function;

7) for devices with a measuring function the alarm threshold must lie outside the explosion and/or ignition limits of the atmospheres to be registered, taking into account the safety factor specified in the technical documentation, the operating conditions and possible aberrations in the measuring system;

8) In the design of software-controlled equipment special account must be taken of the risks arising from faults in the program.

6. Equipment shall be supplied to the customer with the manufacturer's technical documentation that must include the following particulars:

1) the name of equipment and/or designation of equipment (type, brand, model), its parameters and characteristics that have effect on safety, the name of the manufacturer or his registered trade mark;

2) information on intended use;

- 3) instructions for installation, assembling, adjustment or setting;
- 4) instructions for use of equipment and safety measures to be taken during its use (including putting into service, intended use, maintenance, all types of repair and technical inspection, means of protection aimed at the reduction of intensity and localization of process hazards, transportation and storage conditions);
- 5) assigned parameters of lifetime and /or specified lifetime;
- 6) a list of critical failures, possible operator's (customer's) errors leading to abnormal operation of equipment and actions to be taken to preclude the errors referred to above;
- 7) limit states parameters;
- 8) information on measures to be taken when this equipment fault is detected;
- 9) information on the necessity to complete this equipment with additional elements (cable glands, etc.);
- 10) requirements for maintaining technical characteristics of equipment on which its explosion safety depends;
- 11) requirements to package, preservation, transportation and storage conditions, assigned storage periods, instructions for intervals between scheduled examinations of the state, replacements of individual elements, parts, assemblies with expired storage period;
- 12) requirements to equipment salvage;
- 13) rules and conditions of storage, transportation and disposal (to establish the corresponding requirements, if necessary);
- 14) requirements to the personnel;
- 15) the address and other contact information of the manufacturer;
- 16) the name and the address of the authorized representative of the manufacturer, the importer and their contact information;
- 17) production date.

The technical documentation is made in hard copies that may be supplemented by a set of technical documentation in electronic format.

7. The equipment shall have the marking that shall include the following:

- 1) the name of the manufacturer or his registered trade mark;
- 2) the manufacturer's type identification;
- 3) a serial number;
- 4) the number of the certificate of conformity;
- 5) the explosion-proof marking. The drawing of special explosion safety mark is given in Annex 2.

8. The marking and the manufacturer's technical documentation must be drawn up in the Russian language and in the language or languages of the Member State of the Customs Union if the regulation(s) of the Member State of the Customs Union contain(s) the corresponding requirements.

9. The marking shall be affixed on the surface of the equipment or on the label in a location that is visible without disassembly or use of a special tool, and it shall last for the whole lifetime of the equipment.

10. Upon decision of the manufacturer or in accordance with the delivery contract (agreement) the marking of equipment may include additional information that is of importance for its safe use, including the following:

- 1) the rated voltage value or a range of rated voltage values;
- 2) the working voltage value for continuous operation;
- 3) the symbol of the kind of current (if the rated frequency is not specified);
- 4) the symbol of shock-hazard protection class;
- 5) the degree of protection provided by the enclosure;
- 6) the rated consumed or useful power or the rated current;
- 7) the weight;
- 8) dimensions;
- 9) the date of manufacture.

Article 5. Providing conformity to safety requirements

1. The conformity of equipment with this Technical Regulation of the Customs Union is assured by fulfilment its safety requirements or meeting on a voluntary basis the requirements of interstate standards, and in case that these standards do not exist, the requirements of national (state) standards of Member States of the Customs Union, due to the voluntary application of which the fulfillment of the requirements of this Technical Regulation of the Customs Union is provided, and the standards containing the rules and methods of investigations (tests) and measurements, including the sampling rules required for the application and fulfillment of the requirements of this Technical Regulation of the Customs Union and carrying out of assessment of conformity of equipment for use in explosive atmospheres (hereinafter referred to as the standards).

2. The lists of standards referred to in point 1 of this Article shall be approved by the Commission of the Customs Union (hereinafter referred to as the Commission).

