

Guideline of China Compulsory Certification Implementation Rule

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Nanyang Explosion Protected Electrical Apparatus Research Institute

Preface

This Guideline is prepared by Nanyang Explosion Protected Electrical Apparatus Research Institute Co., Ltd, in accordance with the *China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product (CNCA-C23-01:2024)*, as a supporting document of the Implementation Rule. The copyright of the Guideline belongs to CNEx. Any organization or individual shall not use the Guideline in whole or in part in any form without CNEx's permission.

Compared with the CNEX-C2301-2019 5th Edition Implementation Guideline, the main changes are as follows:

1. Added relevant requirements for the certification of "explosion-protected luminaires and control devices";
2. Added relevant requirements for "single batch product" (unit verification) certification;
3. Revised 10.2.5 Initial Factory Inspection Requirements for Expanded Products;
4. Revised Annex 2 Factory Definition Code of Ex Electrical Products and Principles of Factory Inspection Coverage;
5. Revised Annex 5 List of Key Components and Materials, and Periodic Confirmation Inspection and Control Requirements.

The first edition of the CNEX-C2301-2024 Guideline is effective starting from 2024-05-01.

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0 Introduction

This Guideline is based on CNCA-C23-01:2024 *“China Compulsory Certification Implement Rule on Explosion Protected Electrical Product”* (hereinafter referred to as CCC Ex) and is issued by Nanyang Explosion Protected Electrical Apparatus Research Institute (hereinafter, CNEx).

The Guideline provides supplementary material to the CCC Ex. It shall be read in conjunction with, CNCA-00C-003 *“China Compulsory Certification Implementation Rule on Classification Management of Manufacturing enterprises, Selection and Determination of Certification Modes”*, CNCA-00C-004 *“China Compulsory Certification Implementation Rule on Use of Testing Resources and Other Certification Results of Manufacturing enterprises”*, CNCA-00C-005 *“China Compulsory Certification Implementation Rule on Factory Quality Assurance Ability Requirements”*, and CNCA-00C-006 *“China Compulsory Certification Implementation Rule on General Requirements for Factory Inspection”*. The product scope and basis standards applicable to the implementation rules shall be consistent with the CCC Ex Implementation Rules and shall be adjusted in a timely manner in accordance with the announcements on catalogue definitions and catalogue adjustments issued by the Certification and Accreditation Administration of the People's Republic of China (CNCA).

1 Application Scope

This Guideline is applicable to the scope of products specified in CNCA-C23-01-2024 *“China Compulsory Certification Implement Rule on Explosion Protected Electrical Product”* (CCC Ex):

Equipment Groups: Group I, Group II, and Group III.

The products covered include: Explosion-protected (Ex, hereinafter) motors; Ex electric pumps; Ex power distribution devices; Ex switches, control and protection products; Ex starters; Ex transformers; Ex electric actuators, solenoid valves; Ex plug-

in devices; Ex monitoring products; Ex communication, signal devices; Ex air conditioning, ventilation equipment; Ex electric heating products; Ex accessories, Ex components; Ex instruments; Ex sensors; safety barriers; Ex instrument boxes; Ex luminaires and control devices.

Under the following circumstances, new information shall prevail the Guideline: changes regarding the new status of product catalogue and current standards, that are caused by changes in laws and regulations or related product standards, technologies, industrial policies and other factors. Such changes will be according to announcement by CNCA.

2 Standards

Ex electrical products are certified according to the standards applicable to their type of explosion protection. A product's type of explosion protection may be one of the following, or a combination of two or more.

Table 1. Reference standards by protection type

No.	Protection Type	Reference standards	
		General	Specification
1	Flameproof enclosure “d”	GB/T 3836.1	GB/T 3836.2
2	Increased safety “e”		GB/T 3836.3
3	Intrinsic safety “i”		GB/T 3836.4
4	Pressurized enclosure “p”		GB/T 3836.5
5	Liquid immersion “o”		GB/T 3836.6
6	Powder filling “q”		GB/T 3836.7
7	Type of protection “n”		GB/T 3836.8
8	Encapsulation “m”		GB/T 3836.9
9	Dust ignition protected by enclosure “t”		GB/T 3836.31

In principle, the above standards implement the current effective version issued by the national standardization administrative department. When the above standards are revised, they shall be implemented in accordance with the relevant announcement

released by CNCA.

3 Certification Module

The basic certification module for implementing compulsory certification of Ex electrical products includes the following:

Type Test + Initial Factory Inspection + Post-Certification Surveillance

The above-mentioned post-certification surveillance refers to one or a combination of two methods: follow-up inspection after certification, sample inspection or inspection at the production site.

For explosion-protected electrical products manufactured/imported in a small quantity in a single batch, an alternative certification module is optional:

Type Test + 100% Inspection

“A small quantity in a single batch” of manufactured/imported Ex products refers to the quantity of no more than 5 units (sets) in the same batch. A sales contract has been signed and the sales purpose, customer, and product model have been determined. The same raw materials are used in the production process and with the same production conditions.

According to the requirements of CNCA-00C-003 "*Compulsory Product Certification Implementation Rules on Manufacturing enterprise Classification Management, Certification Mode Selection and Determination*", CNEx implements a A/B/C/D classification management system for manufacturing enterprises (factories). Based on classification, CNEx determines the mode and frequency of post-certification surveillance inspections; for manufacturing enterprises (factories) that received A, B or C classification, it is allowed to waive the initial factory inspection of the expanded products, as appropriate.

The mode and frequency of post-certification surveillance are based on the results of the above-mentioned enterprise classification system and are detailed in Article 10.3.3.

The requirements for waiving or reducing the initial factory inspection of the expanded and exempted products are based on results of the manufacturing enterprise's classification, as detailed in Article 10.2.5.

4 Unit Classification and Requirements

In principle, the classification of CCC Ex units is determined according to the equipment classification, Ex protection type, product type, Ex structure and safety parameters of the Ex electrical products. See Annex 1 for detailed classification rules.

Products of different certification applicants, and/or different manufacturers shall be treated as different application units.

Same product by the same manufacturer but different manufacturing enterprises (factories) can either be combined into a single unit for CCC application, or separately as different units. Type test can be conducted on samples at one of the manufacturing enterprises (factories), while the other manufacturing enterprises (factories) are required to provide relevant supporting documents for consistency checks.

Same-unit products manufactured by the same manufacturing enterprise (factory) but different manufacturers may be type tested on only one unit of sample, while other manufacturers' products are required to provide samples/related documents for consistency checks.

5 Manufacturer's Classification System and Requirements

5.1 Purpose

For Ex product manufacturers, CNEx conducts a comprehensive evaluation based on the quality assurance information of the manufacturer, integrity and compliance status, and quality of products manufactured, to categorize the manufacturer into different classes. Based on results of the classification, the products are subject to differentiated management in terms of surveillance mode, frequency (Article 10.3.3) and initial factory inspection of the expanded products (Article 10.2.5) to achieve control of certification risks, improve the quality and efficiency of certification activities, and

ensure the product continues to meet the certification requirements.

The classification result of the manufacturing enterprise is only used as the basis for the certification bodies' management of the certification activities. Enterprises may not use such classification results in marketing, publicity, and other activities, so as not to mislead consumers.

5.2 Principles of Classification

Ex electrical product manufacturers are divided into four classes: A, B, C, and D. CNEx collects, analyzes, evaluates, and retains the information related to the quality of the manufacturer and the certified products, classifies the manufacturer according to the following basic principles, and reclassifies the manufacturers on a regular or irregular basis according to various types of information to achieve dynamic management.

The basic principles of manufacturer classification are as follows:

Type A:

This category is determined by CNEx's comprehensive risk assessment of the collected quality information and relevant information provided by the manufacturer. The criteria for the assessment should include at least the following aspects:

- (1) In the past 2 years, results of the initial factory inspection and post-certification assessments indicate that there is no serious non-conformity (which means the results are among the following: "factory inspection passed", "written verification passed");
- (2) There is no non-conformities in post-certification surveillance supervision/assessment;
- (3) There is no "unqualified" results of quality supervision and inspection of various products at the national and provincial levels;
- (4) When necessary, the enterprise must have good independent design capabilities, and the enterprise's own testing resources are certified in accordance with ISO/IEC 17025 standards by an accreditation body that is mutually recognized

by the International Laboratory Accreditation Corporation (ILAC) agreement.

(5) Other information related to the quality of the manufacturer and certified products.

Type B:

Manufacturers other than Type A, Type C, or Type D.

Type C:

When one of the following problems occurs, the manufacturer is classified as Type C:

- (1) Results of the initial factory inspection and post-certification inspections indicate either non-conformities that require "on-site verification" of corrective actions, or a large number of non-conformities that require "written verification" of corrective actions;
- (2) There is a problem with the quality of the product exposed by the media (not related to product safety) and the manufacturer is responsible, but it does not involve suspending or revoking the certificate;
- (3) CNEx considers that it needs to be adjusted to category C based on the comprehensive evaluation results of quality information related to the manufacturer and the Ex products.

Type D:

When one of the following problems occurs, the manufacturer is classified as Type D:

- (1) Results of the initial factory inspection and follow-up inspection are "not passed";
- (2) Failed to pass the respective safety clauses of post-certification assessments;
- (3) Refusal to audit and/or sampling supervision without justifiable reasons;
- (4) If issues relevant to product safety has been exposed by the media and the manufacturer is responsible, to an extent which CNEx can directly suspend or revoke the certificate;

- (5) National and provincial product quality supervision and spot checks found “disqualifying” compulsory certification items;
- (6) Failed to meet other compulsory product certification requirements, to an extent which the certificate is suspended or revoked;
- (7) The certification body considers that it needs to be adjusted to Class D according to the comprehensive evaluation results of quality information related to the manufacturer and the products.

6 Certification Procedure and Timeline

6.1 Reception of application

Certification applicant initiates the application to CNEx. When applying for new products, the certification applicant must provide the following required information:

- (1) Application;
- (2) Product description (including main technical parameters, structure, model description, difference of various specifications of the product(s) included in the same certification unit, product photos, etc.);
- (3) Proof of business registration of the Applicant, Manufacturer, Manufacturing Enterprise (Factory), such as business license;
- (4) Information of Production Enterprise;
- (5) When necessary, provide agreements or contracts between/among the Applicant, Manufacturer and Manufacturing Enterprise (Factory), such as ODM agreements, OEM agreements, authorizations, etc.;
- (6) CCC Type Test Report, if available;
- (7) For single batch (unit verification) certification, in addition to the above applicable documents, the following documents are also required:
 - a. The signed sales contract (including sales purpose, customer name,

product name, product model, etc.);

- b. Description/statement of the production process of a single batch of products, for example: the raw materials of this batch of products are the same, the production conditions are the same, etc.
- c. When applicable, the label should include production date and unique batch identification to identify the batch of products.

When applying for a change in the certificate, it is necessary to provide supporting materials (such as the original certificate, documentation of change by relevant authorities, product change information, etc.). The specific requirements for certificate change are detailed in Article 11.

CNEx shall review the application according to the relevant requirements and issue a notice of acceptance or rejection within 5 working days, or request the certification applicant to refine and re-submit the application.

An application will be rejected by CNEx if it meets any of the following:

- (1) The product is not listed in the China Compulsory Certification Catalogue;
- (2) In the proof of registration documents provided by the certification applicant, manufacturer and/or factory, the business scope does not cover the product; the legal certification materials are missing;
- (3) In the case of ODM/OEM, there is no valid copies of ODM agreement, OEM agreement, related authorization and certificates;
- (4) Other laws and regulations have mandated the application unacceptable.

6.2 Certification plan

After accepting the application, CNEx establishes a certification plan within 2 working days and notifies the certification applicant. The certification plan usually includes the following information:

- (1) A list of application documents that need to be submitted;
- (2) Required certification process and timeline;

- (3) Laboratory information;
- (4) Estimated certification fee;
- (5) Contact information of the responsible staff of CNEX;
- (6) The responsibility arrangements of each certification procedure;
- (7) For single batch (unit verification) certification, specify product details, such as product name, model specifications, quantity and any other information.
- (8) Any other information.

6.3 Review of application documents

The certification applicant shall provide the information related to the certification specified in Chapter 7 as required by CNEX after the application has been accepted by CNEX.

The contracted laboratory (see Chapter 7) shall complete a review of the information provided by the certification applicant within 10 working days and notify the applicant of the result. If the requirements are not met, the certification applicant shall supplement and improve the relevant information in accordance with the requirements of the laboratory. The technical documentation review requirements are detailed in CNEX-CB-OD-001 "*Basic Requirements for Drawings and Documents of Explosion-Protected Electrical Products*".

6.4 Type Examination and test

When type test is required, after the application materials have been reviewed and approved, the laboratory shall formulate the type test plan within 2 working days and notify the certification applicant.

The type test plan includes sample requirements and quantity, inspection basis standards and inspection items, laboratory information, and others.

Type test samples shall be produced and processed at the certifying manufacturer's production site.

Normally, the certification applicant prepares samples and sends them to the

contracted laboratories according to the requirements of the type test plan; if necessary (for example, for the Class C and D factories), CNEx will select on-site samples and seal these samples according to the requirements of the type test plan. The sample is obtained and sent to the contracted laboratory by the certification applicant.

The certification applicant should ensure the authenticity of the sample and ensure that the samples are consistent with the actual product manufactured.

After receiving the sample, the laboratory will verify the sample, arrange the sample testing. The test time is generally no more than 30 working days (excluding the time taken for the rectification and re-test of the factory due to any unqualified item). If long-term tests are required, the testing time can be extended appropriately. The laboratory makes a complete record of the entire process of inspection and testing and archives it to ensure that the records of the inspection process and results are traceable.

When the test has unqualified items, the certification applicant is allowed to carry out rectification; the rectification shall be completed within 6 months; otherwise, the application is considered voluntarily renounced; the certification applicant may also terminate the application.

After the type test is completed, the laboratory shall issue the CCC Ex type test report in the prescribed format and dispose of the test sample according to the sample management procedure.

