

ATEX Explained

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Ex Equipment

ATEX MARKING

CE mark denotes manufacturers' declaration of product compliance to all relevant EU Directives

Number of Notified Body responsible for EC monitoring of production quality

Specific mark for Explosion Protection

Equipment Group (Mining)

Equipment Category (Mining)

Equipment Category (Industrial)

Equipment Category (Industrial)

Defines suitability of use of Group II equipment in gas and/or dust atmospheres

CE **Ex** **I** **M1** / **II** **1** **GD**

ATEX MARKING

Explosion Protection mark (ATEX Marking)

Supplementary approval, IECEx Certificate Number

Serial/batch number, incorporating year of construction

ATEX Marking: I M1/II GD Baseefa06ATEX0084 - IECEx BAS 06.0023.10915
Ex Ia I/IIc T4 (Ta=50°C) ID A20 IP67 T80°C 3 x LR1

CE mark (ATEX Marking)

Safety measures to be applied in service

Replacement parts specification

CERTIFICATION CODE

explosive gases, vapours & mists

CERTIFICATION CODE

explosive dusts

EC-TYPE EXAMINATION CERTIFICATE NUMBER

Notified body responsible for EC-Type Examination (Test House)

Baseefa 06 ATEX 0084

Year Certificate Issued

ATEX Certificate

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 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 (1163) appearing below the CE mark on Wolf products.

EQUIPMENT GROUP & EQUIPMENT CATEGORY

Equipment Group	Equipment Category	Protection Level	Hazard	Use
Mining	M1	Very high protection	-	Operable in Ex atmosphere
	M2	High protection	-	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

GAS GROUP

Group	Typical Hazard	Maximum Safe Sparking Energy Intrinsic Safety Ex ia/ib	Maximum Safe Gap Flameproof Ex d	Applicable Concepts
I	Methane	more	wide	all concepts
II	Ethylene	less	narrow	Ex e, Ex m, Ex p, Ex o, Ex q, Ex n
II	All Gases	less	narrow	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.

DUST PROTECTION CONCEPTS FOR ELECTRICAL APPARATUS

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

'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 EC Directives.

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 be 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 are also included.

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 CEI, 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 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 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 assessment procedures to be applied.

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 Electromagnetic 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.

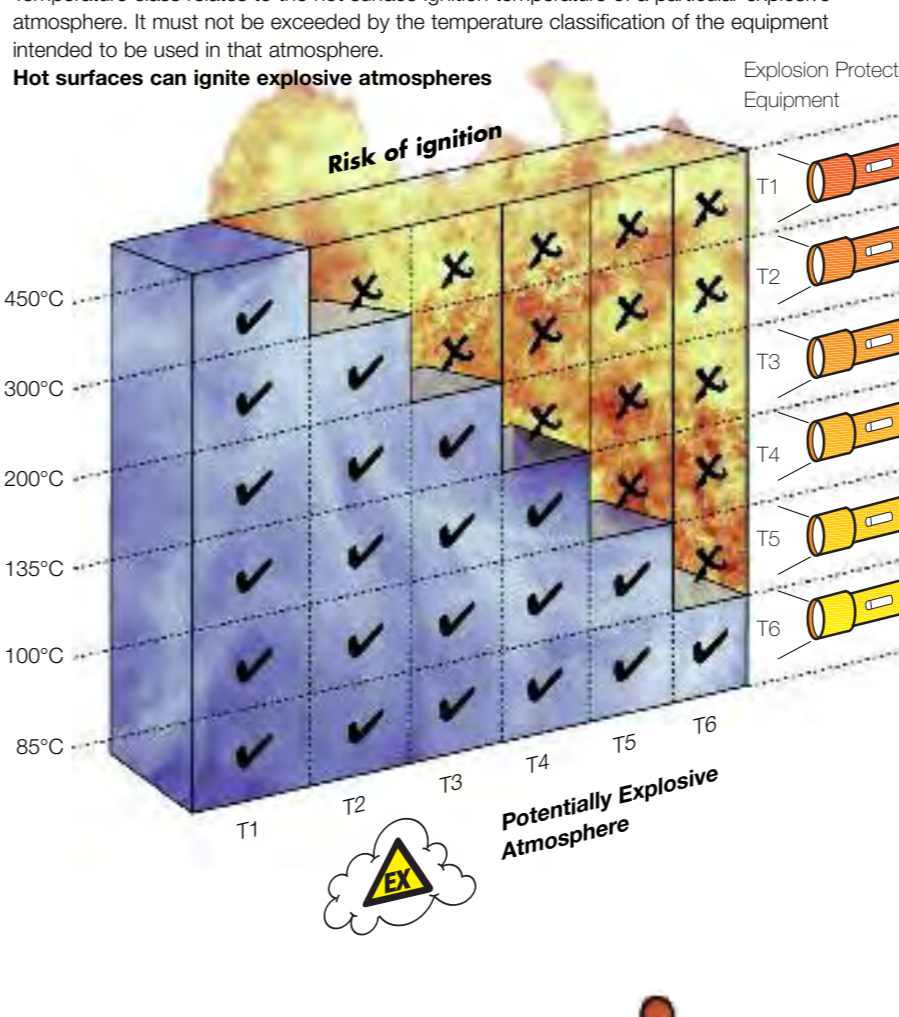
The ATEX Equipment Directive in full, and EC Commission guidance on the Directive, may be found on the following website: <http://ec.europa.eu/enterprise/atesx/directive94-9-en.pdf>