Article 6. Conformity assessment

1. Before the equipment is put into circulation in the common customs territory of the Customs Union it shall be subject to conformity assessment procedure to the requirements of this Technical Regulation of the Customs Union.

Conformity assessment of equipment is mandatory and is performed in the form of certification.

2. Conformity assessment procedures of equipment specified in this Technical Regulation of the Customs Union are performed by the accredited certification bodies (conformity (confirmation) assessment) and by accredited testing laboratories (centers), included in the Unified register of certification bodies and testing laboratories (centres) of the Customs Union.

3. Conformity assessment of equipment is carried out under the schemes in accordance with the Regulation on the order of application of typical conformity (confirmation) assessment schemes within the technical regulations of the Customs Union, approved by the Customs Union Commission:

1) series-produced equipment:

Equipment certification is carried out on the basis of the type tests fulfilled by the accredited testing laboratory (centre) and analysis of the production status and follow-up surveillance audit (scheme 1c);

2) limited batch of equipment:

certification of the batch of equipment on the basis of testing of the samples from this batch (scheme 3c) at the accredited testing laboratory (centre);

certification of the pieces of equipments on the basis of testing of the piece of equipment at the accredited testing laboratory (scheme 4c).

4. The applicant under certification scheme 1c can be a legal or an individual person as an individual entrepreneur or a manufacturer, or functioning as a foreign manufacturer on the basis of the contract with him as regards to ensuring compliance of the supplied products to the requirements of this Technical Regulation and bearing responsibility for non-compliance of the supplied products to the requirements of this Technical Regulation of the Customs Union (person, functioning as a foreign manufacturer), registered on the territory of the Member State in accordance with the law of the Member State of the Customs Union.

5. The applicant under certification scheme 3c, 4c can be a legal or an individual person as an individual entrepreneur or a manufacturer or a seller or functioning as a foreign manufacturer on the basis of the contract with him in the part of ensuring compliance of the supplied products to the requirements of this technical regulation and in the part of bearing responsibility for non-compliance of the supplied products to the requirements of this Technical Regulations of the Customs Union (person, functioning as a foreign manufacturer), registered on the territory of the Member State in accordance with the law of the Member State of the Customs Union.

6. During certification of equipment:

1) manufacturer (person authorized by the manufacturer), importer submits to the certification (conformity (confirmation) assessment) body a set of the documents for

equipment to confirm compliance of equipment with explosion safety requirements of this Technical Regulation of the Customs Union, including:

technical specification (if available);

operating documents;

list of standards equipment complies to from the List of standards specified in cl.1 of Article 5 of this Technical Regulation of the Customs Union (if used by the manufacturer);

explanatory note with description of the used engineering solutions and risk assessment, confirming the fulfillment of explosion safety requirements of this Technical Regulation of the Customs Union, if the standards do not exist or do not apply;

certificate of conformity of the manufacturer's quality management system (if available).

contract (supply agreement) or shipping documentation (for the batch of equipment).

2) the certification (conformity assessment) body shall:

identify the equipment submitted for approval by establishing the identity of its characteristics with the features specified in Article 1 of this Technical Regulation of the Customs Union and with the provisions of points 8 and 9 of Article 4 of this Technical Regulation of the Customs Union;

perform or have performed the tests of a sample (samples) of equipment in an accredited testing laboratory (centre) to establish its/their conformity with the requirements of the standards from the List of standards referred to in point 1 of Article 5 of this Technical Regulation of the Customs Union, and review of the Test Report(s). The Test Report shall contain the list of technical documentation (drawings of means providing explosion protection) that provides evidence of conformity of equipment and Ex-component with the requirements of this Technical Regulation of the Customs Union.

Equipment may be tested at its production and /or installation area if it is necessary because of specific character of construction and installation specified in the manufacturer's technical documentation for construction or installation.

