



Klae

KLAE PLT
(201904000711)

The Trusted CoPC Training Provider & Hazardous Environment Solutions



IECEx CoPC
Training Centre



SCAN TO FIND OUT MORE
ABOUT OUR COMPANY

HAZARDOUS AREA GUIDE for IECEx

Typical Equipment Marking for Gas / Dust Atmospheres

	2503		II 2G / II 2D	Ex d / Ex tb	IIB / IIIC	T4 / T135°C	Gb / Db	
European Union compliance mark	I.D. Number of Notified Body responsible for surveillance	EU Explosive Atmosphere Symbol	Equipment Marker (ATEX Only)	Type of Protection	Gas Group	Dust Group	Temperature Class	Equipment Protection Level (EPL)
2014/34/EU ATEX Directive Marking				EN/IEC 60079-0 General Requirements Marking				

Zones of Use - Gas Zones

Suitable for Zone 2 only	ATEX Group & Category: II 3G IECEx Equipment Protection Level: Gc Types of protection (electrical): dc, ec, ic, mc, nA, nC, nR, oc, pzc, qc, sc Types of protection (non-electrical, ATEX): d, c, b, p, k, h Types of protection (non-electrical, IECEx): d, p, h	Hazard unlikely present in normal operation and if it occurs, it exists only for a short time typically during maintenance or fault condition <10hrs/year
Suitable for Zone 1 & 2	ATEX Group & Category: II 1G IECEx Equipment Protection Level: Ga Types of protection (electrical): da, ia, ma, op is, op sh, sa Types of protection (non-electrical, ATEX): c, b, k, h	Hazard likely to occur during normal operation >10<1000hrs/year
Suitable for Zone 0, 1 & 2	ATEX Group & Category: II 2G IECEx Equipment Protection Level: Gb Types of protection (electrical): db, eb, ib, mb, ob, pxb, pyb, qb, op is, op pr, op sh, sb Types of protection (non-electrical, ATEX): d, c, b, p, k, h	Hazard continuously present for long period of time >1000hrs/year

Zones of Use - Gas Zones

Suitable for Zone 20, 21 & 22	ATEX Group & Category: II 1D IECEx Equipment Protection Level: Da Types of protection (electrical): ta, ia, ma, op is, op sh, sa Types of protection (non-electrical, ATEX): c, b, k, h Types of protection (non-electrical, IECEx): h	Hazard unlikely present in normal operation and if it occurs, it exists only for a short time typically during maintenance or fault condition <10hrs/year
Suitable for Zone 21 & 22	ATEX Group & Category: II 2D IECEx Equipment Protection Level: Db Types of protection (electrical): tb, ib, mb, op is, op pr, op sh, sb Types of protection (non-electrical, ATEX): c, b, p, k, h Types of protection (non-electrical, IECEx): h	Hazard likely to occur during normal operation >10<1000hrs/year
Suitable for Zone 22 only	ATEX Group & Category: II 3D IECEx Equipment Protection Level: Dc Types of protection (electrical): tc, ic, mc, op is, op pr, op sh, sc Types of protection (non-electrical, ATEX): c, b, p, k, h Types of protection (non-electrical, IECEx): h	Hazard continuously present for long period of time >1000hrs/year

SIMPLE APPARATUS - Intrinsic Safety

Thermal ignition compliance
Small component relaxation for Group II T4 temperature classification

Surface Area	Group II T4 Maximum Surface Temperature °C
<20mm ²	275
>20mm ² <10cm ²	200
>10cm ²	135

Variation of matched power dissipation with ambient temperature. For Group II components of surface area not less than 20mm²

Max Ambient Temperature °C	40	50	60	70	80
Max Power Dissipation W	1.3	1.25	1.2	1.1	1.0

