

2 August 2006

OVERVIEW OF IEC STANDARDS FROM TC 31 (Ex) AND TC 70 (INGRESS PROTECTION)

- NOTES
1. Recent changes are highlighted in red.
 2. Readers may view draft documents in the IEC web page by following the instructions in Annex 1.

1. TC 31: Equipment For Explosive Atmospheres

- 1.1 Standards issued
- IEC 60050-426 Ed. 1.0
 - IEC 60079-0 Edition 4.0
 - IEC 60079-0 Edition 5.0
 - IEC 60079-2 Edition 4.0
 - IEC 60079-4 Edition 2.0
 - IEC 60079-4A Edition 2.0
 - IEC 60079-5 Edition 2.0
 - IEC 60079-6 Edition 2.0
 - IEC 60079-7 Edition 2.2
 - IEC 60079-12 Edition 1.0
 - IEC 60079-13 Edition 1.0
 - IEC 60079-15 Edition 2.0
 - IEC 60079-16 Edition 1.0
 - IEC 60079-18 Edition 1.0
 - IEC 60079-20 Edition 1.0
 - IEC 60079-20 Edition 1.0
 - IEC 61779-1 to -6 Edition 1.0
 - IEC 62013-1 Edition 1.0
 - IEC 62013-2 Edition 1.0
 - IEC 62086-1 Edition 1.0
 - IEC 62086-2 Edition 1.0
- 1.2 IEC 60050-426 Ed. 2.0: International Electrotechnical Vocabulary. Chapter 426: Electrical apparatus for explosive atmospheres has been circulated as a CD with closing date for comments 29 April 2005. Comments will be discussed in October 2005 in Cape Town.
- 1.3 IEC 60079-0 Ed 5.0: General requirements CDV has been circulated, closing date for comments November 2006.
- 1.4 IEC 60079-1 Ed. 6.0: Flameproof enclosures "d" CDV has been approved and will be published as an FDIS by October 2006.
- No major changes with respect to the previous edition.
- An interpretation sheet is being developed for IEC 60079-1. Comments received on the draft are currently being processed. An approval stage for voting by the National Committees will follow this comment resolution stage.
- 1.5 IEC 60079-2 Ed. 5.0: Pressurized enclosures "p" CDV has been approved and will be circulated as an FDIS by September 2006.
- No major changes with respect to the previous edition.
- 1.6 IEC 60079-5: Ed 3.0 Sand-filled apparatus CDV has been approved and will be

circulated as FDIS by February 2007.

- 1.7 IEC 60079-6: Ed. 3.0 Oil-immersed apparatus CDV has been approved and will be circulated as FDIS by February 2007.
- 1.8 IEC 60079-7: Increased safety Ex e Edition 4.0 has been published in July 2006.
- 1.9 IEC 60079-15 Ed 3.0: Type “n” This document will be starting its maintenance cycle and National Comment is invited on the current Edition 3 of this standard. This is to ensure that there is a broad consultation in the initial phases of the revision. Closing date 1 September 2006.
- 1.10 IEC 60079-18: Ed 3.0 Encapsulation “m” has been circulated as a CD with closing date for comments 17 March 2006.
- 1.11 IEC 60079-26 Ed. 2.0: Electrical apparatus for explosive gas atmospheres. Part 26: Construction, test and marking of Group II Zone 0 electrical apparatus has been circulated as a CDV with closing date for voting August 2005.
- 1.12 IEC 60079-XX Explosive atmospheres. Part XX: Equipment process sealing

This standard provides specific requirements for process sealing between electrical systems

flammable process fluids where a failure could allow migration of the process fluids directly into the electrical system and result in an explosion.

Many instruments in an explosive atmosphere are connected to flammable processes. There are currently only limited requirements to address the safety of the process sealing as related to explosion protection. In 2003, the US published a document to address this problem within the US.

The same approach should now be considered on an international level.

- 1.13 IEC 61779-1 to 6: Gas Detectors

Local SABS IEC 61779-6: Electrical apparatus for the detection and measurement of flammable gas, Part 6 – Guide for the selection, installation, use and maintenance of apparatus for the detection and measurement of flammable gases, was adopted by SC 65A.

SABS 1515-1: Flammable-gas measuring instruments and warning devices primarily for use in mines, Part 1: Battery operated portable instruments and devices, covers Parts 1 to 5 of the IEC 61779 series for Group I gas detectors. This document, which deviates from the IEC 61779 series in several respects, was published during 2001 by SC65A and its Edition 1.1 has recently been completed.