If the manufacturer did not apply the appropriate standards or the standards do not exist, the certification (conformity assessment) body performs the conformity assessment of this equipment directly to the explosion safety requirements of this Technical Regulation of the Customs Union. For this purpose the certification body shall:

- determine specific safety requirements for the equipment being approved based on the technical documentation and descriptions of the solutions and risk assessment adopted that provide evidence that the requirements of this Technical Regulation of the Customs Union specified in the explanatory note of the manufacturer are met;
- determine the standards establishing the methods of measurements and tests from the List of standards referred to in point 1 of Article 5 of this Technical Regulation of

the Customs Union, or, if these standards lack, determine the methods of inspection, measurement and testing of equipment so as to confirm its conformity with the specified established requirements;

- arrange for the necessary tests of equipment in the accredited testing laboratory (centre);
- carry out the analysis of the manufacturer's production status (production inspection). If the manufacturer operates an approved quality system for the production or the development and production of equipment the certification body shall assess whether this system assures sustained production of approved equipment in conformity with the requirements of this Technical Regulation;

For assessment of conformity of a batch of equipment (unique equipment) the inspection of the manufacturer's production status (production inspection) is not required;

- carry out the surveillance audit (if it is provided for by the certification scheme) for the approved equipment during the whole period of validity of the certificate of conformity by means of testing of samples in the accredited testing laboratory (centre) and /or the inspection of the manufacturer's production status (production inspection) (Scheme 1c);

- issue the certificate of conformity in due (single) form approved by a Decision of the Commission:

- for series-produced equipment for a period of validity of no more than 5 years;
- for a batch of equipment (single equipment) with a period of validity not specified.

The certificate of conformity of Ex-components to the requirements of this Technical Regulation of the Customs Union shall be issued after fulfillment of the procedures specified in this clause in the same form.

The Schedule to the Certificate of Conformity shall contain specifically the following information:

description of design and means providing explosion protection;

special conditions of use (if the explosion protection marking contains the symbol "X");

3) the manufacturer (his authorized representative) , importer shall:

affix a single Conformity Mark (mark of product circulation on the market of the Member States of the Customs Union) and the registration number of the certification (conformity assessment);

prepare a set of documents for the equipment that shall contain:

- the documentation for the equipment referred to in subpoint 1 of this point;
- test reports(s);
- certificate of conformity;

take all measures necessary to ensure that the manufacturing process guarantees compliance of the manufactured equipment with the requirements of this Technical Regulation of the Customs Union (Scheme 1c).

7. If the manufacturer has made modifications to the equipment and/or Ex-component design and/or technical documentation confirming its conformity with the requirements of this Technical Regulation of the Customs Union that may affect explosion protection of the equipment, he shall submit to the certification (conformity assessment) body that had issued the certificate of conformity the description of these modifications, the technical documentation (drawings of means providing explosion protection) with modifications made and a sample of product for additional tests, if the certification (conformity assessment) body considers insufficient only the expert examination of technical documentation with the modifications made for taking a decision on conformity of equipment and/or Ex-component to this Technical Regulation of the Customs Union.

In this case the certification (conformity assessment) body shall carry out the examination of technical documentation (drawings of means providing explosion protection) with the modifications made, and additional tests of a sample, if it considers insufficient the examination of technical documentation alone. In case of positive results the certification (conformity assessment) body shall prepare a decision on confirmation of validity of the certificate of conformity with the modifications made or issue a new certificate of conformity to the Technical Regulation of the Customs Union if the modifications made make it necessary to consider the equipment and/or Ex-component as a new product.

8. In the territory of Member States of the Customs Union the set of documents, including those confirming the conformity of equipment shall be kept for the following periods of time:

for equipment – the manufacturer (its authorized representative) shall keep the documents for at least 10 years after the last piece of equipment was manufactured;

for a batch of equipment (single product) – the importer, the manufacturer or its authorized representative shall keep the documents for at least 10 years after selling the last product of the batch.

The documents and materials confirming the results of certification shall be kept by the certification body that issued the certificate of conformity for at least 5 years after expiry of the period of validity of the certificate of conformity.

The set of documents shall be made available to the state supervisory bodies on their request.

Article 7. Marking with the Conformity Mark of Member States of the Customs Union

1. The equipment that complies with the requirements of this Technical Regulation of the Customs Union and has successfully passed the conformity assessment procedure in accordance with Article 6 of this Technical Regulation of the Customs Union shall be marked with a single Conformity Mark of Member States of the Customs Union.