6.5 Initial factory inspection

Types of initial factory inspections can include the first factory inspection, the expansion inspection (expanding the factory definition code), the OEM/ODM factory inspection, relocation factory inspection, and the full-element factory inspection (such as inspection to resume a discontinued certificate).

The contents of the initial factory inspection should cover an inspection of factory quality assurance capability and product consistency. The detailed requirements are in Articles 10.2.1, 10.2.2, 10.2.3 and 10.2.4.

For applications requiring initial factory inspection, CNEx shall issue an inspection task notification within 5 working days after receiving the type test report or qualified certification materials and appoint an inspector to form an inspection team. The inspection team shall conduct on-site inspections of the factory in accordance with the date specified in the audit plan, form a factory inspection report, and report the inspection conclusions to CNEx. When there is a non-conformity in the factory inspection, the manufacturer shall complete the rectification within the prescribed time limit (within 40 working days), and CNEx shall adopt appropriate methods to verify the rectification results. Failure to complete the rectification on time will result in the factory inspection conclusion being “failed”.

6.6 Evaluation and approval of certification result

CNEx shall conduct a comprehensive evaluation and review after receiving the complete certification materials (including application materials, type test reports, factory inspection reports, etc.) within 5 working days. If the evaluation result is “pass”, the certificate shall be issued; if the evaluation is “failed”, the certificate shall not be issued, and the certification project shall be terminated.

6.7 Technical disputes and appeals

Technical disputes and appeals shall be processed according to the relevant requirements of the certification system document "Control Procedures for Appeals, Complaints and Disputes".

6.8 Additional information

The detailed procedures and time limits for the certification process are not clearly defined in this Guideline, and the requirements of CNEx's relevant procedures and work instructions are subject to change. Therefore, certification applicants, manufacturers, and manufacturing enterprises should actively cooperate with certification activities.

7 Certification Application Documents and Related Requirements

The certification applicant shall provide relevant certification documents to the

designated laboratory after the acceptance of the certification application. These documents may include:

- (1) Product description (including main technical parameters, structure, model description, description of differences between different specifications of products within the same certification unit, product photos, etc.);
- (2) Technical documents related to explosion-protection (i.e. product drawings, technical conditions, user manuals, list of key components and materials);
- (3) Key components and materials qualification certificate, etc.;
- (4) For a change application, supporting documents of the relevant changed items;
- (5) Other required documents.

The certification applicant shall be responsible for the authenticity of the information provided.

The laboratory shall manage, retain, and maintain the confidentiality of the certification materials provided by the certification applicant.

8 Testing Requirements of Samples

8.1 Delivery (sampling) requirements

- (1) The sample is selected by the certification applicant as required by the contracting laboratory for testing.
- (2) If necessary, CNEx may also obtain samples by on-site sampling/sealing.
- (3) For single batch (unit verification) products, 100% of the products in the same batch need to be tested.
- (4) The samples shall be manufactured by the factory specified in the application documents. The samples shall not be borrowed, rented or purchased for testing. The certification applicant shall ensure the samples provided are consistent with the actual products manufactured.
- (5) The laboratory shall verify the samples provided by the certification applicant.

(6) If the laboratory has doubts about the authenticity of the sample, the situation shall be explained to CNEx, and CNEx shall make a corresponding decision to address the issue.

8.2 Requirements of test items

8.2.1 Requirements of type test items

8.2.1.1 Test items for new applications

In principle, all applicable test items specified in the relevant standard shall be included.

For single batch (unit verification) products, one unit/set of products within the batch should, in principle, undergo type testing in accordance with all applicable items specified in the respective standards, and the remaining products should undergo consistency checks.

The consistency check includes the following:

- (1) The content and necessary instructions marked on the certified product are consistent with the documents after review;
- (2) The structure and parameters of the certified product (mainly those related to explosion-protected safety) are consistent with the samples undergoing type testing;
- (3) The key components and materials used in certified products that have an impact on explosion-protected safety performance are consistent with the samples undergoing type testing.

8.2.1.2 Test items when applying for a change to certificate/product or documents

According to the content of the change, the requirements on the test items will be proposed by CNEx and/or the contracted laboratory. When some of the test items in the standard are adjusted, they shall be implemented in accordance with the relevant documents issued by the Certification and Accreditation Administration.

For change applications that make use of an existing certificate in ODM mode, relevant requirements can be found in Article 11.3.

8.2.2 Test items in post-certification surveillance on-site sampling

CNEx shall determine the sampling test items at the production site according to the different Ex types of the products. For details, please refer to CNEX-CB-OD-002 “*CCC Ex Product Post-Certification Surveillance – Production Site Sampling Inspection/Check Specifications*”. If CNEx or test laboratory has doubts about product quality, additional test items may be included.

8.3 Requirements of the test samples

8.3.1 Requirements of the type test samples

The number of test samples and other relevant requirements are specified in the type test plan.

8.3.2 Requirements of sample change

According to the specific changes, the requirements of the test samples are determined by CNEx/laboratory.

9 Application of Tests Conducted by Testing Facilities of Manufacturing Enterprises

9.1 Application scope

Under the premise that the manufacturing enterprise has the equipment and human resources that meet the requirements of relevant standards, and according to CNEX-CB-OD-003 “*Guidelines for the Inspection/Check of On-site Designated Inspection Items Using the Enterprise Inspection Resources*”, the on-site inspection can be carried out under the following circumstances:

- Type test, which is only permitted under any of the following situations:
 - (a) The sample has a large volume (e.g. 2 cubic-meters or more), big mass (e.g. 3 tons or more), incurs high delivery cost, and is challenging to deliver;
 - (b) The equipment is only produced in batches and will not be

manufactured in the future;

(c) Other special circumstances.

- Supervised sampling inspection post-certification.
- Difference testing supplemented with certificate extensions and changes.

In principle, if the same project of the same factory has been tested using the factory's resources for five consecutive years, it should send a sample to the designated test laboratory for testing to address systemic risks.

9.2 Implementation method

According to the comprehensive situation of equipment resources, human resources and soft resources of the factory laboratory, combined with product characteristics, the use of factory testing resources for sample testing is divided into TMP and WMT.

9.2.1 TMP method

The engineers of the qualified contracted laboratories sent by CNEx use the testing equipment of the factory laboratory for testing, and the factory should send their inspectors to assist. A test report is issued and approved by the contracted laboratory.

9.2.2 WMT method

Under the WMT method, the engineers of the qualified contract laboratories sent by CNEx witness the factory laboratory test conditions, and the factory laboratories use their own equipment to complete all tests. Alternatively, the engineers focus on the test plan provided by the factory laboratory to CNEx, and witness only part of the factory-based test conditions and test items. Factory test laboratory inspectors are responsible for issuing original records and jointly drafting test reports with designated laboratory engineers, in line with prescribed format. The final test report is reviewed and issued by the contracted test laboratory.

9.3 Conditions for testing using manufacturer's testing resources

9.3.1 The manufacturer that uses its own laboratory for testing has to meet the following conditions: the factory has a high-level Classification (e.g. Class A), the

testing resources are 100% owned by the manufacturer or factory, the lab received proper accreditation (e.g. recognized by ILAC) and is within the same city as the factory.

9.3.2 Only factory laboratories that have been evaluated by CNEx to meet the following conditions can use the testing resources of the manufacturing enterprise for sample testing.

9.3.2.1 For TMP method

- (1) The classification result of the manufacturing enterprise shall be relatively high, and its design, manufacturing, risk control and quality management are at a relatively advanced level in the industry;
- (2) The manufacturer's quality manual shall have provisions relating to the use of the factory inspection resource procedures and shall be consistent with the requirements of the CCC certification procedures;
- (3) The manufacturing enterprise laboratory meets the requirements of GB/T 27025 (ISO/IEC 17025) Chapter 6 Resource Requirements and Chapter 7 Process Requirements;
- (4) The laboratory shall have appropriate testing instruments and equipments that meet the relevant testing requirements and are in good functioning conditions. [Comply with all requirements for testing equipment in the resource requirements part of GB/T 27025 (ISO/IEC 17025)].

9.3.2.2 For WMT method

- (1) The classification result of the manufacturing enterprise shall be relatively high, and its design, manufacturing, risk control and quality management are at a relatively advanced level in the industry;
- (2) The manufacturer's quality manual shall have provisions relating to the use of the factory inspection resource procedures and shall be consistent with the requirements of the CCC certification procedures;
- (3) The manufacturing enterprise laboratory meets the requirements of GB/T 27025 (ISO/IEC 17025) Chapter 6 Resource Requirements and Chapter 7

Process Requirements;

- (4) The laboratory shall have appropriate testing instruments and equipments that meet the relevant testing requirements and are in good functioning conditions.
[Comply with all requirements for testing equipment in the resource requirements part of GB/T 27025 (ISO/IEC 17025)].
- (5) Laboratory personnel in manufacturing enterprises should be familiar with product structure and testing standards, as well as processing certain testing experience.
- (6) The test record format of the manufacturing enterprise laboratory can meet the requirements of the contracted laboratories working on site.

9.4 Evaluation of testing resources of manufacturing enterprises

9.4.1 The manufacturing enterprise (factory)'s laboratory conducts a self-inspection in accordance with Article 9.3 above, then submits the results and relevant documentation to CNEx for a testing capability evaluation.

9.4.2 CNEx conducts a document review of the application materials. The acceptance decision shall be made within 2 working days if the requirements are met, and the on-site assessment of the manufacturing enterprise laboratory shall be returned to the certification applicant; otherwise, CNEx shall make a decision on the inadmissibility and explain the reasons.

9.4.3 After accepting the application, CNEx organizes the review team to conduct the on-site review of the factory laboratory and maintain the corresponding audit assessment record. Only those factories that have passed the assessment can use the laboratory resources of the factory for testing.

9.4.4 CNEx shall conduct regular surveillance of the approved factory laboratories (once a year, which may be combined with the annual surveillance of the factory), organize the factory laboratories to participate in the comparison test, ensure the accuracy and validity of the test results, and maintain the qualifications.

For the TMP method, at least one production company tester should cooperate with

the contracted laboratory's engineer to conduct on-site tests. After the on-site test, the contracted laboratory issues the original test record, and the manufacturing enterprise's laboratory signs and confirms; the test report is issued by the contracted laboratory, and the report indicates that the test was conducted using the manufacturer's laboratory.

For the WMT method, after the on-site test, the original test record is issued by the test personnel of the manufacturer, and the contracted laboratory's engineer signs and confirms; the test report is issued by the contracted laboratory, and the report indicates that the test is carried out using the manufacturer's laboratory.

The on-site tests conducted or witnessed by the contracted laboratory engineer should be the entire process of relevant tests in accordance with the standard requirements.

For technical disputes in the field test, the manufacturing enterprise and the contracted laboratory engineer shall negotiate and resolve; if necessary, the issue shall be reported to CNEx.

The contracted laboratory shall ensure the authenticity, correctness, and traceability of the test results.

9.4.5 The use of factory testing resources for sample testing does not exempt, reduce or transfer the responsibility of designated laboratories and certification bodies specified in the Compulsory Product Certification Management Regulations for test results and certification results.

10 Factory Inspection and Post-certification Surveillance Requirements

10.1 Definition of factory inspection objects and coverage requirements for factory inspection

Factory inspection is an evaluation activity of the quality assurance capability, product consistency and compliance to standards for the production of compulsory product certification factories. A compulsory product certification factory is a place where

production, processing and/or testing of certified products where certification marks are applied. When the above process of the product cannot be completed in one place, a more complete place including at least the production process, routine inspection, confirmation inspection (if any), product nameplate and certification mark should be made for inspection, the right to further inspection to other sites is reserved.

Factory inspections should involve “products applying for certification/already certified” and all of their “processing sites”. “Processing sites” refers to all departments, places, personnel and activities related to the quality of product certification; coverage of “products applying for certification/already certified” means the inspection includes assessment of the factory quality assurance capability and the product consistency.

If CNEx is unable to complete the factory inspection at the production site, as required by Annex 3 “Requirements on CCC Ex Factory Quality Assurance Capability”, the inspection may be extended to the certification applicant, manufacturer, and manufacturer of key components, etc. as appropriate.

Under the same Factory Definition Code, if there is a similar product that has already obtained the CCC certificate and the certificate status is valid, the factory quality assurance capability and product consistency check of other similar products can be waived so that no duplicate inspection is performed (see Annex 2).

10.2 Initial factory inspection

The initial factory inspection is an on-site inspection and evaluation conducted by CNEx to determine whether the manufacturer's quality assurance capability and product consistency control capability meet the certification requirements.

The initial factory inspection is conducted in a manner that informs the manufacturer/factory in advance.

CNEx shall conduct the initial factory inspection in accordance with the factory quality assurance capability inspection requirements, product consistency inspection requirements, and factory quality control inspection requirements.

10.2.1 Ex electrical products factory quality control inspection requirements

Implementation shall be undertaken in accordance with Annex 3 of the Guideline, “Requirements on CCC Ex Factory Quality Assurance Capability”.

10.2.2 Product consistency check requirements

When the factory is inspected, the consistency of the products to be certified shall be checked at the production site. The consistency check usually includes the following:

- (1) The contents of the marking on the Ex product and the necessary instructions are consistent with the type test report;
- (2) The structure and parameters of the product (mainly the structure and parameters related to Ex safety) are consistent with the type test report;
- (3) The product's key components and the materials that have an impact on the safety performance of explosion protection are consistent with the type test report.

At the factory inspection, on-site witness test can be taken for the Ex safety performance of the product.

10.2.3 Inspection requirements in factory quality control

Implementation shall be undertaken in accordance with Annex 4 of the Guideline, “Inspection Requirements for CCC Ex Factory Quality Control”.

10.2.4 Periodic confirmation of inspection and control requirements for key components and materials of Ex electrical products

Implementation shall be undertaken in accordance with Annex 5 “List of Key Components and Materials, and Periodic Confirmation Inspection Control Requirements”.

