APPARATUS GROUPS & TEMPERATURE CLASSES FOR COMMON FLAMMABLE MATERIALS

Gas/Vapour	Apparatus group	Temperature class
Acetic acid	IIA	T1
Acetone	IIA	T1
Acetylene	IIC	T2
Ammonia	IIA	T1
Butane	IIA	T2
Cyclohexane	IIA	T3
Di-ethyl ether	IIB	T4
Ethanol (ethyl alcohol)	IIA	T2
Ethylene	IIB	T2
Hydrogen	IIC	T1
Kerosene	IIA	T3
Methane (natural gas) (non-mining)	IIA	T1
Methanol (methyl alcohol)	IIA	T2
Methyl ethyl ketone (MEK)	IIB	T2
Propane	IIA	T1
Propan-1-ol (n-propyl alcohol)	IIB	T2
Propan-2-ol (iso-propyl alcohol)	IIA	T2
Toluene	IIA	T1
Xylene	IIA	T1

Dusts	Typical Ignition Temperature (˚C)	
	Cloud	Layer
Aluminium	590	>450
Coal dust (lignite)	380	225
Flour	490	340
Grain dust	510	300
Methyl cellulose	420	320
Phenolic resin	530	>450
Polythene	420	(melts)
PVC	700	>450
Soot	810	570
Starch	460	435
Sugar	490	460

TEMPERATURE CLASS (GROUP II)

Maximum surface temperature	T. Codes CENELEC IEC
450˚C	T1
300˚C	T2
200˚C	T3
135˚C	T4
100˚C	T5
85˚C	T6

N.B. For Group I applications apparatus has rigid 150˚C and 450˚C limits rather than 'T' classes.

SIRA ATEX CERTIFICATE NUMBER

SIRA 07 ATEX 1234

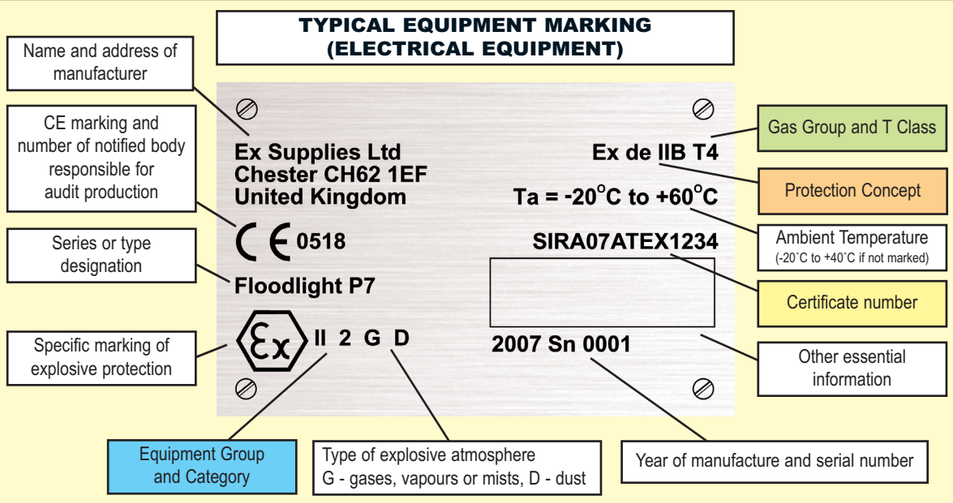
- Serial number
- Reference to ATEX 95 directive
- Year of certification
- Name of notified body performing EC-type examination

Suffixes:

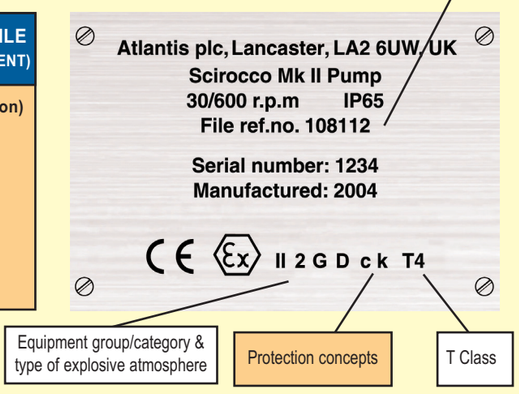
U – component certification

X – special conditions for safe use apply

TYPICAL EQUIPMENT MARKING (ELECTRICAL EQUIPMENT)