Equipment is marked with the Conformity Mark of Member States of the Customs Union if it meets the requirements of all technical regulations of the Customs Union and EurAsEC that apply to this equipment and provide for affixing of the Conformity Mark of Member States of the Customs Union.

2. The Conformity Mark of Member States of the Customs Union shall be affixed to the equipment before its placing on the market.

3. The Conformity Mark of Member States of the Customs Union shall be affixed to each piece of equipment (product) by any method providing legible and clear marking for the whole lifetime of the equipment.

The Conformity Mark of Member States of the Customs Union shall be affixed to the product and shall also be shown in the accompanying manufacturer's technical documentation.

4. The Conformity Mark of Member States of the Customs Union may be affixed to the package and the accompanying manufacturer's documentation, if it is impossible to affix it directly to the equipment because of its design features.

Article 8. Disclaimer clause

1. The Member States of the Customs Union shall take all appropriate measures to restrict and prohibit the placing on the market in the common customs territory of the Customs Union of equipment for use in explosive atmospheres that is not conform with the safety requirements of this Technical Regulation of the Customs Union and also to withdraw such equipment from the market.

Classification of parameters defining the explosion safety of equipment

I. Classification of hazardous areas

1. Classification of hazardous areas is used for the purpose of selection of equipment according to its level of protection providing safety operation of such equipment in the relevant hazardous zone.

2. Hazardous areas are classified according to frequency of the occurrence and duration of an explosive gas or dust atmosphere into the following zones:

explosive gas atmospheres - zones 0, 1 and 2;

explosive dust atmospheres - zones 20, 21 and 22.

II. Equipment grouping

According to the field of application electrical equipment is divided into the following groups:

1) Group I equipment - equipment intended for use in underground mines and surface installations of such mines susceptible to firedamp and (or) combustible dust. Depending on construction to group I equipment one of three equipment protection levels can be assigned;

2) Group II equipment - equipment intended for use in places with an explosive gas atmospheres other than underground mines and surface installations of such mines. Depending on construction to group II equipment one of three equipment protection levels can be assigned. Group II equipment is subdivided into the sub-groups IIA, IIB, IIC according to the category of the explosive mixture it is intended to be used in;

3) Group III equipment – equipment intended for use in places with explosive dust atmosphere other than underground mines and surface installations of such mines. Depending on construction to group II equipment one of three equipment protection levels can be assigned. Group III equipment is subdivided into the sub-groups IIIA, IIIB, IIIC according to the category of the explosive mixture it is intended to be used in;

III. Classification of equipment according to equipment protection levels

1. According to the likelihood of becoming a source of ignition and conditions of its use in explosive atmospheres equipment is classified to equipment protection levels:

- 1) «ultra explosion-proof» («very high»);
- 2) «explosion-proof» («high»);
- 3) «equipment protection by increased safety» («increase safety») .

2. Ultra explosion-proof («very high») equipment protection level is applied to equipment intended for use in accordance with the operational parameters specified by the manufacturer, ensures the required equipment protection level even in the event of rare failures relating to equipment, with an explosive atmosphere present, and which in the event of failure of one means of protection, at least an independent second means provides the required level of protection or the required level of protection is assured in the event of two failures occurring independently of each other;

Equipment with this equipment protection level is intended for use in underground mines and surface installations of such mines susceptible to firedamp and/or combustible dust (group I equipment) or at the objects and/or its parts (group II and III equipment) where explosive atmosphere, created by the mixture with air of flammable substances in the form of gas, vapour, dust, fibres, or flyings is present permanently for long-term periods or frequently.

3. Explosion-proof («very high») equipment protection level is applied to the equipment intended for use in accordance with the operational parameters specified by the manufacturer, ensures the required equipment protection level and functioning under normal operation mode in the event of single recognized expected fault.

Group I equipment with this equipment protection level shall be provided with the means of safe shutdown when the specified concentration of the firedamp in the surrounding atmosphere achieves.

