Exemplary comparison of non-electrical equipment explosion protection marking 2014/34/EU (ATEX), EN 13463-1:2009 or ISO 80079-36:2016 in accordance with the European explosion protection directive and harmonized standards

As of: November 2019

1. General

Equipment that is used in potentially explosive atmospheres in Europe and which has its own potential source of ignition as defined by EN 1127-1:2011, has to be marked according to its suitability for use. This marking is based on the requirements of the European explosion protection directive 2014/34/EU (ATEX) and the concerns of the associated harmonized standards.

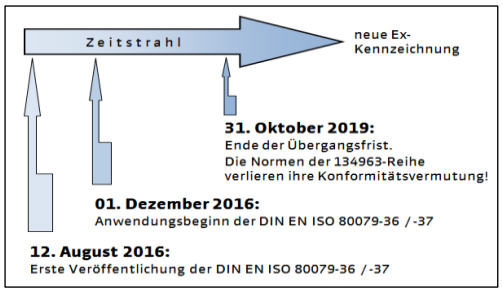
1.1 Changes relevant to standards for non-electrical equipment explosion protection

- Einzelne Individual standards of the European EN 13463 standards series, describing mechanical ignition protection types, are now included in the ISO 80079 series of international standards.

- Dies This is welcome in light of global standardization efforts. On the other hand, this conversion necessitates extensive modifications that mainly affect the labeling of the equipment.
- The basic safety requirements set out by the EN 13463 series of standards have been adopted by the ISO 80079 series of international standards; adaptations of a technical nature are therefore usually not required.

- No ATEX-compliant product with the previous explosion protection marking (according to DIN EN 13463-1:2009) must be put on the market after October 31, 2019.

It has been possible to apply the new standards as early as December 1, 2016. The transition period ended on October 31, 2019. This is the date as of which the previous standards have lost their so-called “presumption of conformity”. This means that full compliance is no longer given so that conformity with the explosion protection directive 2014/34/EU (ATEX) could be presumed.



1.2 The following standards from the 13463 series were transferred to the 80079 series

- EN 13463-1:2009 Basic method and requirements ISO 80079-36:2016

- EN 13463-5:2011 Protection by constructional safety “c”
- EN 13463-6:2005 Protection by control of ignition source “b” } ISO80079-37:2016
- EN 13463-8:2003 Protection by liquid immersion “k”

2. Examples and illustrations of explosion protection markings

2.1 Example 1: URACA FV1200 foot valve

Permissible marking up to October 31, 2019:

CE Ex **II 3G c IIB T4**

Mandatory marking as of November 1, 2019:

CE Ex **II 3G Ex h IIB T4 Gc**

Illustration of new marking To be used as of November 1, 2019 at the latest										
ATEX 2014/34/EU						**ISO 80079-36:2016**				
A	B	C	D	E	F	1	2	3	4	5
CE		Ex	**II**	**3**	**G**	**Ex**	**h**	**IIB**	**T4**	**Gc**

2.1.1 Detailed explanation of explosion protection marking on FV1200

	Marking in accordance with ATEX 2014/34/EU	**Character(s) / Symbol**	**Meaning**
A	CE mark	CE	Conformité Européenne / European Conformity
B			No entry as type testing is not required
C	Special mark for explosion protection	Ex	Marking relevant to explosion prevention
D	Device group	**II**	Used to mark equipment suitable for use in potentially explosive atmospheres in any field (with the exception of mining).
E	Device category	**3**	Used to mark equipment subject to device group II with a normal degree of safety [1)]
F	Potentially explosive atmosphere	**G**	Suitable for use in areas where potentially explosive mixtures of gases, vapors, mists or air exist. [1)]

	Marking in accordance with ISO 80079-36:2016	**Character(s) / Symbol**	**Meaning**
1	Explosion protection marking	**Ex**	In accordance with ISO 80079-36:2016, Chp. 11.2 c)
2	Type of protection	**h**	Non-electrical equipment for use in potentially explosive atmospheres
3	Explosion hazard group	**IIB**	Suitable for use in conjunction with gases subject to group IIB (flammable gases of high or average minimum ignition energy)
4	Surface temperature	**T4**	Temperature class
5	Equipment Protection Level (EPL)	**Gc**	Equipment with enhanced level of protection for use in potentially explosive atmospheres where no risk of ignition exists during normal operation.

[1)] Device category **"3"** and potentially explosive atmosphere **"G"** result in a suitability for use in explosion hazard **zone 2**.