10.2.5 Waiver/Reduction of initial factory inspection for expanded products

According to the classification results of the manufacturing enterprises, the initial factory inspection can be reduced for the expanded products under the following conditions:

- (1) The expanded product belongs to the same product unit;
- (2) Expanded products can be covered according to the Factory Definition Code coverage principle.

10.2.6 Inspection timeline

Normally, the initial factory inspection is carried out after the type test has been passed.

At the initial factory inspection, the factory shall manufacture products within the scope of the certification. The duration of factory inspection and the number of inspectors (auditors) in the factory inspection team are determined according to the type and quantity of the products applied for certification, and due consideration is given to the production scale and distribution of the factory.

Following the type test, the initial factory inspection shall be completed within one year.

10.2.7 Conclusion of factory inspection

The factory inspection conclusions are divided into four types: “factory inspection pass”, “written verification pass”, “on-site verification pass”, and “factory inspection failed”. Among them, “written verification” means there was a non-conformity, but the factory took corrective measures within the prescribed time limit, which was then validated through written verifications, so the factory inspection was eventually passed; “On-site verification pass” means there was a non-conformity, and the factory took corrective measures within the prescribed time limit, which was validated through on-site verifications, so the factory inspection was eventually passed.

10.3 Post-certification surveillance

Post-certification surveillance refers to one or a combination of two methods: follow-up inspection post-certification, sample inspection or inspection at the production site.

Note: The above-mentioned surveillance measures are not applicable to single batch (unit verification) product certification.

10.3.1 Follow-up inspection post-certification

10.3.1.1 Principles of post-certification inspection

CNEx shall carry out effective follow-up inspection on the certified products and their manufacturing enterprises on the basis of the classification results of the manufacturing enterprises. By doing so, CNEx can verify that the quality assurance capabilities of the manufacturers continue to meet the certification requirements, and ensure that the certified products continue to meet the standards and its quality remains consistent with the type test sample.

The follow-up inspection shall be carried out in a manner that is not notified to the inspected party in advance when the manufacturing enterprise is in normal production. For non-continuously produced products, the certification applicant shall submit relevant production plans to CNEx to facilitate effective follow-up inspections post-certification.

10.3.1.2 Post-certification tracking inspection content and conclusion

The post-certification inspections cover most if not all contents of the factory quality assurance capability inspection and the product consistency inspection, which are specifically implemented in accordance with the requirements of Articles 10.2.1, 10.2.2, 10.2.3, 10.2.4. In addition, such inspections check the appropriate use of the "CCC" mark and the certificate.

The conclusions of the follow-up inspection shall be determined in accordance with Article 10.2.7.

10.3.2 Sample Inspection/Check at the production site

10.3.2.1 Principles of sample Inspection/Check at the production site

If necessary, CNEx conducts on-site Sampling Inspection/Check of the certified products, according to the product quality risk management requirements and the classification of the factory (for example, if product inconsistency was found, and it may negatively impact compliance with relevant standards).

In principle, the sample inspection or inspection at the production site should cover

the type of explosion protection and product type of the certified product.

The certification applicant, manufacturer and manufacturing enterprise shall cooperate with on-site sampling inspections.

10.3.2.2 Content of sample Inspection/Check at the production site

Surveillance sampling inspection/check shall be conducted in accordance with the CNEX-CB-OD-002 *"CCC Ex Product Post-Certification Surveillance – On-site Sampling Inspection/Check Requirements"*. The inspection/check shall be carried out by the contracted laboratory, or by using the qualified manufacturer's testing resources.

10.3.3 Mode and frequency of post-certification surveillance

After the initial certification, the manufacturing enterprise shall be supervised according to the frequency and method outlined in Table 2.

Table 2 Frequency and Mode of Post-certification Surveillance

Manufacturer Class	Surveillance Frequency	Assessment Mode
A	Every 2 years	Follow-up inspection <u>or</u> sample inspection /inspection at the production site
B	Every 1.5 years	Follow-up inspection <u>and/or</u> sample inspection /inspection at the production site
C	Every year	Follow-up inspection <u>and</u> sample inspection /inspection at the production site
D	Twice a year	Follow-up inspection <u>and</u> sample inspection /inspection at the production site

CNEX determines the time required for post-certification surveillance and inspection according to the specific conditions of the certified products and due consideration of the scale and distribution of the factories.

At the time of surveillance and inspection, the factory shall provide qualified products that are within the scope of the certificate.

10.4 Record of post-certification supervision

CNEx records and archives the entire process of post-certification supervision for at least 10 years to ensure traceability of the certification process and results.

10.5 Evaluation of the results from post-certification supervision

CNEx conducts a comprehensive evaluation of the conclusions of the follow-up inspection, sample inspection/check at the production site, other relevant information, and (when applicable) information gathered during inspection at production site. If the evaluation result is "pass", the certificate may be maintained and CCC marking may be continuously used. If the evaluation result indicates "fail", CNEx shall suspend or revoke the certificate and announce the results.

10.6 Factory inspection in ODM/OEM mode

The factory inspection requirements for initial certification in ODM mode are detailed in Article 10.2.

10.6.1 Use of the results of obtained certificate to obtain the ODM manufacturer certificate

10.6.1.1 Initial factory inspection

No initial factory inspection is required for factories using the original test results of obtained original certificate to obtain the ODM manufacturing enterprise certificate.

10.6.1.2 Surveillance inspection

The surveillance and inspection of the ODM certificate is carried out together with the surveillance and inspection of the ODM manufacturer. The inspection includes the implementation of the ODM cooperation agreement, certification mark management, customer product management, production and sales management, and actual ODM production of the certified product for other manufacturers, etc. Special attention should be paid to the consistency of ODM products when performing consistency checks.

10.6.2 OEM mode

10.6.2.1 Initial factory inspection

The initial factory inspection includes at least the key components and materials procurement control, production process control, routine inspection/confirmation inspection and site-specific testing, certification product conformity requirements and other product consistency checks, but does not exclude re-examination of other necessary clauses and/or disputed clauses.

10.6.2.2 Surveillance check

Requirements of annual surveillance checks of the OEM certificate are detailed in Article 10.3.

Note: When conducting OEM factory inspections, the following supplementary information are required: OEM contract; and relevant authorization documents (such as authorization documents for using the CCC mark in OEM factories).

11 Requirements for Certification Changes (Including Changes Incurred by Revision of Standard)

After the product has been certified, if any changes as described in Article 11.1 need to be implemented, the certification applicant shall submit an application for change to CNEx and obtain approval/completion of the record before the change can be implemented.

11.1 Scope of certification change

When the following changes occur, the certification applicant shall submit a change request to CNEx:

1. Changes in key components and materials used in the product, structures and parameters related to Ex safety;
2. Changes to the name and model of the certified product, due to changes in the product naming method;

3. Addition of other models of the same product to the certificate (under the condition that relevant technical data are provided to CNEx to determine whether the difference has an impact on the safety performance of the explosion-protection. If there is any impact, the new model needs to be tested before the change can be made);
4. Reduction of the scope of certificate for models of the same product;
5. The name of the factory changes, while the address remains unchanged, and the factory has not been relocated;
6. The name of the factory changes, the name of the address also changes, but the factory has not been relocated;
7. The name of the factory remains unchanged, but the address name changes, yet the factory has not been relocated;
8. The factory has been relocated and the original certificate has been returned;
9. Changes to the name and/or address of the original certification applicant;
10. Changes to the original manufacturer's name and/or address;
11. Changes to the national standards, technical rules or certification rules that serve as basis to the product certification;
12. Changes affecting the design and specification of the product;
13. Change of the key component manufacturer;
14. The quality system of the manufacturing enterprise has undergone major changes;
15. Other changes affecting the scope of the certified product.

11.2 Procedures for filling a certificate change

Procedures for certificate change are detailed in Article 6 “Certification Procedure and Timeline”.

11.3 Special requirements for ODM changes

The ODM certification change application must be submitted by the initial certificate holder. Upon approval by CNEx, other ODM certificate holders must submit the

certification change application within one month, except for changes involving ex safety performance (examples of acceptable changes include changes to applicant name, product model naming method, and certificate validity period, etc.).

11.4 Evaluation and approval of changes

CNEx evaluates the information provided based on the content of the change to determine whether the change can be approved. For sample testing and/or factory inspections, the changes can only be approved after testing and/or inspection. The changes cannot be implemented until they are approved by CNEx.

For single batch (unit verification) products, changes are not allowed (unless specifically approved by the certification body).

11.5 Filing of change

For changes related to key components and materials used in the product and structural and parameter changes related to ex safety, the manufacturer/manufacturer's certification person in charge of CCC Ex certification, whom have been approved by CNEx are allowed to approve the changes (referred to as "Technical Expert" hereafter), document and file the changes to CNEx. CNEx verifies and if necessary, conducts re-tests during post-certification surveillance.

11.6 Change to certification reference standards

When the reference standard changes, the certification applicant shall complete the product standard revision within the time limit specified in the corresponding standard revision notice published by CNEx.

12 Key Component and Material List

12.1 Key component and material

For each type of Ex electrical products, the key components and materials are classified into Type A and Type B.

The key components and materials categorized under Type A are detailed in Annex 5. Other key components not listed in Annex 5 are listed as Type B.

After a product has been certified, the following actions shall be undertaken in respond to changes to key components and materials:

When the key components and materials of Type A are changed (for example, replacement of key components and materials used in the certified product; change of manufacturers of key components and materials; change of the manufacturer; and change to the electrical parameters of the key components and materials, etc.), the application for change is submitted to CNEx for approval. The sample is sent to the contracted laboratory for testing per request from CNEx and/or the contracted laboratory.

When the key components and materials of Type B are changed, if the manufacturing enterprise (factory) has a designated Technical Expert in CCC Ex whom has been approved by CNEx (see Article 13), the Technical Expert shall be responsible for confirming and approving the change, and the sample test is no longer required. The manufacturing enterprise shall keep the corresponding records and report to CNEx for filing. CNEx shall conduct verification during the post-certification surveillance of the manufacturing enterprise and conduct verification tests if necessary. If the manufacturing enterprise does not have a Certification Technical Expert approved by CNEx, it shall submit the change application to CNEx, and according to the sample delivery requirements specified by CNEx, the certification applicant needs to send the sample to the contracted laboratory for testing.

Note: For Type B key components and materials that are approved for change by the manufacturing enterprise's Certification Technical Expert, if they are within the scope of the certification scheme, they must obtain respective compulsory product certifications. The safety indicators of the key components and materials post-change must not be lower than the original safety indicators.

12.2 Key component and material control requirements

12.2.1 When applying for the whole machine certification, the key components and materials (both A and B types) in the whole machine should be sampled separately according to the corresponding requirements for testing. The list of key components and materials, the criteria for testing, and the number of samples to be sent with the complete machine are determined by the contracted laboratory.

12.2.2 Under the following conditions, the key components and materials are exempt from testing alone, but samples and related information should still be provided for verification by CNEX:

- 1) A compulsory product certification has been obtained; or
- 2) A voluntary certificate recognized by the National Certification and Accreditation Administration (CNCA) has been obtained; or
- 3) Type test report has been issued by the designated laboratory.

13 Requirements for Manufacturing Enterprise's Technical

Expert in CCC Ex Certification

13.1 Requirements for the person in charge of CCC certification for Ex electrical products (Technical Expert in CCC Ex)

13.1.1 The Technical Expert for CCC Ex products shall have the following duties regardless of the type of work performed in the organization:

- 1) Understanding of the relevant laws, regulations, standards and requirements to the certified products and their key components and materials;
- 2) Familiarity with the principles, structures, key components and materials, parameters, and performance requirements of the certified products, as well as the relationships between them;
- 3) Familiarity with product consistency management requirements and product change management requirements;
- 4) Organize evaluation reviews to determine whether changes to the certificate are needed and implementing activities related to the change;
- 5) Keep a track record of their implementation of duties.

13.1.2 The Technical Expert in CCC Ex shall be a formal employee of the organization, engaged in technical work, or engaged in production, quality assurance and other related technical work that demonstrates proven capabilities for the role.

13.1.3 The Technical Expert in CCC Ex must be appointed by the organization and has the relevant authority in the exercise of duties.

13.1.4 For OEM mode applications, the Technical Expert in CCC Ex must be authorized or appointed by the manufacturer.

13.1.5 In principle, the person in charge of the certification technology only serves in the organization and may not concurrently serve the same role in other organizations.

13.1.6 The Technical Expert in CCC Ex determines the change control method by establishing a documented simplified process procedure to determine the key components and materials that are applicable.

13.1.7 The Technical Expert in CCC Ex controls, approves, and implements changes to the timing of certification change.

13.1.8 The Technical Expert in CCC Ex keeps records of changes to key component and material changes and pass change information within the organization for consistency control.

13.1.9 The Technical Expert's abilities must be assessed (at appointment) and must be re-assessed when changes occur. These assessments must be filed with CNEx.

13.2 Certification body management of the Technical Expert in CCC Ex

13.2.1 The qualifications of the Technical Expert in CCC Ex are grouped according to the type of product explosion-protection. The capabilities required for each type of protection are determined separately.

13.2.2 CNEx is responsible for the assessment, identification and approval of the Technical Expert in CCC Ex and maintains relevant records. The technical assessment method for authorized persons in charge is detailed in Annex 7.

13.2.3 CNEx is responsible for issuing certificates to qualified Technical Expert in CCC Ex and publicizing the list of qualified personnel.

13.2.4 When there is a major change in the laws, regulations, rules, standards and requirements related to the certified products, the Technical Expert in CCC Ex need to be re-confirmed per notification from CNEx.

13.2.5 CNEx has the right to withdraw the qualification of the Technical Expert in CCC Ex if he/she is unable to perform their duties or fails to perform their duties in good faith.

14 Basis of Charge

Certification fees shall be determined in accordance with “CNEx Compulsory Product Certification Fees Standards” issued by CNEx.

The fees for product testing shall be determined in accordance with the “Compulsory Product Certification Testing Fees Standards” published by the laboratory.

