



# NEC Hazardous Location Definitions

The following definitions are from the 2008 National Electrical Code. Consult the National Electrical Code NFPA 70 for up-to-date information.

## Class I

### Class I Division 1:

A Class I Division 1 location is a location

- 1) In which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors can exist under normal operating conditions, or
- 2) In which ignitable concentrations of such flammable gases, flammable liquid-produced vapors, or combustible liquids above their flash points may exist frequently because of repair or maintenance operations or because of leakage, or
- 3) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors and might also cause simultaneous failure of electrical equipment in such a way as to directly cause the electrical equipment to become a source of ignition.

### Class I Division 2:

A Class I Division 2 location is a location

- 1) In which volatile flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are handled, processed, or used, but in which the liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems or in case of abnormal operation of equipment, or
- 2) In which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are normally prevented by positive mechanical ventilation and which might become hazardous through failure or abnormal operation of the ventilating equipment, or
- 3) That is adjacent to a Class I Division 1 location, and to which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors above their flash points might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air and effective safeguards against ventilation failure are provided.

## Class II

### Class II Division 1:

A Class II Division 1 location is a location

- 1) In which combustible dust is in the air under normal operating conditions in quantities sufficient to produce explosive or ignitable mixtures, or
- 2) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electrical equipment, through operation or protection devices, or from other causes, or
- 3) In which Group E combustible dusts may be present in quantities sufficient to be hazardous.

### Class II Division 2:

A Class II Division 2 location is a location

- 1) In which combustible dust is not normally in the air in quantities sufficient to produce explosive or ignitable mixtures; or
- 2) Where combustible dust accumulations are present but are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus, but could as a result of infrequent malfunctioning of handling or processing equipment become suspended in the air; or

- 3) In which combustible dust accumulations on, in, or in the vicinity of the electrical equipment could be sufficient to interfere with the safe dissipation of heat from electrical equipment, or could be ignitable by abnormal operation or failure of electrical equipment.

## Class III

### Class III Division 1:

- 1) A Class III, Division 1 location is a location in which easily ignitable fibers/flyings are handled, manufactured, or used.

### Class III Division 2:

- 2) A Class III, Division 2 location is a location in which easily ignitable fibers/flyings are stored or handled other than in the process of manufacture.

**NOTE:** Luminaires manufactured by Paramount Industries, Inc., for Class III locations carry a Class II, Division 2, Group G label issued by Underwriters Laboratories.

## Group Classifications

For a complete list of materials in these group classifications, please see the following two pages.

### (1) Group A (Class I) Acetylene

### (2) Group B (Class I)

Flammable gas, flammable liquid-produced vapor, or combustible liquid-produced vapor mixed with air that may burn or explode, having either a maximum experimental safe gap (MESG) value less than or equal to 0.45 mm or a minimum igniting current ratio (MIC ratio) less than or equal to 0.40.

(Typical Class I group B material is hydrogen.)

### (3) Group C (Class I)

Flammable Gas, flammable liquid-produced vapor, or combustible liquid-produced vapor mixed with air that may burn or explode, having either a maximum experimental safe gap (MESG) value greater than 0.45 mm and less than or equal to 0.75 mm, or minimum igniting current ratio (MIC ratio) greater than 0.40 and less than or equal to 0.80. (Typical Class I group C material is ethylene.)

### (4) Group D (Class I)

Flammable gas, flammable liquid-produced vapor, or combustible liquid-produced vapor mixed with air that may burn or explode, having either a maximum experimental safe gap (MESG) value greater than 0.75 mm or a minimum igniting current ratio (MIC ratio) greater than 0.80. (Typical Class I group D material is propane.)

### Class II Group Classifications

### (1) Group E (Class II)

Atmospheres containing combustible metal dusts, including aluminum, magnesium, and their commercial alloys, or other combustible dusts whose particle size, abrasiveness, and conductivity present similar hazards in the use of electrical equipment.