2.2 Example 2: Spring-loaded overflow valves (FÜV series) from URACA

Permissible marking up to October 31, 2019:

CE Ex II 2G c IIB T4

Mandatory marking as of November 1, 2019:

CE Ex II 2G Ex h IIB T4 Gb

Illustration of new marking to be used as of November 1, 2019 at the latest										
ATEX 2014/34/EU						**ISO 80079-36:2016**				
A	B	C	D	E	F	1	2	3	4	5
CE		Ex	**II**	**2**	**G**	**Ex**	**h**	**IIB**	**T4**	**Gb**

2.2.1 Detailed explanation of explosion protection marking on the FÜV series

	Marking in accordance with ATEX 2014/34/EU	**Character(s) / Symbol**	**Meaning**
A	CE mark	CE	Conformité Européenne / European Conformity
B			No entry as type testing is not required
C	Special mark for explosion protection	Ex	Marking relevant to explosion prevention
D	Device group	**II**	Used to mark equipment suitable for use in potentially explosive atmospheres in any field (with the exception of mining).
E	Device category	**2**	Used to mark equipment subject to device group II with a high degree of safety.[2)]
F	Potentially explosive atmosphere	**G**	Suitable for use in areas where potentially explosive mixtures of gases, vapors, mists or air exist.[2)]

	Marking in accordance with ISO 80079-36:2016	**Character(s) / Symbol**	**Meaning**
1	Explosion protection marking	**Ex**	In accordance with ISO 80079-36:2016, Chp. 11.2 c)
2	Type of protection	**h**	Non-electrical equipment for use in potentially explosive atmospheres
3	Explosion hazard group	**IIB**	Suitable for use in conjunction with gases subject to group IIB (flammable gases of high or average minimum ignition energy)
4	Surface temperature	**T4**	Temperature class
5	Equipment Protection Level (EPL)	**Gb**	Equipment with high level of protection for use in potentially explosive atmospheres where no risk of ignition exists during normal operation or in the case of foreseeable faults or malfunctions.

[2)] Device category **"2"** and potentially explosive atmosphere **"G"** result in a suitability for use in explosion hazard **zone 1**.

2.3 Example 3: Tank cleaning heads from URACA (TWK series with ATEX type testing)

Permissible marking up to October 31, 2019:

CE 0123 Ex II 1GD c IIB T4 130°C

Mandatory marking as of November 1, 2019:

CE 0123 Ex II 1G Ex h IIB T4
CE 0123 Ex II 1D Ex h IIIC T130°C Da

Illustration of new marking, to be used as of November 1, 2019 at the latest										
ATEX 2014/34/EU						**ISO 80079-36:2016**				
A	B	C	D	E	F	1	2	3	4	5
CE	0123	Ex	**II**	**1**	**G**	**Ex**	**h**	**IIB**	**T4**	**Ga**
			II	**1**	**D**	**Ex**	**h**	**IIIC**	**T130°C**	**Da**

2.3.1 Detailed explanation of explosion protection marking on the TWK series

	Marking in accordance with ISO 80079-36:2016	**Character(s) / Symbol**	**Meaning**
A	CE mark	CE	Communautés Européennes / European Union
B	Identification no. of inspection body (notified body)	**0123**	TÜV SÜD Product Service GmbH, 80339 München
C	Special mark for explosion protection	Ex	Marking relevant to explosion prevention
D	Device group	**II**	Used to mark equipment suitable for use in potentially explosive atmospheres in any field (with the exception of mining).
E	Device category	**1**	Used to mark equipment subject to device group II with a very high degree of safety. [3) 4)]
F	Potentially explosive atmosphere	**G**	Suitable for use in areas where potentially explosive mixtures of gases, vapors, mists or air exist. [3)]
		D	Suitable for use in areas where dust can result in the formation of potentially explosive atmospheres. [4)]

	Marking in accordance with ISO 80079-36:2016	**Character(s) / Symbol**	**Meaning**
1	Explosion protection marking	**Ex**	In accordance with ISO 80079-36:2016, Chp. 11.2 c)

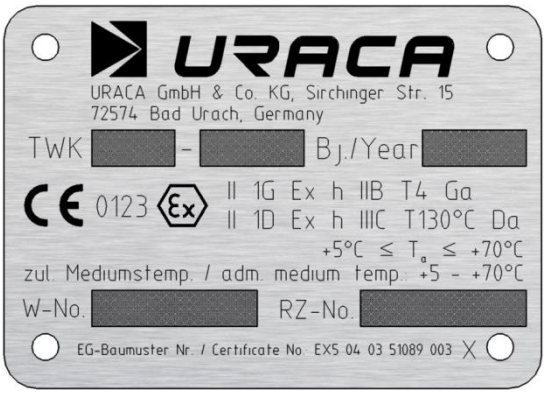
[3)] Device category **"1"** and potentially explosive atmosphere **"G"** result in a suitability for use in explosion hazard **zone 0**.
[4)] Device category **"1"** and potentially explosive atmosphere **"D"** result in a suitability for use in explosion hazard **zone 20**.