CNEX

Annex 1. Principles of Product Classification

The scope of Ex electrical products that are implemented with mandatory certification management is detailed in Table 4.

In principle, the product classification is categorized according to the equipment classification, Ex protection type, product category, Ex structure and safety parameters of the Ex electrical products.

—— **Product category:** Ex motor; Ex electric pump; Ex power distribution device; Ex switch, control and protection products; Ex starter products; Ex transformer products; Ex electric actuators, solenoid valve products; Connection device; Ex monitoring products; Ex communication, signal devices; Ex air conditioning, ventilation equipment; Ex electric heating products; Ex accessories, Ex components; Ex instrumentation products; Ex sensors; safety barrier products; Ex instrument boxes; Ex luminaires and control devices.

—— **Equipment group:** Group I, Group II and Group III

—— **Type of explosion protection:** Flameproof enclosure “d”, increased safety “e”, intrinsic safety “i”, pressurized enclosure “p”, liquid immersion “o”, powder filling “q”, type of protection “n”, encapsulation “m”, dust ignition protected by enclosure “t”, and combinations of two or more types of explosion protection types described above.

—— **Ex structure:** See the description of elements for Ex product classification in Table 3.

—— **Safety parameters:** See the description of elements for Ex product classification in Table 3.

Table 3 Classification of Ex Product

SN	Equipment Group	Ex type	Product category	Ex structure	Safety Parameter
1	I	Flameproof enclosure “d”	Ex motors;	1) Enclosure material	1) Voltage level
	II		Ex electric pump; Ex power distribution equipment; Ex switch, control and protection products;	2) Flameproof structure 3) Gas type 4) Cable entry mode	2) Current, power or capacity 3) Equipment protection level
2	I	Increased safety “e”	Ex starter products; Ex transformer products; Ex electric actuators and solenoid valve products;	1) Enclosure material 2) Entry device 3) Insulation level 4) Power supply mode	1) Enclosure protection level (IP) 2) Voltage level 3) Current, power or capacity
	II		Ex plug-in device; Ex monitoring products; Ex communication and signal devices; Ex air conditioning and ventilation equipment; Ex electric heating products;	1) Enclosure 2) Gas type 3) Entry device 4) Insulation class 5) Circuit 6) Power supply mode	1) Enclosure protection level (IP) 2) Temperature group 3) Voltage level 4) Current, power or capacity 5) Equipment protection level
3	I	Intrinsic safety “i”	Ex accessories, Ex components; Ex instrumentation products;	1) Enclosure 2) Circuit 3) Power supply mode	1) Intrinsic safety parameters
	II		Ex sensor; Safety barrier products; Ex instrument box products; Ex luminaires and control devices.	1) Enclosure 2) Gas type 3) Circuit 4) Power supply mode	1) Temperature group 2) Equipment protection level 3) Intrinsic safety parameters 4) Enclosure protection level (IP)

SN	Equipment Group	Ex type	Product category	Ex structure	Safety Parameter
	III			1) Enclosure 2) Dust type 3) Circuit 4) Power supply mode	1) Temperature group 2) Equipment protection level 3) Intrinsic safety parameters 4) Enclosure protection level (IP)
4	I	Pressurized enclosure "p"		1) Positive pressure enclosure 2) Positive pressure protection system 3) Built-in system	1) Protection type of "px" 2) Voltage level 3) Current, power or capacity
	II			1) Positive pressure housing 2) Gas level 3) Positive pressure protection system 4) Built-in system	1) Voltage level 2) Equipment protection level 3) Current, power or capacity
	III			1) Positive pressure housing 2) Gas level 3) Positive pressure protection system 4) Built-in system	1) Voltage level 2) Equipment protection level 3) Current, power or capacity
5	I	Liquid immersion "o"		1) Protect the liquid 2) Enclosure material 3) Safety device 4) type of Equipment (sealed/ unsealed)	1) Equipment protection level 2) Voltage level 3) Current, power or capacity
	II				
6	I	Powder filling "q"		1) Enclosure material 2) Filling material	1) Voltage level 2) Current, power or capacity
	II				

SN	Equipment Group	Ex type	Product category	Ex structure	Safety Parameter
7	II	Type of protection “n”		1) Enclosure material 2) Gas level 3) Protection type 4) Insulation class 5) Circuit 6) Power supply mode	1) Protection level 2) Voltage level 3) Current, power or capacity
8	I	Type of protection “m”		1) Protection device 2) Pouring compound 3) Circuit	1) Equipment protection level 2) Voltage level 3) Current, power or capacity
	II			1) Protection device 2) Gas level 3) Pouring compound 4) Circuit	1) Equipment protection level 2) Voltage level 3) Current, power or capacity
	III			1) Protection device 2) Dust level 3) Pouring compound 4) Circuit	1) Equipment protection level 2) Voltage level 3) Current, power or capacity 4) Enclosure protection level (IP)
9	III	Dust ignition protected by enclosure “t”		1) Enclosure 2) Entry device	1) Voltage level 2) Current, power or capacity 3) Equipment protection level 4) Enclosure Protection level (IP)
10	I , II, III (combination of any two or	Multi-Ex type		See corresponding Ex type	See corresponding Ex type

SN	Equipment Group	Ex type	Product category	Ex structure	Safety Parameter
	three Ex protection types)				
Notes: 1. Products of the same equipment group, Ex protection type, product type, similar Ex structure and safety parameters should be classified into the same Unit. 2. For Ex structure and safety parameters, according to the corresponding product type, select the applicable parameters.					

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Table 4 Scope of CCC Ex Products

SN	Product Category	Scope of Product
1	Ex motors	1. Framesize $\leq 160\text{mm}$ or rated power $\leq 15\text{kW}$ 2. $160\text{mm} < \text{framesize} \leq 280\text{mm}$ or $15\text{kW} < \text{rated power} \leq 100\text{kW}$ 3. $280\text{mm} < \text{framesize} \leq 500\text{mm}$ or $100\text{kW} < \text{rated power} \leq 500\text{kW}$ 4. Framesize $> 500\text{mm}$ or rated power $> 500\text{kW}$
2	Ex electric pump	1. Rated power $\leq 15\text{kW}$ 2. $15\text{kW} < \text{rated power} \leq 100\text{kW}$ 3. Rated power $> 100\text{kW}$
3	Ex power distribution devices	1. Distribution box (cabinet) 2. Power inspection box 3. Junction box 4. Junction box 5. Power supply (box) 6. Filter (box) 7. Power compensation device 8. Rectifier (box) 9. Power converter (switching device)
4	Ex switch, control and protection products	1. Switch (box, cabinet) 2. Button (box) 3. Breaker 4. Control cabinet (box, device, platform) 5. Relay 6. Operation (box, platform, panel) 7. Protector (box) 8. Protection device 9. Drilling rig 10. Release 11. Driver controller 12. Speed control device 13. Disconnecter (meter) 14. Remote transmitter (receiver) 15. Chopper

SN	Product Category	Scope of Product
5	Ex starter	1. Starter 2. Soft starter 3. Inverter (box) 4. Reactor
6	Ex transformer	1. Mobile substation 2. Transformer (box) 3. Voltage regulator 4. Transformer
7	Ex actuator, valve	1. Electric actuator 2. Valve electric device 3. Electric valve positioner 4. Electric valve 5. Solenoid valve 6. Electromagnet 7. Electromagnetic head 8. Electromagnetic coil 9. Electric stop valve 10. Electric shut-off valve 11. Regulating valve 12. Electric/gas converter 13. Brake 14. Pusher
8	Ex plug-in device	1. Electrical connector 2. Pin (including plug, socket) 3. Latch switch
9	Ex monitoring devices	1. Camera 2. Pan/Tilt 3. Monitor 4. Monitoring station 5. Repeater 6. Transmission interface 7. Video server 8. Display

SN	Product Category	Scope of Product
		9. Computer, industrial computer (with accessories) 10. Sound and light (vocal, signal, static electricity) alarm device
10	Ex communication and signaling device	1. Walkie-talkie 2. Speaker (electric horn) 3. Telephone 4. Player 5. Station 6. Base station 7. Switch 8. Optical transceiver 9. Junction machine 10. Signal coupler 11. Amplifier 12. Distributor 13. Expander 14. Network (line) terminal 15. Isolator 16. Speaker 17. Dotting device 18. Signaling device 19. Bell (electric whistle) 20. Communication interface 21. Annunciator 22. Indicator 23. Network Accessor 24. Bridge 25. Driver 26. Gateway 27. Transmitter, receiver (device) 28. Signal (photovoltaic, data) converter

SN	Product Category	Scope of Product
11	Ex air conditioning, ventilation equipment	1. Refrigeration (heat) air conditioning or unit 2. Dehumidifier 3. Fan coil unit 4. Fan 5. Heater 6. Electric fan
12	Ex heating devices	1. Electric heater 2. Electric heater 3. Electric heating belt 4. Electric heat tracing cable 5. Electric heating rod 6. Electric heating plate 7. Electric heating tube
13	Ex accessories, component	1. Threading box 2. Distribution box 3. Sealing box 4. Flameproof enclosure 5. Flexible connecting pipe 6. Cable entry device 7. Stuffing box 8. Plastic fan (leaf) 9. Terminal block 10. Terminal sleeve 11. Pipe fittings 12. Insulators
14	Ex instrument	1. Collector (box) 2. Counter 3. Encoder 4. Decoder 5. Card reader 6. Recognizer 7. Marking card

SN	Product Category	Scope of Product
		8. Identification card
15	Ex sensors	1. Photoelectric sensor 2. Speed sensor 3. Temperature (humidity) sensor 4. Status sensor 5. Acoustic (light) sensor 6. Pyroelectric (infrared) sensor 7. Tension sensor 8. Smoke sensor 9. Coal (coal) sensor 10. Touch sensor 11. Tear sensor 12. Deviation sensor 13. Throttle sensor 14. Voltage (current) sensor 15. Tilt sensor 16. Magnetic (Hall) sensor; 17. Feed sensor 18. Proximity switch (sensor) 19. Delay sensor 20. Open stop (emergency stop) sensor 21. Material sensor 22. Position (displacement, stroke) sensor
16	Safety barriers	1. Zener barrier 2. Isolation barrier 3. Safety limiter (module) 4. Safety coupler 5. Intrinsically safe power supply
17	Ex instrument box	1. Instrument box 2. Instrument panel 3. Instrument cabinet 4. Electricity meter box

SN	Product Category	Scope of Product
18	Ex luminaires and control devices	Ex luminaires: 1. Fixed Ex luminaires 2. Portable Ex luminaires 3. Mobile Ex luminaires
		Ex luminaire (light source) control devices: 1. Control devices installed independently of the Ex luminaire 2. Electrical ballasts of gas-discharge lamps installed independently of the Ex luminaire
		Notes: 1. According to <i>China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product (CNCA-C23-01:2024)</i>, “Ex luminaires and control devices” refer to lighting fixtures, light indicators and light sign fixtures with Ex safety functions that are suitable for explosive environments, as well as light source control devices that are used together with Ex light fixtures but are independently installed outside the fixtures. 2. Ex luminaires do not include fire emergency sign or fire emergency lighting devices.

Annex 2. Factory Definition Code of Ex Electrical Products and Principles of Factory Inspection Coverage

Factory definition code

Explosion protected electrical products are classified according to product type, product grouping and explosion protection type. The coding rules are as follows: the Factory Definition Code is composed of four digits, the first two digits (01 -18) indicate the product type, the third digit is the product grouping code (1-7), and the fourth digit is the product's explosion protection type code (1-9). See Table 5 for more details.

Factory inspection coverage principles

1. In principle, different product types are mutually exclusive at factory inspections; however, at the initial factory inspection, depending on the production conditions of the factory, appropriate mutual coverage can be made.
2. Products of the same Factory Definition Code can be grouped together for factory inspection. When expanding the coverage of the factory inspection, it should be done in a manner that is according to the descending order of voltage, power, processing equipment capabilities, etc. For example, high voltage products can extend coverage and cover low voltage products of the same Factory Definition Code.
3. A composite product consisting of various groups and protection types can cover respective single products of the same equipment group and protection type.

Table 5 Factory Definition Code for CCC Ex Products

Factory Definition Code					
Product type (first 2 digits)		Equipment group (3rd digit)		Protection type (4th digit)	
01	Ex Motors	1	I Coal mine (M)	1	Ex d/ Ex t
02	Ex electric pump	2	II other than coal mine (gas atmosphere) (G)	2	Ex p
03	Ex power distribution	3	III Dust (D)	3	Ex e / Ex t

	devices				
04	Ex switch, control and protection products	4	I + II coal mine + other gas atmosphere M G	4	Ex i
05	Ex starter	5	I + III, coal mine + dust M D	5	Ex n / Ex t
06	Ex transformer	6	II + III, other gas atmosphere+ dust G D	6	Ex o
07	Ex actuator, valve	7	I + II + III, coal mine + other gas atmosphere + Dust M G D	7	Ex q
08	Ex plug-in device			8	Ex m
09	Ex monitoring devices			9	Ex t (new addition)
10	Ex communication and signaling device				
11	Ex air conditioning, ventilation equipment				
12	Ex heating devices				
13	Ex accessories, component				
14	Ex instrument				
15	Ex sensors				
16	Safety barriers				
17	Ex instrument box				
18	Ex luminaires and control devices				

Examples of Factory Definition Code:

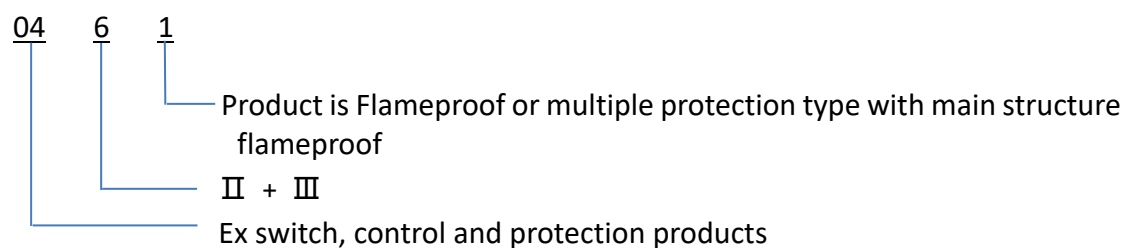
0111: Mine flameproof motor;

0131: Enclosure-protected motor for dust environment;

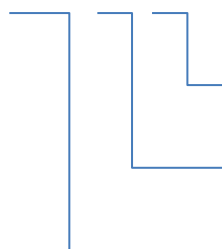
1524: Intrinsic safety sensor for gas environment;

0461: Flameproof switch for Gas and Dust environment;

0464 Intrinsic safety switch for gas/dust environment



01 3 9



Ex “t” dust ignition protected by enclosure

III

Ex motors

CNEX

Annex 3. Requirements on CCC Ex Factory Quality Assurance Capability

0 Introduction

This document is formulated in accordance with the requirements of CNCA-C23-01-2024 “China Compulsory Certification Implementation Rules for Ex Electrical Products” to establish a quality assurance capability for the factory that Ex manufactures ensure that products continue to meet CCC certification requirements. This document forms part of the basis for the establishment of quality assurance capabilities and CNEx implementation of on-site inspections.

