Putting IECEx and ATEX together

For the World

Aim: One single certificate for any hazardous area product recognised and accepted throughout the world.

Already accepted in many countries. Alternatively a single test report (ExTR) can be sent to any member certification body (ExCB) to issue locally accepted certification.

Currently only electrical equipment to IEC Standards (but IEC Standards for non-electrical equipment are being developed).

ExCB issues an ExTR (covering the product type) and a quality assessment report (QAR) (covering the related production facility)

Certificates of conformity created directly on the IECEx website, fully visible for the whole world to read and check status.

ExCB maintains the status of certificate based on the outcome of further QARs, a minimum of 2 audit visits in a 3 year period.

IECEx
Product Certification

Technically identical standards for electrical equipment since 2006.

For single standards, a single set of tests and assessments can support both IECEx and ATEX.

An ATEX EC-Type Examination Certificate can be based on an IECEx ExTR but ATEX documentation does not necessarily support an IECEx certificate.

The technical requirements of a manufacturer's QA system are effectively the same, both are based on EN13980 (ISO/IEC 60079-34 from 2011) and an IECEx QAR can support the issue of an ATEX QAN.

ATEX
Conformity Assessment

For Europe

A common approach to lifting barriers to trade within the European Economic Area (EEA).

The Directive becomes law on implementation in each member country and compliance is mandatory within the EEA.

Applicable to non-electrical equipment and protective systems as well as electrical equipment.

Certification from a Notified Body is Mandatory for cat. 1 and M1 equipment, protective systems and cat. 2 and M2 electrical equipment. Otherwise self-declaration of compliance is permitted.

An EC-Type Examination Certificate and Quality Assessment Notification (QAN) are issued by a Notified Body.

The manufacturer - alone - is responsible for the Declaration of Conformity which must accompany every product which bears the European CE Marking.

Electrical Protection Concepts

Standard IEC/EN		Code		Protection Concept	Zone	
Gas	Dust	Gas	Dust		Gas	Dust
60079-0*				General Requirements		
60079-1		Ex d		Flameproof	1	
	60079-31		Ex ta Ex tb Ex tc	Enclosure		20 21 22
60079-2**	61241-4	Ex pxb Ex pyb Ex pzc	Ex pD	Pressurised	1 1 2	21/22
60079-5		Ex q		Powder Filled	1	
60079-6		Ex o		Oil Filled	1	
60079-7		Ex e		Increased Safety	1	
60079-11	61241-11	Ex ia Ex ib Ex ic	Ex ia Ex ib Ex ic	Intrinsic Safety	0 1 2	20 21 22
60079-15		Ex nA Ex nR Ex nC		Non-sparking Restricted breathing Enclosed break	2	
60079-18*		Ex ma Ex mb Ex mc	Ex ma Ex mb Ex mc	Encapsulation	0 1 2	20 21 22

**Recently published standard combining gas and dust requirements for the first time.*
***Soon to be published with combined gas and dust requirements.*

Ingress Protection (IP)

Hazardous area equipment typically requires a minimum IP rating of IP54 but may be assessed and tested to the higher ratings below:

DUST
IP 5x - Dust protected
IP 6x - Dust tight
WATER
Protected against:
IP x4 - splashing water
IP x5 - water jets
IP x6 - powered water jets
IP x7 - temporary immersion
IP x8 - continuous immersion

