

FLAMMABLE AND COMBUSTIBLE LIQUIDS

and it is preferable that fueling be done out of doors

Only equipment from reliable manufacturers made according to the NFPA *Flammable & Combustible Liquids Code* should be used, and the operator should understand and explicitly follow the instructions of the manufacturer. The equipment should never be used close to combustible materials. Other means of performing the operation are preferable.

Liquefied petroleum gases

Liquefied petroleum gases include any material which is composed predominantly of any of these hydrocarbons, or mixtures of them: propane, propylene, butane (normal butane or isobutane), and butylenes. The gases liquefy under moderate pressure, but convert into a gaseous state upon relief of the pressure. LP-gas in the gaseous state presents a hazard comparable to that of any flammable natural or manufactured gas, except that since it is heavier than air, the matter of adequate ventilation requires

added attention.

Liquefied petroleum gases are used as fuel gases, as raw materials in chemical processes, for example, in the making of hydrogen, and to form special atmospheres in heat-treating furnaces. It is important that employees understand the properties of these gases and that they be thoroughly trained in safe practices for handling, distribution, and operation.

Systems should be designed and installed by experienced, reliable concerns which are thoroughly familiar with the hazards, with state and local codes, and with fire organization and insurance company recommendations.^o

^oSee National Fire Protection Association, Associated Factory Mutual Fire Insurance Companies, LP-Gas Association, and Factory Insurance Association references on this subject in "References."

References

- American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati: *Threshold Limit Values* (published annually)
- American Petroleum Institute, 1271 Avenue of the Americas, New York City
 - Cleaning Petroleum Storage Tanks* Accident Prevention Manuals Nos. 1A and 1B
 - Safe Practices in Bulk Plant Operations* Accident Prevention Manual No. 8
 - Safe Transportation of Petroleum Products by Tank Truck* Accident Prev. Manual No. 11
 - Specifications for Welded Oil Storage Tanks* Standard No. 12C
- American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa.
 - Standard Method of Test for Vapor Pressure of Petroleum Products* Standard D323-58
 - Standards, Part 5 "Fuels, Petroleum, Aromatic Hydrocarbons, Engine Antifreezes"*
- American Standards Association, 10 East 40th St., New York City
 - Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment* 253.1
 - Standards for Petroleum Products* 211 Series
- American Welding Society, 33 West 39th St., New York City
 - Safe Practices for Welding and Cutting Containers That Have Held Combustibles*
- Associated Factory Mutual Fire Insurance, Factory Mutual Engineering Division, 1151 Boston-Providence Turnpike, Norwood, Mass.
 - Approved Equipment for Industrial Fire Protection Manual*
 - Flammable Liquids Drum Storage* Loss Prevention Bulletin 13 22
 - Flammable Liquid Safeguards* Loss Prevention Bulletin 13 20
 - Liquefied Petroleum Gas* Loss Prevention Bulletin 11 45
 - Metal Cleaning* Loss Prevention Bulletin 11 60
 - Piping Systems for Flammable Liquids* Loss Prevention Bulletin 13 21
 - Properties of Flammable Liquids, Gas and Solids* Loss Prevention Bulletin 36 10
 - Storage Tanks for Flammable Liquids* Loss Prevention Bulletin 13 23
- Association of American Railroads, Bureau of Explosives, 63 Vesey St., New York City
 - Handling Collisions and Derailment Involving Explosives, Gasoline and Other Dangerous Articles* Pamphlet No. 22
 - Recommended Practice for the Prevention of Electric Sparks That May Cause Fires in Tanks or Tank Cars Containing Flammable Liquids or Flammable Compressed Gases, Due to Proximity of Wire Lines* Bureau of Explosives Circular No. 17-E
 - Signal Section Manual of Recommended Practice*