### (2) Group F (Class II)

Atmospheres containing combustible carbonaceous dusts that have more than 8 percent total entrapped volatiles or that have been sensitized by other materials so that they present an explosion hazard. Coal, carbon black, charcoal, and coke dusts are examples of carbonaceous dusts.

### (3) Group G (Class II)

Atmospheres containing combustible dusts not included in Group E or F, including flour, grain, wood, plastic, and chemicals.

**Definitions taken from National Electrical Code 2008 Edition**



# Classification of Hazardous Locations

## SELECTED FLAMMABLE GASES AND VAPORS OF LIQUIDS CLASSIFIED AS CLASS I, GROUP A, B, C, & D:

### Group Classification and Autoignition Temperature (AIT) of Selected Flammable Gases and Vapors of Liquids having Flash Points below 100°F (37.8°C)

Material	Group
Acetaldehyde	C
Acetone	D
Acetonitrile	D
Acetylene	A
Acrolein (inhibited)	B
Acrylonitrile	D
Allyl Alcohol	C
Allyl Chloride	D
Ammonia	D
n-Amyl Acetate	D
sec-Amyl Acetate	D
Benzene	D
1,3-Butadiene	B
Butane	D
1-Butanol	D
2-Butanol	D
n-Butyl Acetate	D
iso-Butyl Acetate	D
sec-Butyl Acetate	D
Butylamine	D
Butylene	D
Butyl Mercaptan	C
n-Butylaldehyde	C
Carbon Monoxide	C
Chlorobenzene	D
Chloroprene	D
Crotonaldehyde	C
Cyclohexane	D
Cyclohexene	D
Cyclopropane	D
1,1-Dichloroethane	D
1,2-Dichloroethylene	D
1,3-Dichloropropene	D
Dicyclopentadiene	C
Diethyl Ether	C
Diethylamine	C
Di-isobutylene	D
Di-isopropylamine	C
Dimethylamine	C
1,4-Dioxane	C
Di-n-propylamine	C
Epichlorohydrin	C
Ethane	D
Ethanol	D
Ethyl Acetate	D
Ethyl Acrylate (inhibited)	D
Ethylamine	D
Ethyl Benzene	D
Ethyl Chloride	D
Ethylene	C
Ethylenediamine	D
Ethylene Dichloride	D
Ethylenimine	C
Ethylene Oxide	B
Ethyl Formate	D
Ethyl Mercaptan	C
n-Ethyl Morpholine	C
Formaldehyde (Gas)	B

Material	Group
Gasoline	D
Heptane	D
Heptene	D
Hexane	D
2-Hexanone	D
Hexenes	D
Hydrogen	B
Hydrogen Cyanide	C
Hydrogen Selenide	C
Hydrogen Sulfide	C
Isoatmyl Acetate	D
Isoamyl Alcohol	D
Isobutyl Acrylate	D
Isobutylaldehyde	C
Isoprene	D
Isopropyl Acetate	D
Isopropylamine	D
Isopropyl Ether	D
Isopropyl Glycidyl Ether	C
Liquefied Petroleum Gas	D
Manufactured Gas (more than 30% H <sub>2</sub> )	B
Mesityl Oxide	D
Methane	D
Methanol	D
Methyl Acetate	D
Methylacetylene	C
Methylacetylene-Propadiene (stabilized)	C
Methyl Acrylate	D
Methylamine	D
Methylcyclohexane	D
Methyl Ether	C
Methyl Ethyl Ketone	D
Methyl Formal	C
Methyl Formate	D
Methyl Isobutyl Ketone	D
Methyl Isocyanate	D
Methyl Mercaptan	C
Methyl Methacrylate	D
2-Methyl-1-Propanol	D
2-Methyl-2-Propanol	D
Monomethyl Hydrazine	C
Naphtha (Petroleum)	D
Nitroethane	C
Nitromethane	C
Nonane	D
Norene	D
Octane	D
Octene	D
Pentane	D
1-Pentanol	D
2-Pentanone	D
1-Pentene	D
Propane	D
1-Propanol	D
2-Propanol	D
Propionaldehyde	C
n-Propyl Acetate	D
Propylene	D
Propylene Dichloride	D
Propylene Oxide	B

