



# UL RP 60079-46

## Recommended Practice for Explosive Atmospheres – Part 46: Equipment Assemblies

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Recommended Practice for Explosive Atmospheres – Part 46: Equipment Assemblies, UL RP 60079-46

First Edition, Dated July 22, 2022

### **Summary of Topics**

***First Edition of the UL IEC-Based Technical Specification for Explosive Atmospheres – Part 46: Equipment Assemblies, ANSI/UL RP 60079-46, dated July 22, 2022. This is an adoption of IEC TS 60079-46, Explosive Atmospheres – Part 46: Equipment Assemblies, (first edition, issued by IEC August 2017) as a new IEC-based UL Recommended Practice, UL RP 60079-46 with US National Differences.***

The requirements are substantially in accordance with Proposal(s) on this subject dated March 13, 2021 and May 20, 2022.

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**JULY 22, 2022**



**ANSI/UL RP 60079-46-2022**

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**UL RP 60079-46**

**Recommended Practice for Explosive Atmospheres – Part 46: Equipment  
Assemblies**

**First Edition**

**July 22, 2022**

This ANSI/UL Recommended Practice consists of the First Edition.

The most recent designation of ANSI/UL RP 60079-46 as an American National Standard (ANSI) occurred on July 22, 2022. ANSI approval for a Recommended Practice does not include the Cover Page, Transmittal Pages, and Title Page and Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards.

Comments or proposals for revisions on any part of the Recommended Practice may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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## PREFACE

This UL Recommended Practice is based on IEC Publication 60079-46: First edition Technical Specification Explosive atmospheres – Part 46: Equipment assemblies. IEC publication IEC 60079-46 is copyrighted by the IEC.

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Note – Although the intended primary application of this Recommended Practice is stated in its Scope, it is important to note that it remains the responsibility of the users of the Recommended Practice to judge its suitability for their particular purpose.

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## NATIONAL DIFFERENCES

National Differences from the text of International Electrotechnical Commission (IEC) Publication 62915, Explosive atmospheres – Part 46: Equipment assemblies, copyright 2017, are indicated by notations (differences) and are presented in bold text. The national difference type is included in the body.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

**DR** – These are National Differences based on the **national regulatory requirements**.

**D1** – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

**D2** – These are National Differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

**DC** – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

**DE** – These are National Differences based on **editorial comments or corrections**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

**Addition / Add** - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

**Modification / Modify** - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

**Deletion / Delete** - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

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## FOREWORD

### INTERNATIONAL ELECTROTECHNICAL COMMISSION

#### EXPLOSIVE ATMOSPHERES – Part 46: Equipment assemblies

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.

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6) All users should ensure that they have the latest edition of this publication.

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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

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The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 60079-46, which is a technical specification, has been prepared by IEC technical committee TC 31: Equipment for explosive atmospheres.

The text of this technical specification is based on the following documents:

Enquiry draft	Reports on voting
31/1312/DTS	31/1327/RVDTS

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60079 series, published under the general title *Explosive atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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## INTRODUCTION

The provision of products into end markets for installation by end users may take the form of either individual items of equipment or pre-manufactured assemblies comprising many items of equipment. Pre-manufactured equipment assemblies may be as either subsystems requiring integration as part of an installation at a site or complete functional machines which require little or no additional reassembly on site.

This document is applied when assembly of Ex Equipment(s) results in an assembly that creates a need for additional assessment that is not already completely covered by the individual equipment certificates. Additional assessment might include (but is not limited to) evaluation of wiring methods used to connect the equipment(s) or temperature rise within the assembly.

This document provides requirements for the design, construction, assembly, testing, inspection, marking, documenting and assessment of equipment assemblies such that the items of Ex Equipment and the interconnection of the items of equipment form an assembly that also meets other parts of the ISO 80079 and IEC 60079 series.

This document is intended to be used for verification of assemblies to assist in ensuring products are in compliance with the requirements of the ISO 80079 and IEC 60079 series at the time of initial installation at the end user site.

After the initial installation, the assembly is considered as part of the site installation in accordance with other parts of the ISO 80079 and IEC 60079 series.