Equipment with this equipment protection level is intended for use in underground mines and surface installations of such mines endangered by the possible presence of firedamp and/or combustible dust (group I equipment) or at the objects and/or its parts (group II and III equipment) where explosive atmosphere is likely to present in the form of gas, vapour, dust, fibres, or flyings.

4. Equipment protection level «equipment protection by increased safety» («increased safety») is applied to equipment intended for use in accordance with the operational parameters specified by the manufacturer and which ensures functioning only in normal operation mode specified by the manufacturer.

Group I equipment with this equipment protection level shall be provided with the means of safe shutdown when the specified concentration of the firedamp in the surrounding atmosphere achieves.

Equipment with this equipment protection level is intended for use in underground mines and surface installations of such mines (group I equipment) where firedamp and/or combustible dust or explosive atmosphere created by the mixture with air in the form of gas, vapour, dust, fibres, or flyings is not likely to occur in normal operation, but if it does occur, will persist for a short period only.

IV. Types of protection of equipment

1. Depending on the special measures applied to prevent ignition of the surrounding explosive atmosphere one type or combination of several types of explosion protection may be applied to:

1) electrical equipment intended for use in explosive gas atmospheres:

"d" – flameproof enclosure;

"e" – increased safety;

"i" ("ia", "ib", "ic") – intrinsic safety (intrinsically safe electric circuit);

"m" ("ma", "mb", "mc") –encapsulation by compound;

"nA" – non-sparking equipment;

"nC" - enclosed-break devices, hermetically-sealed device or non-incendive components producing arcs, sparks or hot surfaces;

"nR" - restricted-breathing enclosure;

"nL" - energy-limited apparatus;

"nZ" – pressurized enclosure;

"o" - oil immersion;

"p" ("px", "py", "pz") - pressurization;

"q" - powder filling;

"s" - special protection;

2) electrical equipment intended for use in explosive dust atmospheres:

"t" ("ta", "tb", "tc") – protection by enclosure;

"i" ("ia", "ib") - intrinsic safety (intrinsically safe electric circuit);

"m" ("ma", "mb", "mc") - encapsulation;

"p" - pressurization;

"s" - special protection;

3) non-electrical equipment intended for use in explosive atmospheres:

"c" – protection by constructional safety;

"b" - protection by control of ignition source;

"k" – protection by liquid immersion;

"d" – protection by flameproof enclosure;

"fr" - Protection by flow restricting enclosure;

"p" - pressurization;

4) other recognized types of explosion protection.

2. The types of explosion protection of equipment are determined by the following special measures, applied to equipment with different levels of protection to avoid ignition of a surrounding explosive atmosphere:

- 1) flameproof enclosure "d" - type of protection in which the parts capable of igniting an explosive gas atmosphere are provided with an enclosure which can withstand the pressure developed during an internal explosion of an explosive mixture, and which prevents the transmission of the explosion to the explosive gas atmosphere;
- 2) dust ignition protection type «t» - type of protection whereby all equipment is protected by an enclosure to avoid ingress of dust and by means of surface temperature limitation;
- 3) increased safety "e" - type of protection in which additional measures are applied so as to give increased security against the possibility of excessive temperatures and of the occurrence of arcs and sparks in normal service or under specified (abnormal) conditions;
- 4) intrinsic safety (intrinsically safe electric circuit) "i" - type of protection based on restriction of electrical energy (power) of electrical discharge and temperature of the components of electrical equipment to a level below that which can cause ignition by either sparking or heating effects ;
- 5) encapsulation “m” - type of protection whereby parts that are capable of igniting an explosive atmosphere by either sparking or heating are enclosed in a compound in such a way that the explosive atmosphere cannot be ignited under operating or installation conditions;
- 6) type of protection "n" - type of protection applied to electrical apparatus such that, in normal operation and in certain specified (abnormal) conditions, it is not capable of igniting a surrounding explosive gas atmosphere;