- 1.14 IEC 62013-1 and -2: Edition 2.0 Caplights These documents have been circulated as FDIS with closing date for voting 30 September 2005. Both were approved.

Local SABS 1438 Parts 1 to 5 differ from the IEC standards; for example, the battery is not fully intrinsically safe. On the other hand, better mechanical protection is required.

These standards are currently being revised by a TC65 working group. It will differ from the IEC standards.

- 1.15 IEC 62086-1: Electrical resistance heating in potentially explosive atmospheres, Part 1: General requirements Ed 2 CDV has been circulated, closing date for comments 16 December 2005. The main features are:

- ◆ The trace heater must comply with one of the standardized Ex techniques
- ◆ Circuit protection, including an isolation device, earth fault protection, over-current protection
- ◆ Temperature limitation by means of a temperature control/protection device or a stabilised design

IEC 62086-2: Application guide for design, installation and maintenance Ed 2 CDV has been circulated, closing date for comments 16 December 2005.

- 1.16 IEC 60079-28 Ed. 1.0: Electrical apparatus for explosive gas atmospheres Part 28: Protection of equipment and transmission systems using optical radiation has been circulated as a CDV with closing date for voting August 2005.

1.17 General

1.17.1 The subject of developing explosion protection standards for non-electrical equipment is currently being addressed by IEC TC 31. An informative document was circulated in September 2005 of which a summary is given below:

a) Explosion protection standards for non-electrical equipment

Below an overview is given of the new work proposal, (ISO/TS/P 200), which has been submitted by DIN Germany. It proposes the formation a new ISO TC on "Potentially explosive atmospheres – Explosion prevention and protection". The following is the list of standards that it proposes should be developed and the suggested time to completion of task:

- 1) Potentially explosive atmospheres – Application of quality systems (Joint work with IEC/TC 31; Urgent need for certification purposes) (3 years)
- 2) Non-electrical equipment for use in potentially explosive atmospheres – Protection by flameproof enclosure (Joint work with IEC/TC 31) (3 years)
- 3) Non-electrical equipment for use in potentially explosive atmospheres – Protection by pressurization (Joint work with IEC/TC 31) (3 years)
- 4) Potentially explosive atmospheres – Terms and definitions for equipment and protective systems intended for use in potentially explosive atmospheres (3 years)
- 5) Design of fans working in potentially explosive atmospheres (4 years)

b) Motivation

Recently the title and scope of TC 31 was changed to remove the reference to electrical. This was done to recognise the fact that TC 31 has been producing standards that are not just related to electrical apparatus for most of its nearly 60 years as an IEC committee. However, it was also to open up the possibility of developing other standards in the field that were not electrical related.

TC 31 has already learnt about the pitfalls of separate development. Historically although the

'gas standards' were well established, the dust standards were developed separately. This led to application difficulties where many of the standards were a duplication of the same protection concept with different requirements. This is now being addressed with the combining of the same protection concept requirements within one series of standards. It would be a retrograde step to make the same mistakes for non-electrical standards, with the problem exacerbated by the use of different standards development bodies.

Standards only applicable to completely non-electrical protection concepts could be developed as additions to the IEC 60079 series as they have been for "dust" and refer to the existing standards on general protection concepts, classification/installation, gas/vapour/ignition tests/data and detection equipment where applicable.

The proposal also makes reference to the urgent need for a quality systems standard. However, the IECEx scheme already has such a document (OD 005) based on the proposed EN 13980. Although not seen as urgent, it would be feasible in the future for TC 31, in conjunction with ISO, to develop this as a published standard.

Further to the above, the setting up of a complimentary ISO TC would dilute scarce resources as most of the TC 31 experts would have to spread their time with work in the new ISO TC. Finally, in most (if not all) countries the regulators of such equipment are not divided into those interested in electrical hazards and those interested in non-electrical hazards.

In summary there appears to be no logical reason for creating an artificial division between electrical and non-electrical standards from the perspective of development, the users or the regulators.

c) Suggested action

If TC 31 members agree with the above analysis, they are encouraged to talk to their ISO counterparts in their country to vote against the new proposal in ISO with a view to having the work done through IEC TC 31, but with liaisons with appropriate ISO committees.

