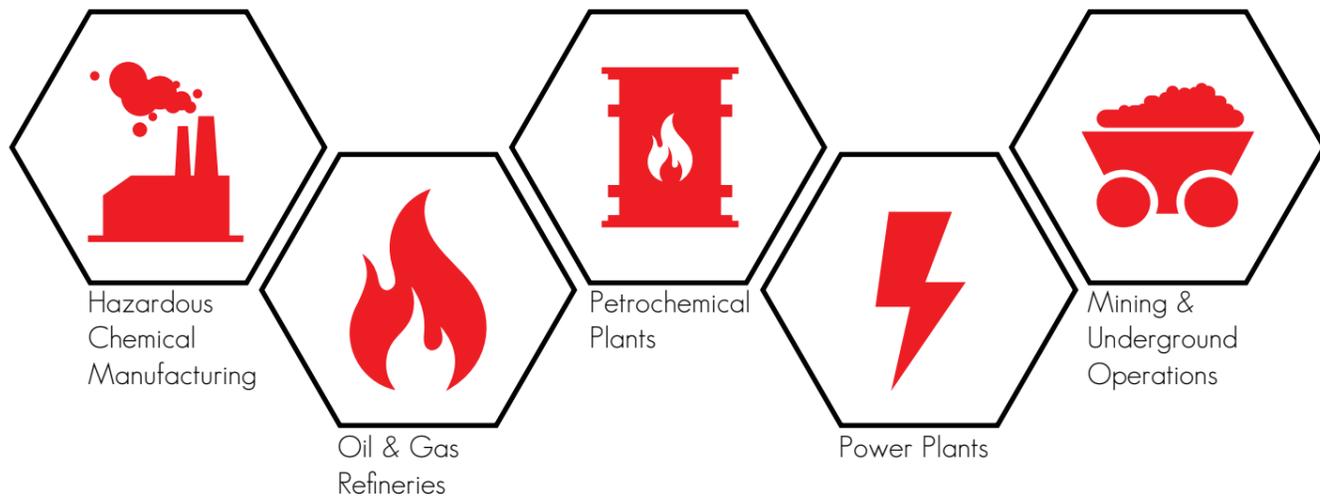


Technical Information

Explosion protected or commonly referred to, flameproof devices are designed to keep their surroundings safe from potential hazardous explosions. The units are designed to be resistant to spark and shock, and have a high tolerance to extreme temperatures, creating an ideal solution for hazardous locations. These explosion protected products keep any interior explosion from spreading to the external environment and potentially damaging personnel and property.

Hazardous locations are defined as places where fire or explosion hazards may exist due to flammable gases, flammable liquid-produced vapors, combustible liquid-produced vapors, combustible dusts, or ignitable fibers/flyings present in the air in quantities sufficient to produce explosive or ignitable mixtures.

EXAMPLES OF HAZARDOUS AREAS:



Coal Mine Hazardous Location:

Typically 180 m from the working face, return airways, battery charging and cap lamp rooms.
 Zone 1: Area when the concentration does not exceed 1.4 % methane/firedamp in air. (EPL Mb)
 Zone 0: Area when the concentration exceeds 1.4 % methane/firedamp in air. (EPL=Ma)
 Gas concentrations in excess of 0.5 % methane/firedamp in general body of air. (EPL = Mb)

Hard Rock Mine Hazardous Location:

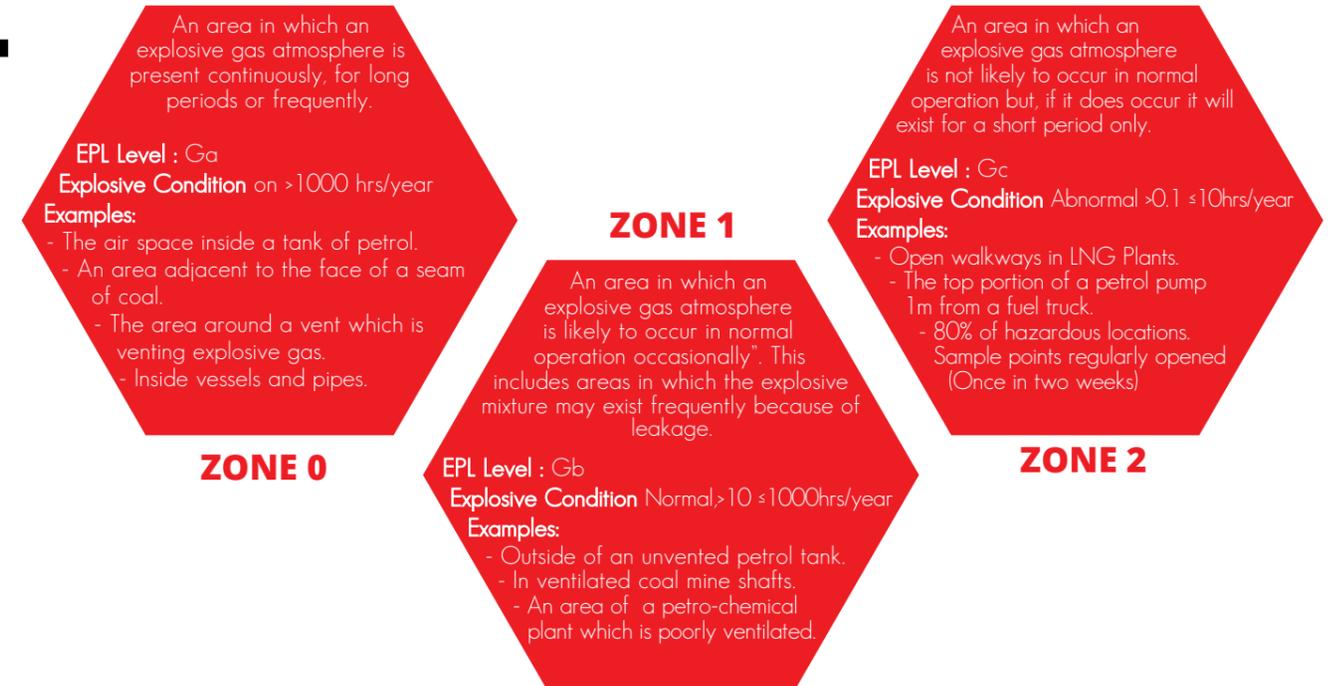
Areas when the concentration exceeds 0.5 % methane/firedamp in the general body of air. (EPL=Mb)
 NB: Gases/Vapors other than methane/firedamp that may be present are additionally considered through a risk assessment/area classification.