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# EXPLOSIVE ATMOSPHERES – Part 46: Equipment assemblies

## 1 Scope

**1DV.1 DE Modification of first 2 paragraphs of Clause 1 to replace with the following:**

**1DV.1.1** This ~~part of IEC 60079 document~~, which is a technical specification Recommended Practice, specifies requirements for the design, construction, assembly, testing, inspection, marking, documenting and assessment of equipment assemblies for use in explosive atmospheres under the responsibility of the assembly manufacturer (see 3.4.2ADV) of the equipment assembly.

**1DV.1.2** The requirements of this document apply to individual items according to the ~~IEC 60079~~ UL 60079 series or ~~ISO 80079~~ UL 80079 series that comprise the assembly and that have individual certificates. These individual items are then integrated as part of the equipment assembly. Also included are requirements to address aspects for the assembly which may be beyond the certificates of the individual items forming the assembly.

The scope of this document includes assessment of the additional requirements for assemblies for hazardous areas and does not include requirements for non-hazardous areas. It is assumed that compliance with other electrical or mechanical requirements that are applicable for non-hazardous areas will be verified by either the same or different party in addition to the requirements of this document.

**1DV.2 DR Modification of 3rd through 5th paragraphs, including Notes, of Clause 1 to replace with the following:**

**1DV.2.1** This document does not apply to:

- equipment which is covered, in its entirety, by one or more ~~IEC 60079~~ UL 60079 and ~~ISO 80079~~ UL 80079 equipment types of protection;
- ~~pressurized rooms, “p”, and artificially ventilated rooms, “v” in accordance with IEC 60079-13~~ UL 60079-13, ~~artificial ventilation for the protection of analyzer(s) houses~~ pressurized rooms in accordance with ~~IEC TR 60079-16~~ NFPA 496, and other standards addressing specific Ex assemblies;
- ~~installation at the end-user site under the scope of IEC 60079-14~~ the applicable installation codes (e.g. NFPA 70, API RP 14F, API RP 14FZ);
- classification of the hazardous area;
- equipment assemblies for mines susceptible to firedamp (Group I applications);
- inherently explosive situations and dust from explosives or pyrophoric substances (for example explosives manufacturing and processing);
- rooms used for medical purposes;
- electrical installations in areas where the hazard is due to flammable mist.

**1DV.2.2 ~~The specification~~ This document is only intended to provide validation for the initial supply of an equipment assembly as provided. Any subsequent changes made after installation are not covered by this document, and are the responsibility of the local authority having jurisdiction over the installation.**

NOTE 1 Additional guidance on the requirements for hazards due to hybrid mixtures of dust or flyings and flammable gas or vapour is provided in ~~IEC 60079-14~~ NFPA 70.

**1DV.2.3 Where a requirement of this document conflicts with a requirement of either ~~IEC 60079-0~~ UL 60079-0 or ~~ISO 80079-36~~ UL 80079-36, the requirement of this document takes precedence.**

NOTE 2 For this first edition, the only requirements of this document that take precedence over ~~IEC 60079-0~~ UL 60079-0 or ~~ISO 80079-36~~ UL 80079-36 are the markings for equipment assemblies.

**1ADV.3 DE *Modification to add to Clause 1:***

**Where references are made to IEC and ISO standards, the referenced requirements found in these standards shall apply as modified by any applicable US National Differences for the standard (see Clause 2).**

## **2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

**2DV DR *Modification of Clause 2 references to replace with the following:***

~~IEC 60079 (all parts), Explosive atmospheres~~

~~IEC 60079-0, Explosive atmospheres — Part 0: Equipment — General requirements~~

~~IEC 60079-10-1, Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres~~

~~IEC 60079-10-2, Explosive atmospheres — Part 10-2: Classification of areas — Explosive dust atmospheres~~

~~IEC 60079-14, Explosive atmospheres — Part 14: Electrical installations design, selection and erection~~

~~IEC 60079-25, Explosive atmospheres — Part 25: Intrinsically safe electrical systems~~

