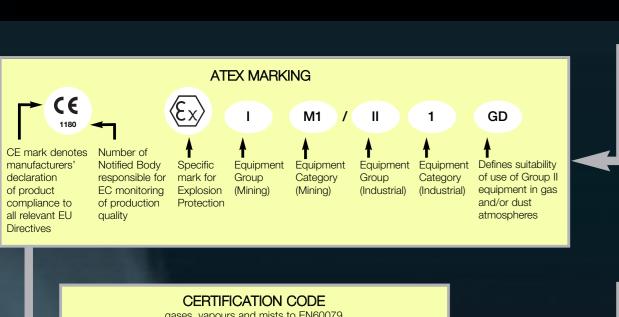


Wolf Safety Lamp Company

www.wolf-safety.co.uk





gases, vapours and mists to EN60079 $(Ta = 50^{\circ}C)$ Explosion Protection Temperature Ambient Concept Groups Temperature Note: 'Ex' and Protection Concepts are not marked if

EQUIPMENT GROUP & EQUIPMENT CATEGORY

a 'Technical File' from first principles is applied.

	Equipment	Equipment	Protection	Hazard		Use
	Group	Category	Level	Gas	Dust	
	Ι	M1	Very high protection	1	1	Operable in Ex atmosphere
Mining		M2	High protection	ı	-	De-energised in Ex atmosphere
Industrial		1	Very high protection	G		Zones 0,1,2,
					D	Zones 20,21,22
		2	High protection	G		Zones 1,2
					D	Zones 21,22
		3	Normal protection	G		Zones 2
					D	Zones 22
Equipment Group and Category identify the areas in which equipment may be safely used						

'CE' MARKING AND THE 94/9/EC ATEX DIRECTIVE ON EQUIPMENT AND PROTECTIVE SYSTEMS INTENDED FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES.

MANDATORY WITHIN THE EU.

'CE' marking has been introduced as part of the European Union's new approach to technical harmonisation as a means of identifying products that comply with all relevant Subject to certain safeguards, products bearing the 'CE' mark are permitted to be sold

throughout the EU without interference from national regulatory authorities. The Directives have been put in place in order to remove artificial trade barriers within the European Union previously caused by individual countries' national standards, a secondary function is as a means of regulating safety. The Explosive Atmospheres 94/9/EC ATEX (Equipment) Directive became mandatory on 1 July 2003. On this date the existing Explosive Atmospheres and Gassy Mines Directives were repealed. Since then only equipment and systems 'CE' marked as compliant with the ATEX Equipment Directive (and all other relevant mandatory directives) may placed on the market within the EU.

The Directive applies to all equipment and systems for use in potentially explosive atmospheres within the EU. The scope of the Directive includes electrical and mechanical equipment for use in Group I (mining) or Group II (industrial) applications, both on and offshore and considers risks of ignition of potentially explosive gas, vapour, mist and dust atmospheres. In addition, devices intended for use outside potentially explosive atmospheres that contribute to the safe functioning of equipment and systems with regard to explosion risk

Compliance of products to the ATEX Equipment Directive, through conformity assessment, takes a modular approach, and is generally in two stages; design and production. A common route to product design compliance is to apply to a Notified Body (Ex. Test House) for an EC Type Examination Certificate. To comply, the equipment or system must meet the Essential Health and Safety Requirements (EHSRs) listed in the Directive. Harmonised EU standards have been adopted by CENELEC and CEN, relating to the design, construction and testing of equipment; a product complying with these standards is deemed to meet the EHSRs to which the standards relate. Where apparatus follows a protection concept

design and construction of equipment for use in explosive atmospheres. The production quality stage of the conformity assessment procedures ensure continued product compliance in manufacturing. Typically a manufacturer should have a certified ISO 9000 quality management system and comply with one of the quality modules in the ATEX Equipment Directive, however this will vary depending on product equipment category; equipment used in higher risk areas will require more onerous conformity

not covered by these standards, compliance to the 94/9/EC Directive is still possible by compiling a 'Technical File' from first principles, demonstrating compliance through test and assessment to the EHSRs relating to

