EyeCGas™

The only Infrared gas imaging camera certified and classified for Hazardous Locations: ATEX, UL, ANSI & CSA

Opgal's EyeCGas camera is certified to the following standards

- **UL1604 -** Electrical Equipment for Use in Class I and II, Division 2, and Class III (Classified) Locations. Third edition.
- **CSA C22.2 No. 213-M1987 -** Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations. First edition.
- **ANSI/ISA-12.12.01 -** Non-incendive Electrical Equipment for Use in Class I and II, Division 2, and Class III Hazardous (Classified) Locations. 2011 edition.
- **ATEX II 3G Ex nL IIC T6 -**
  EN600079-0 Electrical apparatus for explosive gas atmospheres - Part 0: General requirements.
  EN60079-15 Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marketing of type protection "n" electrical apparatus.

Utilizing certified equipment for use in hazardous location allows a higher level of safety and operability confidence. It increases operators efficiency as it eliminates the need for getting a "hot permit" before entering the inspection area.

What is a hazardous location?

The hazardous location classification system was designed to promote the safe use of electrical equipment in environments where fire or explosion hazards may exist due to the presence of ignitable concentrations of flammable gases or vapors. These locations are grouped according to the characteristics of the hazard that may exist and the likelihood of their existence.
Areas are classified according to the likelihood that they will produce a combustion hazard for the electronic device. In a hazardous area each apparatus must possess the appropriate approvals for safe operation in that area (i.e. to ensure that it does not become a source of ignition). Various methods of protection are used to meet this need.
In the gas detection applications, hazardous areas are generally defined by a few factors: the type of gas that may be present, and the degree of probability that it will be present at any given instant.
Hazardous areas and certification standards are defined differently in various countries, this document will explain the ones that are relevant for the EyeCGas camera.

OPGAL
Beyond the Visible

For North America

EyeCGas is certified for Class I Division 2, Groups A-D, T6

According to UL1604, CSA C22.2 No. 213-M1987 and ANSI/ISA-12.12.01

The NEC and CSA define hazardous locations by class and division

There are three classes:

Class 1 Locations are made hazardous by the presence of flammable gases, liquids or vapors.
Class 2 Locations are described as hazardous because of the presence of combustible dusts.
Class 3 Locations contain easily ignitable fibers or flyings.

Division refers to the likelihood that ignitable concentrations of flammable materials are present.

Division 1 Designates an environment where ignitable concentrations of flammable gases, liquids, vapors or dusts can exist some of the time or all of the time under normal operating conditions or where easily ignitable fibers and flyings are manufactured, handled or used.
Divison 2 Locations are areas where ignitable concentrations are not likely to exist under normal operating conditions or where Class 3 materials are stored or handled.

Hazardous classes are further defined by groups. Combustible materials are grouped by their relevant physical properties.
These groups include (but are not limited to):

Group A Acetylene
Group B Hydrogen
Group C Ethylene, carbon monoxide
Group D Propane, gasoline, naphtha, benzene, butane, ethyl alcohol, acetone, methane
Group E Metals including aluminum, magnesium (Div 1 only)
Group F Carbonaceous dusts including coal, carbon black, coke
Group G Dusts not included in E and F including wood, plastics, flour, starch or grain dusts

EyeCGas Certification:				**Class I Division 2, Groups A-D, T6**
Class I	***Division 2***	***Groups A-D***	***T6***	
			T6	Maximum Surface Temperature Of Electrical Apparatus = 85°C Ignition Temperature Of Gas Or Vapor > 85°C *T6 marked equipment can be used in T5 – T1*
			Group A-D	Typical gases for the different groups are: Group A Acetylene Group B Hydrogen Group C Ethylene, carbon monoxide Group D Propane, gasoline, naphtha, benzene, butane, ethyl alcohol, acetone, methane
			Division 2	Where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions
			Class I	Flammable Gases, Vapors Or Liquids

For Europe

EyeCGas is certified for Ex II 3G EX nL IIC T6

According to ATEX ratings for use in potentially explosive atmospheres:

EN60079-0:2009: Electrical apparatus for explosive gas atmosphere – Part 0: General Requirements
EN60079-15:2005: Electrical apparatus for explosive gas atmosphere – Part 15: Construction, test and marking of type of protection "n" electrical apparatus

Marking element	Examples of possible values
Equipment Group	I Mines II Above ground
Equipment Category	1 Gas, Vapor, Mist, Dust – Two Faults 2 Gas, Vapor, Mist, Dust – one Faults 3 Gas, Vapor, Mist, Dust – Normal Operation
EX	Explosion protection
Protection concept	nc Hermetic sealing, keep flammable gas out ia Intrinsically safe, limit energy of sparks & temp pz Pressurized, keep flammable gas out nL Energy limited nC Flame proof, contain the explosion
Gas Group	Gases are grouped based on MESG - Maximum Experimental Safe Gap (IEC 60079-1A) and the MIC - Minimum Ignition Current (IEC 60079-3) II Gas/Vapor (broken in IIA, IIB, IIC) III Dust (broken in IIA, IIB, IIC)
Temperature Classification	The equipment Maximum surface Temp. (T6 is the most stringent, as T6 covers T1-T5) T1 - 450°, T2 - 300°, T3 - 200°, T4 - 135°, T5 - 100°, T6 - 85°

EyeCGas Certification: Ex II 3G EX nL IIC T6

II 3 G EX nL IIC T6	
T6	Device surface temperature will not exceed 85° T6 marked equipment can be used in T5 – T1 (100° - 450°)
IIC	Protected for gases of Gas group IIC that includes groups IIA & IIB Typical gases for the different groups are: II A Acetic Acid, Acetone, Ammonia, Butane, Ethanol, Kerosene, Methane (Natural Gas), Methanol, Propane, Iso-propyl alcohol, Toulene, Xylene II B Ethylene, MEK, n-propyl alcohol, THF II C Acetylene, Hydrogen
nL	Type of protection code 'nL' energy limited
EX	Explosion-protected equipment, certified to European ATEX
G	Gas
3	Normal protection Category 2 (non-mining) for Zone 2 (normal protection)
II	Group II "other" environments (chemical industries, refineries, etc.)

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