# Terms and Requirements from IEC 60079-0:2017

**3.12.1**
**Ex Component Certificate**
certificate prepared for an Ex Component (see 3.36)

**3.12.2**
**Ex Equipment Certificate**
certificate prepared for Ex Equipment

**3.36**
**Ex Component**
equipment intended to be part of Ex Equipment, marked with the symbol "U", which is not intended to be used alone, and requires additional consideration when incorporated into Ex Equipment

**3.37**
**Ex Equipment**
explosion-protected equipment

Note 1 to entry: Such equipment often includes Ex Components, but additional evaluation is always required as part of their incorporation into equipment.

**3.83**
**symbol "U"**
suffix to the certificate number used to denote an Ex Component

Note 1 to entry: The symbol "U" is used to identify that the equipment is incomplete and is not suitable for installation without further evaluation.

**3.84**
**symbol "X"**
suffix to the certificate number used to denote Specific Conditions of Use for Ex Equipment

Note 1 to entry: The symbol "X" is used to provide a means of identifying that essential information for the installation, use, and maintenance of the equipment is contained within the certificate.

## 13 Ex Components

### 13.1 General

Ex Components shall comply with the requirements given in Annex B. Examples of Ex Components include:

a) an empty enclosure; or
b) components or assemblies of components for use with equipment which complies with the requirements of one or more of the types of protection listed in Clause 1.

### 13.5 Ex Component certificate

As Ex Components are not intended to be used alone and require additional consideration when incorporated into equipment or systems, they do not have "Specific Conditions of Use" along with the associated "X" suffix for the certificate number. Where this standard or one of its sub-parts specify "Specific Conditions of Use" and the associated "X" suffix for the certificate number, a "Schedule of Limitations" for the Ex Component certificate and the associated "U" suffix for the Ex Component certificate number shall be substituted for an Ex Component. Information necessary to correctly apply the Ex Component shall be included in the Schedule of Limitations on the Certificate. See also 28.2 and Annex B.

NOTE 1 The Schedule of Limitations includes the temperature range for the Ex Component. In some cases, ranges at multiple points are defined to allow maximum flexibility in the application of the Ex Component.

NOTE 2 In accordance with Annex B, Ex Components are not assigned a temperature class.

### 28.2 Certificate

The manufacturer shall prepare, or have prepared, a certificate confirming that the equipment is in conformity with the requirements of this document along with other applicable parts and additional standards mentioned in Clause 1. The certificate can relate to Ex Equipment or an Ex Component.

An Ex Component certificate (Identified by the symbol "U" suffix to the certificate number) is prepared for parts of equipment that are incomplete and require further evaluation prior to incorporation in Ex Equipment. Information necessary to correctly apply the Ex Component shall be included in the Schedule of Limitations on the Certificate.

An Ex Component certificate shall state that it is not an Ex Equipment certificate.

### 29.10 Ex Components

Ex Components, according to Clause 13, shall be legibly marked and the marking shall include the following:

a) the name or the registered trade mark of the manufacturer;

b) the manufacturer's type identification;

c) the symbol Ex;

d) the symbol for each Type (or Level) of Protection used;

e) the symbol of the group of the equipment of the Ex Component;

f) the name or mark of the issuer of the certificate, and the number of the certificate;

g) the symbol "U";

NOTE 1 The symbol "X" is not used.

h) the additional marking prescribed in the specific standard for the types of protection concerned, as in Clause 1;

NOTE 2 Additional marking may be required by the standards for construction of the equipment.

i) as much of the remaining marking information per 29.4 or 29.5, as applicable, as can be accommodated.

The Ex marking for explosive gas atmospheres and explosive dust atmospheres shall be separate and not combined.

The Ex marking of enclosures as Ex Components shall not be marked externally. Only the information of bullet point a) and b) may be marked externally. The internal marking need not be permanent. The internal markings may be omitted if the enclosure (as Ex Component) manufacturer is also the holder of the equipment certificate, and indicated as such in the Schedule of Limitations of the Ex Component certificate.

## Terms and Requirements from IEC 60079-1:2014

**3.18**
**Ex component enclosure**
empty flameproof enclosure provided with an Ex component certificate, without the internal equipment being defined, so as to enable the empty enclosure to be made available for incorporation into an equipment certificate without the need for repetition of type testing

# Annex D
(normative)

# Empty flameproof enclosures as Ex components

## D.1 General

The purpose of an Ex component enclosure certificate for empty enclosures is to enable a manufacturer of flameproof enclosures to obtain a certificate without the internal equipment being defined, so as to enable the empty enclosure to be made available to third parties for incorporation into a full equipment certificate without the need for repetition of all the type tests for flameproof enclosures “d” as required by IEC 60079-1 and IEC 60079-0. When a certificate concerning the full equipment is required, an Ex component enclosure certificate for the empty enclosure is not necessary.

## D.2 Introductory remarks

The requirements for an Ex component enclosure certificate for an empty enclosure are contained in this annex. This does not eliminate the need for a subsequent equipment certificate, but it is intended to facilitate such a certificate.

The Ex component enclosure manufacturer shall be responsible for ensuring that each and every unit supplied

a) is identical in construction with the original design as detailed in the documents mentioned in the Ex component enclosure certificate,
b) has been subjected to such routine overpressure testing as is required, and
c) meets the requirements of the applicable schedule of limitations imposed by the Ex component enclosure certificate.

## D.3 Ex component enclosure requirements

**D.3.1** Ex component enclosures shall comply with the requirements, as applicable, of IEC 60079-0 and of this standard.