In addition to the 94/9/EC ATEX (Equipment) Directive, products for use in potentially explosive atmospheres may require to be compliant with other Directives including the 2004/108/EC Electro-Magnetic Compatibility (EMC) Directive. This Directive applies to virtually all electrical and electronic apparatus potentially able to generate interfering emissions or exhibit an undue sensitivity to interference sources

Once compliance with the relevant Directives is complete and an EC Declaration of Conformity issued by the manufacturer, the 'CE' mark may be applied and the product placed on the market. The ATEX Equipment Directive in full, and EC Commission guidance on the Directive, may be found on the following website: http://ec.europa.eu/enterprise/atex/direct/text94-9-en.pdf

99/92/EC ATEX (WORKPLACE) DIRECTIVE ON MINIMUM REQUIREMENTS FOR IMPROVING THE SAFETY AND HEALTH PROTECTION OF WORKERS POTENTIALLY AT RISK FROM EXPLOSIVE ATMOSPHERES. MANDATORY WITHIN THE EU.



The Directive covers both Group I and Group II activities, on shore and offshore within the EU, and aims to provide a better level of protection for the health and safety of workers in potentially explosive gas, vapour, mist and dust atmospheres It lists a set of obligations and safety measures for employers, requiring the adoption of a coherent risk assessment based strategy for the prevention of explosions. These obligations include:

• Generation of an explosion protection document, evaluating explosion risk, including: likelihood of the presence of the explosive atmosphere, the presence of ignition sources (including electrostatic discharge), identification of the substances and processes in use, definition of specific measures taken to safeguard the health and safety of workers.

- Equipment in service before 30 June 2003 may continue to be used after this date if it has been risk

- Equipment brought into service after 30 June 2003 must be CE marked as compliant with the

- Classification of areas into zones and marking points of entry with safety signs. Appropriate training and supervision for workers.
- Use of written instructions and permits to work Special requirements for work equipment:-
- 94/9/EC ATEX (Equipment) Directive. • Due consideration of explosion protection measures, encompassing issues such as:
- Use of protective measures appropriate to the greatest potential risk.

assessed and the explosion protection document indicates it can be safely used.

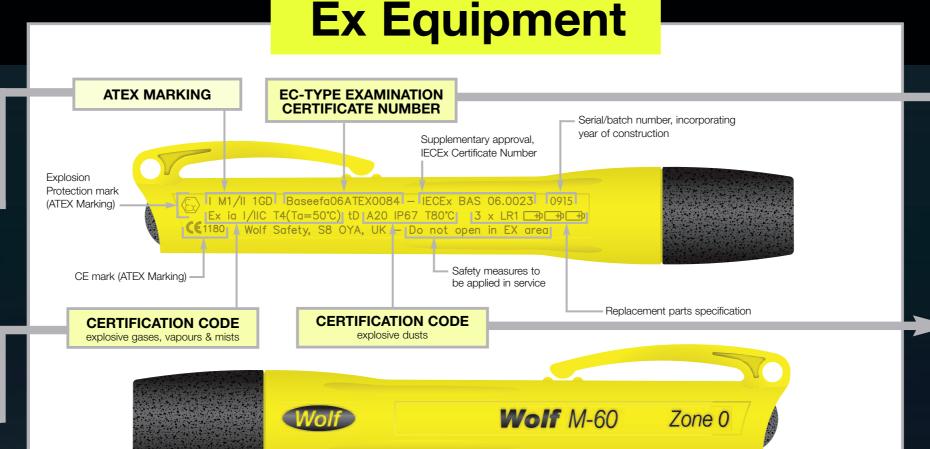
- Selection of appropriate equipment by referencing the explosion protection document.
- Minimising the risk of explosion and the effect of explosion in the workplace. - Provision of suitable warning and escape facilities.