Material	Group
n-Propyl Ether	C
Propyl Nitrate	B
Pyridine	D
Styrene	D
Tetrahydrofuran	C
Toluene	D
Triethylamine	C
Tripropylamine	D
Turpentine	D
Unsymmetrical Dimethyl Hydrazine (UDMH)	C
Valeraldehyde	C
Vinyl Acetate	D
Vinyl Chloride	D
Vinylidene Chloride	D
Xylenes	D

### Group Classification and Autoignition Temperature (AIT) of Vapors of Selected Liquids Having Flash Points 100°F (37.8°C) or Greater, but less than 140°F (60°C)

Material	Group
Acetic Acid	D
Acetic Anhydride	D
Acrylic Acid	D
Allyl Glycidyl Ether	B
t-Butyl Acetate	D
n-Butyl Acrylate (inhibited)	D
N-Butyl Glycidyl Ether	B
Cumene	D
Cyclohexanone	D
p-Cymene	D
Decene	D
Diethyl Benzene	D
Di-isobutyl Ketone	D
Dimethyl Formamide	D
Dipentene	D
Ethyl sec-Amyl Ketone	D
Ethyl Butanol	D
Ethyl Butyl Ketone	D
Ethylene Chlorohydrin	D
Ethylene Glycol Monoethyl Ether	C
Ethylene Glycol Monoethyl Ether Acetate	C
Ethylene Glycol Monomethyl Ether	D
2-Ethylhexaldehyde	D
Ethyl Silicate	D
Formic Acid (90%)	D
Fuel Oils	D
sec-Hexyl Acetate	D
Hydrazine	C
Iso-octyl Aldehyde	C
Kerosene	D
Methyl Amyl Alcohol	D
Methyl n-Amyl Ketone	D
o-Methylcyclohexanone	D
alpha-Methyl Styrene	D
Morpholine	C
Naphtha (Coal Tar)	D
1-Nitropropane	C

Material	Group
2-Nitropropane	C
Propionic Acid	D
Tetramethyl Lead	C

### Group Classification and Autoignition Temperature (AIT) of Vapors of Selected Liquids Having Flash Points 140°F (60°C) or Greater, but less than 200°F (93.3°C)

Material	Group
Acetone Cyanohydrin	D
Adiponitrile	D
Aniline	D
Benzyl Chloride	D
n-Butyl Formal	C
t-Butyl Toluene	D
n-Butyric Acid	D
Chloroacetaldehyde	C
1-Chloro-1-Nitropropane	C
Cresol	D
Cyclohexanol	D
n-Decaldehyde	C
n-Decanol	D
Diacetone Alcohol	D
o-Dichlorobenzene	D
1,1-Dichloro-1-Nitroethane	C
Diethylaminoethanol	C
Diethylene Glycol Monobutyl Ether	C
Diethylene Glycol Monomethyl Ether	C
N-N-Dimethyl Aniline	C
Dimethyl Sulfate	D
Dipropylene Glycol Methyl Ether	C
Dodecene	D
Ethylene Glycol Monobutyl Ether	C
Ethylene Glycol Monobutyl Ether Acetate	C
2-Ethyl Hexanol	D
2-Ethyl Hexyl Acrylate	D
2-Ethyl-3-Propyl Acrolein	C
Furfural	C
Furfural Alcohol	C
Hexanol	D
Isodecaldehyde	C
Iso-octyl Alcohol	D
Isophorone	D
Methylcyclohexanol	D
2-Methyl-5-Ethyl Pyridine	D
Monoethanolamine	D
Monoisopropanolamine	D
Monomethyl Aniline	C
Nitrobenzene	D
Nonyl Alcohol	D
n-Octyl Alcohol	D
Phenylhydrazine	D
Propiolactone	D
Propionic Anhydride	D
Tetrahydrophthalene	D
Tridecene	D
Triethylbenzene	D
Undecene	D
Vinyl Toluene	D