~~ISO 80079 (all parts), Explosive atmospheres~~

~~ISO/IEC 80079-34, Explosive atmospheres — Part 34: Application of quality systems for equipment manufacture~~

~~ISO 80079-36, Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements~~

API 505, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2

ISA 60079-10-1 (12.24.01), Explosive atmospheres – Part 10-1: Classification of areas – Explosive gas atmospheres

ISA 60079-10-2 (12.10.05), Explosive atmospheres – Part 10-2: Classification of areas – Explosive dust atmospheres

NFPA 70, National Electrical Code (NEC)

NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas

NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas

UL 60079 (all parts), Explosive atmospheres, specifically including:

- UL 60079-0, Explosive atmospheres – Part 0: Equipment – General requirements
- UL 60079-17, Explosive atmospheres – Part 17: Electrical installations inspection and maintenance
- UL 60079-25, Explosive atmospheres – Part 25: Intrinsically safe electrical systems

UL 80079 (all parts), Explosive atmospheres, specifically including:

- UL 80079-36, Explosive atmospheres – Part 36: Non-electrical equipment for explosive atmospheres – Basic method and requirements

### 3 Terms and definitions

**3DV DR Modification of Clause 3, first paragraph to replace with the following:**

For the purposes of this document, the terms and definitions given in ~~IEC 60079-0~~ UL 60079-0, ~~IEC 60079-14~~ NFPA 70, ISO 80079-36 UL 80079-36 and the following apply.

**NOTE** ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

**3.1DV DR Modification of Clause 3.1 to replace with the following:**

#### 3.1DV.1

equipment assembly

pre-manufactured combination of Ex Equipment and Ex Components, together with other parts (i.e. other items) as necessary, that are electrically or mechanically interconnected

that are pre-assembled prior to being placed into service at the end-user site, and that can be disassembled and then re-assembled at the end-user site

**3.2DV DR *Modification of Clause 3.2 to replace with the following:***

**3.2DV.2**

**equipment assembly certificate**

**document that conveys the assurance of the conformity of an equipment assembly with specified requirements**

**~~Note 1 to entry: The certificate is either the supplier's declaration of conformity or the purchaser's recognition of conformity or certification (as a result of action by a third party) as defined in ISO/IEC 17000:2004, definition 2.~~**

**3.3**

**pre-manufactured**

equipment assembly produced at any location(s) other than the end-user site

**3.4ADV DR *Addition of 3.4ADV as follows:***

**manufacturer**

**organization, situated at a stated location or locations, that carries out or controls such stages in the manufacture, assessment, handling and storage of a product that enables it to accept responsibility for continued compliance of the product with the relevant requirements and undertakes all obligations in that connection**

**[SOURCE: ISO/IEC 80079-34]**

**3.4.1ADV DR *Addition of 3.4.1ADV as follows:***

**equipment manufacturer**

**manufacturer of Ex Equipment and Ex Components, together with other parts (i.e. other items) as necessary, that can be supplied individually or as part of an equipment assembly in whose name a certificate was originally prepared**

**3.4.2ADV DR *Addition of 3.4.2ADV as follows:***

**assembly manufacturer**

**manufacturer of equipment assemblies comprised of Ex Equipment and Ex Components that are made by an equipment manufacturer**

## 4 General requirements for equipment assemblies

### 4.1 General specifications

**4.1DV DR Modification of Clause 4.1 to replace with the following:**

**4.1DV.1** The equipment assembly shall be verified for suitability against the requirements of this document, ~~IEC 60079-0~~ UL 60079-0, ~~IEC 60079-14~~ NFPA 70, and ~~ISO 80079-36~~ UL 80079-36 as applicable.

**4.1DV.2** The general specifications for the intended use of the equipment assembly may be provided by the end-user or by the assembly manufacturer ~~for the intended use of the equipment assembly~~ and shall cover the following as a minimum:

- assembly manufacturer's unique equipment assembly identifier (e.g. serial number);
- input and output ratings;
- intended environmental conditions, including ambient temperature range and ingress protection;
- applicable explosion protection codes, standards and regulations;
- utility-related issues, including power supply;
- any requirements for items to be used in the equipment assembly;
- process conditions, including fluids, pressures, duty;
- external sources of heating and cooling;
- external interface parameters (e.g. for intrinsic safety, controls, shutdowns and interlocks, including details regarding failure modes).