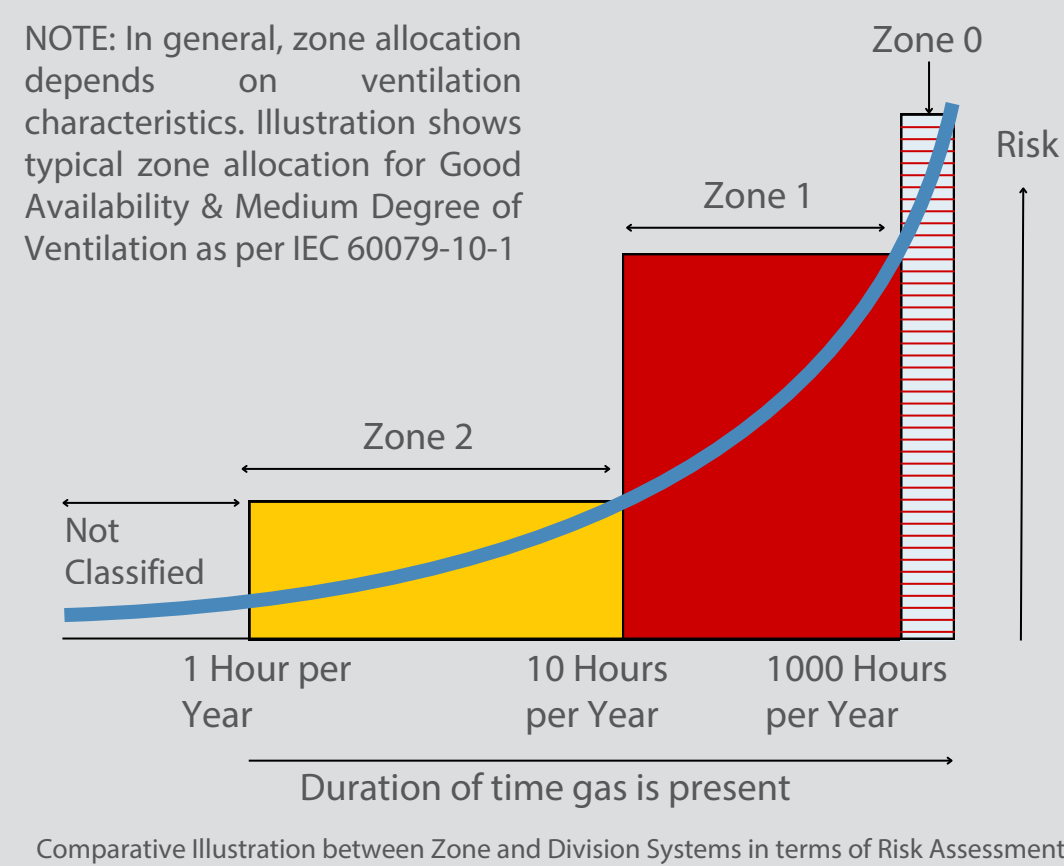
Simple Apparatus

Passive components	
Well defined sources of stored energy considered in safety analysis	
Sources of generated energy not more than *1.5V, 100mA & 25mW	
NOT piezoelectric crystal protected components voltage or current enhancement	

IECEx Explosion Groups: Gas vs. Dust

Equipment Group	Subgroup	Atmosphere Type	Example Substance
Group I	I	Mining	Methane (Fire Damp)
Group II (Gases, Vapors & Mists)	IIA	Least volatile gases	Propane
	IIB	Medium volatility gases	Ethylene
	IIIC	Most volatile / easily ignited	Hydrogen
Group III (Combustible Dusts)	IIIA	Combustible flyings	Fibres and Flyings
	IIIB	Non-conductive dusts	Grain Dust, Coal Dust
	IIIC	Medium volatility gases	Metal Dust

Gas Duration Vs. Zone



Our Solutions:

WHY CHOOSE KLAE PLT



40+ Years of Proven Expertise:

As part of the KL Automation Engineering Group, we bring over four decades of battle-tested experience in managing high-stakes installations for hazardous and harsh environments.



Led by Elite Industry Authorities:

Our team consists of certified professional engineers and technologists holding doctorate qualifications and professorships. You are partnering with the highest tier of technical intellect.



Training Excellence:

As a premier remote assessment centre for Certificate of Personnel Competence (CoPC) training centre in Malaysia, we don't just follow industry standards—we are trusted to teach and qualify them.