# Classification of Hazardous Locations

## SELECTED NONCONDUCTIVE DUSTS CLASSIFIED AS CLASS II, GROUP F and G:

**Ignition Sensitivity Equal to or Greater than 0.2; Explosion Severity Equal to or Greater than 0.5**

### AGRICULTURAL DUSTS

Alfalfa Meal  
Almond Shell  
Apricot Pit  
Cellulose  
Cherry Pit  
Cinnamon  
Citrus Peel  
Cocoa Bean Shell  
Cocoa, natural, 19% fat  
Coconut Shell  
Corn  
Corn cob Grit  
Corn Dextrine  
Cornstarch, commercial  
Cornstarch, modified  
Cork  
Cottonseed Meal  
Cube Root, South Amer.  
Flax Shive  
Garlic, dehydrated  
Guar Seed  
Gum, Arabic  
Gum, Karaya  
Gum, Manila (copal)  
Gum, Tragacanth  
Hemp Hurd  
Lycopodium  
Malt Barley  
Milk, Skimmed  
Pea Flour  
Peach Pit Shell  
Peanut Hull  
Peat, Sphagnum  
Pecan Nut Shell  
Pectin  
Potato Starch, Dextrinated  
Pyrethrum  
Rauwolfia Vomitoria Root  
Rice  
Rice Bran  
Rice Hull  
Safflower Meal  
Soy Flour  
Soy Protein  
Sucrose  
Sugar, Powdered  
Tung, Kernels, Oil-Free  
Walnut Shell, Black  
Wheat  
Wheat Flour  
Wheat Gluten, gum  
Wheat Starch  
Wheat Straw  
Woodbark, Ground  
Wood Flour  
Yeast, Torula

### CARBONACEOUS DUSTS

Asphalt, (Blown Petroleum Resin)  
Charcoal  
Coal, Kentucky Bituminous  
Coal, Pittsburgh Experimental  
Coal, Wyoming  
Gilsonite  
Lignite, California  
Pitch, Coal Tar  
Pitch, Petroleum  
Shale, Oil

### CHEMICALS

Acetoacetanilide  
Acetoacet-p-phenetidide  
Adipic Acid  
Anthranilic Acid  
Aryl-nitrosomethylamide  
Azelaic Acid  
2,2-Azo-bis-butyronitrile  
Benzoic Acid  
Benzotriazole  
Bisphenol-A  
Chloroacetoacetanilide  
Diallyl Phthalate  
Dicumyl Peroxide 40-60  
Dicyclopentadiene Dioxide  
Dihydroacetic Acid  
Dimethyl Isophthalate  
Dimethyl Terephthalate  
3,5 - Dinitrobenzoic Acid  
Dinitrotoluamide  
Diphenyl  
Ditertiary Butyl Paracresol  
Ethyl Hydroxyethyl Cellulose  
Fumaric Acid  
Hexamethylene Tetramine  
Hydroxyethyl Cellulose  
Isotac Anhydride  
Methionine  
Nitrosoamine  
Para-oxy-benzaldehyde  
Paraphenylene Diamine  
Parateritary Butyl Benzoic Acid  
Pentaerythritol  
Phenylbetanaphthylamine  
Phthalic Anhydride  
Phthalimide  
Salicylanilide  
Sorbic Acid  
Stearic Acid, Aluminum Salt  
Stearic Acid, Zinc Salt  
Sulfur  
Teraphthalic Acid

### DRUGS

2-Acetyl amino-5-nitrothiazole  
2-Amino-5-nitrothiazole  
Aspirin  
Gulasonic Acid, Diacetone  
Mannitol  
Nitropyridone  
1-Sorbose  
Vitamin B1, mononitrate  
Vitamin C (Ascorbic Acid)

### DYES, PIGMENTS, INTERMEDIATES

Beta-naphthalene-azo-Dimethylaniline  
Green Base Harmon Dye  
Red Dye Intermediate  
Violet 200 Dye