**4.1DV.3** These general specifications related to the application of the equipment assembly shall be documented by the assembly manufacturer.

### 4.2 Explosion protection specifications

**4.2DV DE Modification of Clause 4.2 to replace with the following:**

~~In addition to the general specifications of 4.1, if not specified as part of them the general specifications in 4.1, the assembly manufacturer shall document the following specifications related to the installation of the equipment assembly by the end-user:~~

- default equipment protection level (EPL) as defined in ~~IEC 60079-14~~ NFPA 70, as a minimum requirement;
- equipment Group;
- temperature classification or maximum surface temperature;

- allowances for dust layers as applicable;
- Specific Conditions of Use (“X” conditions).

### 4.3 Hazardous area classification related to the equipment assembly

#### 4.3.1 General

##### 4.3.1DV DE Modification of Clause 4.3.1 to replace with the following:

There are two aspects of area classification that can impact equipment assemblies. The first is due to the area in which the equipment assembly is to be installed, and the second is due to any source of release from the equipment assembly.

It is not a requirement of this document to verify either of these area classifications.

The assembly manufacturer shall document the suitability of the equipment assembly for the intended end-site hazardous area classification and for the defined installation conditions.

#### 4.3.2 Equipment assembly with its own source of release

##### 4.3.2DV DE Modification of Clause 4.3.2 to replace with the following:

If the equipment assembly has its own source of release, the assembly manufacturer shall also document:

- the hazardous area classification identifying any source of release, factors relevant to the sources of release (e.g. release rate, orifice size, operating mode, failure mode, recommendation for management of the hazard) and any other information relevant to quantifying the hazard and the methodology and any references used to arrive at the classification; and
- any conditions defined by the equipment manufacturer such that the suitability of the equipment assembly for the hazardous area classification remains valid.

The classification of hazardous areas shall be in accordance with API 505, NFPA 497, NFPA 499, IEC ISA 60079-10-1 (12.24.01) or IEC ISA 60079-10-2 (12.10.05) as applicable. This classification may be provided by the end-user.

### 4.4 Competencies

##### 4.4DV DR Deletion of Clause 4.4, it does not apply.

~~For equipment assemblies subjected to type verification, the manufacturing process and the competency of the related personnel shall conform to ISO/IEC 80079-34.~~

~~For equipment assemblies subjected to unit verification, competency of the personnel performing the production processes is verified by conformity of the equipment assembly~~



~~with this document. The verifying party shall be competent in the explosion protection aspects of the assembly being verified.~~

~~When equipment assemblies are subjected to unit verification, the verifying party shall have evidence of competency through an independent party or system.~~

~~Documentation regarding the above shall be included with each equipment assembly.~~

~~NOTE An example of suitable documentation to demonstrate the competency required for type verification would be a record of current assessment to ISO/IEC 80079-34 by a competent third-party assessor, and for unit verification it could be a current certificate issued by a competent third-party assessor.~~

## 5 Design of equipment assemblies

### 5.1 General

**5.1DV DR Modification of Clause 5.1 to replace with the following:**

The selection, installation and inspection of the electrical equipment in an assembly shall be in accordance with ~~IEC 60079-14~~ NFPA 70 and UL 60079-17, except as modified by this document.

UL 60079-17 addresses both close and detailed inspections. A close inspection as defined in UL 60079-17 shall always be performed. If a detailed inspection in accordance with UL 60079-17 is not performed, the marking in accordance with the marking requirements of UL 60079-0 and the appropriate Specific Conditions of Use shall be listed on the certificate (e.g. "Detailed inspection in accordance with UL 60079-17 was not performed").

NOTE When the inspection schedules included in UL 60079-17 are modified based on user needs, details of what was done are to be documented in the instructions.