99/92/EC is a separate directive specifically covering workers in explosive atmospheres, working within the more general 89/391/EEC Directive on the introduction of measures to encourage improvements in the safety and health of workers at work. The ATEX Workplace Directive in full may be found on the following website:

DSEAR – THE DANGEROUS SUBSTANCES AND EXPLOSIVE ATMOSPHERES REGULATIONS 2002.

In the UK the 99/92/EC ATEX Workplace Directive has been implemented as The Dangerous Substances and Explosive Atmospheres Regulation 2002 (DSEAR). These regulations also include the safety aspects of the 98/24/EC Chemical Agents Directive, resulting in flammable and dangerous substances being covered by a single set of regulations, thus reducing the volume of legislation covering this area. A copy of the DSEAR regulations is available at: http://www.hmso.gov.uk/si/si2002/20022776.htm

A guide to DSEAR, published by the Health and Safety Executive can be downloaded at:



GAS GROUP GROUP II GAS SUBDIVISION Maximum Safe Maximum Safe Gap Sparking Energy Intrinsic Safety Ex ia/ib Methane Ethylene Hydrogen/Acetylene All Gases Ex e, Ex m, Ex p Ex o, Ex q, Ex n Equipment sub-grouping segregates gases according to ease of ignitability by sparks or flames. These apply to flameproof Ex d and intrinsically safe Ex ia/ib equipment only.

TEMPERATURE CLASS

300°C -

200°C ---

135°C ---

100°C ---

Hot surfaces can ignite explosive atmospheres

Temperature class relates to the hot surface ignition temperature of a particular explosive

atmosphere. It must not be exceeded by the temperature classification of the equipment

PROTECTION CONCEPTS FOR ELECTRICAL APPARATUS

Concept	Symbol	Icon	Description	Category	EN Standard
General req.	-		General requirements	-	EN 60079-0
Flameproof	Ex d		ignition within the apparatus enclosure is contained and will not ignite surrounding explosive atmosphere	2	EN 60079-1
Pressurised	Ex p	4	explosive gas excluded by surrounding ignition source with pressurised inert gas	2	EN 60079-2
Powder filled	Ex q	10 mm	explosive gas excluded by immersing ignition source in sand	2	EN 60079-5
Oil immersion	Ex o		explosive gas excluded by immersing ignition source in oil	2	EN 60079-6
Increased safety	Ex e		design excludes the possibility of incendive arcs, sparks or hot surfaces	2	EN 60079-7
Intrinsic safety	Ex ia Ex ib Ex ic		energy in circuit and temperature on components reduced to a safe level	1 2 3	EN 60079-11
Non-incendive	Ex nA Ex nL Ex nR Ex nC		will not ignite explosive gas in normal operation, faults unlikely to occur	3	EN 60079-15
Encapsulation	Ex ma Ex mb Ex mc	4	flammable gas excluded by encapsulating the ignition source in resin	1 2 3	EN 60079-18

Protection	n concep	ot identifies	s the means by whic	h explosion protection is achiev	ved.	
e.		1	106	231	46	
Area Classification		n Zo	one Criteria	CI	LASS AZAR	
Gases	Dusts					
Zone 0	Zone 2	20 &	- A	ntinuously or for long periods per annum)	Ha	EN 600 azardou o zones guency
Zone 1	Zone 2	21 &		cur in normal operation occasio 1000hrs per annum)	onally oc	currence mospherale are to

(<10hrs per annum)

This diagram shows how hazardous area zones may occur in typical circumstances.

EXAMPLE OF HAZARDOUS AREA ZONES

FUEL STORAGE TANK

Wolflite Primary Cell Handlamp H-4DCA

II 2 GD EEx e ib IIC T4 IP66 T135°C

unlikely to occur in normal operation.

if it does will only be for short periods

DECANTING OF FLAMMABLE LIQUID

FROM CONTAINER TO CONTAINER

SIFICATION OF RDOUS AREAS ous areas are classified es on the basis of the by and duration of the nce of an explosive here. Durations on typical.