360° Industrial Synergy:

As the dedicated Training, Investment, and Asset Management arm, we uniquely bridge the gap between elite technical competency and long-term asset value.

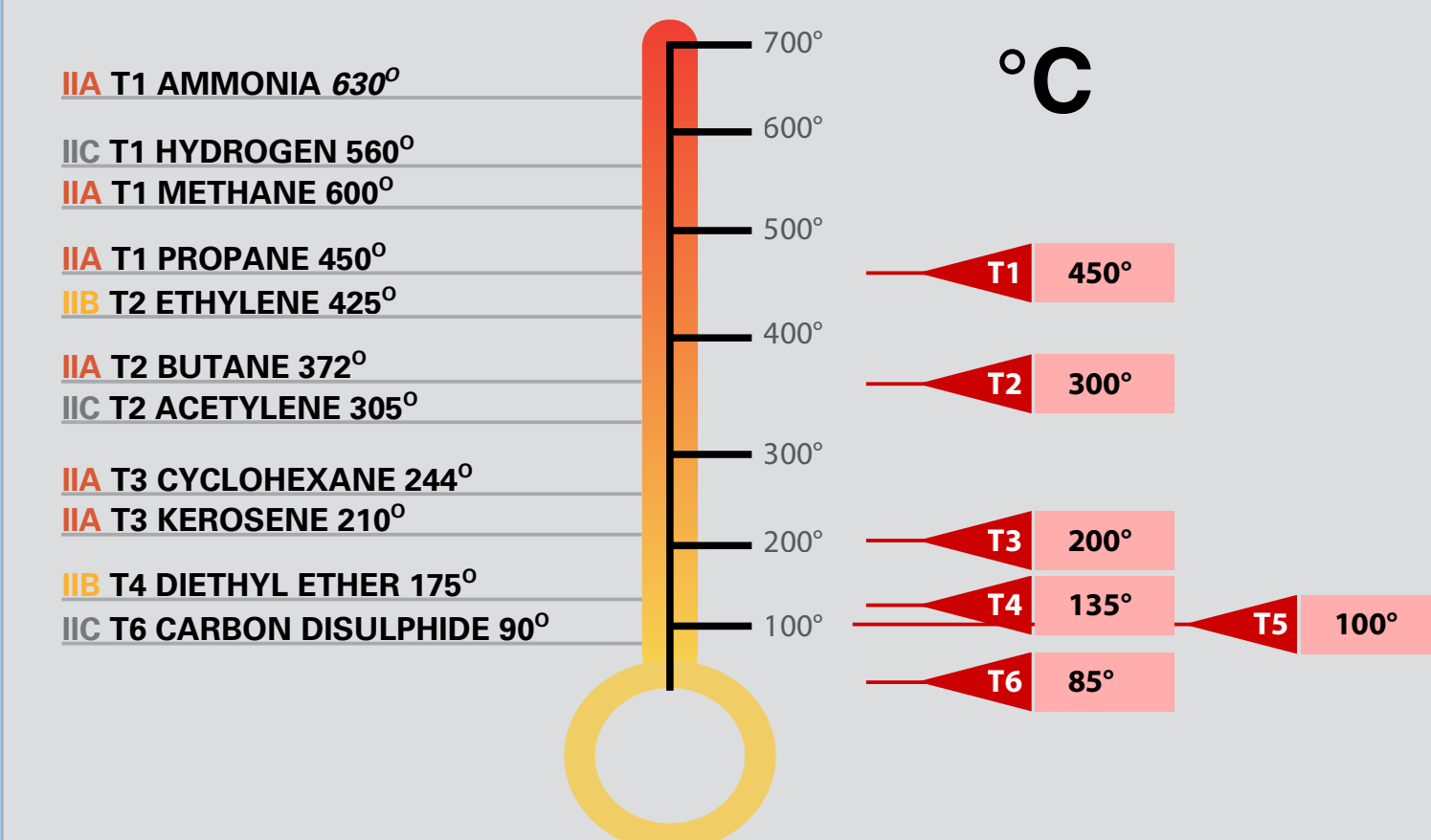


Group II Electrical Apparatus for gas atmospheres 'G' and combustible dusts 'D'