- 7) oil immersion "o" - type of protection in which the equipment or parts of the equipment are immersed in a protective liquid in such a way that an explosive gas atmosphere which may be above the liquid or outside the enclosure cannot be ignited;
- 8) pressurization "p" – type of protection for guarding against the ingress of the external atmosphere into an enclosure or room by maintaining a protective gas therein at a pressure above that of the external atmosphere;
- 9) powder filling "q" – type of protection in which the parts capable of igniting an explosive atmosphere are fixed in position and completely surrounded by filling material to prevent ignition of an external explosive atmosphere;
- 10) special protection “s” – type of protection based on the measures of protection other than those specified in items 1-9 of the present clause, but which are considered to be sufficient to ensure explosion safety during assessment or tests;
- 11) constructional safety "c" – type of ignition protection in which constructional measures are applied so as to protect against the possibility of ignition from hot surfaces, sparks and adiabatic compression generated by moving parts;
- 12) protection by control of ignition source 'b' – type of explosion protection by means of installation in non-electrical equipment of a device, which prevents creation of ignition source and whereby integral sensors detect impending operation and initiate operation of automatic protective and signal devices.
- 13) liquid immersion 'k' - a type of protection in which potential ignition sources are made ineffective or separated from the explosive atmosphere by either totally immersing them in a protective liquid, or by partially immersing and continuously coating their active surfaces with a protective liquid in such a way that an explosive atmosphere which may be above the liquid, or outside the equipment enclosure cannot be ignited.
- 14) Protection by flow restricting enclosure "fr" - type of ignition protection which, by means of an enclosure, reduces the probability of ingress of a surrounding explosive atmosphere into the enclosure to an acceptably low level so that the concentration inside the enclosure is below the lower explosive limit.

V. Temperature classification of equipment

Group II equipment is classified according to the maximum permissible surface temperature as follows:

- 1) T1 - 450 degrees Celsius;
- 2) T2 - 300 degrees Celsius;
- 3) T3 - 200 degrees Celsius;
- 4) T4 - 135 degrees Celsius;
- 5) T5 - 100 degrees Celsius;
- 6) T6 - 85 degrees Celsius.

to the Technical Regulation of
the Customs union «On safety of
equipment intended for use in
explosive atmospheres»
(TP TC 012/2011)

Drawing of special Explosion Safety Mark

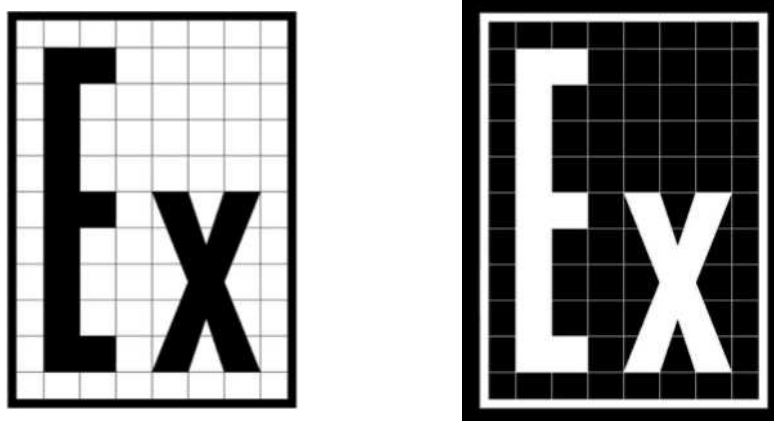


Fig. 1

Fig. 2

Description of special Explosion Safety Mark drawing

Explosion Safety Mark drawing consists of two conventionalized Latin letters «E» and «x». The height of letter «x» shall be 5/9 of letter's «E» height. The letters are inscribed in the rectangle on the light (Fig.1) or hard (Fig.2) background with height-to-width aspect ratio 11/8.

Ex stands for explosion protection (Explosion-proof).

The size of the special ex-marking shall be determined by the manufacturer of the equipment for use in explosive atmospheres. The coordinating dimension of the rectangular shall be not less than 10 mm. the size of the special ex-marking shall ensure legibility of its components and distinguishability with an unaided eye on the overall color background of equipment or Ex-component.