TYPICAL EQUIPMENT MARKING (NON-ELECTRICAL EQUIPMENT)



CONTENTS OF AN ATEX TECHNICAL FILE (FOR CATEGORY 2/3 NON-ELECTRICAL EQUIPMENT)

Ref: Annex VIII (Internal Control of Production)

- General description of product
- Design/manufacturing drawings
- List of standards applied
- Applicable test reports
- Ignition hazard assessment

ATEX 95
Directive 94/9/EC

ATEX 137
99/92/EC & DSEAR

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sira CERTIFICATION

PROTECTION CONCEPTS

Electrical	Symbol	Typical Zone(s)	IEC/EN Standard (status at May 2007)	Basic concept of protection
Increased safety	e	1,2	EN IEC 60079-7	No arcs, sparks or hot surfaces
Type 'n' (Non-sparking)	nA	2	EN IEC 60079-15	
Flameproof	d	1,2	EN IEC 60079-1	Contain the explosion, quench the flame
Type 'n' (Enclosed break)	nC	2	EN IEC 60079-15	
Quartz/sand filled	q	1,2	EN IEC 60079-5	
Intrinsic safety	ia	0,1,2	EN IEC 60079-11	Limit the energy of sparks and surface temperatures
Intrinsic safety	ib	1,2	EN IEC 60079-11	
Intrinsic safety	ic	2	EN IEC 60079-11	
Type 'n' (Energy limitation)	nL	2	EN IEC 60079-15	
Pressurised	p	1,2	EN IEC 60079-2	Keep the flammable gas out
Type 'n' (Restricted breathing)	nR	2	EN IEC 60079-15	
Type 'n' (Simple pressurised)	nZ	2	EN IEC 60079-15	
Encapsulation	ma	0,1,2	EN IEC 60079-18	
Encapsulation	mb	1,2	EN IEC 60079-18	
Oil immersion	o	1,2	EN IEC 60079-6	

Non-electrical	Symbol	Typical Zone(s)	EN Standard (status at May 2007)	Basic concept of protection
Flow restricted enclosure	fr	2,22	EN 13463-2	Relies on tight seals, closely matched joints and tough enclosures to restrict the breathing of the enclosure
Flameproof enclosure	d	1,2,21,22	EN 13463-3	
Inherent safety	g	0,1,2,20,21,22	prEN 13463-4	Low potential energy (draft standard)
Constructional safety	c	0,1,2,20,21,22	EN 13463-5	Ignition hazards eliminated by good engineering methods
Control of ignition sources	b	0,1,2,20,21,22	EN 13463-6	Control equipment fitted to detect malfunctions
Pressurisation	p	1,2,21,22	EN 13463-7	Enclosure is purged and pressurised to prevent ignition sources from arising
Liquid immersion	k	0,1,2,20,21,22	EN 13463-8	Enclosure uses liquid to prevent contact with explosive atmospheres

Dust Protection	Symbol	Typical Zone(s)	IEC Standard (status at May 2007)	Basic concept of protection
Enclosure	tD	20,21,22	EN IEC 61241-1	Standard protection for dusts, rugged tight enclosure
Intrinsic safety	iaD	20,21,22	EN IEC 61241-11	Similar to tD, but with some relaxations if circuit inside is intrinsically safe
Intrinsic safety	ibD	21,22		
Pressurised	pD	21,22	EN IEC 61241-2	Protection by pressurisation of enclosure
Encapsulation	maD	20,21,22	EN IEC 61241-18	Protection by encapsulation of incendive parts
Encapsulation	mbD	21,22		

IEC 61508 FUNCTIONAL SAFETY

IEC 61508 covers functional safety of electrical, electronic and programmable electronic safety systems whose failure can impact on the safety of persons and/or the environment.

cass

Sira offers a range of functional safety services which include:

- Certifying the overall capability of a company (Functional Safety Capability Assessment)
- System certification to IEC 61511
- Product certification
- Safety-related software
- Training and consultancy in all areas of functional safety

Sira is accredited by UKAS for the certification aspects above, in accordance with the CASS Scheme

The 7 parts of the standard:

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	Methods for the determination of safety integrity levels
IEC 61508-6	Guidelines on the application of parts 2 & 3
IEC 61508-7	Overview of techniques and measures