The factory shall establish and maintain the quality assurance capability in accordance with the requirements of this document, based on the product's Ex type, Ex structure and production and processing characteristics to ensure the consistency of the certified products with the certification documents. The “factory” in this Annex refers to the certification applicant, manufacturer or manufacturing enterprise that hold respective responsibilities.

1 Responsibilities and resources

1.1 Responsibilities

The factory shall stipulate the duties, authorities and relations of various personnel related to the certification requirements, designate a management level person to be in charge of ensuring product quality. Regardless of other duties he/she has already taken, such person should have the following responsibilities and authorities:

- (1) Ensure that the requirements specified in this Annex are effectively established, implemented and maintained at the factory;
- (2) Ensure product consistency and product compliance with standards;
- (3) Proper use of the CCC certificate and mark, as well as ensure that the status of the CCC certificate is valid;
- (4) Be responsible for maintaining contact with CNEx, tracking changes in certification

requirements and communicating the implementation of such changes to internal personnel or departments.

The person in charge of quality shall have sufficient ability to perform the job, he/she may concurrently serve as the Technical Expert of CCC Ex (the person in charge of CCC certification for Ex electrical products).

1.2 Resources

The factory shall be equipped with necessary production equipment, inspection and testing equipment to meet the needs of stable production that satisfy the requirements of certification standards; it shall be equipped with corresponding human resources to ensure that staff members who have an impact on the quality of product certification have the necessary capabilities; it shall also establish and maintain the necessary environment and facilities for production, inspection and testing, and storage.

For external resources that need to be leased, the factory should ensure the continuous availability and proper use of such resources; the factory should maintain records related to external resources, such as contractual agreements and usage record.

When major changes occur to the production and/or testing equipment, the factory shall conduct corresponding applicability assessment, calibration and testing to ensure that the changes do not affect the production requirements of the certified products, or lower the equipment's capability level from its original level. The factory should keep the corresponding records, and promptly submit relevant documentation to CNEX for filing.

2 Documents and records

Factories shall establish and maintain documented procedures to ensure effective control of the documents required by this document, necessary external documents, certification documents, production technical documents and records. Production

documents such as drawings, prototypes, process documents, work instructions, etc. shall ensure the consistency of the Ex structure and safety parameters as well as the continuous validity of the documents. The product design standard or specification shall not be lower than the certification basis of the product.

The factory's documentation procedures shall ensure the following:

- a) The factory shall ensure the adequacy, suitability and validity of the documentation.
- b) An implementation system should be established to ensure that all drawings related to the production of Ex electrical products are consistent with the certification drawings.
- c) The quality system shall ensure that the elements specified in the certification documents (critical parameters for explosion protection) are not modified.
- d) The documented procedure should ensure that all related products are changed at the same time when the shared certification drawings associated with multiple certificates are changed.
- e) If the manufacturer also produces non-Ex electrical products, there should be a system that clearly identifies and distinguishes the technical documentation for the different products.
- f) Technical documents or factory related documents shall be guaranteed to be correct when they are transferred to a third party.
- g) The factory shall have documented procedures for the periodic verification of the validity of all CCC certificates, standards, applicable laws and regulations and other external regulations.

Factories should ensure that records are clear, complete, and traceable, to provide evidence that the product meets regulatory requirements. The record keeping period related to the quality and traceability of Ex products shall be no less than the product life cycle (usually 10 years), and it shall be ensured that records for at least 3 inspection

cycles can be obtained at the current inspection.

The factory shall identify and maintain important documents and quality information related to product certification, such as certification documents (certification drawings and instruction manuals), type test reports, factory inspection results, CCC certificate status (such as valid, suspended, withdrawn, cancelled, etc.), certification change approval information, market supervision sampling inspection reports, product quality complaints and respective results.

3 Purchasing and quality control of key components

3.1 Purchasing control

The factory shall establish, evaluate, and maintain a list of qualified manufacturers/manufacturing enterprises of purchased parts. The factory shall keep records of key parts procurement and use, such as purchase orders, inbound and outbound orders, and ledgers.

For critical purchases (see Annex 5 for details), the facility should identify and document its technical requirements in the procurement documentation, which should also ensure that the final product meets the certification requirements.

For suppliers that provide procurement (products, processes, or services) related to the critical parameters of the certification, the factory shall evaluate the supplier's ability to ensure compliance with respective requirements. To evaluate a supplier's ability to provide qualified products, processes, and services that meet the respective requirements, one or more of the following methods can be used:

- (1) Whether suppliers have quality assurance capabilities that meet the requirements of compulsory certification of Ex electrical products;
- (2) Use appropriate controls to evaluate suppliers and document them. When necessary, conduct on-site assessments and maintain a valid on-site assessment record. The assessment should consider the following elements:
 - The degree of crucialness of the supplier's product, process or service

- The degree of difficulty or uncertainty in the manufacturing process;
- The supplier's location, and effectiveness of subsequent communications;
- Whether the supplier subcontracts the product, process or service;
- It should be assessed whether the service capability of the calibration/certification metrology service provider can meet the specified requirements.

Suppliers should be regularly reviewed, and the period should not exceed one year.

For suppliers that have not been procured for more than one year, they should be re-evaluated as new suppliers before choosing.

Purchased parts that may affect the Ex type and cannot be confirmed by inspection (for example, the encapsulated intrinsically safe circuit) shall be subject to periodic factory inspection by CNEx or controlled by the manufacturer to prove the consistency of the product. When CNEx needs to audit suppliers that have an impact on the key parameters of certification, the manufacturer should arrange the audit.

Where there are detailed requirements in the technical documentation, the procurement documentation should be clearly described (e.g. process control, testing or inspection).

For parts that cannot be inspected for compliance after they have been manufactured (e.g. encapsulated intrinsically safe circuits), the procurement information should include the specific quality control procedures, materials and process flows associated with the part.

Factories should specify specific requirements in the form of documents, for example, specify technical specifications in purchase orders to ensure traceability from documents to orders. If the factory does not provide the abovementioned documents in subsequent orders, the factory shall have procedures to ensure that the supplier has a complete copy of the current documents.

3.2 Quality control of the purchased components

The factory shall establish and maintain a documented procedure to complete the verification and/or inspection of the purchased parts, in accordance with the technical requirements at the time of purchase (incoming to the factory) and to maintain relevant records.

For the quality characteristics of the purchased parts, the factory shall select the appropriate control method to ensure that the requirements specified in the technical documents are continuously met, and that the final product meets the certification requirements, and records are kept. Appropriate controls include:

- (1) Obtain a CCC certificate or a voluntary product certification from which result can be recognized for compulsory certification. The factory shall ensure that the status of its certificate is valid.
- (2) For purchased parts that do not have the relevant certificates, their periodic confirmation inspections shall comply with the requirements of the product certification implementation rules/detailed rules.
- (3) The factory develops a control plan which can achieve a control effect of no less than that achieved through abovementioned (1) or (2).

When purchasing key components from distributors and traders, the factory shall take appropriate measures to ensure the consistency of the purchased parts and ability to continuously meet their technical requirements.

For products manufactured by the subcontractor, the factory shall take control measures of the purchased parts to ensure that the subcontracted products continue to meet the specified requirements.

Self-made key parts shall be controlled by Article 4 as follows.

4 Control of production process

4.1 The factory shall identify the processes that affect the quality of the certified

products (referred to as key processes), and the identified key processes shall meet the specified requirements. The operators of the key processes should have appropriate capabilities; the control of key processes should ensure the conformity of the certified products with the standards as well as the consistency of the products; if the key processes do not guarantee the quality of the certified products, then the corresponding work instructions should be formulated to keep the production process under control.

4.2 If the production process of the product requires certain environmental conditions, the factory shall ensure that the working environment meets the specified requirements.

4.3 The factory shall monitor and measure the appropriate process parameters when necessary.

4.4 The facility shall establish and maintain a maintenance system for the production equipment, to ensure that the equipment's capabilities continue to meet production requirements.

4.5 When necessary, the factory shall inspect, monitor and measure the product and its characteristics at the appropriate stage of production, as required, to ensure product conformity and product consistency.

5 Routine test and/or verification test

The factory shall establish and maintain a documented procedure to control the routine test and/or verification test of the final product; the test procedure shall comply with the specified requirements, and the content of the procedure shall include the project, content, method, judgment, etc. The factory shall implement and maintain relevant inspection records.

For inspections commissioned by external agencies, the factory shall ensure that the capabilities of the external agencies meet the inspection requirements and preserve the evaluation results on their capabilities, such as laboratory accreditation certificates.

6 Testing facilities

6.1 Basic requirements

The factory shall be equipped with sufficient inspection and testing equipment to ensure that the equipment and equipment used in the procurement, manufacturing and final inspection tests meet the inspection and testing requirements for the mass production of certified products.

The inspection and test personnel shall be able to use the equipment correctly, master the inspection test requirements and implement them effectively.

6.2 Calibration and verification

The inspection test equipment used to determine that the certified products produced meet the specified requirements shall be calibrated or verified according to the specified period. The calibration or verification period may be set according to the frequency of use of the equipment, the previous calibration, etc.; The factory shall specify calibration methods, acceptance criteria, calibration cycles, etc.; calibration or verification shall be traceable to national or international standards. The calibration or verification status of the equipment should be easily identified. The factory shall maintain a calibration or verification record of the equipment.

For calibration or verification activities commissioned by an external agency, the facility shall ensure that the capabilities of the external agency meet the calibration or verification requirements and maintain relevant competency evaluation results.

Note: For critical monitoring and measuring devices in production process control, the factory shall manage them in accordance with the requirements of the product certification implementation rules detailed above.

6.3 Functional inspection

When necessary, the factory shall perform functional inspections of routine inspection equipment.

When the functional inspection results are not satisfactory, they should be traceable to the tested products; if necessary, these products should be re-tested. The factory shall specify the measures to be taken by the operator when it is found that the instrument no longer functions properly.

The factory shall keep a record of the results of the function inspection and the measures taken when the function of the instrument fails.

7 Control of non-conforming products

7.1 For non-conforming products found in procurement, manufacturing, inspection and other steps, the factory shall adopt measures such as identification, isolation and disposal to avoid unintended use or delivery of non-conforming products. Products that are reworked or returned for repair should be re-inspected.

7.2 For national and provincial supervisory spot checks, product recalls, customer complaints and complaints, etc., information on the non-conformity of certified products from external sources shall be analyzed by the factory and appropriate corrective actions shall be taken. The factory shall keep records of the unqualified information, cause analysis, disposal and corrective actions of the certified products.

7.3 The factory shall notify CNEx in time when there are major quality problems in its certified products (such as major quality problems found at market supervision inspections at the national and provincial levels).

8 Internal audits

Factories should establish documented internal audit procedures to ensure ongoing compliance with product quality assurance capabilities, product consistency, and product compliance with relevant standards. The factory shall take appropriate corrective and preventive measures to address the problems found in the audit. Factories should keep internal quality audit results.

9 Certified product change and consistency control

Factories shall establish and maintain documented procedures to control changes

(such as processes, production conditions, critical parts, and product structures) that may affect product consistency and product compliance with relevant standards, and such procedures shall comply with respective requirements. Changes should be approved by CNEx or Technical Expert of CCC Ex, and the factory shall maintain relevant records.

The factory shall control the product consistency from the applicable quality factors of product design (design change), process and resources, procurement, manufacturing, inspection, product protection and delivery to ensure that the products continue to meet the certification standards.

10 Product protection and delivery

Product protection, such as labeling, handling, packaging, storage, protection, etc., carried out by the factory in the process of procurement, manufacturing, inspection, etc. shall comply with the requirements. When necessary, the factory shall control the delivery process of the product.

11 CCC certificate and marking

The management and use of CCC certificates and marks by the factory shall comply with the provisions of the “Management Regulations for Compulsory Product Certification” and “Administrative Measures for Compulsory Product Certification Marks”. For the uniformly printed standard specification CCC mark or the CCC mark applied by printing, molding, etc., the factory shall keep a record of use. For the following products, the CCC mark may not be applied or released:

- (1) Products that are listed in the catalog of compulsory product certification but are not yet certified;
- (2) Certified products that have a certification change requiring confirmation by CNEx, but the change application has not yet been approved by CNEx;
- (3) Products covered by certifications that have expired the validity period;

(4) Products that had been certified but the certificate is currently suspended or cancelled;

(5) Non-conforming product.

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Appendix A. Information on Particular Types of Protection

(Informative Appendix)

A.1 General information

This appendix contains information on quality management systems related to specific types of explosion protection.

This appendix provides examples to illustrate how to meet the requirements of Annex 3.

A.2 Overview

The prescribed drawings associated with the Ex certificate can provide the conditions of use for a specific type of protection. All signs should be consistent with the prescribed drawings.