AMBIENT TEMPERATURE +40°C Equipment approved to the CENELEC standard have T. class based on use in an ambient of -20°C to +40°C unless otherwise stated i.e. (Ta = 50°C) -20°C

GARAGE

UNVENTILATED

INSPECTION PIT

Turpentine Xvlene A more comprehensive list of gases and vapours is provided in IEC 60079-20 Explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist, or a cloud of combustible dust in air.

ZONE 1 ZONE 1 ZONE 2

Ex d equipment < = less than > = more than

Flameproof flange gap on

EC-TYPE EXAMINATION CERTIFICATE NUMBER Notified body responsible for ____

EC-Type

Examination (Test House)

Allowable Dust

using 'practice A'

only applicable to tD)

MARKING FOR DUST PROTECTION

Protection

Concept

to EN 61241-0 and EN 61241-1

Explosion

Protected

Equipment

Explosion

Protected

Equipment

Explosion Protected

Equipment

Year Certificate Issued X Suffix denotes special conditions of certification U Suffix denotes Ex component approval

EC NOTIFIED BODIES

Notified Bodies have been appointed by the governments of individual EC countries as responsible to carry out part or all of the functions specified in the ATEX Equipment Directive, such as EC type examination of equipment and quality assurance assessment of

0084

equipment production. Baseefa (2001) Ltd are responsible for the quality assurance assessment of equipment manufactured by the Wolf Safety Lamp Company, this is identified by their notified body number (1180) appearing below the CE mark on Wolf

DUST PROTECTION CONCEPTS FOR ELECTRICAL APPARATUS							
Concept	Symbol	Symbol	Description	Category	EN Standard		
General req.	1		General requirements	-	EN 61241-0		
Enclosure	Ex tD	4	enclosure is sealed against dust ingress, design excludes the possibility of enclosure failure	1/2/3	EN 61214-1		
Pressurised	Ex pD	4	flammable dust excluded by surrounding ignition source with pressurised inert gas	2/3	EN 61214-2		
Intrinsic Safety	Ex iaD Ex ibD Ex icD	R L	energy in circuit and temperature on components reduced to a safe level	1 2 3	EN 61241-11		
Encapsulation	Ex mD	4	flammable dust excluded by encapsulating the ignition source in resin	1/2/3	EN 61241-18		
LATER STREET		CONTRACTOR OF					

T80°C

Maximum

Temperature

INGRESS PROTECTION (IP) CODE to EN 60529

IP67

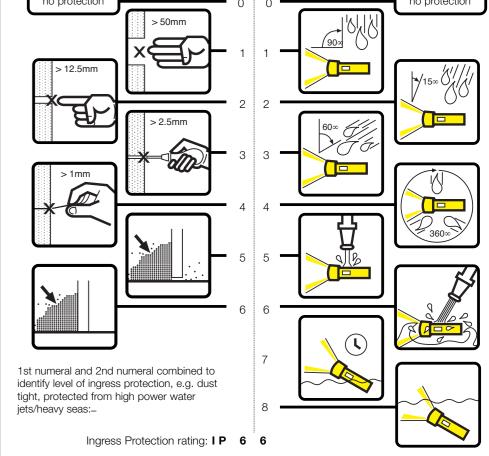
Ingress

Zone (assessed Protection External Surface

Code

Ex equipment selection for use in gases, vapours, mists or dusts must take into consideration the environmental conditions of the area in which it is to be used. Apparatus resistance to ingress of both solid bodies and water is identified by use of an "IP rating".

1st Numeral Protection Against Solid Bodies **2nd Numeral** Protection Against Water no protection no protection