Hazardous Zone Classifications

GAS ZONE DEFINITIONS

Zones 0, 1 and 2:

Atmospheres with explosive gases and vapours (AS2380; AS/NZS/IEC 60079)



DUST ZONE DEFINITIONS

Zones 20, 21 & 22:

Hazardous Areas due to the presence of combustible dusts, fibres or flyings (AS/NZS/IEC 60079-31)



All about Flameproof & Explosion Proof Products

Temperature Classifications

Temperature classification defines the maximum surface temperature that a product destined for use in a potentially hazardous atmosphere is allowed to operate at.

CLASSIFICATION	T1	Ignition Temp. < 450 °C	300°C < Surface Temp. < 450°C
	T2	300°C < Ignition Temp. < 450°C	200°C < Surface Temp. < 300°C
	T3	200°C < Ignition Temp. < 300°C	135°C < Surface Temp. < 200°C
	T4	135°C < Ignition Temp. < 200°C	100°C < Surface Temp. < 135°C
	T5	100°C < Ignition Temp. < 135°C	85°C < Surface Temp. < 100°C
	T6	85°C < Ignition Temp. < 100°C	Surface Temp. ≤ 85°C

IGNITION TEMPERATURE OF GAS/ VAPOR **MAX. APPLICABLE SURFACE TEMP. OF CERTIFIED EQUIPMENT**

Mining Group:
Methane/Firedamp (537°C)
Coal Dust (150°C)

Selection of Equipment

Equipment used in hazardous areas should be carefully evaluated before selecting a specific product. The below table serves as a guideline to help make the correct decision.

VERY HIGH PROTECTION REQUIRED

EPL			TYPE OF PROTECTION	CODE	STANDARD	CONDITIONS OF OPERATION
GROUP I	GROUP II	GROUP III				
Ma			Intrinsically Safe	ia	IEC 60079-11	Equipment remains functioning when explosive atmosphere is present.
			Encapsulation	ma	IEC 60079-18	
			Two independent type of protection each meeting EPL Gb criteria.		IEC 60079-26	
			Optical radiation		IEC 60079-28	
	Ga		Same as "Ma"			Equipment remains functioning in Zones 0, 1, and 2.
		Da	Intrinsically Safe	iD	IEC 60079-11	Equipment remains functioning in Zones 20, 21, and 22.
			Encapsulation	mD	IEC 60079-18	
			Enclosure	tD	IEC 60079-31	

HIGH PROTECTION REQUIRED

Mb			Intrinsically Safe	ib	IEC 60079-11	Equipment de-energised when explosive atmosphere is present.
			Encapsulation	mb	IEC 60079-18	
			Flameproof	d	IEC 60079-1	
			Increase Safety	e	IEC 60079-7	
			Oil immersion	o	IEC 60079-6	
			Pressurised	p/ px/ py	IEC 60079-2	
			Powder filled	q	IEC 60079-5	
			FISCO		IEC 60079-27	
			Optical radiation		IEC 60079-28	
	Gb		Same as "Ma"			Equipment remains functioning in Zones 1 and 2.
		Db	Intrinsically Safe	iD	IEC 60079-11	Equipment remains functioning in Zones 21 and 22.
			Encapsulation	mD	IEC 60079-18	
			Enclosure	tD	IEC 60079-31	
			Pressurised	pD	IEC 61241-4	

BASIC PROTECTION REQUIRED

Mb			Intrinsically Safe	ib	IEC 60079-11	Equipment de-energised when explosive atmosphere is present.
			Encapsulation	mb	IEC 60079-18	
			Flameproof	d	IEC 60079-1	
			Increase Safety	e	IEC 60079-7	
			Oil immersion	o	IEC 60079-6	
			Pressurised	p, px, or py	IEC 60079-2	
			Powder filled	q	IEC 60079-5	
			FISCO		IEC 60079-27	
			Optical radiation		IEC 60079-28	
	Gb		Same as "Ma"			Equipment remains functioning in Zones 1 and 2.
		Db	Intrinsically Safe	iD	IEC 60079-11	Equipment remains functioning in Zones 21 and 22.
			Encapsulation	mD	IEC 60079-18	
			Enclosure	tD	IEC 60079-31	
			Pressurised	pD	IEC 61241-4	

NOTE:

If no ambient temperature is indicated on the equipment, it may be used in -20°C to +40°C (default) ambient. Alternative ambient temperature marked on the equipment. See marking/certificate of equipment.