### 5.2 Ex Equipment

#### 5.2.1 Individual items

**5.2.1DV Modification of Clause 5.2.1 to replace with the following:**

**5.2.1DV.1 DR DE** Individual items that comprise the equipment assembly shall conform to the ~~IEC 60079~~ UL 60079 series or ~~ISO 80079~~ UL 80079 series standards based on the associated ignition ~~risks~~ hazards, and shall have individual Ex Equipment certificates or be assessed as part of the assembly.

**5.2.1DV.2 DR** All individual items shall be suitably rated for the application and be utilized in accordance with the equipment manufacturer's instructions.

**5.2.1DV.3 DE** Where items other than suitably rated Ex Equipment were not separately assessed as part of Ex Equipment, an assessment, including further tests according to the ~~IEC 60079~~ UL 60079 series or ~~ISO 80079~~ UL 80079 series standards if necessary, shall be made as part of the equipment assembly evaluation.

NOTE Items other than Ex Equipment can include, for example, Ex Components, simple apparatus, general industrial products within an A Ex "d" or AEx "p" enclosure, Group I equipment used in a Group II application.

## 5.2.2 Specific Conditions of Use as specified on certificates

### 5.2.2DV DE Modification of Clause 5.2.2, first paragraph to replace with the following:

All Specific Conditions of Use as specified on equipment certificates shall be considered and their application documented by the assembly manufacturer as follows:

- If directly related to the equipment assembly, how they were satisfied in the equipment assembly.
- If directly related to the equipment assembly, but not satisfied in the equipment assembly, how they will be able to be satisfied in the end-user site installation.
- If not directly related to the equipment assembly, why they were not directly related.

Specific Conditions of Use that are related to items of equipment forming the equipment assembly, that are not satisfied in the equipment assembly, but able to be satisfied in the end-user site installation, shall be included or addressed, on the equipment assembly certificate.

## 5.2.3 Item list

### 5.2.3DV DE Modification of Clause 5.2.3 to replace with the following:

An item list shall be prepared by the assembly manufacturer ~~of the equipment assembly~~ and included as part of each equipment assembly certificate.

This list shall include an inventory of all Ex Equipment, including Ex Components that were assessed as part of this equipment assembly, incorporated into the equipment assembly.

Regarding each item on this list, details shall be provided that indicate the:

- description (type of device);
- equipment manufacturer's name and model or part number (type designation);
- identification number of each item (e.g. tag number);
- Ex Equipment certificate number, including issue number;
- Ex Component certificate number, including issue number, for Ex Components that were assessed as part of this equipment assembly;
- Standard number and edition for each item, if applicable;
- type of protection, Group and temperature classification (which may be provided as the complete Ex marking string);
- ambient temperature range; and
- ingress protection (IP Code), if applicable.

### 5.3 Other items

#### 5.3DV DE *Modification of Clause 5.3 to replace with the following:*

Regarding other items that may be relevant to explosion protection for the equipment assembly (e.g. non-metallic parts such as housings, handles, cable trays, rollers, fluid tubing), details shall be provided that indicate the:

- description (type of device);
- equipment manufacturer's name and model or part number (type designation);
- description of any explosion ~~risk~~ hazards involved and how the ~~risks~~ hazards are mitigated.

NOTE ~~ISO 80079-36~~ UL 80079-36 provides guidance regarding ignition ~~risk~~ hazard assessments applicable to both non-electrical and electrical ignition ~~risks~~ hazards.

### 5.4 Wiring system

#### 5.4DV *Modification of Clause 5.4 to replace with the following:*

5.4DV.1 *DR* Design of the wiring system for the equipment assembly that interconnects the Ex Equipment shall incorporate wiring methods that conform to ~~IEC 60079-14~~ NFPA 70.

5.4DV.2 *DR* Information shall be provided by the assembly manufacturer for each wiring method, including termination means, used as part of each equipment assembly.

