

**Classifications, flammable and combustible liquids.** A flammable liquid is one having a flash point below 100°F (37.8°C) and having a vapor pressure not exceeding 40 pounds per square inch absolute at 100°F. A combustible liquid is one having a flash point at or above 100°F (37.8°C). For classifications and details, see Chart 1.

**Vapor.** In any liquid there is a constant movement of molecules. As temperature increases, molecules speed up, some acquiring enough energy to escape from the liquid surface as a vapor.

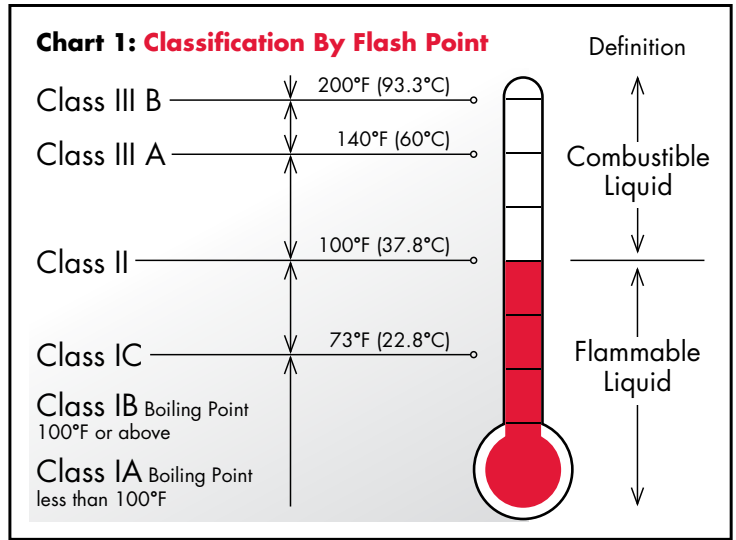
When vapor escapes from a flammable liquid into the air, a flammable or explosive situation can occur, depending upon the air/vapor mixture.

**Flash point** is the lowest temperature in any liquid at which it gives off vapors sufficient to form an ignitable mixture with the air near the surface of the liquid or within the vessel used. See Chart 2 for examples of typical flammable/combustible liquids.

**Ignition temperature** is the minimum temperature to which flammable liquid vapor in air must be heated in order to initiate or cause self-sustained combustion independent of the original heat source. An extremely small area and duration of temperature contact is all that's needed to set the flammable vapor aflame. A static spark with a duration of a few thousandths of a second, contacting a few molecules of the vapor/air mixture is enough to raise the temperature above the ignition point.

**Flammable (explosive) range** of flammable liquids is the percentage range of liquid vapor in air, by volume, within which ignition can occur, see Chart 3. Gasoline, for example, has an explosive range between 1.4% and 7.6%. This indicates that any concentration of gasoline vapor in air between these percentage limits will ignite at any temperature at or above its flash point when an ignition source provides a contact temperature in the range of 500° to 800°F (260 to 426.6°C) (ignition temperature).

Explosive range figures are based on normal atmospheric pressures and temperatures. There may be considerable variation in the explosive range where other pressures and temperatures are present. Increases in temperature will widen the explosive range. Pressure differences depend on the flammable liquid involved; but substantial pressure decreases will generally narrow the explosive range.



**Chart 2: Typical Flammable/Combustible Liquids**

Classification	Chemical	Flash Point	Boiling Point
Class IIIB (at or above 200°F)	Lubricating Oil, Turbine, Hydraulic Brake/Trans Fluid	400°F (204°C) 250-450°F (121-232°C)	
Class IIIA (at or above 140°F)	Heavy Fuel Oil No. 6 Aniline	150-270°F (66-132°C) 158°F (70°C)	364°F (184°C)
Class II (at or above 100°F)	Mineral Spirits Kerosene (Fuel Oil No.1)	104°F (40°C) 100-162°F (38-72°C)	300°F (149°C) 304-574°F (151-304°C)
Class IC (at or above 73°F)	Xylene Turpentine	63°F (17°C) 95°F (35°C)	292°F (144°C) 300°F (149°C)
Class IB (below 73°F) (boils at or above 100°F)	Methyl ethyl ketone Acetone Gasoline	16°F (-9°C) -4°F (-20°C) -45 - -36°F (-43 - -38°C)	176°F (80°C) 133°F (56°C) 100-400°F (38-204°C)
Class IA (below 73°F) (boils below 100°F)	Pentane Ethyl Ether	<40°F (<40°C) -49°F (-45°C)	97°F (36°C) 95°F (35°C)