For enclosures and other components forming part of the enclosure, and for fans, fan hoods and ventilation screens, the manufacturer should verify the material composition [e.g. supplier's declaration of conformity in compliance with GB/T 27050.1 (ISO/IEC 17050-10)].

The use of sampling technique is not acceptable for conducting routine tests required by the Ex certificate, except when sampling is specifically allowed in the following documents:

- relevant standard(s);
- relevant interpretation and clarification sheets.

When taking measurements, temperature variations should be considered.

A.3 Ex d – flameproof enclosures

A.3.1 Verification

Verification includes visual inspection and measurement.

Measurement should be carried out with a suitable measuring equipment. The

persons doing this measurement should have the competence and knowledge of using this measuring equipment.

A.3.2 Castings

Castings should be subject to verification that demonstrates conformity, for example:

- a) 100% visual inspection should be done on each part;
- b) Wall thickness (including those parts not subject to machining);
- c) Flaws, inclusions, blow holes and porosity (by either a visual or test method, depending on the severity).

Note: Verification can take the form of 100% visual inspection or other methods based on the manufacturer's effective control of production capabilities.

Recovery of porous castings by impregnation methods, such as silicon, is not permitted. In the event that a casting is recovered by welding, it will become subject to the requirements applicable to fabricated enclosures, such as routine pressure testing.

A.3.3 Machining

Machining should be subject to verification by either 100% inspection or statistical techniques as appropriate that demonstrates conformity. For example, the following items should be verified:

- a) Flatness of flanged flamepaths;
- b) Surface roughness of non-threaded flamepaths;
- c) Fit of all threaded flamepaths (e.g. cable entries and threaded access covers);
- d) Depth of drilling and tapings to ensure adequate residual wall thickness;
- e) Dimensional requirements of all flamepaths.

Note: When statistical techniques are used, this should be in accordance with GB/T 2828.1, ISO 3951-1 or equivalent standard.

A.3.4 Cemented joints and potted assemblies

When applicable, documented procedures should address the following:

- a) Shelf life and storage of cement, potting compounds;
- b) Mixing;
- c) Surface preparation (degreasing or equivalent is usually required immediately before the potting-operation to ensure good adhesion);
- d) Method of application, for example, filling instructions, freedom from voids and temperature conditions;
- e) Curing: this could include curing period, any relevant environmental factors, provision to ensure product is undisturbed during the curing period. cement, potting compounds;
- f) After curing has been done, each potted component should be inspected. Depending on the characteristics and reproducibility of potting components and processes, inspection activities may use statistical methods.

A.3.5 Routine pressure testing

A.3.5.1 Overview

The purpose of the test is to check that the enclosure does not suffer damage or permanent deformation and that there is no leakage from the enclosure during the test other than through constructional gaps, such as flamepaths.

Leakage through cemented joints or potted assemblies would constitute a failure, unless it has been specifically accepted by the certification body issuing the CCC certificate.

The test can be a single test conducted on a complete assembly, or a series of tests on each sub-assembly or component part. For enclosures that contain more than one discrete compartment, each compartment should be tested individually. The method used should ensure that the assembly, sub-assembly or component parts are subjected to representative stress patterns, for example, when actual fastening facilities are used. Clamping that affects the mechanical properties of the type of protection would invalidate the test results.

Due to safety considerations and difficulty in detecting leakage, hydraulic rather than pneumatic methods are recommended.

The test facility should be adequate to readily provide the required pressure during the test period. Leakage from flamepaths can be reduced by the use of gaskets or “O” rings.

The pressure gauge should be calibrated, of suitable resolution and range, located such that it does not invalidate the test (e.g. due to pressure drop pipelines).

The method of test should any leakage to be monitored during the period.

The verification of the routine pressure test should include verification of the product for damage or deformation, for example, flange flamepaths are still within stated tolerances and fastenings are not stretched.

A.3.5.2 Batch tests

When the certificate permits, routine pressure tests may be replaced by batch tests that comply with the following requirements based on GB/T 2828.1:

- a) If the quantity of batch products is less than or equal to 100, 8 samples should be taken and tested at 1.5 times the reference pressure and there should be no failure in the test;
- b) For batch quantities of products between 101 and 1000, 32 samples should be taken and tested at 1.5 times the reference pressure and there should be no failures in the test;
- c) For batch product quantities between 1,001 and 10,000, 80 samples should be taken and tested at 1.5 times the reference pressure, and there should be no failures in the test;
- d) When the batch size exceeds 10,000, it should be divided into smaller batches for testing.

If the test result fails, all remaining products in the sampled batch should undergo a 1.5 times reference pressure test. Until the batch test is re-evaluated as feasible, the

remaining batches should be routinely tested at 1.5 times the reference pressure.

Note: When the test results fail, the certification body that issued the certificate should be contacted for adjustment of the batch test method.

A.3.5.3 Welded structure

When the certificate permits, routine pressure testing may be replaced by one of the following inspection methods:

- a) Radiographic inspection of welds; or
- b) Ultrasonic inspection of welds; or
- c) Weld magnetic particle inspection; or
- d) Weld liquid penetration inspection.

Note: The above weld inspection methods have relevant national standards.

A.3.6 Flanged joints

Flanged joints should be verified after final assembly to ensure the specified gap is not exceeded. If not possible, special measure should be taken during the production.

A.3.7 Elements, with non-measurable paths, of breathing and draining devices

For products containing elements like sintered metal, pressed metal wire or metal foam, see Appendix B.

A.4 Ex i – intrinsic safety

A.4.1 Components for intrinsically safe products

The following features should be verified with respect to the following components for use in intrinsically safe apparatus and associated apparatus. This normally means verifying the marking on the components or packaging and may be achieved by using statistical techniques where appropriate.

Table 6 Component Features Requiring Compatibility

Component	Feature
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Resistors	Value, power, type, tolerance, case size
Capacitors	Value, tolerance, type, rated voltage, case size
Piezo-electric devices	Manufacturer, type, capacitance
Inductive components	Type, inductance, DC resistance, number of turns, wire gauge and material, material specification of core and bobbin, where appropriate
Transformers	Type, manufacturer, isolation, voltage
Optical isolator	Type, isolation, voltage
Semi-conductors: - diodes - Zener diodes - transistors - integrated circuits - thyristors	Type number power value and where appropriate, the manufacturer
Cells and batteries	Manufacturer and type number, or IEC designation
Fuses	Manufacturer, type, value
Insulating materials	Specification, dimensions and where appropriate, type number
Connectors (e.g. plugs/sockets and terminals)	Type number and where appropriate, the manufacturer

A.4.2 Printed circuit boards (PCB)

A.4.2.1 Non-populated PCBs

PCBs can be accepted with a declaration of conformity (in accordance with GB/T 27050.1 requirements). The statement should state that the printed circuit board complies with procurement documents (e.g., quality plan) and other documents that list factors proving product conformity. For simple single- or double-sided PCBs, the copper artwork may be visually verified using photographic negative(transparency), certified drawing or controlled inspection sample. Purchase documents should specify copper thickness with tolerances, PCB thickness with tolerances and CTI values.

A.4.2.2 Populated PCBs

Varnish and coatings should be controlled with respect to specification of material, effectiveness of cover and, where required, application of two independent coverings, i.e. the first covering is allowed to cure or to dry for a suitable time before application of the second covering.

For PCBs, the manufacturer should maintain a list of safety key components used in production (e.g. resistors and Zener diodes) determined during Ex equipment assessment. The safety critical component placed on the PCB should be verified on a 100% basis.

Specified distances and clearances on manual assembled PCBs should be verified on a 100% basis.

This may be conducted by one of the following methods:

- a) Visual verification;
- b) For surface mount components, by ensuring correct loading of the “pick and place” machines and a visual verification of correct placement;
- c) By automatic test equipment (ATE) provided that ATE addresses each individual safety critical component and by a visual verification is conducted to type number of components in shunt Zener diode/diode assemblies.

Note: Where the surface mount component “pick and place” machine selects the component reel based on measuring the component value, the measuring function should be calibrated.

Documented procedures should ensure that segregation of related parts (e.g. terminals) and wiring/cabling is maintained and that specified colors, cross-sectional area, insulation thickness and labels (where appropriate) are fitted.

A.4.3 Sub-assemblies and assemblies

Documented procedures should ensure that production documentation includes all relevant variations to the product design.

Production documentation should include all safety-critical components. Where potted components are involved, the manufacturer, type, mix and minimum depth of the potting compound should be considered.

Documented procedures should include the following:

- a) Pot life and storage requirements for adhesives and potting compounds;
- b) mix;
- c) Surface treatment (before encapsulation operation, degreasing or equivalent measures are usually required to ensure good bonding);
- d) Instructions for use, such as: filling instructions, avoidance of air holes, temperature conditions;
- e) Curing should include: curing cycle, any relevant environmental factors, and provisions to ensure that the product is not disturbed during curing;
- f) After curing, each potted component should be inspected. Depending on the characteristics and reproducibility of potting components and processes, inspection activities may use statistical methods.

Documented procedures should ensure that segregation of related parts (e.g. terminals) and wiring/cabling is maintained and that specified colors, cross-sectional area, insulation thickness and labels (where appropriate) are fitted.

Sealing arrangements should be verified for compatibility with the product's ingress protection rating.

A.4.4 Group III equipment or small spacing equipment

For Group III intrinsically safe equipment or equipment that relies on the enclosure to reduce the spacing, the following methods should be used to prove the consistency of the enclosure with the specified drawings:

- a) Depth of drilled and tapped holes;
- b) Requirements on the shell related to sealing effect or mechanical stability;
- c) Insulating coating and surface condition; material, layer thickness;

Documented procedures should include:

- a) Pads in specified documents;
- b) The effectiveness of the sealing device, for example: checking the correct installation of the sealing device;

If the correct installation of the sealing device can only be verified after assembly, visual inspection can be performed using an impression method, e.g. using chalk.

A.4.5 Routine verifications and tests

All routine verifications and tests specified in the specified drawings should be reviewed. The results of these verifications and tests such as high voltage testing of assembled assemblies and individual components such as transformers should be controlled by documented procedures and should be 100% implemented unless otherwise specified.

A.4.6 Intrinsically safe circuits and assemblies housed in other Ex types of protection

When Ex equipment contains intrinsically safe circuits, measures should be taken to ensure that the information specified in the certificate is selected, installed, and assembled in accordance with the specified drawings.

A.5 Ex e – increased safety

A.5.1 Ingress protection (IP)

Documented procedures should ensure that the following are verified:

- a) Weld continuity;
- b) Fitting of gaskets and seals;
- c) Continuity of moulded grooves and tongues;
- d) Application of cements.

A.5.2 Internal wiring and contact integrity

Documented procedures should ensure that the following are verified:

- a) The wires are clamped according to the specified drawing requirements;
- b) The wires are connected according to the specified drawing requirements;
- c) The wiring meets the requirements of the specified drawings;
- d) The connecting parts comply with the fastening requirements of the specified drawings;
- e) Electrical clearances and creepage distances comply with the requirements of the specified drawings and have not been reduced.

A.5.3 Rotating machines

Documented procedures should ensure that the following are verified:

- a) Rotor end connections and fixing bars are as specified in the schedule drawings;
- b) The die-casting rotor process meets the requirements of the specified drawings;
- c) Production controls are in place for the following:
 - the air gap (rotor to stator) meets the drawing's requirement;
 - the fan clearance meets the drawing's requirement;
 - the bearing seal clearances meets the drawing's requirement.

Note: Since bearing seal clearances are not required for all protection levels when designing bearing seals, some regulatory drawings may not specify bearing seal clearances.

A.5.4 Windings

Documented procedures should ensure that the following are verified:

- a) Wire and insulation system comply with requirement in the schedule drawings;
- b) The impregnation process complies with the requirements of the specified pattern;
- c) Insulation materials are as specified in the schedule drawings;
- d) Mechanical securing of conductors are as specified in the schedule drawings;
- e) Type and mounting of protective device (e.g. thermal cut-outs) are as specified in the schedule drawings.

A.5.5 Terminal boxes

Documented procedures should ensure that the following are verified:

- a) Terminals are as specified in the schedule drawings;
- b) The requirements of the clearance and creepage distances, as specified in the drawings, have not been reduced.

A.5.6 Cable glands, terminals and other accessories

Dimensions in specified drawings should be verified statistically.

When non-Ex temporary plugs are installed at the entrance (e.g. for transport only) additional information should be provided.

A5.7 Requirements for “ec” equipment printed circuit boards (PCBs)

Documented procedures should ensure verification of the following:

- a) The CTI, plate thickness and copper foil thickness of single-layer and multi-layer boards should comply with the certification drawings, and the supplier's statement should be provided;
- b) The PCB should be correctly assembled and a declaration obtained from the supplier (if applicable);
- c) Conformal coatings used to reduce spacing requirements shall comply with the certification drawings and be inspected or declared by the supplier.

These verifications can be done by inspection where possible, or the PCB can be accepted with a Declaration of Conformity. The statement should state compliance with the procurement documents.

A.5.8 Routine verifications and tests

All routine verifications and tests specified in the specified drawings and their results should be confirmed.

A.6 Ex p – Pressurized equipment

A.6.1 Ingress protection (IP)

Documented procedures should ensure that the following are verified:

- a) Weld continuity;
- b) Fitting of gaskets and seals;
- c) Continuity of moulded grooves and tongues;
- d) Bonding process includes post-curing inspection.

A.6.2 Components and manufacturing process

The documented procedure should at least ensure the verification of assembling with typical components:

- a) Monitoring devices for pressure, differential pressure, purging time, tare of volume, flow, temperature monitoring device (and its location);
- b) Ex components and ex equipment;
- c) Enclosure, enclosure parts, materials of enclosure and enclosure parts and gaskets.