COMPLIANCE ROUTES AND EQUIPMENT SELECTION

Zone Gas	Zone Dust	Equipment Category	Relevant ATEX Annexes for Compliance	Group	Hazardous Area Characteristics
0	20	1	III and IV or V	II	Explosive atmosphere present continuously or long periods or frequently (>1000 hours/year)
1	21	2*	III and VII or VI		Explosive atmosphere is likely to occur in normal operation occasionally (>10 <1000 hours/year)
1	21	2**	VIII#		
2	22	3	VIII		Explosive atmosphere is not likely to occur in normal operation or infrequently and for short periods (<10 hours/year)
Mining		M1	III and IV or V	I	If explosive atmosphere present, equipment remains energised
		M2*	III and VII or VI		If explosive atmosphere present, equipment de-energised
		M2**	VIII#		If explosive atmosphere present, equipment de-energised
Any		Any	IX≠	Any	–

* Electrical equipment and internal combustion engines only

** Non-electrical equipment only

and communicate the technical file to a notified body

≠ Alternative route for any product

HAZARDOUS AREA TRAINING

Sira offers a range of training courses designed to give you the knowledge you need to understand the requirements and responsibilities of working within hazardous areas.

Sira training courses are endorsed by the IET (Institution of Engineering and Technology) and offer up-to-the-minute information on legislation and compliance issues.

Sira Training Courses:

Hazardous Area

- ATEX & DSEAR Legislation
- IEC 61508 Functional Safety

Health & Safety

- Fire Safety & Risk Assessment

Competence

- Recommended Training Provider for the UKAS Accredited Competence Professional Scheme

Sira Training Facilities

- In-house training facility
- Off-site capability
- Bespoke courses for individual organisations
- Experienced compliance engineers as lecturers

sira CERTIFICATION SERVICE — CP COMPETENCE PROFESSIONAL

DSEAR & ATEX 137

On 1st July 2006 DSEAR entered into force in the UK, implementing ATEX 137 now mandatory in the European Union.

Responsibilities and Requirements of DSEAR & ATEX 137

- Risk assessments are in place and include fire and explosion risks
- Hazardous area classification report and drawings are up to date
- Instrument and electrical installations are inspected and maintained
- Non-electrical equipment risk assessments have been developed
- Permit to Work system is in place
- Portable ignition sources are controlled
- Static electricity is controlled
- Warning signs are adequate
- Information is provided to contractors
- Appropriate training is provided

Useful documentation	Abbreviated description
L138-HSE	- HSE Guidance on DSEAR implementation
EN 1127-1	- Explosion prevention & protection
EN IEC 60079-10	- Area Classification for gases, vapours and mists
IEC 61241-10	- Area Classification for dusts
EN IEC 60079-14	- Electrical installations in hazardous areas
EN IEC 60079-17	- Inspection and maintenance of electrical installations in hazardous areas
EN IEC 60079-19	- Repair and overhaul of apparatus
EN IEC 60079-20	- Data for flammable gases and vapours
IEC 61241-17	- Inspection for dusts
IGE/SR/25	- Hazardous area classification for natural gas

INGRESS PROTECTION (IP) CODE BS EN 60529 (IEC 60529)

FIRST NUMERAL	SECOND NUMERAL
Protection against solid objects	**Protection against water**
0 - No special protection	0 - No special protection
1 - Objects > 50 mm diameter (e.g. part of a hand)	1 - Vertically dripping water
2 - Objects > 12.5 mm diameter (e.g. finger)	2 - Vertically dripping water, when enclosure tilted by 15^0
3 - Objects > 2.5 mm diameter (e.g. tool)	3 - Sprayed water up to 60^0 from the vertical
4 - Objects > 1.00 mm diameter (e.g. wire)	4 - Sprayed water from all directions
5 - Dust protected	5 - Water jets
6 - Dust tight	6 - Powerful water jets
IP testing can also be carried out in accordance with DIN 40050	7 - Temporary submersion to a depth of 1m
	8 - Extended submersion to a depth > 1m

Sira performs a range of testing in its UKAS accredited test laboratory, including impact, humidity and pressure testing, as well as the full range of IP testing. Please contact Sira for more details.

UKAS TESTING 0327 — UKAS PRODUCT CERTIFICATION 011 — IET Endorsed Training Provider® — IECEx — IEC — apea working for a safer environment

Accredited certification and EU Notified Body activities are undertaken by Sira Certification Service