5.4DV.3 *DE* Regarding this information, details shall be provided that indicate the:

- type of cable or conduit construction designation (e.g. tray cable, marine cable, rigid metal conduit, flexible conduit);
- number and size of conductor cores, if applicable;
- temperature ratings, if applicable;
- electrical parameters (such as inductance and capacitance per meter, inductance to resistance ratio) for intrinsically safe systems;
- environmental compatibility in accordance with [4.1](#) (such as outdoor use, moisture, flexibility, vibration, chemical compatibility); and
- verification that entry devices and fittings (e.g. cable glands, conduit sealing devices, conduit elbows) are appropriate for the Type of Protection of the interconnected item of Ex Equipment.

5.4DV.4 *DR* ~~It is not a requirement of this document that the conformity of the cable specifications be verified by testing, except as required by IEC 60079-14.~~

## 5.5 Drawings

**5.5DV Modification of Clause 5.5 to replace with the following:**

**5.5DV.1 DR DE** Drawings shall be provided by the assembly manufacturer to cover all relevant information for the assembly including details found in other ISO UL 80079 and ~~IEC~~ UL 60079 series standards. This information may include, as applicable:

- layouts;
- mechanical details;
- single line diagrams;
- interconnection diagrams including wire and core designations;
- cable and conduit details; and
- for intrinsically safe wiring systems a “systems descriptive document” as defined in ~~IEC~~ UL 60079-25 and ~~IEC~~ UL 60079-14.

NOTE IECEx OD 017 provides guidelines for the content recommendation and purpose for certification drawings, and other documentation that form the specification of the product.

## 6 Construction and assembly

### 6.1 General

**6.1DV DE** Modification of Clause 6.1 to replace with the following:

The manufacturer shall provide mechanical layout drawings of the equipment assembly. Construction and assembly, along with disassembly if applicable, shall be in accordance with the design of the equipment assembly.

### 6.2 Disassembly and reassembly

**6.2DV DE** Modification of Clause 6.2 Disassembly and reassembly, and relocate as Clause 6.6ADV, Inspection & testing.

~~The following is permitted to be performed by the manufacturer of the equipment assembly, as long as it is documented in the equipment assembly assessment records:-~~

- ~~– disassembly in the factory of a completed equipment assembly;-~~
- ~~– transportation of the disassembled equipment assembly to the end-user site, and;-~~
- ~~– reassembly of the equipment assembly at the end-user site.-~~

~~Alternatively, the reassembly activity is permitted to be performed under the responsibility of the manufacturer, as long as this is documented in the equipment assembly assessment records.~~

~~NOTE Local regulations might consider the reassembly of an equipment assembly in the field at the end site as an installation activity, and therefore reassembly could be subject to local installation regulations.~~

## 6.3 System interfaces

**6.3DV DE Modification of Clause 6.3, System interfaces, to relocate as Clause 6.4ADV.1, Ignition hazard assessment.**

~~The need for system interfaces related to the explosion protection shall be addressed by the manufacturer as part of the equipment assembly documentation. See [4.1](#).~~

~~When these interfaces are integral to the equipment assembly, they are addressed as indicated in this document.~~

~~When these interfaces are to be located remotely from the equipment assembly, the manufacturer shall include instructions as to the necessary characteristics of these interfaces.~~

## 6.4 Ignition hazard assessment

**6.4DV DE Modification of Clause 6.4 as follows:**

The assembly manufacturer shall perform and document an assessment of all ignition hazards that might have been caused by the combination of the Ex Equipment in accordance with ~~ISO 80079-36~~ UL 80079-36 for both non-electrical and electrical risks hazards. Additionally, a risk hazard assessment methodology specified by the end-user may also be performed.

The documentation shall address the risks ignition hazards as follows:

- ignition hazards directly related to the equipment assembly, and how they were mitigated in the equipment assembly;
- ignition hazards directly related to the equipment assembly, not mitigated in the equipment assembly, but able to be mitigated in the end-user site installation.

For ignition hazards that are not mitigated in the equipment assembly, but that are able to be mitigated in the end-user site installation, the equipment assembly certificate number shall be marked include the "X" suffix in accordance with the marking requirements of ~~IEC 60079-0~~ UL 60079-0 and the Specific Conditions of Use shall be listed on the certificate and in the instructions, with guidance included on the intended mitigation.

Ignition hazards for each item of Ex Equipment are addressed by the Ex Equipment certificates, and therefore need not be reassessed.