1.17.2 TC31 Maintenance Team, MT60079-29 is to draft IEC 60079-29-3: Edition 1: EXPLOSIVE ATMOSPHERES, Part 29-3: Electrical equipment for the detection and measurement of flammable gases – General Requirements on the functional safety of fixed gas detection systems.

Initial text has been circulated that is based on the European Standard EN 50402:2005 and a CD or a CDV will be prepared following this comment period.

National Committees are asked to respond to this document by submitting comments. Comments/ proposals to be returned by 17 March 2006.

1.17.3 TC31 Good Working Practice details agreed committee working practices for the organisation, communication and the drafting of standards in TC31 and its subcommittees.

- The document is intended to promote a common approach:
 - To the drafting of standards,
 - To the working practices, organisation and communication of Chairman, Secretaries and Convenors of Working Groups (WG) and Maintenance Teams (MT).
- The document is intended to be an authoritative document, except where clearly shown as informative.
- The next version will be Edition 1 and will become an authoritative document for

procedures to be followed within TC 31. Subsequent Editions will be dependent on comments received and requirements identified.
Comments/ proposals to be returned by 10 March 2006.

1.17.4 At the TC31 2005 Plenary Meeting it was agreed to change the generic title of the 60079 series from “Electrical apparatus for explosive gas atmospheres” to “Explosive atmospheres”.

It was further agreed that the titles of the Parts of the IEC 60079 series “Explosive atmospheres” will for the next editions of the Parts, be drafted by the Editing Committee. This is required because gas/vapour and dust requirements will be included into single standards forming part of the IEC 60079-0 series, meaning that most of the IEC 61241 series standards will fall away. **The proposed new numbers and titles are listed in Annex 2.**

1.17.5 A TC 31 meeting is to be held in Rio de Janeiro on Thursday 19th and Friday 20th October 2006.

2. SC 31G: Intrinsically safe apparatus

<u>Standards issued</u>	IEC 60079-11 Ed 4.0
	IEC 60079-25: Ed 1.0
	IEC 60079-27 Ed. 1.0: Electrical apparatus for explosive gas atmospheres - Part 27: FISCO

2.1 IEC 60079-11 Ed 5.0 Electrical apparatus for explosive gas atmospheres - Part 11: Intrinsic safety "i" CDV has been approved as a standard (parallel voting with CENELEC) on 14 July 2006.

The significant changes with respect to the previous edition are listed below:

- introduction of level of protection 'ic' (this level of protection has been introduced to allow removal of 'energy limitation' concept from IEC 60079-15).
- introduction of Annex F that allows reduction in segregation distance requirements when the pollution degree has been reduced by installation or enclosure.
- introduction of alternative spark test apparatus construction when used with high current circuits.
- introduction of Annex E that provides a method for transient energy test.
- changes in the table of 'Temperature Classification of Tracks on PCB's' to allow correlation with IPC2152.
- allowing alternative methods of rating resistors when used to limit the discharge from capacitance.
- introduction of methods to deal with the spark ignition energy consideration when high current low voltage cells and batteries are used.
- introduction of tests to measure the maximum pressure in sealed batteries.
- introduction of methods to deal with fault application on voltage enhancement ICs.
- introduction of infallible connection methods for SMD's (Surface Mount Devices).
- introduction of alternative methods to deal with the spark ignition energy in circuits with both inductance and capacitance.
- introduction of alternative high voltage test requirements for transformers.
- introduction of methods to assess the reduction of effective capacitance when protected by series resistances.

- 2.2 IEC 60079-25 Ed. 2.0: Explosive atmospheres - Part 25: Intrinsically safe systems CD has been circulated with closing date for comments July 2006.

3. SC 31H: Apparatus for use in combustible dusts

<u>Standards issued</u>	IEC 61241-0 Ed 1.0
	IEC 61241-0 Ed 1.0
	IEC 61241-1-1 Edition 2.0
	IEC 61241-1-2 Edition 2.0
	IEC 61241-2-1 Edition 1.0
	IEC 61241-2-2 Edition 1.0
	IEC 61241-2-3 Edition 1.0
	IEC 61241-3 Edition 1.0
	IEC 61241-4 Edition 1.0
	IEC 61241-10 Ed 1.0
	IEC 61241-11 Ed 1.0
	IEC 61241-14 Ed 1.0
	IEC 61241-17 Ed 1.0
	IEC 61241-18 Ed 1.0

