



Understanding “Intrinsically Safe Ratings”

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What are we learning today?

- Types of Ratings
 - Who Does the Certification
 - Classification
 - Divisions
 - Groups
-
- Ultimately: Will learn what type of safety lights should my facility utilize!

Two Basic Classes of “Safety Rated”

Intrinsically Safe

- Certified to be **incapable of generating enough heat, energy or spark to cause an explosion** in the hazardous environment that it's rated for (even if there's a fault in the product).

Explosion Proof

- Constructed with an outer housing of a sufficient enough structure such that **WHEN an explosion occurs within the devise, the design of the housing retains the explosion** long enough for the ignited materials to cool down to a temperature below the ignition point of the outside atmosphere.

Certification Marking File

Permissible Nightstick 5422 Flashlight/Floodlight



APPROVAL No. 20-A130001-0

TESTED FOR INTRINSIC SAFETY IN METHANE-AIR MIXTURES ONLY

WARNINGS: MSHA approved for use with three AA Duracell Type PC1500, Energizer Type EN91, and Energizer Type L91 batteries only. Replace the batteries in fresh air only and replace all batteries at the same time. Do not mix batteries from different manufacturers or of different types. Energizer Lithium (Type L91) batteries are to be replaced by a qualified technician only. The Model Nightstick 5422 must not be opened in areas where permissibility is required.



Intertek

ID 4003544
INTRINSICALLY SAFE
SECURITE INTRINSEQUE

CE 0359



CLASS I DIV 1 GRPS A-D T3	Ex ia I Ma
CLASS II & III DIV 1 GRPS E-G T135C	Ex ia IIC T3 Ga
CLASS I ZONE 0 AEx ia IIC T3 Ga	Intertek ITS 13 ATEX27837X
CLASS I ZONE 0 Ex ia IIC T3 Ga	IECEX ETL 13.0026X
⊕ I M 1 Ex ia I Ma	-20°C ≤ Tamb ≤ +40°C
⊕ II 1 G Ex ia IIC T3 Ga	1.5V/Cell AA Alkaline

Conforms to:

ANSI/UL STD 913, ANSI/UL
60079-0, ANSI/UL 60079-11
ANSI/ISA 60079-26

Certified to:

CAN/CSA STD C22.2 No 157
CAN/CSA STD C22.2 No 60079-0
CAN/CSA STD C22.2 No 60079-11
CSA STD C22.2 No 25

Certifying Agencies

Many Choices – Same Testing Process

- UL
- Intertek
- CSA
- FM
- etc.

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Agency that
certified the
product

Classification Across The Globe

Three Main Systems of Classifications

- North American
- ATEX
- IECEx

North American

- For North America, a classification system is used based upon the **National Electrical Code (NEC)** as published by the **National Fire Protection Association (NFPA)**.
- Approval of equipment for use within specific hazardous environments is done by federally and state recognized independent testing organizations such as Underwriters Laboratories, Intertek, etc. wherein the suitability of equipment is tested and verified according to NEC standards.

How to Read: North American Certification Marking File

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North American Classifications

- **North American Classifications are broken down into:**
 - Classes
 - Divisions
 - Groups
 - Temperature Codes

North American Classifications

- **Classes**

- **Class I:** Refers to **Flammable Gases and Vapors** (further divided into Groups A-D).
- **Class II:** Refers to **combustible and electrically conductive dusts** (further divided into Groups E-G).
- **Class III:** Refers to **fibers and flyings such as wood chips** (Class III is a singular designation and is not subdivided with Groups).

Why NOT LIQUIDS?

- Because most liquids are actually not volatile it is their VAPORS! i.e. Gasoline



North American Classifications

- **Divisions (*Distance and Threat)**

- **Division 1:** Refers to the presence of the hazardous material during normal operating conditions and indicates that a **hazardous condition is expected** to exist all or most of the time.
- **Division 2:** Refers to the presence of hazardous materials under abnormal conditions, such as during container failures, leaks or system failures. In this case, a **hazardous condition is NOT** expected to exist at all times and only under unusual conditions where hazardous materials would not normally be exposed to equipment.

