Safety Ratings Explained

Our thanks to Streamlight for allowing us to reprint the following.

Any flashlight that will be used in a hazardous environment or confined space should be properly tested to meet or exceed all applicable safety standards for those locations. When selecting a flashlight, make sure it carries the proper approval ratings. Choosing the correct light for your application requires a thorough understanding of your working environment, and a realistic expectation of how a properly selected flashlight will operate in those conditions.

What Is a Hazardous Location?

Hazardous locations, or potentially explosive atmospheres, are areas where fire or explosion hazards may exist due to the presence of ignitable concentrations of flammable gases, liquids, vapors, dusts or ignitable fibers or flyings. These locations are classified or "grouped" according to the properties of the flammable materials that may be present and the likelihood of flammable concentrations.

The National Electric Code (NEC) defines hazardous locations classifications and protection techniques. The basic designation is by "class" and "division." There are three classes characterized by the type of material present. Class I locations are made hazardous by the presence of flammable gases, liquids or vapors. Class II locations can be described as hazardous because of the presence of combustible dusts. Class III locations contain easily ignitable fibers or flyings. "Division" refers to the likelihood that ignitable concentrations of flammable materials are present in a given area. 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. Division 2 locations are areas where ignitable concentrations are NOT likely to exist under normal operating conditions or where Class III materials are stored or handled.

Hazardous atmosphere 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, and coke
- **Group G:** Dusts not included in E and F including wood, plastics, flour, starch or grain dusts

As of July 2003, mandatory compliance to the European Union (EU) Directive 94/9/EC (ATEX) for all products intended for use in potentially explosive atmospheres within the EU member countries came into effect. Differing from the NEC, the ATEX Directive categorizes equipment into Group I (mining) and Group II (non-mining) applications according to the relevant protection methods used in their design. Similar to divisions, "zones" (0, 1 or 2) and gas groups; A (propane), B (ethylene) and C (Acetylene and Hydrogen), are used to define Group II hazardous area characteristics. For a particular zone and group a specific equipment category and protection concept are required.

NEC			**ATEX**	
Division	Occurance	Group	Category	Zone
1	Continuous	II	1	0
	Likely		2	1
2	Not likely		3	2

Further, all approved flashlights are temperature rated from T1 (less than or equal to 450°C) to T6 (less than or equal to 85°C) and the flashlight you select partly depends on the auto ignition temperature characteristics of the substances you may encounter and the ambient temperature (adjusted to 40°C) of the area.

1547 N. Trooper Road • P. O. Box 1117 • Worcester, PA 19490-1117 USA
Corporate Phone: 610-825-4990 • Sales: 800-832-4866 or 610-941-2400
Fax: 800-854-8665 or 610-828-5623 • Web: www.techni-tool.com

This document contains a simplified explanation of safety approvals and list of some of the substances and conditions for which the approval is valid. It is not intended as a substitute for a thorough understanding of the subject. Remember; you or the “Authority Having Jurisdiction” are responsible for the proper selection and application, in a properly defined area, of any hazardous locations approved product. The National Fire Protection Agency (NFPA), The International Electrotechnical Association (IEC) as well as most certifying agencies offering hazardous locations services are helpful references for defining hazardous locations.

Streamlight flashlights have been tested and approved by the world’s leading independent laboratories such as Factory Mutual Research Corporation, Underwriters Laboratories Inc. and Demko. It’s your assurance that the Streamlight flashlight you choose will be safe, reliable and tough enough for the job - characteristics that have distinguished our products for over a quarter century.

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