

# MTL FLAMMABLE FACTS

## AREA CLASSIFICATION

	Guideline figures	Flammable atmosphere present continuously >1000hrs/annum	Flammable atmosphere present intermittently >10<1000hrs/annum	Flammable atmosphere present abnormally <10hrs/annum	Standard
IEC/CENELEC/EUROPE	Gas	Zone 0	Zone 1	Zone 2	IEC 60079-10
	Dust	Zone 20	Zone 21	Zone 22	IEC 61241-3
NORTH AMERICA	NEC 505 Gas	Zone 0	Zone 1	Zone 2	Listed in NEC 505-5
	NEC 500 Gas & Dust	Division 1		Division 2	Listed in NEC 500-3(c)

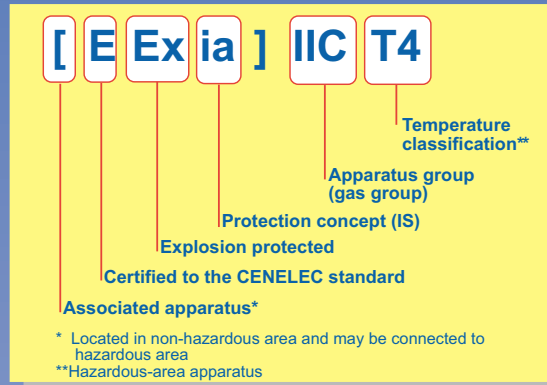
No catalogue?  
Contact MTL

## GAS GROUPING

Typical gas hazard	IEC 60079-0 CENELEC EN50014	North America NEC Article 500 (Class I)*	Minimum ignition energy (microjoules)
ACETYLENE	IIC	A	20
HYDROGEN	IIC	B	20
ETHYLENE	IIB	C	60
PROPANE	IIA	D	180

\*North American hazard categories: Class I (Gases & Vapours); Class II (Dusts); Class III (Fibres)

## Certification Code

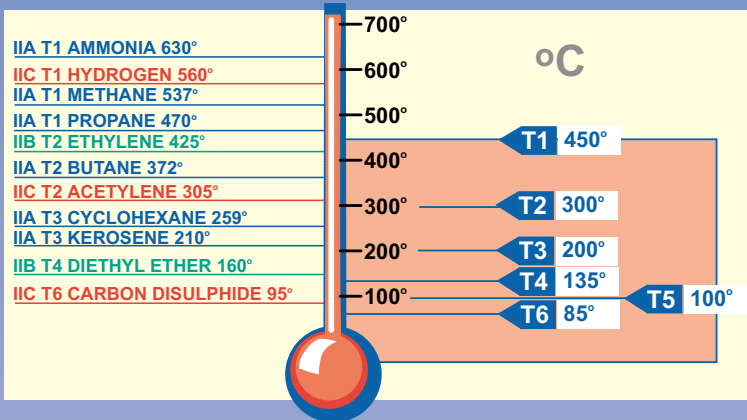


Application notes  
Technical papers  
Textbooks etc

Training & education on hazardous area instrumentation

## 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
- piezoelectric crystal NOT protected components voltage or current enhancement



## APPARATUS TEMPERATURE CLASSIFICATION (T CLASS)

Small component relaxation

SURFACE AREA	T4 CLASSIFICATION
<20mm <sup>2</sup>	Surface temperature <275°C
>20mm <sup>2</sup> <10cm <sup>2</sup>	Surface temperature <200°C
>20mm <sup>2</sup>	Power dissipation < 1.3 W* at 40°C ambient

\*Reduced to 1,2 W with 60°C ambient or 1,0 W with 80°C ambient

## STANDARDS FOR METHODS OF PROTECTION

	Code	CENELEC EN	IEC 60079	Permitted Zone ATEX category			Remarks
				0	1	2	
Explosion prevention & protection-pt. 1		1127-1					Basic concepts and methodology. Further sections imminent
Category M1		50303					Mining equipment operated in gas atmosphere
Electrical equipment for dusts (D)		50281-1-1					Enclosure protected - construction and testing
Electrical equipment for dusts (D)		50281-1-2					Enclosure protected - selection, installation & maintenance
<b>GROUP II ELECTRICAL APPARATUS for gas atmospheres</b>							
Category 1G		50284	-26				Permits combined methods of protection
General requirements		50014	-0				Basic electrical requirements
Oil immersion	o	50015	-6				Protection by gas exclusion - transformers
Pressurised	p	50016	-2				Protection by gas exclusion - analysers
Powder filled	q	50017	-5				Protection by gas exclusion - weighing machines
Flameproof	d	50018	-1				Prevention of propagation of internal explosion - dc motors
Increased safety	e	50019	-7				Prevention by design - induction motors
Intrinsic safety ia	ia	50020	-11				Low energy. Safe with two faults - level measurement
Intrinsic safety ib	ib	50020	-11				Low energy. Safe with one fault - displays
Intrinsically safe systems	m	50039	-25				Considers combination of intrinsically safe apparatus
Encapsulated		50028	-18				Protection by gas exclusion - solenoid valves
Type of protection 'n'	n	50021	-15				

## Codes of Practice

SUBJECT	STANDARD IEC 60079-60079
Classification of hazardous areas	-10 -10
Electrical installations	-14 -14
Inspection and maintenance	-17 -17
Repair and overhaul	-19 -19
Data for flammable gases	-20

BSI standards  
+44 (0) 2020 996 9001  
bsonline.techindex.co.uk

Lightning & surge protection? consult TELEMATIC

Have you received the companion ATEX poster? Contact your local MTL office

CENELEC Marking: R L P C A  
IEC Marking: R L Z C A  
SUB DIVISIONS OF TYPE n  
Restricted breathing enclosures  
Energy limited apparatus  
Simplified pressurised enclosure  
Otherwise protected sparking apparatus  
Non-sparking apparatus

## INGRESS PROTECTION (IP) CODES (IEC/EN 60529)

FIRST NUMERAL	Protection against solid bodies	SECOND NUMERAL	Protection against liquid
0	NO PROTECTION	0	NO PROTECTION
1	OBJECTS GREATER THAN 50mm	1	VERTICALLY DRIPPING WATER
2	OBJECTS GREATER THAN 12mm	2	ANGLED DRIPPING WATER -75° to 90°
3	OBJECTS GREATER THAN 2.5mm	3	SPRAYED WATER
4	OBJECTS GREATER THAN 1.0mm	4	SPLASHED WATER
5	DUST-PROTECTED	5	WATER JETS
6	DUST-TIGHT	6	HEAVY SEAS
		7	EFFECTS OF IMMERSION
		8	INDEFINITE IMMERSION

Example: IP65 equipment is dust-tight and protected against water jets

## US ENCLOSURE RATINGS (NEMA 7 to 10 Hazardous Area Enclosures)

NEMA, UL, & CSA type rating	Approximate IEC/IP classification	Abbreviated protection description
1	IP30	Indoor, from contact with contents
2	IP31	Indoor, limited, from dirt & water
3	IP64	Outdoor, from rain, sleet, windblown dust & ice damage
3R	IP32	Outdoor, from rain, sleet & ice damage
4	IP66	Indoor & outdoor, from windblown dust, rain, splashing & hose directed water & ice damage
4X	IP66	Indoor & outdoor, from corrosion, windblown dust, rain, splashing & hose directed water & ice damage
6	IP67	Indoor & outdoor, from hose-directed water, water entry during submersion & ice damage
12	IP55	Indoor, from dust, falling dirt & dripping non-corrosive liquids
13	IP65	Indoor, from dust, spraying water, oil & non-corrosive liquids

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