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		explosive gas excluded by surrounding inert gas source with pressurised inert gas	2	EN 60079-2
Powder filled	Ex q		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 inductive 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-incandive	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		flammable gas excluded by encapsulating the ignition source in resin	1 2 3	EN 60079-18

Protection concept identifies the means by which explosion protection is achieved.

TEMPERATURE CLASS



INGRESS PROTECTION (IP) CODE TO EN 60529

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 using an 'IP rating'.

1st Numerical Protection Against Solid Bodies

no protection

> 50mm

> 12.5mm

> 2.5mm

> 1mm

2nd Numerical Protection Against Water

no protection

0

1

2

3

4

5

6

7

8

1st numeral and 2nd numeral combined to identify level of ingress protection, e.g. dust tight, protected from high power water jets/heavy seas:-

Ingress Protection rating: IP 6 6

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 sets 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.
- 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:-
 - Equipment in service before 30 June 2003 may continue to be used after this date if it has been risk assessed and the explosion protection document indicates it can be safely used.
 - Equipment brought into service after 30 June 2003 must be CE marked as compliant with the 94/9/EC ATEX (Equipment) Directive.
- Due consideration of explosion protection measures, encompassing issues such as:
 - Control of releases.
 - Use of protective measures appropriate to the greatest potential risk.
 - Selection of appropriate equipment by referencing the explosion protection document.
 - Ensuring equipment is correctly maintained and operated.
 - 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.

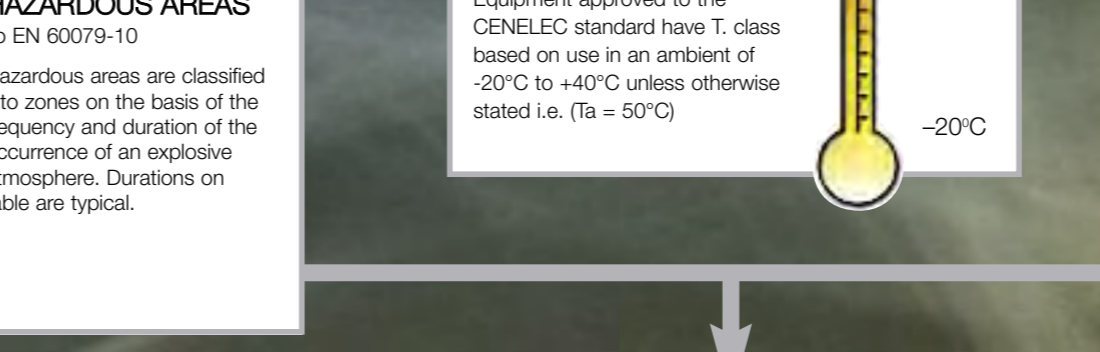
The ATEX Workplace Directive in full may be found on the following website: <http://ec.europa.eu/enterprise/atesx/dir92-en.pdf>

CLASSIFICATION OF HAZARDOUS AREAS

Hazardous areas are classified into zones on the basis of the frequency and duration of the occurrence of an explosive atmosphere. Durations on table are typical.