The following renumbering of dust standards have been proposed by WG3 of SC31H:

Number of Current Standard	Proposed New Number	Subject	Anticipated Date of Change
IEC 61241-1-1	IEC 61241-0	General Requirements	2003
	IEC 61241-1	Protection by enclosure	2003
IEC 61241-1-2	IEC 61241-14	Selection & Installation	2003
IEC 61241-2-1	IEC 61241-20-1	Test Methods	2005
IEC 61241-2-2	IEC 61241-20-2	Test Methods	2005
IEC 61241-2-3	IEC 61241-20-3	Test Methods	2005
IEC 61241-3	IEC 61241-10	Classification	2003
IEC 61241-4	IEC 61241-2	Protection by pressurization	2005
	IEC 61241-11	Protection by intrinsic safety	2002
	IEC 61241-18	Protection by encapsulation	2004
	IEC 61241-17	Inspection & Maintenance	?
	IEC 61241-19	Repair & Overhaul	?

- 3.1 IEC 61241-11 Ed. 1.0 Electrical apparatus for use in the presence of combustible dust - Part 11: Protection by intrinsic safety "iD" FDIS has been circulated, closing date for comments 9 September 2005.

The following principles are to be followed:

- ◆ The electronic circuits must fulfill Group IIB requirements according to 60079-11 to avoid spark ignition.
- ◆ IP 6x or encapsulation is normally required to ensure that creepage and clearance distances are not compromised by dusts. Therefore the importance and the durability of the integrity of the enclosure or encapsulation are much higher than required by IEC 60079-11.
- ◆ Power limitation for apparatus or parts of apparatus not protected by an enclosure or encapsulation (eg uninsulated sensor) to avoid ignition of a dust layer by power dissipation directly into the dust (power matching by conductive dusts) and to avoid thermal ignition at the surface of components.
- ◆ Limitation of the temperature of all exposed surfaces of all apparatus or parts of apparatus exceeding the power limitation limits in accordance to 61241-0. The surface can be the surface of the enclosure or of the encapsulation.

3.2 [IEC 60079-31 Ed. 1.0: Explosive atmospheres - Part 31: Equipment - Protection by enclosure "tD"](#) Circulated as a CD in June with closing date for comments September 2006.

This first edition of IEC 60079-31 has been developed from the first edition of IEC 61241-1 and supersedes IEC 61241-1.

The significant changes with respect to the previous edition are listed below:

- Combination and rationalisation of practice A and B into a single practice.
- Introduction of three levels of protection, "taD", "tbD" and "tcD"
- Defined test voltage ranges and overload conditions for thermal tests.

4. SC 31J: Area classification and installation of electrical apparatus

<u>Standards issued</u>	IEC 60079-10 Edition 4.0
	IEC 60079-14 Edition 3.0
	IEC 60079-17 Edition 3.0
	IEC 60079-19 Edition 1.0

4.1 [IEC 60079-10-1 Ed. 1.0: Explosive atmospheres – Explosive atmospheres - Part 10-: Classification of areas - Explosive gas atmospheres](#) A CDV has been circulated in July, closing date for comments December 2006.

This project will replace IEC 60079-10 Ed. 4.0. The title has been changed to reflect the decision taken at the TC 31 Plenary Meeting 2005 and TC 31 CAG Meeting 2006 to change the titles of the 60079 series for future publications.

The significant technical changes with respect to the previous edition are as follows:

- Introduction of mists in the area classification in general and consequently, introduction of Annex D (Mist Flow Chart) which deals with criteria for classification of the areas where liquids are handled that may form flammable mists.
- Introduction of Clause A.3 (Release rate) which gives thermodynamic equations for release rate with a number of examples for estimating release rate of fluids and gases.

4.2 [IEC 60079-14 Ed. 4.0: Explosive atmospheres - Part 14: Electrical Installations](#)

design, selection and erection A CDV has been circulated in June with closing date for voting December 2006.

The title has been changed to reflect the decision taken at the TC 31 Plenary Meeting 2005 and TC 31 CAG Meeting 2006 to change the titles of the 60079 series for future publications.

The significant technical changes with respect to the previous edition are as follows:

- Knowledge, skills and competencies of "Responsible Persons" and "Operatives" are explained in Annex F.
- Equipment Protection Levels (EPLs) have been introduced and are explained in the new informative Annex H.
- Annex G with examples of marking on the equipment has been added.