See IEC/EN 60529 for full definition of IP ratings

Mechanical Protection Concepts

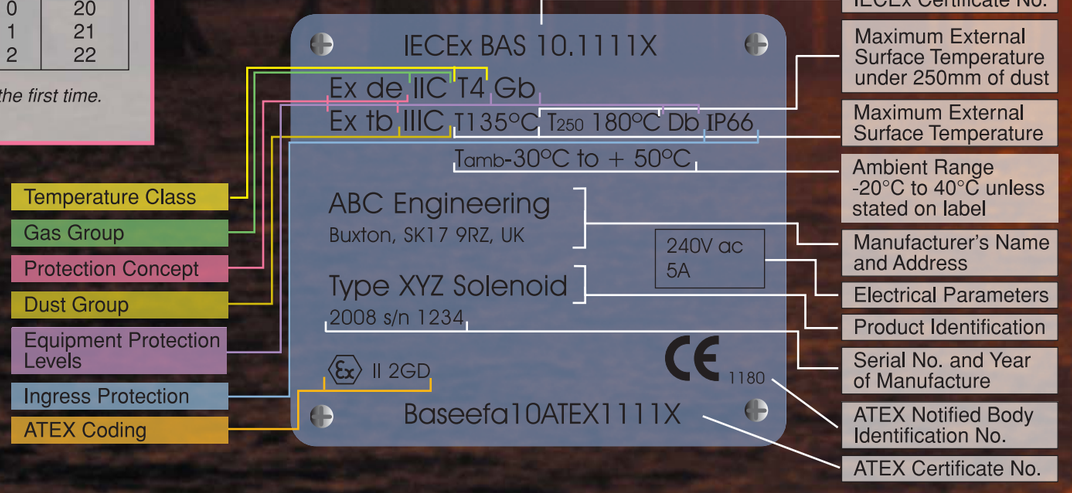
Standards	Code	Concept	Zone
EN13463-1		general requirements	
EN13463-2	fr	flow restriction	2 22
EN13463-3	d	flameproof	1 21
EN13463-5	c	constructional safety	1 21
EN13463-6	b	control of ignition sources	1 21
EN13463-8	k	liquid immersion	1 21

Mechanical certification is based on a risk assessment approach.

Category 3 equipment must be safe for use in normal operation.
Category 2 equipment must be safe for use in normal operation and expected malfunction
Category 1 equipment must be safe for use in normal operation, expected and rare malfunction.

Potential ignition sources identified in the risk assessment are made safe by applying one or more of the concepts. The number of '*' in the table below indicate the number of protection concepts which need to be applied.

	cat 3	cat 2	cat1
normal operation	*	*	**
expected malfunction		*	**
rare malfunction			*



Equipment Protection Level

Equipment protection level	Zone
Ga	0
Gb	1
Gc	2
Da	20
Db	21
Dc	22
Ma	energised*
Mb	De-energised*

G=gas, D=dust, M=mining
**in presence of explosive atmosphere*

Temperature Class

T Class	Maximum Surface Temperature
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C

Gas Groups

Gas Group	Representative Test Gas
I	Methane (mining only)
IIA	Propane
IIB	Ethylene
IIC	Hydrogen

Gases are classified according to the ignitability of gas-air mixture.
Refer to IEC/EN 60079-20-1 for classification of common gases and vapours.

Dust Groups

Dust Group	
IIIA	Combustible flyings
IIIB	Non-conductive dust
IIIC	Conductive dust

IEC 61508 - Safety Systems

IEC/EN 61508 is the international standard for electrical, electronic and programmable electronic safety related systems. It sets out the requirements for ensuring that systems are designed, implemented, operated and maintained to provide the required safety integrity level (SIL). Four SILs are defined according to the risks involved in the system application, with SIL4 being used to protect against the highest risks.

IEC 61508 is the base standard for EN 50495 Safety Devices for ATEX.

The standard is in seven parts:

IEC 61508-1, General requirements
IEC 61508-2, Requirements for E/E/PE safety-related systems
IEC 61508-3, Software requirements
IEC 61508-4, Definitions and abbreviations
IEC 61508-5, Examples and methods for the determination of safety integrity levels
IEC 61508-6, Guidelines on the application of IEC 61508-2 and IEC 61508-3
IEC 61508-7, Overview of techniques and measures

ATEX Coding

EU Explosive atmosphere symbol

II 2 GD

Equipment group
I - mining
II - non-mining

Equipment category
M1 - energised
M2 - de-energised (*)
1 - very high protection
2 - high protection
3 - normal protection

	Gas	Dust
1 - very high protection	0	20
2 - high protection	1	21
3 - normal protection	2	22

(*) = in presence of explosive atmosphere

Baseefa Services

ATEX & IECEx certification
IECEx Certificate of Personnel Competency
IEC 61508 certification
Quality system approval
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IECEx Service Facility Certification
Technical file storage
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Assistance with DSEAR (ATEX User Directive) Implementation

www.baseefa.com

SGS Baseefa Limited,
Rockhead Business Park,
Staden Lane,
Buxton, SK17 9RZ
tel. +44 (0)1298 766600
fax. +44 (0)1298 766601
e-mail info@baseefa.com

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