Area Classification	Zone Criteria	
Zone 0	Zone 20	present continuously or for long periods (>1000hrs per annum)
	Zone 1	likely to occur in normal operation occasionally (>10hrs, <1000hrs per annum)
Zone 2	Zone 21	unlikely to occur in normal operation, if it does it will only be for short periods (<10hrs per annum)
	Zone 22	unlikely to occur in normal operation, if it does it will only be for short periods (<10hrs per annum)

AMBIENT TEMPERATURE



APPARATUS GROUPS AND TEMPERATURE CLASSES FOR COMMON EXPLOSIVE GASES AND VAPOURS

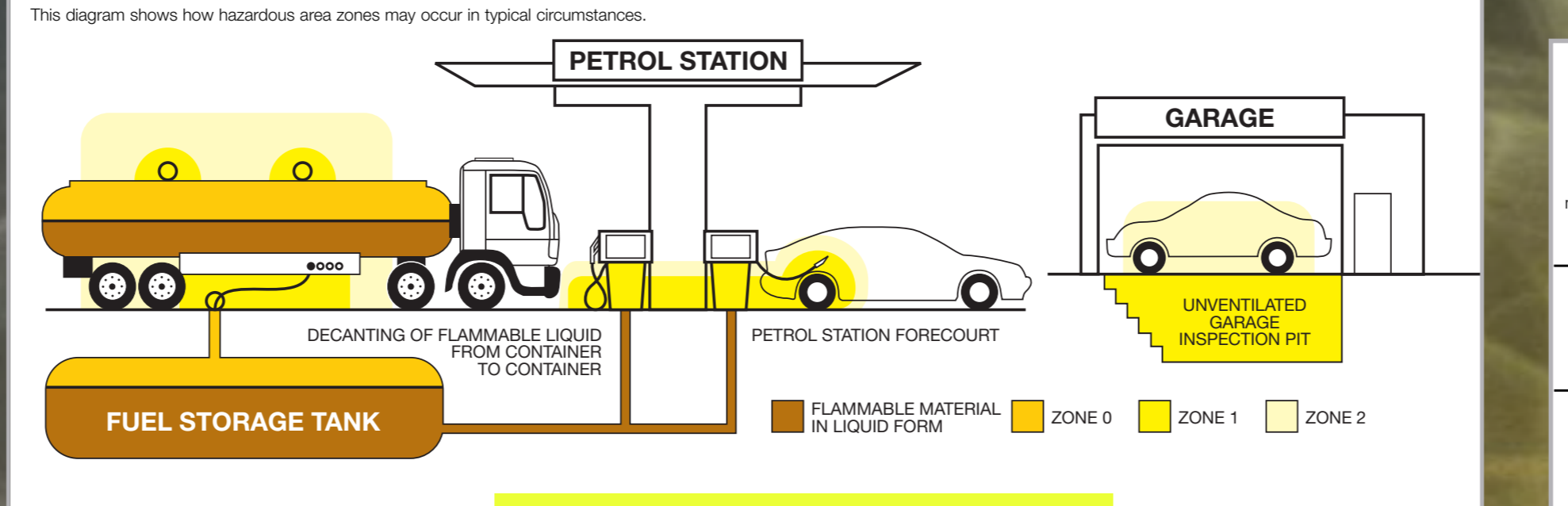
Gas/Vapour Temperature	Gas Group	Temperature Class
Acetic acid	IIA	T1
Acetone	IIA	T1
Acetylene	IIC	T2
Aniline	IIA	T1
Benzene	IIA	T1
Butane	IIA	T2
Cumene	IIA	T2
Cyclohexane	IIA	T3
Ethanol (ethyl alcohol)	IIA	T2
Ethylene	IIB	T2
Hydrogen	IIC	T1
Methane (industrial)	IIA	T1
Methanol	IIA	T1
Petroleum	IIA	T1
Propene	IIA	T1
Toluene	IIA	T1
Turpentine	IIA	T3
Xylene	IIA	T1