APPARATUS GROUPS AND TEMPERATURE CLASSES FOR COMMON EXPLOSIVE GASES AND VAPOURS				IGNITION TEMPERATURES FOR COMMON COMBUSTIBLE DUST			
Gas/Vapour Temperature	Gas Group	Temperature Class	b	Dust type	Dust Layer – minimum ignition	Dust Cloud – minimum ignition	
Acetic acid	IIA	T1			temperature (°C)	temperature (°C	
Acetone	IIA	T1		Aluminium	280	530	
Acetylene Ammonia	IIC IIA	T2 T1		Coal	270	590	
Benzene	IIA	T1		Flour	470	410	
Butane	IIA	T2		Grain	290	420	
Cumene	IIA	T2		Iron	300	310	
Cychlohexane	IIA	T3		PVC	430	680	
Ethanol (ethyl alcohol)	IIA	T2		Rubber	220	460	
Ethylene Hydrogen	IIB IIC	T2 T1		Sawdust			
Methane (industrial)	IIA	H		(Wood)	300	400	
Methanol	IIA	Ť1		Soot	385	620	
Petroleum	IIA	T1		Starch	530	380	
Propane	IIA	T1		Sugar	360	450	
Toulene	IIA	T1					
Turpentine Xvlene	IIA IIA	T3 T1		A database of 'Combustion and Explosion			

Characteristics of Dusts' is available

at www.hvbg.de/e/bia/fac/expl/

ASSOCIATED STANDARDS **Explosive Atmospheres. Explosion prevention & protection** Basic concepts and methodology Electrical equipment for use in potentially explosive gases, vapours and mists Classification of hazardous areas EN 60079-10 Electrical installations EN 60079-14 nspection and maintenance of electrical installations EN 60079-17 Repair and overhaul of apparatus IEC 60079-19 Data for flammable gases and vapours IEC 60079-20 Electrical apparatus for use in the presence of combustible dusts Classification of areas Selection, installation and maintenance EN 61241-14 Inspection and maintenance of electrical installations | EN 61241-17 Standards available from: British Standards Institution, 369 Chiswick High Road. London W4 4AL www.bsi-global.com

Ex Environment

PETROL STATION FORECOURT

IN LIQUID FORM

PETROL STATION

This guide is provided to aid in the selection of Wolf lighting products for use in potentially explosive atmospheres. Information given is based on practice within the EU, as specified in the requirements of the 94/9/EC ATEX (Equipment) Directive and the 99/92/EC ATEX (Workplace) Directive.











BAS02ATEX2220X

Wolf ATEX Safety Torches

Ex II 2 GD EEx e ib IIC T6 IP67 T65°C

IP67 T95°C (Tamb=55°C)

X II 2 GD EEx e ib IIC T4 (Tamb=40/55°C)









Wolf 'Zone 0' Headtorch HT-200 €x II 1 G EEx ia IIC T4/T3 Baseefa04ATEX0398



I M2/II 2 GD Ex ib I/IIC T4/T3 tD A21 IP67 T85°C (TR-40/ TR-40+) x I M1/II 1 G Ex ia I/IIC T4/T3 IP67 (TR-45) Baseefa07ATEX0091



 $\frac{1}{100}$ I M1/II 1 GD Ex ia I/IIC T5 (Ta=+50°C) tD A20 IP67 T80°C (M-10)

 E_{x} I M1/II 1 GD Ex ia I/IIC T4 (Ta=+50°C) tD A20 IP67 T80°C (M-40/M-60)

Wolf ATEX LED Torch

I M2/II 2 GD Ex ib I/IIC T4 tD A21 IP67 T80°C (M-20)

Wolflite LED Rechargeable Handlamp H-251A/LED Ex II 2 GD EEx e ib IIC T4 IP66 T135°C BAS00ATEX2176



Fluorescent Leadlamp ⟨Ex⟩ II 2 GD Ex emb II T3/T4 Ex tD A21 IP66/67/68 T100°C (Ex) II 2 GD Ex embd IIC T3/T4 Ex tD A21 IP66 T100°C (Linkable)



Ex II 1 G EEx ia IIC T4 BAS99ATEX1044



II 2 GD Ex emb II T3/T4 Ex tD A21 IP66/67/68 T100°C SIRA08ATEX3098 **GRP Transforme** ⟨€x⟩ II 2 GD Ex de IIC T3 (Ta=55°C) DIP A21 IP66 T=200°C LCIE02ATEX6248X Stainless Steel Transformer ⟨Ex⟩ II 2 GD Ex de IIC T4 A21 IP66 T135°C



SIRA08ATEX3182X





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