Protection Method	IEC/EN	Permitted Zone			Permitted Zone			Remarks	
		ATEX category			ATEX category				
		0	1	2	20	21	22		
		1	2	3	1	2	3		
IEC Equipment Protection Level (EPL)		Ga	Gb	Gc	Da	Db	Dc		
General requirements	60079-0							Equipment - General requirements	
Two independent methods	60079-26							Permits combined methods of protection (marking shows symbols for the 2 types of protection joined by '+')	
Oil immersion	60079-6		O	O				Protection by gas exclusion e.g. Transformers	
Pressurised	60079-2		pX, pY	pZ		P	P	Protection by gas exclusion e.g. Analysers	
Powder filling	60079-5		q	q				Protection by exclusion e.g. Weighing machines	
Encapsulation	60079-18		ma	mb	mc	ma	mb	mc	Protection by exclusion e.g. High power electronics
Increased safety	60079-7		e	e				Prevention by design e.g. Junction boxes & terminals	
Type of protection 'n'	60079-15			nA, nC, nR				Prevention by design e.g. Luminaires	
Flameproof	60079-1		da	db	dc			Prevention of propagation of internal explosion e.g. DC motors	
Intrinsic safety	60079-11		ib	ic	ia	ib	ic	Low energy equipment e.g. Instrumentation. Includes Fieldbus Intrinsically safe concept	
Intrinsically safe electrical system	60079-25							Considers combinations of intrinsically safe apparatus includes Fieldbus Intrinsically safe concept	
Optical radiation	60079-28		100 % (21.0)	100 % (21.0)	100 % (21.0)	100 % (21.0)	100 % (21.0)	Equipment and transmission systems using optical radiation (EPL is determined by type of protection employed)	
Protection by enclosure	60079-31				ta	tb	tc	Protected by enclosure and temperature limitation	

* Edition 5 of IEC60079-7 will include levels of protection eb (for Zone 1/Category 2) and ec (for Zone 2/Category 3)

MAXIMUM SURFACE TEMPERATURES FOR GROUP II ELECTRICAL EQUIPMENT (T CLASS)



IECEx CoPC Certification Programme

Unit of competence

Unit Ex 000 - Basic knowledge and awareness to enter a site which includes a classified hazardous area

Unit Ex 001 - Principles of protection in explosive atmospheres knowledge
Competence in plant or machinery operation or installations, maintenance or service functions

Unit Ex 002 - Perform classification of hazardous areas
Competence in gathering and analyzing technical data and using this data for risk assessment

Unit Ex 003 - Install explosion-protected in explosive atmospheres
Competence in installation of electrical, electronic, instrumentation and/or data communication equipment and wiring systems

Unit Ex 004 - Maintain equipment in explosive atmospheres
Competence in maintenance of industrial electrical, electronic, instrumentation and/or data communication equipment and wiring systems

Unit Ex 005 - Overhaul and repair of explosion-protected equipment
Competence in overhaul and repair of industrial electrical/electronic equipment

Unit Ex 006 - Test electrical installations in or associated with explosive atmospheres
Competence in conducting testing of general electrical, electronic, instrumentation and/or data communication installations

Unit Ex 007 - Perform visual and close inspection of electrical installations in or associated with explosive atmospheres
Competence in general electrical installation inspection is an alternative to the specific units

Unit Ex 008 - Perform detailed inspection of electrical installations in or associated with explosive atmospheres
Competence in general electrical installation inspection is an alternative to the specific units

Unit Ex 009 - Design electrical installations in or associated with explosive atmospheres
Competence in designing electrical systems and installations

Unit Ex 010 - Perform audit inspection of electrical installations in or associated with explosive atmospheres
Competence in general electrical installation inspection is an alternative to the specific units

Unit Ex 011 - Basic knowledge of the safety of hydrogen systems

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KLAE Group for Hazardous and Harsh Environment Business: