

INTRINSICALLY
SAFE

FLIR **GfX320**[™]

Intrinsically Safe Optical Gas Imaging Camera

WHY “INTRINSICALLY SAFE” IS IMPORTANT

Workplace dangers are an everyday concern when surveying for fugitive methane, hydrocarbon, and volatile organic compound (VOC) emissions. At well sites, offshore rigs, and production plants, there's a risk that these flammable gases could leak, collect, and ignite with a stray spark or hot surface.

Workers have two options for keeping safe in these conditions: either avoid hazardous areas altogether – and risk missing hydrocarbon leaks in that area – or enter and scan for leaks using equipment that is designated Intrinsically Safe.

Equipment that is designed and certified to be Intrinsically Safe can minimize fire risks and potentially remove the need to obtain a hot work permit for hazardous areas, depending on company protocols. This allows inspectors to get to work faster and to enter more areas that require checking for fugitive gas emissions.

WHAT “INTRINSICALLY SAFE” MEANS

Intrinsically Safe is a protection technique for the design and operation of electrical equipment in hazardous areas. These products are designed to control energy (electrical and thermal) to nonincendive levels so any short circuit or failure will not cause sparks – an important feature in explosive atmospheres.

The process involves internal coating techniques and rigorous testing procedures to ensure the system can be used safely in a variety of hazardous environments. FLIR purposefully opted to pursue the Intrinsically Safe protection method over less stringent and outdated techniques, such as the Energy Limited protocol.

The FLIR GFx320 has been independently certified as Intrinsically Safe, meaning it can be used safely and confidently in areas where there is the potential for explosions. The camera also complies with standards issues by the International Electrotechnical Commission, the European Conformity, and the Canadian Standards Association. It has been certified by two independent testing houses: Element and MET labs.

CERTIFICATION AND CLASSIFICATION FOR HAZARDOUS



LOCATIONS

As long as there are flammable substances, an oxidizer (e.g. air), and an ignition source, there's a potential for explosion. With these ever-present dangers, it's critical to maintain the highest levels of safety and to understand what the hazards are and how long they can persist.

Hazardous locations are classified using either the Zone system or the Class/Division system. Either can help clarify the types and levels of hazard in areas with flammable gases, vapors, and dusts.

In North America, NEC and CSA define the use of the Class/Division System.

THE FLIR GFX320 IS INDEPENDENTLY CERTIFIED FOR CLASS 1 DIVISION 2

CLASSES	GROUP	DIVISIONS	
		1	2
I – Gases, vapors, liquids	a. Acetylene b. Hydrogen c. Ethylene, carbon monoxide d. Hydrocarbons, propane, etc.	Normally explosive and hazardous	Not normally present in an explosive concentration, but may accidentally exist
II – Combustible dusts	e. Metal dust f. Carbon and charcoal dust g. Flour, grain, wood, plastic	Ignitable quantities of dust exist all or some of the time under normal operations	Dust not normally present in ignitable concentrations, but may accidentally exist
III – Fibers and flyings	Ignitable fibers such as cotton lint, flax, rayon	Easily ignitable fibers or materials producing combustible flyings are present	Easily ignitable fibers are stored and handled

In Europe and the rest of the world, the International Electrotechnical Commission (IEC) defines the use of the Zone System.

THE FLIR GFX320 IS INDEPENDENTLY CERTIFIED FOR ZONE 2

Hazard Type	Zone	Duration	Equipment
Gases, vapors, mists	0	Continuously, for a long period, frequently	1G
	1	Occasionally	2G
	2	Rarely	3G
Dusts	20	Continuously, for a long period, frequently	1D
	21	Occasionally	2D
	22	Rarely	3D

Another safety consideration is temperature. If a surface or piece of equipment inside a hazardous area gets hot enough, it could ignite flammable gas. It's important to ensure that any device used in a hazardous area never reaches a surface temperature that's equal to or above the minimum ignition temperature of the gas present.

IEC/NEC/GENELEC¹ TEMPERATURE CLASSES

Maximum Surface Temperature of Electrical Equipment		Temperature Class
Celsius	Fahrenheit	
450°C	842°F	T1
300°C	572°F	T2
200°C	392°F	T3
135°C	275°F	T4
100°C	212°F	T5
85°C	185°F	T6

¹CENELEC: European Committee for Electrotechnical Standardization

Gases and vapors are categorized with the same temperature classes. So, for example, methane at concentrations between 5 and 15 percent becomes flammable when in contact with something that's 450°C – or class T1. The Intrinsically Safe FLIR GFx320 is certified as class T4. This means its maximum permissible surface temperature is 135°C – far below the ignition temperature of methane.

For more information on the FLIR GFx320 and FLIR's entire line of Optical Gas Imaging cameras, go to www.tivision.co.uk

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