North American Classifications

- **Groups – Gases/Vapors**

- **Group A:** Refers only to Acetylene, which has an extremely high explosion pressure.
- **Group B:** Refers to Hydrogen, and other gases with similar explosive properties.
- **Group C:** Refers to Ether, Ethyl, and Ethylene gases, and other gases of a similar potential.
- **Group D:** Refers to Gasoline, Acetone, Ammonia, Benzene, Butane, Methanol, Propane and other more commonly encountered compounds.

North American Classifications

- **Groups – Dusts**

- **Group E:** Refers to conductive combustible metal dusts such as Aluminum and Magnesium as well as alloys made from these materials.
- **Group F:** Refers to carbon type dusts such as Coal, Charcoal, Carbon Black, and similar materials.
- **Group G:** Refers to organic and synthetic dust compounds such as Flour Dust, Sugar Dust, Starch, Wood, Plastics, Composites, and dust from chemically derived materials.



Why Can't I have More Lumen



North American Classifications

- **Temperature Codes**

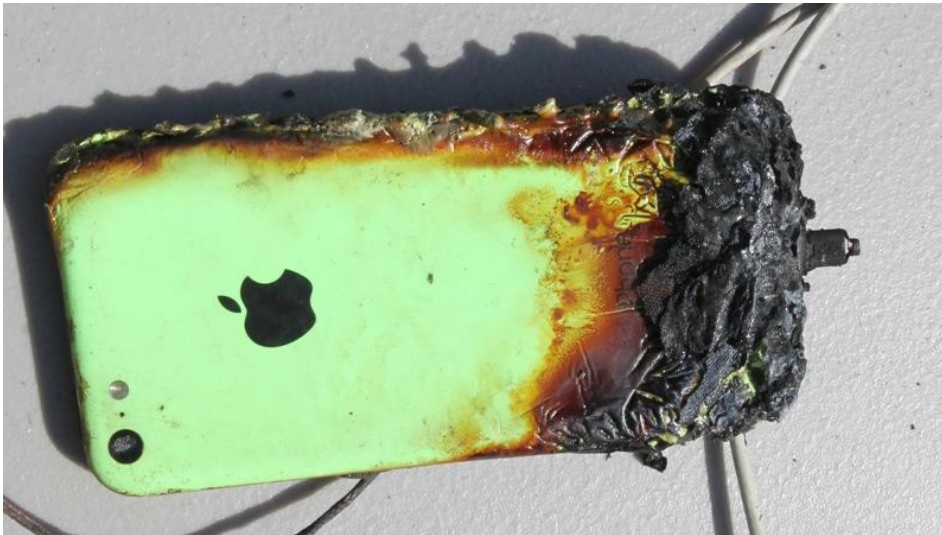
- Temperature ratings specify the **maximum surface operating temperature** of electrical equipment.
- Temperature Codes cover a range of temperatures ranging from highest to lowest, and relate to the suitability of equipment for use with various materials according to ignition temperature.



North American Classifications

- **Temperature Codes**

- As defined by the NEC, temperature codes are as follows:



Temperature Code	Max Temperature
T1	450°C
T2	300°C
T2A	280°C
T2B	260°C
T2C	230°C
T2D	210°C
T3	200°C
T3A	180°C
T3B	165°C
T3C	160°C
T4	135°C
T4A	120°C
T5	100°C
T6	85°C

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CLASS I DIV 1 GRPS A-D **T3**

Temperature
Code

CLASS II & III DIV 1 GRPS E-G T135C

Certified for use in a hazardous environment for:

- **Class I:** Flammable Gases and Vapors.
- **Div 1:** Hazardous condition is expected to exist all or most of the time.
- **Groups A-D:** Gases: Acetylene, Hydrogen, Ether, Ethyl, Ethylene Gases, Gasoline, Acetone, Ammonia, Benzene, Butane, Methanol, Propane and other gases with similar explosive properties.
- **Temperature Code T3:** Where the ignition temperature of the gas is greater than 200°C.

How to Read: North American Certification Marking File

CLASS I DIV 1 GRPS A-D T3

CLASS II & III DIV 1 GRPS E-G T135C

Class



Certified for use in a hazardous environment for:

- **Class II & III:** Combustible and electrically conductive dusts, fibers & flyings.

Final Questions?

**ALL current Nightstick Safety Rated Products are listed
Intrinsically Safe.**