The verifier shall confirm that the assembly manufacturer has carried out an ignition hazard assessment and documented control measures and any residual risk hazards.

**6.4ADV DE Modification of Clause 6.3, System interfaces, to relocate as Clause 6.4ADV.1, System interfaces, and replace with the following:**

**6.4ADV.1 System interfaces**

The need for system interfaces related to the explosion protection shall be addressed by the assembly manufacturer as part of the equipment assembly documentation. See [4.1](#).

When these interfaces are integral to the equipment assembly, they are addressed as indicated in this document.

When these interfaces are to be located remotely from the equipment assembly, the assembly manufacturer shall include instructions as to the necessary characteristics of these interfaces.

**6.5 Calculations**

**6.5DV Modification of Clause 6.5 to replace with the following:**

**6.5DV.1 DR** The assembly manufacturer shall provide all calculations and safety parameters (such as trip settings on a motor overload, explosion relief calculations, etc.) relevant to the explosion protection of equipment assembly in accordance with ~~IEC 60079-44~~ **NFPA 70**, and the applicable Type of Protection standards if not addressed by ~~IEC 60079-14~~ **NFPA 70**.

**6.5DV.2 DE** Calculations relevant to the explosion protection of equipment assemblies may include maximum power dissipation for increased safety “e” enclosures, cable rating with the settings of the overload protecting circuit breakers and intrinsically safe loop analysis (also referred to as descriptive system documents or control drawings).

**NOTE** It is not a requirement of this document that the calculations for remotely located items be verified.

**6.6 Inspection & testing**

**6.6DV DR Modification of Clause 6.6 to replace with the following:**

Inspection and testing of the entire equipment assembly after assembly, including a close inspection in accordance with **UL 60079-17**, shall be performed and documented by the manufacturer.

While a detailed inspection may not always be performed (see [5.1](#)), a close inspection as defined in **UL 60079-17** shall be performed as a minimum.

**NOTE** The inspection schedules included in **UL 60079-17** may be modified based on user needs.

The electrical aspects of the assembly shall be inspected and tested in accordance with ~~IEC 60079-14~~ **UL 60079-14**, with the non-electrical aspects addressed in accordance with the ignition hazard assessment in [6.4](#).

When disassembly and reassembly is involved, the equipment assembly shall be subjected to an documented inspection and testing, ~~and documented~~ either entirely after reassembly, or partially prior to disassembly and partial after reassembly.

**6.6ADV DE Modification of Clause 6.2, Disassembly and reassembly, to relocate as Clause 6.6ADV.1, Disassembly and reassembly, and replace with the following:**

**6.6ADV.1 Disassembly and reassembly**

The following is permitted to be performed by the assembly manufacturer, as long as it is documented in the instructions:

- disassembly in the factory of a completed equipment assembly;
- transportation of the disassembled equipment assembly to the end-user site; and
- reassembly of the equipment assembly at the end-user site.

Alternatively, the reassembly activity is permitted to be performed under the responsibility of the assembly manufacturer, as long as this is documented in the instructions.

NOTE Local regulations might consider the reassembly of an equipment assembly in the field at the end-site as an installation activity, and therefore reassembly could be subject to local installation regulations.

**6.7 Validation and documentation**

**6.7.1 General**

**6.7.1DV DE Modification of Clause 6.7.1 to replace with the following:**

Verification of an equipment assembly's conformity to the design drawings and specifications shall include:

- confirmation that all Ex Equipment on the assembly is identified in the documentation and that the documentation matches the assembly;
- verification of the content of the item list (see [5.2.3](#))

Assessment of the assembly shall include:

- confirmation that each Ex Equipment, including Ex Components that were assessed as part of this assembly equipment, is appropriate for the application (e.g. ratings match operating conditions);
- confirmation that Specific Conditions of Use for Ex Equipment are either addressed in the assembly or passed on to the end-user;
- confirmation that the Schedule of Limitations for Ex Components that were assessed as part of this equipment assembly are either addressed in the assembly or passed on to the end-user, including details regarding the assessment;