A.6.3 Components, constructional characteristics

The documented procedure should include the verification, the manufacturing processes and quality assurance technology for components and constructional characteristics relevant for safety:

- a) Purging openings inside the pressurized enclosure or in the enclosure wall;

- b) Internal installations (components, partitions, enclosures);
- c) Installations into enclosure wall (components, entries);
- d) Purging pipes, purge controlled components (internal, external) shall be verified with respect to their constructional specifications and the constructional characteristics.

A.6.4 Routine verifications and tests

All tests should be documented. Usually these tests include:

- a) Functional test of the pressurized equipment;
- b) A leakage test, to ensure the specified maximum leakage rate is not exceeded.
- c) Failure-free built-in system testing;
- d) Limited release built-in system test.

A.7 Ex m – encapsulation

A.7.1 Production documentation

Thermal protection (e.g. thermal fuses) should be positioned according to, and be of the type specified in, the schedule drawings.

Documented procedures should include:

- a) Pot life and storage requirements for adhesives and potting compounds;
- b) mix;
- c) Surface treatment (before encapsulation operation, degreasing or equivalent measures are usually required to ensure good bonding);
- d) Instructions for use, such as: filling instructions, avoidance of air holes, temperature conditions;
- e) Curing should include: curing cycle, any relevant environmental factors, and provisions to ensure that the product is not disturbed during curing;

f) After curing, each potted component should be inspected. Depending on the characteristics and reproducibility of potting components and processes, inspection activities may use statistical methods.

A.7.2 Routine verifications and tests

All tests should be documented. Usually these tests include:

- a) Visual examination;
- b) Dielectric characteristics verification.

A.8 Ex o – oil immersion

A.8.1 Material control

All materials including filling liquid should be of a defined type.

A.8.2 Filling

The filling method and liquid level should be declared in accordance with the prescribed drawings. The filling process and liquid quantities should be documented.

A.8.3 Ingress Protection level (IP)

Documented procedures should ensure that the following are verified:

- a) Welding continuity;
- b) Matching of gaskets and seals;
- c) Continuity of molded grooves and bosses;
- d) The bonding process includes inspection after curing. All tests should be documented.

A.8.4 Routine verifications and tests

All tests should be documented. Usually, these tests include:

- a) Reduced pressure test (sealed enclosures only);
- b) Overpressure test (sealed and unsealed enclosures).

A.9 Ex q – powder filling

A.9.1 Material control

The material should be of defined size and type.

Evidence should exist as to the flammability verification of enclosure materials and these materials should align with those specified in the Ex certificate or schedule drawings.

A.9.2 Filling

Filling should be made without voids. Care is clearly needed to ensure that voids are not created after filling by shaking down. The process for filling should be documented and the documentation should include verification criteria.

A.9.3 Ingress protection (IP)

Documented procedures should ensure that the following aspects are verified:

- a) Weld continuity;
- b) Fitting of gaskets and seals;
- c) Continuity of moulded grooves and tongues;
- d) Application of cements.

A.9.4 Routine verifications and tests

All tests should be documented. Usually, these tests include:

- a) Pressure test;
- b) Dielectric strength test of filling material.

A.10 Ex n type of protection

A.10.1 Basic requirements

Equipment protected by type "n" requires routine dielectric performance testing.

A.10.2 Ex nC-sealing device

There should be documented procedures to ensure that the following are verified:

- a) Electrical clearances and creepage distances should be confirmed statistically;
- b) The sealing requirements in the specified drawings should be confirmed statistically.

A.10.3 Ex nR-restricted breathing enclosures

A.10.3.1 General requirements

There should be documented procedures to ensure that the following are verified:

- a) The electrical clearances and creepage distances of the overall device in the specified drawings are not affected;
- b) The dimensional requirements in the specified drawings are confirmed (statistical methods can only be used if permitted by the certification standards).

A.10.3.2 Cable entry devices

There should be a documented method of ensuring clear identification of which cable connections in the specified drawing are associated with the enclosure to form a unit or mating in order to clarify whether routine testing of the enclosure is to be carried out.

A.10.3.3 Push rod actuators, joysticks and shafts

Documented methods should ensure that no lubricants or similar materials are used before routine testing.

A.10.3.4 Test equipment

A documented method should ensure the correct installation and functionality of test equipment.

A.10.3.5 Routine verifications and tests

All routine testing including procedures and reports should be documented. They mainly include the pressure test of restricted breathing enclosure and the test of electronic starter and ignition device.

A.11 Ex t – dust ignition protected by enclosure

A.11.1 Castings

Castings should be subject to the following verifications to satisfy conformance to specified drawings, for example:

- a) Wall thickness (including parts that cannot be machined);
- b) Cracks, slag inclusions, bubbles and pores.

A.11.2 Housing components

Enclosure components should be subject to verification to satisfy compliance with specified drawings, for example:

- a) Depth of drilled and tapped holes;
- b) Dimensional requirements for housing components related to seal effectiveness or mechanical stability;
- c) Insulating coating and surface treatment; material, layer thickness.

A.11.3 Pads

Documented procedures should include the following:

- a) The liner meets the technical requirements;
- b) Effectiveness of seals, e.g. by checking the correct fit of the seals.

If the correct installation of the gasket can only be verified after assembly, visual inspection can be done using an impression method such as a chalk mark.

A.11.4 Protective devices

Protective devices should be subject to verification to demonstrate conformance to specified drawings. Protective devices specified in the certificate (e.g. thermal safety devices) should be verified based on type and location.

A.11.5 Glued and potted components

Documented procedures should include the following:

- a) Pot life and storage requirements for adhesives and potting compounds;
- b) mix;
- c) Surface treatment (before encapsulation operation, degreasing or equivalent measures are usually required to ensure good bonding);
- d) Instructions for use, such as: filling instructions, avoidance of air holes, temperature conditions;
- e) Curing should include: curing cycle, any relevant environmental factors, and provisions to ensure that the product is not disturbed during curing;
- f) After curing, each potted component should be inspected.

A.11.6 Ingress Protection level (IP)

Documented procedures should ensure that the following are verified:

- a) Welding continuity;
- b) Matching of gaskets and seals;
- c) Continuity of molded grooves and bosses;
- d) The bonding process includes inspection after curing.

A.11.7 Routine testing

All testing should be documented. Typical tests include:

- a) Visual inspection;
- b) Further verification and testing can refer to the ideas of dust protection standards. In any case, these can be obtained from the requirements of currently existing explosion protection types.

Appendix B. Verification criteria for elements with non-measurable paths used as an integral part of a type of protection

(informative appendix)

B.1 General information

Many products such as gas detectors and speakers use sintered materials.

When the Ex certificate involves such components, the design parameters for the component normally cover the following three factors:

- a) Maximum bubble pore size;
- b) Minimum density;
- c) Component construction, as follows:
 - For sintered metal and metal foam: material, diameter and thickness;
 - For pressed metal wire: material, wire diameter and mesh size, thickness of the component.

Therefore, the purpose of this annex is not to add any technical requirements, but to provide manufacturers with guidance as to how they can demonstrate that the actual components comply with the design requirements, as detailed in the Ex certificate.

B.2 Guidance on verification

Three options are available:

- a) The manufacturer conducts the verification examination and tests;
- b) The manufacturer signs a pre-contract, conducts follow-up periodic, documented assessments of the component supplier, and accepts sintered components with a “declaration of conformity”;
- c) The manufacturer accepts sintered components with a “declaration of conformity” from a component manufacturer, who has an acceptable quality management system with an appropriate scope.

B.3 Tests

The tests for all verification options should be performed in accordance with the requirements of the Ex certificate. Typical test requirements are provided in GB/T 5249 (ISO 4003) and GB/T 5163 (ISO 2738).

The test may be conducted on a statistical basis, provided that the sample size is not less than 5% of the batch size. A single failure in the 5% sample should result in another 5% being tested; if a failure is detected in the second sample, all sintered components in the batch should be 100% tested. Where tests that determines the maximum bubble pore size and density are conducted on a sample basis, the results should be calculated to establish the standard deviation (Φ) for the sample batch, as follows:

- Φ_p is the standard deviation of maximum bubble pore size;
- Φ_D is the standard deviation of density.

Therefore, the mean value of the sample batch, plus $3\Phi_p$ (for pore size), should not exceed the maximum bubble pore size specified in the Ex certificate. The mean value of the sample batch, minus $3\Phi_D$ (for density) should be greater than or equal to the minimum value stated in the Ex certificate.

B.4 Test examples

Note: The following examples of sintered metal are provided for reference.

B.4.1 Example 1 (pore size)

An example for maximum permitted bubble pore size is as follows:

- Maximum value stated by Ex certificate is $150 \mu\text{m}$
- Mean value is $140 \mu\text{m}$
- Standard deviation (σ_p) is $2 \mu\text{m}$

Therefore, maximum value $= 140 \mu\text{m} + (2 \times 3) \mu\text{m} = 146 \mu\text{m} < 150 \mu\text{m} \rightarrow \text{PASS}$

If standard deviation (σ_p) $= 5 \mu\text{m}$, maximum value $= 140 \mu\text{m} + (5 \times 3) \mu\text{m} = 155 \mu\text{m} >$

150m → FAIL

B.4.2 Example 2 (density)

An example of minimum permitted density is detailed as follows:

- Minimum value specified by Ex certificate is 5gcm^{-3}
- Mean value is 5.3gcm^{-3}
- Standard deviation (σ_D) is 0.05gcm^{-3}

Therefore, minimum value = $5.3\text{gcm}^{-3} - (0.05 \times 3)\text{gcm}^{-3} = 5.15\text{gcm}^{-3} > 5\text{gcm}^{-3} \rightarrow \text{PASS}$

If standard deviation (σ_D) = 0.12, then minimum value = $5.3\text{gcm}^{-3} - (0.12 \times 3)\text{gcm}^{-3} = 4.94\text{gcm}^{-3} < 5\text{gcm}^{-3} \rightarrow \text{FAIL}$

Note: In some cases, the sintered component is formed directly in a solid shell. To establish the density value, the following formula should be used:

$$\rho = \frac{M_1 \times \rho_W}{M_2 - M_3}$$

Substitute as follows:

$$\rho = \frac{(m_3 - m_1) \times \rho_W}{(m_4 - m_1) - (m_5 - m_2)}$$

Where

ρ_W is the density of water;

m_1 is the mass of the shell in air;

m_2 is the mass of the shell in water;

m_3 is the mass of the shell and sintered component (as an assemblage) in air;

m_4 is the mass of the coated assemblage in air;

m_5 is the mass of the coated assemblage in water.

B.5 Purchase information

The manufacturer should ensure that the purchase documents include the following information:

- The component material specification;
- The dimensional requirements;
- The maximum bubble pore size and the standard stated in the Ex certificate, for example, GB/T 5249 (ISO 4003);
- The minimum density and the standard stated in the Ex certificate, for example, GB/T 5163 (ISO 2738).

B.6 Pre-tested components

If the manufacturer does not conduct their own tests, the manufacturer should provide a "declaration of conformity" that includes the following:

- The manufactured batch size;
- The sample size that was used to establish the maximum bubble pore size and the minimum density;
- The number of components supplied;
- The calculated maximum bubble pore size and minimum density, such as the mean values and standard deviations.

B.7 Measurement and monitoring

Upon receipt of the components, the manufacturer should take the following actions:

- Check the "declaration of conformity" against the requirements of section B.5 "Purchase information";
- Check the compatibility of the purchase order requirements with the "declaration of conformity". (If test was not performed on-site, special

attention shall be drawn to the stated values of the pore size and density, to ensure that when taking the stated tolerance into account, the specification does not exceed the permitted values);

- Conduct the tests (only if test was conducted on-site);
- Conduct a statistical check on the overall size of the component, such as diameter and thickness.

CNEX

Annex 4. Inspection Requirements for CCC Ex Factory Quality Control

The manufacturer's inspection of CCC Ex electrical products, as part of the factory quality control, includes routine tests and verification tests, as detailed in Table 7.

Routine inspection: it aims to eliminate non-conforming products caused by accidental factors in the production process, so usually such inspection is carried out on 100% of the certified products at the final stage of production. Routine inspection allows for an equivalent, quick way for confirming product compliance.

Note: For special products, sampling test is allowed under the condition that it is carried out in accordance with the requirements of the product certification implementation rules/detailed rules.

Verification inspection: it is a sampling test to verify whether the product continues to meet the certification standard.