2	Type of protection	**h**	Non-electrical equipment for use in potentially explosive atmospheres
3	Explosion hazard group	**IIB**	Suitable for use in conjunction with gases subject to group IIB (flammable gases of high or average minimum ignition energy)
		IIIC	Suitable for use in conjunction with dust category IIIC (combustible particulates; electrically non-conductive dusts and electrically conductive dusts)
4	Surface temperature	**T4**	Temperature class
		T130°C	Measured max. surface temperature
5	Equipment Protection Level (EPL)	**Ga**	Equipment with a very high level of protection for use in potentially explosive atmospheres where no risk of ignition exists during normal operation or in the case of foreseeable or rare faults or malfunctions.
		Da	

2.3.2 The most distinctive changes regarding explosion protection markings

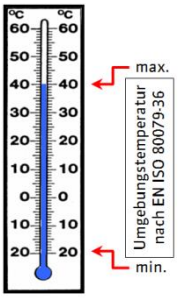
- The letters “Ex” have to form the prefix of the marking area in accordance with EN ISO 80079-36:2016.
- The symbol “h” is to be used to identify the use of a mechanical ignition protection type (regardless of which type of ignition protection is used).
- The Equipment Protection Level (EPL) “Ga”, “Gb” or “Gc” or “Da”, “Db” or “Dc” has to form the suffix of the marking area.
- The marking for suitability of use in a potentially explosive atmosphere due to gases, vapors, mists (G) and dusts (D) has to be in the form two rows (see TWK series).
- The max. surface temperature for device group III (dusts) has to be expressed in °C with the prefix “T” (see TWK series).
- The symbol “X” is used at the end of the number of the type testing certificate to refer to special conditions of use that need to be followed.

2.3.3 Example of explosion protection marking on the TWK series



Note: The letter “h” is used to confirm that the mechanical device is suitable for use in potentially explosive atmospheres as a rule. As far as the explosion protection marking is concerned, the “h” takes the place where previously the ignition protection type “c” (protection by constructional safety) was indicated. The criteria for satisfying the requirements for this and other types of ignition protection have been adopted by the ISO 80079 series of standards, so that the TWK series from URACA continues to meet the requirements accordingly.

3. Ambient temperatures



Insofar as the equipment cannot be operated in the normal ambient temperature range (as per EN ISO 80079-36:2016) from -20 °C to +40 °C, the permissible ambient temperature range has to be added to the marking accordingly.

Example: **+5°C ≤ T_a ≤ + 70°C**

Alternatively, the symbol “X” can be used to indicate special conditions of use that need to be followed.

4. Impacts on the Declaration of Conformity in accordance with ATEX

Declarations of conformity in accordance with ATEX 2014/34/EU include the explosion protection marking(s) for the corresponding equipment, as well as the relevant harmonized standards that form the basis for the design, manufacture and testing of the equipment. Declarations of conformity must include the new explosion protection marking(s) by November 1, 2019 without making reference to the old standards.

5. Overview: Classification and delimitation of areas regarding explosion protection

Connection regarding explosion hazard zones (Ex-zones), device groups, device categories, explosion protection groups and Equipment Protection Levels (EPL) as well the relevant delimitation from one another. Connection regarding explosion hazard zones (Ex-zones), device groups, device categories, explosion protection groups and Equipment Protection Levels (EPL) as well the relevant delimitation from one another.

Potentially Explosive Atmosphere Consisting of Oxygen and	Duration of Presence of Combustible Mixture	Ex-Zones	Minimum Equipment Requirements				Protection Level
			ATEX Directive 2014/34/EU		EN 60079-0 Standard or EN ISO 80079-36 Standard		
			Device Group	Device Category	Explosion Protection Group(s)	Equipment Protection Level (EPL)	
Methane, coal dust		Mining	I	M1	I	Ma	Very high
		Mining	I	M2	I	Mb	High
Gases, mists, vapors	Continuous, long-term or frequent	0	II	1G	IIA, IIB, IIC	Ga	Very high
	Occasional	1	II	2G	IIA, IIB, IIC	Gb	High
	Rare or brief	2	II	3G	IIA, IIB, IIC	Gc	Enhanced
Dusts	Continuous, long-term or frequent	20	II	1D	IIIA, IIIB, IIIC	Da	Very high
	Occasional	21	II	2D	IIIA, IIIB, IIIC	Db	High
	Rare or brief	22	II	3D	IIIA, IIIB, IIIC	Dc	Enhanced

Please note: The dust groups III according to EN 60079-0 or EN ISO 80079-36 belong to device group II as far as the ATEX Directive 2014/34/EU is concerned.