NOTE – In essence, EPLs normally correlate with the zones as follows:

Zone	Equipment Protection Level (EPL) required
0	Ga
1	Gb
2	Gc
20	Da
21	Db
22	Dc

except on the odd occasion when the consequence of an explosion would be considerably more or less severe than normal and a higher or lower EPL therefore may apply.

- 4.3 IEC 60079-17 Ed. 4.0: Explosive atmospheres - Part 17: Electrical installations inspection and maintenance To be circulated as a CDV by August 2006.

5. TC 70: Degrees of protection by enclosures

Standards issued IEC 60529 Edition 2.0
IEC 61032 Edition 2.0
IEC 62262, Edition 1.0

6. General news

Refer section 1.15.

Abbreviations

NP New Work Item Proposal
CD Committee Draft

CDV Committee Draft for Voting
FDIS Final Draft International Standard

XPL/JGA/IECSTD OVERV-Aug06

Annex 1**Access to IEC TC information****JG Auret, Expolabs
1 September 2004****DASHBOARD:**<http://iectest.iec.ch/tctools/dashbd-e.htm>**COMMITTEE OR SUBCOMMITTEE:**

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circulated in the last 12 months

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Annex 2

Annex 2006-06-06			
New Publication number	Proposed New Title	Old number	Existing Titles
	60079 – Explosive atmospheres		60079 – Electrical apparatus for explosive gas atmospheres --- 61241 – Electrical apparatus for use in the presence of combustible dust --- 61179 – Electrical apparatus for the detection and measurement of flammable gases
60079-0	Part 0: Equipment general requirements (includes existing 61241-0)	60079-0 Ed 4	Part 0: General requirements
60079-1	Part 1: Equipment protection by flameproof enclosure "d"	60079-1 Ed 5.0	Part 1: Flameproof enclosures "d"
		60079-1-1 Ed 1.0	Part 1-1: Flameproof enclosures "d" - Method of test for ascertainment of maximum experimental safe gap
60079-2	Part 2: Equipment protection by pressurized enclosure "p" (including Gas & Dust or Parts 2-1 & 2-2)	60079-2 Ed 4	Part 2: Pressurized enclosures "p"
		60079-3	Part3: Spark test for intrinsically-safe circuits
		60079-4 Ed 2.1	Part 4: Method of test for ignition temperature
		60079-4A Ed 2	Part 4A: Method of test for ignition temperature- First supplement. *Note.-This supplement applies also to the second edition of 1975
60079-5	Part 5: Equipment protection by powder filling "q"	60079-5 Ed 2	Part 5: Powder filling "q"
60079-6	Part 6: Equipment protection by oil-immersion "o"	60079-6 Ed 2	Part 6: Oil-immersion 'o'
60079-7	Part 7: Equipment protection by increased safety "e"	60079-7 Ed 3	Part 7: Increased safety "e"

		60079-9	Marking
60079-10-1	Part 10-1: Classification of areas - Explosive gas atmospheres	60079-10 Ed 4	Part 10: Classification of hazardous areas
60079-10-2	Part 10-2: Classification of areas - Combustible dust atmospheres	61241-10 Ed 1	Part 10: Classification of areas where combustible dusts are or may be present
60079-11	Part 11: Equipment protection by intrinsic safety "i" (will eventually incorporate 61241-11)	60079-11 Ed 4	Part 11: Intrinsic safety "i"
		60079-12 TR Ed 4	Part 12: Classification of mixtures of gases or vapours with air according to their maximum experimental safe gaps and minimum igniting currents
60079-13	Part 13: Construction and use of rooms or buildings protected by pressurization / Artificial ventilation (includes existing 16)	60079-13 TR Ed 1	Part 13: Construction and use of rooms or buildings protected by pressurization
60079-14	Part 14: Electrical installations design, selection and erection (to eventually include 61241-14)	60079-14 Ed 3	Part 14: Electrical installations in hazardous areas (other than mines)
60079-15	Part 15: Equipment protection by type of protection "n"	60079-15 Ed 2	Part 15: Type of protection "n"
		60079-16 TR Ed 1	Part 16: Artificial ventilation for the protection of analyser(s) houses
60079-17	Part 17: Electrical installations inspection and maintenance (includes draft 61241-17)	60079-17 Ed 3	Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)
60079-18	Part 18: Equipment protection by encapsulation "m" (includes existing 61241-18)	60079-18 Ed 2	Part 18: Encapsulation 'm'