**D.3.2** Ex component enclosures shall consist of a basically simple geometry of only square, rectangular, or cylindrical cross-section with taper not exceeding 10 %.

NOTE Simple geometry is considered to include those constructions in which major dimensions do not exceed any other dimension by 4:1 for Group I, IIA and IIB, or do not exceed any other dimension by 2:1 for Group IIC.

**D.3.3** Enclosures for rotating machines shall not be evaluated as Ex component enclosures.

NOTE "Machines" are taken to mean electric motors which substantially fill the enclosure.

**D.3.4** Ex component enclosures shall be provided with adequate means for the mounting and location of internal components.

**D.3.5** No holes, whether for mechanical or electrical purposes, and whether blind or clear, shall be drilled in the Ex component enclosure other than those permitted by the Ex component enclosure certificate.

**D.3.6** For Group I, IIA and IIB Ex component enclosures, the reference pressure is determined according to 15.2.2, with modifications to the test sample as follows:

- when no major dimension exceeds any other major dimension by more than 2:1, no modification is needed;
- for all other permitted constructions, a solid obstruction (baffle plate) of approximately 80 % of the cross-sectional area shall be located centrally on the minor axis, and located approximately two-thirds of the way along the major axis. The solid obstruction shall reasonably replicate the cross-section of the enclosure.

For Group IIC Ex component enclosures, the reference pressure is determined according to 15.2.2, with a solid obstruction (baffle plate) of approximately 60 % of the cross-sectional area located centrally on the minor axis, and located approximately two-thirds of the way along the major axis. The solid obstruction shall reasonably replicate the cross-section of the enclosure.

When the sample is required to be modified by inclusion of the solid obstruction, ignition sources and pressure recording devices shall be positioned on both sides of the solid obstruction to simultaneously measure the resultant pressures.

**D.3.7** Ex component enclosures shall withstand an overpressure type test with the maximum number of apertures of the maximum sizes at a pressure which shall be equal to 1,5 times the peak explosion pressure (reference pressure) measured according to 15.2.2 with the Ex component enclosure empty, and with the entries closed by suitable means.

Routine tests are not required for Ex component enclosures when the prescribed type test has been made at a static pressure of four times the reference pressure. However, Ex component enclosures of welded construction shall, in every case, be submitted to the routine test.

The routine test shall consist of either a dynamic test with, inside and outside the Ex component enclosure, the appropriate explosive mixture specified in 15.2.2 (for the determination of explosion pressure) at a pressure of 1,5 times atmospheric pressure; or a static test at a pressure of at least 350 kPa and not less than 1,5 times the reference pressure.

**D.3.8** The enclosure shall be marked in accordance with the requirements for marking of Ex components given in IEC 60079-0, but shall be internal and not required to be permanent. The Ex marking string shall not be marked externally. Only the manufacturer's name and enclosure identifier information (such as type or serial number) may be marked external to the enclosure. This marking need not be permanent.

These markings may be omitted if the Ex component enclosure manufacturer is also intended to be the holder of the equipment certificate, and indicated as such in the Ex component certificate schedule of limitations.

**D.3.9** Provision shall be made for the mounting of external marking for equipment according to IEC 60079-0.

**D.3.10** The following information shall be given in the Ex component enclosure certificate as part of the schedule of limitations:

a) the maximum number of apertures, their maximum sizes and their positions shall be addressed through direct statement or reference to a drawing number;

b) oil-filled circuit-breakers and contactors shall not be used;

c) (for ambient ranges other than –20 °C to +40 °C) the ambient range;

d) (if applicable per D.3.8) indication that the Ex component enclosure manufacturer is intended to be the only holder of the related equipment certificate(s);

e) (for Group I, IIA and IIB Ex component enclosures) the content of the Ex component enclosure equipment may be placed in any arrangement, provided that an area of at least 20 % of each cross-sectional area remains free to permit an unimpeded gas flow and, therefore, unrestricted development of an explosion. Separate relief areas may be aggregated provided that each area has a minimum dimension in any direction of 12,5 mm;

f) (for Group IIC Ex component enclosures) the content of the Ex component enclosure equipment may be placed in any arrangement provided that an area of at least 40 % of each cross-sectional area remains free to permit unimpeded gas flow and, therefore, unrestricted development of an explosion. Separate relief areas may be aggregated provided that each area has a minimum dimension in any direction of 12,5 mm; and

g) any additional limitation required for the particular construction, e.g. maximum operating temperature of the window.

## D.4 Utilization of an Ex component enclosure certificate to prepare an equipment certificate

### D.4.1 Procedure

Enclosures which have an Ex component enclosure certificate may be considered for incorporation in equipment certificates with IEC 60079-0 and this standard, normally without repetition of application of those requirements already applied to the Ex component enclosure, subject to consideration of the schedule of limitations detailed in D.3.10.

Documents shall be prepared for an equipment certificate depicting the specified equipment, any permitted substitutions or omissions, together with the mounting conditions within the Ex component enclosure, so that compliance can be verified with the schedule of limitations of the Ex component enclosure certificate.

Any hole permitted in accordance with the Ex component enclosure certificate may be provided either by the Ex component enclosure manufacturer, or by the equipment manufacturer through agreement between the equipment manufacturer and the Ex component enclosure manufacturer.

The continuous effects of devices, such as rotating devices, which can create significant turbulence that may result in an increase in reference pressure shall be considered.

### D.4.2 Application of the schedule of limitations

In addition to compliance with the schedule of limitations, all application issues shall be considered and determined to comply with the applicable requirements of IEC 60079-0 and this standard.