IGNITION TEMPERATURES FOR COMMON COMBUSTIBLE DUSTS

Dust type	Dust Layer - minimum ignition temperature (°C)	Dust Cloud - minimum ignition temperature (°C)
Aluminium	280	530
Coal	270	590
Flour	470	410
Grain	290	420
Iron	300	310
PVC	430	680
Rubber	220	460
Sawdust (Wood)	300	400
Scott	385	620
Starch	530	380
Sugar	360	450

A database of 'Combustion and Explosion Characteristics of Dusts' is available at www.hvbg.de/bia/fac/exp/

EXAMPLE OF HAZARDOUS AREA ZONES



ASSOCIATED STANDARDS

Explosive Atmospheres, Explosion prevention & protection	
Basic concepts and methodology	EN 1127-1
Electrical equipment for use in potentially explosive gases, vapours and mists	
Classification of hazardous areas	EN 60079-10
Electrical installations	EN 60079-14
Inspection 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	EN 61241-10
Selection, installation and maintenance	EN 61241-14
Inspection and maintenance of electrical installations	EN 61241-17

Standards available from: British Standards Institution, 9890 Chesswick High Road, London W4 4AL, www.bsi-global.com

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 99/24/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.hms.gov.uk/ais/2002/20022776.htm>

A guide to DSEAR, published by the Health and Safety Executive can be downloaded at: <http://www.hse.gov.uk/freandexplosion/dsear.htm>

Ex Environment

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.

Wolfite Primary Cell Handlamp H-4DCA
 Ex II 2 GD EEx e ib IIC T4 IP66 T135°C
 BAS00ATEX2203

Wolf Mini & Micro Torches
 Ex I M1/II 1 GD Ex ia I/IIc T5 (Ta=50°C) ID A20 IP67 T80°C (M-10)
 Ex I M2/II 2 GD Ex ib I/IIc T4 ID A21 IP67 T80°C (M-20)
 Ex I M1/II 1 GD Ex ia I/IIc T4 (Ta=50°C) ID A20 IP67 T80°C (M-40/M-60)
 Baseefa06ATEX0084

Wolf Hazard Lamp HL-95
 Ex II 1 G EEx ia IIC T4
 BAS99ATEX1044

Wolf ATEX LED Torch
 Ex I M2/II 2 GD Ex ib I/IIc T4/T3 ID A21 IP67 T85°C (TR-40/ TR-40+)
 Ex I M1/II 1 G Ex ia I/IIc T4/T3 IP67 (TR-45)
 Baseefa07ATEX0091

Wolf Rechargeable Torch R-30/R-50/R-55
 Ex II 2 GD EEx ib IIC T4 ID A21 IP67 T85°C (R-30/R-50)
 Ex I 1 G Ex ia IIC T4 IP67 (R-55)
 Baseefa05ATEX0068 (R-30)
 Baseefa05ATEX0069 (R-50/R-55)

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

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

Wolf ATEX Safety Torches
 Ex II 2 GD EEx e ib IIC T6 IP67 T65°C
 Ex II 2 GD EEx e ib IIC T4 (Tamb=40/55°C)
 IP67 T95°C (Tamb=55°C)
 BAS02ATEX220X

Wolf Flameproof Leadlamp
 Ex II 2 G EEx d IIC T4/T3
 BVS03ATEX279

Wolf ATEX Turbottle
 Ex I M2/II 2 GD II T4 (Tamb=55°C) T135°C
 SIRA02ATEX5098X

ATEX LED Worklite - WL-85/WL-80/WL-70
 Ex II 2 GD Ex e ib mb IIC T4 Ex ID A21 IP66 T135°C
 SIRA07ATEX3027

Wolfite 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 ID A21 IP66/67/68 T100°C
 Ex II 2 GD Ex emb IIC T3/T4 Ex ID A21 IP66 T100°C (Linkable)
 SIRA08ATEX3098

Tank Lighting Kit
 Ex II 2 GD Ex emb II T3/T4 Ex ID A21 IP66/67/68 T100°C
 SIRA08ATEX3098
 GRP Transformer
 Ex II 2 GD Ex d IIC T3 (Ta=55°C) DIP A21 IP66 T=200°C
 LCIE2ATEX5240H
 Stainless Steel Transformer
 Ex II 2 GD Ex d IIC T4 A21 IP66 T135°C
 SIRA08ATEX3182X

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