Table 7 Inspection Requirements for CCC Ex Factory Quality Control

Type of protection	Standards	Test items	Routine test	Verification test
Flameproof enclosure "d"	GB/T 3836.1 GB/T 3836.2 GB/T 3836.3	Ex structure and parameter inspection (Ex marking, grounding, flameproof joint surface parameter measurement, creepage distance, electrical clearance measurement, when applicable)	✓	Once/batch, or at least once/year
		Static pressure test	✓	——
Increased safety "e"	GB/T 3836.1 GB/T 3836.3	Ex structure and parameter inspection (Ex marking, grounding, creepage distance, electrical clearance measurement)	✓	Once/batch, or at least once/year
		Dielectric test	✓	——
		Battery insulation dielectric strength test	✓	——

		Turn to turn overvoltage test	✓	——
Intrinsic safety “i”	GB/T 3836.1 GB/T 3836.4	Ex structure and parameter inspection (Ex marking, grounding when applicable, spacing measurement, enclosure structural inspection when applicable)	✓	Once/batch, or at least once/year
		Measurement of Intrinsic parameters	——	Once/batch, or at least once/year
		Dielectric strength test	✓	——
		Routine test of diode safety barrier	✓	Once/batch, or at least once/year
		Routine test of infallible transformer	✓	——
Pressurized enclosure “p”	GB/T 3836.1 GB/T 3836.5	Ex structure and parameter inspection (Ex marking, grounding, creepage distance, electrical clearance measurement when applicable, enclosure structural inspection when applicable)	✓	Once/batch, or at least once/year
		Measurement of pressure and flowrate	——	Once/batch, or at least once/year
		Functional test	✓	Once/batch, or at least once/year
		Leakage test	✓	Once/batch, or at least once/year
		Tests for an infallible containment system	✓	Once/batch, or at least once/year
		Test for a containment system with a limited	✓	Once/batch, or at least

		release		once/year
Liquid immersion “o”	GB/T 3836.1 GB/T 3836.6	Ex structure and parameter inspection (Ex marking, grounding, creepage distance, and electrical clearance measurement when applicable)	✓	Once/batch, or at least once/year
		Measurement of insulation resistance	✓	Once/batch, or at least once/year
		Dielectric strength test	✓	Once/batch, or at least once/year
		Overpressure test on sealed enclosures	✓	Once/batch, or at least once/year
		Reduced pressure test on sealed enclosures	✓	Once/batch, or at least once/year
		Overpressure test on unsealed enclosures	✓	Once/batch, or at least once/year
Powder filling “q”	GB/T 3836.1 GB/T 3836.7	Ex structure and parameter inspection (Ex marking, grounding, creepage distance, electrical clearance measurement when applicable)	✓	Once/batch, or at least once/year
		Pressure type test of container	✓	Once/batch, or at least once/year
		Dielectric strength test of the filling material	✓	Once/batch, or at least once/year

Type of Protection “n”	GB/T 3836.1 GB/T 3836.8	Ex structure and parameter inspection (Ex marking, grounding, creepage distance, electrical clearance measurement, enclosure structural inspection)	✓	Once/batch, or at least once/year
		Dielectric strength test	✓	——
		Routine test requirements for restricted-breathing enclosures	✓	——
		Temperature rise routine test	✓	Once/batch, or at least once/year
		Temperature calculation	——	Once/batch, or at least once/year
Encapsulation “m”	GB/T 3836.1 GB/T 3836.9	Ex structure and parameter inspection (Ex marking, grounding, creepage when applicable, enclosure structural inspection when applicable)	✓	Once/batch, or at least once/year
		Visual inspection	✓	——
		Dielectric strength test	✓	——
Dust ignition protected by enclosure “t”	GB/T 3836.1 GB/T 3836.31	Ex structure and parameter inspection (Ex marking, grounding), and enclosure structural inspection	✓	Once/batch, or at least once/year

Notes:

1. Routine testing of transformers can be carried out during incoming inspection or process inspection.
2. The flameproof joint surface parameter measurement and inter-turn overvoltage test can be carried out during incoming inspection or process inspection.

Annex 5. List of Key Components and Materials, and Periodic Confirmation Inspection and Control Requirements

This annex lists the typical key components and materials of Type A and Type B according to the requirements of Ex standards categorized by Ex type (see Table 8). The laboratory may increase or decrease according to the specific products.

Note: The key component is a general term for elements, components, raw materials, etc. that play a key role in meeting the certification requirements.

Periodic inspection of key components: Periodic sampling inspections to verify that the quality characteristics of key components continue to meet certification standards and/or technical requirements.

1. For CCC key components and materials, their periodic inspection and control requirements are as follows:

If the key components and materials have been listed in the national compulsory product certification catalogue, they must obtain the CCC certification. As long as these certificates are valid, the inspection reports of these key components and materials will not be necessary.

2. For key components and materials with voluntary certification, and their test results can be accepted in the compulsory certification of the final product, the periodic inspection and control requirements are as follows:

For key components and materials that have obtained voluntary certifications, and for which test results can be accepted for compulsory certification of the final product, as long as these certificates are valid, the inspection reports for these key components and materials will not be necessary.

3. For Class D companies, CNEx may sample key components and materials for inspection in accordance with appropriate standards when necessary.

4. If there is no CCC certificate or voluntary certificate that provides acceptable certification results for the product's compliance with the compulsory certification, the periodic confirmation test of key components and materials shall meet the requirements of Table 8.

Table 8 Inspection and Control Requirements for Key Components and Materials

Protection type	Key component/material	Type	Test item/ Frequency	Standard	Other requirements
Flameproof enclosure “d”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Transparent part	A	Resistance to impact (once/batch)	GB/T 3836.1 Clause 26.4.2	Quality proof required for each batch
	Adhesive or potting compound	A	—	GB/T 3836.1 Clause 7.1.2.4	Proof required for each batch
	Breathing/Drainage device components	A	—	GB/T 3836.2 Clause 10, Annex B	Proof required for each batch
	Sealing ring or compound for cable gland	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Terminals (insulation bushing)	A	—	GB/T 3836.1 Clause 11, 26.6	Proof or report required for each batch
	Fan (non-metallic or light metal)	A	—	GB/T 3836.1 Clause 17.2	Datasheet required for each batch
	Fan shield (non-metallic or light metal)	A	—	GB/T 3836.1 Clause 17.2	Datasheet required for each batch
	Single cell or battery pack	A	Relevant parameter measurements (1 time/batch)	GB/T 3836.1 Clause 23, GB/T 3836.2 Annex E	Quality proof required for each batch
	Built-in system	A	—	GB/T 3836.2 Annex G	Design and structure details required for each



Protection type	Key component/material	Type	Test item/ Frequency	Standard	Other requirements
					batch
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch
Increased safety “e”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Non-metallic part related to enclosure IP code (Sealing gasket, sealing ring, cement, compound)	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Transparent part	A	Resistance to impact (once/batch)	GB/T 3836.1 Clause 26.4.2	Quality proof required for each batch
	Sealing ring or compound for cable gland	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Electrical connections (e.g. terminal blocks)	A	Dielectric test (once/batch)	GB/T 3836.3 Clause 4.2, 6.1	Proof or report required for each batch
	Winding insulation (1000V and above)	A	—	GB/T 3836.3 Clause 5.2.10	Proof required for each batch
	Fan (non-metallic or light metal)	A	—	GB/T 3836.1 Clause 17.2	Proof required for each batch
	Fan shield	A	—	GB/T 3836.1 Clause	Datasheet required for

Protection type	Key component/material	Type	Test item/ Frequency	Standard	Other requirements
				17.2	each batch
	Heating wire and insulating material of electric resistance heater	A	—	GB/T 3836.3 Clause 5.8, Annex B	Datasheet required for each batch
	PCBA Printed Circuit Board Assembly	A	—	GB/T 3836.3 Clause 4.4, 4.5	Proof required for each batch
	Single cell or battery pack	A	Relevant parameter measurements (1 time/batch)	GB/T 3836.1 Clause 23, GB/T 3836.3 Clause 5.6, 7.2	Quality proof required for each batch
	Light source	A	—	GB/T 3836.3 Clause 5.3, Annex J	Qualification certificate required for each batch
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch
Intrinsic safety “i”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Non-metallic part related to enclosure IP code (sealing gasket, sealing ring, cement, compound)	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Infallible component/assembly	A	Associate parameter (once/batch)	GB/T 3836.4 Clause 7.1	Specification of element required
	PCBA Printed Circuit Board Assembly	A	—	GB/T 3836.4 Clause 5.6.4, 6.3, 8.8, Annex F	Datasheet required for each batch

Protection type	Key component/material	Type	Test item/ Frequency	Standard	Other requirements
	Adhesion material	A	—	GB/T 3836.4 Clause 6.6	Datasheet required for each batch
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch
Pressurized “p”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Transparent part	A	Resistance to impact (once/batch)	GB/T 3836.1 Clause 26.4.2	Quality proof required for each batch
	Non-metallic part related to enclosure IP code (Sealing gasket, sealing ring, cement, compound)	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Built-in system	A	—	GB/T 3836.5 Clause 12	Quality proof required for each batch
	Single cell or battery pack	A	Relevant parameter measurements (1 time/batch)	GB/T 3836.1 Clause 23, GB/T 3836.5 Annex G and H	Quality proof required for each batch
	Positive pressure safety device	A	—	GB/T 3836.5 Clause 7, 8, 17.1	Datasheet required for each batch

Protection type	Key component/material	Type	Test item/ Frequency	Standard	Other requirements
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch
Liquid immersion “o”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Non-metallic part related to enclosure IP code (Sealing gasket, sealing ring, cement, compound)	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Protective liquid	A	—	GB/T 3836.6 Clause 5	Datasheet required for each batch
	Sealing ring or compound for cable gland	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Safety device	A	—	GB/T 3836.6 Clause 4.7.3	Proof required for each batch
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch
Powder filling “q”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Non-metallic part related to enclosure IP code (Sealing gasket, sealing ring, cement, compound)	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Filling material	A	—	GB/T 3836.7 Clause	Datasheet required for



Protection type	Key component/material	Type	Test item/ Frequency	Standard	Other requirements
				4.2	each batch
	Sealing ring or compound for cable gland	A	—	GB/T3836.1 Clause 7	Datasheet required for each batch
	Protective device	A	—	GB/T 3836.7 Clause 4.7, 4.8	Proof or report required for each batch
	Single cell or battery pack	A	Relevant parameter measurements (1 time/batch)	GB/T 3836.1 Clause 23, GB/T 3836.7 Clause 4.6	Quality proof required for each batch
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch
Type of protection “n”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Non-metallic part related to enclosure IP code (Sealing gasket, sealing ring, cement, compound)	A	—	GB/T 3836.1 Clause 7	Quality proof required for each batch
	Transparent part	A	Resistance to impact (once/batch)	GB/T 3836.1 Clause 26.4.2	Quality proof required for each batch
	Sealing ring or compound for cable gland	A	—	GB/T 3836.1 Clause 7	Datasheet of sealing device or compound required for each batch

Protection type	Key component/material	Type	Test item/ Frequency	Standard	Other requirements
	Single cell or battery pack	A	Relevant parameter measurements (1 time/batch)	GB/T 3836.1 Clause 23, GB/T 3836.8 Clause 10.2.2	Quality proof or report required for each batch
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch
Encapsulation “m”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Encapsulation compound	A	—	GB/T 3836.9 Clause 5, Annex A	Datasheet required for each batch
	Protective device	A	—	GB/T 3836.9 Clause 7.9	Proof or report required for each batch
	Single cell or battery pack	A	Relevant parameter measurements (1 time/batch)	GB/T 3836.1 Clause 23, GB/T 3836.9 Clause 7.8	Quality proof or report required for each batch
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch
Dust ignition protected by enclosure “t”	Enclosure (shell walls, doors and covers that make up the shell)	A	—	GB/T 3836.1 Clause 7, 8	Datasheet required for each batch
	Non-metallic part related to enclosure IP code (Sealing gasket, sealing ring, cement, compound)	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch



Protection type	Key component/material	Type	Test item/ Frequency	Standard	Other requirements
	Transparent part	A	Resistance to impact (once/batch)	GB/T 3836.1 Clause 26.4.2	
	Sealing ring or compound for cable gland	A	—	GB/T 3836.1 Clause 7	Datasheet required for each batch
	Single cell or battery pack	A	Relevant parameter measurements (1 time/batch)	GB/T 3836.1 Clause 723, GB/T 3836.31 Clause 4.3.5, 4.4.5	Quality proof or report required for each batch
	Protective device	A	—	GB/T 3836.31 Clause 4.3.5, 4.4.5	Quality proof or report required for each batch
	Fan (non-metallic or light metal)	A	—	GB/T 3836.1 Clause 17.2	Datasheet required for each batch
	Fan shield	A	—	GB/T 3836.1 Clause 17.2	Datasheet required for each batch
	Internal additional enclosure	A	—	GB/T 3836.31 Clause 4.3.6	Datasheet required for each batch
	Ex accessories with CCC certification (such as Ex components and Ex equipment)	B	—	—	Qualification certificate required for each batch

Notes:

1. The above table is not an exhaustive list of all key components/materials. According to the specific structure of the product, the actual key components list should include, but not be limited to the key components/materials listed in the table.
2. Ex accessories (such as Ex components and Ex devices) that are not in the scope of CCC Ex certification are Class A key components.

References

China Compulsory Certification Rules:

CNCA-C23-01:2024 *"China Compulsory Certification Implement Rule on Explosion Protected Electrical Product"*

CNCA-00C-002 *"Supplementary Provisions Concerning ODM Mode in China Compulsory Certification Implementation Rules"*

CNCA-00C-003 *"China Compulsory Certification Implementation Rule on Classification Management of Manufacturing Enterprises, Selection and Determination of Certification Modes"*

CNCA-00C-004 *"China Compulsory Certification Implementation Rule on Use of Testing Resources and Other Certification Results of Manufacturing Enterprises"*

CNCA-00C-005 *"China Compulsory Certification Implementation Rule on Factory Quality Assurance Ability Requirements"*

CNCA-00C-006 *"China Compulsory Certification Implementation Rule on General Requirements for Factory Inspection"*

CNEx QR Documents:

CNEX-CCC-CB-QR-002 *"Supplementary Provisions Concerning ODM mode in China Compulsory Certification Implementation Rules for Explosion Protected Electrical Products"*

CNEX-CCC-CB-QR-003 *"China Compulsory Certification Implementation Rule for Explosion Protected Electrical Products on Classification Management of Manufacturing Enterprises, Selection and Determination of Certification Modes"*

CNEX-CCC-CB-QR-004 *"China Compulsory Certification Implementation Rule for Explosion Protected Electrical Products on Use of Testing Resources and Other Certification Results of Manufacturing Enterprises"*

CNEX-CCC-CB-QR-005 *"China Compulsory Certification Implementation Rule for*

Explosion Protected Electrical Products on Factory Quality Assurance Ability Requirements"

CNEX-CCC-CB-QR-006 "China Compulsory Certification Implementation Rule for Explosion Protected Electrical Products on General Requirements for Factory Inspection"

CNEX QA Documents:

CNEX-CB-OD-001 "Requirement on Technical Document for China Compulsory Certification for Explosion Protected Electrical Products"

CNEX-CB-OD-002 "Code of Sampling Verification/Inspection at Production Site"

CNEX-CB-OD-003 "Code of Designated Testing Items for Verification/Inspection Conducted on-site with Enterprise Testing Resources"

CNEX-CB-OD-004 "Measures for the Assessment of the Technical Expert for Manufacturer in China Compulsory Certification for Explosion Protected Electrical Products"