60079-19	Part 19: Equipment repair, overhaul and reclamation	60079-19 Ed 1	Part 19: Repair and overhaul for apparatus used in explosive atmospheres (other than mines or explosives)
		60079-20 TR3 Ed 1	Part 20: Data for flammable gases and vapours, relating to the use of electrical apparatus
60079-20 -1	Part 20-1: Test methods and data- Classification of mixtures of gases or vapours with air (includes existing 1-1, 4, 4A , 12 & 20)		
60079-20 -2	Part 20-2: Test methods and data – Classification of combustible dust materials (includes existing 61241-20-1, 2 and 3)		
		60079-21	Probably were the numbers allocated to the trace heating and caplights documents originally
		60079-22	as above
		60079-23	as above
		60079-24	as above
60079-25	Part 25: Intrinsically safe systems	60079-25 Ed 1	Part 25: Intrinsically safe systems
60079-26	Part 26: Equipment with Equipment Protection Level (EPL) Ga	60079-26 Ed 1	Part 26: Construction, test and marking of Group II zone O electrical apparatus
60079-27	Part 27: Fieldbus intrinsically safe concept (FISCO)	60079-27 Ed 1.0	Part 27: Fieldbus intrinsically safe concept (FISCO) and fieldbus non-incendive concept (FNICO)
60079-28	Part 28: Protection of equipment and transmission systems using optical radiation.		none
60079-29-1	Part 29-1: Gas Detectors – Performance requirements (includes 61779-1,2,3,4 and 5)	61779-1 Ed 1	Part 1: General requirements and test methods
		61779-2 Ed 1	Part 2: Performance requirements for group I apparatus indicating a volume fraction up to 5 % methane in air
		61779-3 Ed 1	Part 3: Performance requirements for group I apparatus indicating a volume fraction up to 100 % methane in air
		61779-4 Ed 1	Part 4: Performance requirements for group II apparatus indicating up to 100% lower explosive limit
		61779-5 Ed 1	Part 5: Performance requirements for group II apparatus indicating a volume fraction up to 100 % gas
60079-29-2	Part 29-2: Gas Detectors – Guide for selection, installation, use and maintenance	61779-6 Ed 1	Part 6: Guide for the selection, installation, use and maintenance of apparatus for the detection and measurement of flammable gases
60079-29-3	Part 29-3: Gas Detectors – Requirements on the functional safety of fixed gas detection systems.		
		61241-0 Ed 1	Part 0: General requirements
		61241-1-1 Ed 2	Part 1-1: Electrical apparatus protected by enclosures and surface temperature limitation - Specification for apparatus
		61241-1-2 Ed 2	Part 1-2: Electrical apparatus protected by enclosures and surface temperature limitation - Selection, installation and maintenance
		61241-3	Part 3: Classification of areas where combustible dust are or may be present
		61241-4 Ed 1	Part 4: Type of protection "pD"
		61241-11 Ed 1	Electrical apparatus for use in the presence of combustible dust - Part 11: Protection by intrinsic safety "ID"
		61241-14 Ed 1	Part 14: Selection and installation
		61241-17 Ed 1	Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)
		61241-18 Ed 1	Part 18: Protection by encapsulation "mD"
60079-30-1	Part 30-1: Electrical resistance trace heating - General and testing requirements	62086-1 Ed 1	Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating - Part 1: General and testing requirements
60079-30-2	Part 30-2: Electrical resistance trace heating - Application guide for design, installation and maintenance	62086-2 Ed 1	Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating - Part 2 Application guide for design, installation and maintenance
60079-31	Equipment protection by enclosure "ID"	61241-1 Ed 1	Part 1: Protection by enclosures "ID"
60079-XX	Equipment process sealing		
60079-XX-1	Part XX-1: Caplights for use in mines susceptible to firedamp - General requirements of Construction and testing	62013-1 Ed 1	Caplights for use in mines susceptible to firedamp - Part 1: General requirements - Construction and testing in relation to the risk of explosion
60079-XX-2	Part XX-2: Caplights for use in mines susceptible to firedamp - Performance and other safety-related matters	62013-2 Ed 1	Caplights for use in mines susceptible to firedamp - Part 2: Performance and other safety-related matters
60050-426	IEV - Equipment for explosive atmospheres (TC 1)	60050-426	IEV - Electrical apparatus for explosive gas atmospheres (TC 1)