### PESTICIDES

Benzethonium Chloride  
Bis(2-Hydroxy-5-chlorophenyl) methane  
Crag No. 974  
Dieldrin (20%)  
2,6-Ditertiary-butyl-paracresol  
Dithane  
Ferbam  
Manganese Vancide  
Sevin  
a,a Trithiobis (N,N Dimethylthioformamide)

### THERMOPLASTIC RESINS & MOLDING COMPOUNDS

Acetal Resins  
Acetal, Linear (Polyformaldehyde)  
Acrylic Resins  
Acrylamide Polymer  
Acrylonitrile Polymer  
Acrylonitrile - Vinyl Pyridine Copolymer  
Acr  
ylonitrile-Vinyl Chloride-Vinyl-dene Chloride Copolymer (70-20-10)  
Methyl Methacrylate Polymer  
Methyl Methacrylate - Ethyl Acrylate Copolymer  
Methyl Methacrylate-Ethyl Acrylate-Styrene Copolymer  
Methyl Methacrylate-Styrene-Butadiene-Acrylonitrile Copolymer  
Methacrylic Acid Polymer  
Cellulosic Resins  
Cellulose Acetate  
Cellulose Triacetate  
Cellulose Acetate Butyrate  
Cellulose Propionate  
Ethyl Cellulose  
Methyl Cellulose  
Carboxymethyl Cellulose  
Hydroxyethyl Cellulose  
Chlorinated Polyether Resins  
Chlorinated Polyether Alcohol  
Nylon (Polyamide) Resins  
Nylon Polymer  
(Polyhexa-methylene Adipamide)  
Polycarbonate Resins  
Polycarbonate  
Polyethylene Resins  
Polyethylene, High Pressure Process  
Polyethylene, Low Pressure Process  
Polyethylene Wax  
Polymethylene Resins  
Carboxypolymethylene  
Polypropylene Resins  
Polypropylene (No Antioxidant)  
Rayon Resins  
Rayon (Viscose) Flock

Styrene Resins  
Polystyrene Molding Compd.  
Polystyrene Latex  
Styrene-Acrylonitrile (70-30)  
Styrene-Butadiene Latex (> 75% Styrene; Alum Coagulated)

Vinyl Resins  
Polyvinyl Acetate  
Polyvinyl Acetate/Alcohol  
Polyvinyl Butyral  
Vinyl Chloride - Acrylonitrile Co-polymer  
Polyvinyl Chloride - Dioctyl Phtha-late Mixture  
Vinyl Toluene - Acrylonitrile Buta-diene Copolymer

### THERMOSETTING RESINS & MOLDING COMPOUNDS

Allyl Resins  
Allyl Alcohol (Derivative CR-39)  
Amino Resins  
Urea Formaldehyde Molding Compound  
Urea Formaldehyde - Phenol Form-aldehyde Molding Compound (Wood Flour Filler)  
Epoxy Resins  
Epoxy  
Epoxy - Bisphenol A  
Phenol Furfural  
Phenolic Resins  
Phenol Formaldehyde  
Phenol Formaldehyde Molding Compound (Wood Flour Filler)  
Phenol Formaldehyde, Polyalky-lene - Polyamine Modified  
Polyester Resins  
Polyethylene Terephthalate  
Styrene Modified Polyester - Glass Fiber Mixture  
Polyurethane Resins  
Polyurethane Foam, No Fire Retardant  
Polyurethane Foam, Fire Retardant

### SPECIAL RESINS AND MOLDING COMPOUNDS

Alkyl Ketone Dimer Sizing Compound  
Cashew Oil, Phenolic, Hard  
Chlorinated Phenol  
Coumarone-Indene, Hard  
Ethylene Oxide Polymer  
Ethylene-Maleic Anhydride Copolymer  
Lignin, Hydrolyzed, Wood-Type, Fines  
Pettrin Acrylate Monomer  
Petroleum Resin (Blown Asphalt)  
Rosin, DK  
Rubber, Crude, Hard  
Rubber, Synthetic, Hard (33% S)  
Shellac  
Sodium Resinate  
Styrene - Maleic Anhydride Copolymer