

CHECKLIST FLAMMABLE AND COMBUSTIBLE LIQUIDS

AFOSH STD 91-501, Chapter 22

This is not an all-inclusive checklist. It simply highlights some critical items in this standard. Other requirements exist in the standard that are not included in the checklist. Where appropriate, MAJCOMs, DRUs, FOAs, local safety staffs, and supervisors will add to this checklist to include command or mission and (or) work-unique requirements or situations.

General Requirements:

- 1.** Have all personnel handling, storing or using flammable or combustible liquids received the appropriate levels of training commensurate with the degree of hazard? (Reference **22.4.1.2.**)

- 2.** Have all personnel been provided with the appropriate PPE, been trained on its use, care, maintenance and reporting procedures on unserviceable PPE. (Reference **22.4.1.2.**)

Facility Pre-Fire Plans:

- 3.** Has the Fire Department developed pre-fire plans for the flammable and combustible liquids area? (Reference **22.4.2.**)

General Requirements -- Containers:

- 4.** Have appropriate containers and portable tanks been procured to meet handling, storage, and dispensing requirements? (Reference **22.4.3.**)

- 5.** Is the capacity of flammable or combustible liquid containers according to table **22.1**? (Reference **22.4.3.1.**)

- 6.** Are flammable and combustible liquids prohibited from office occupancies except those required for maintenance and operation of building and operating equipment? (Reference **22.4.3.3.**)

Storage Cabinets:

- 7.** Are no more than 120 gallons of Class I, Class II, and Class IIIA liquids being stored in a storage cabinet? (Reference **22.4.4.**)

- 8.** Are no more than three cabinets (120 gallons) located in a single fire area? (Reference **22.4.4.**)

- 9.** If additional cabinets are located in an industrial area are they separated from the others by at least 100 feet? (Reference **22.4.4.**)

10. Are cabinets conspicuously labeled “Flammable - Keep Fire Away”? (Reference **22.4.4.1.**)

11. Are storage cabinets in use designed and constructed to meet the requirements of NFPA 251? (Reference **22.4.4.3.1.**)

12. Are the bottom, top, and sides of metal cabinets at least No. 18 gauge sheet steel and double walled with 1-1/2 inch air space? (Reference **22.4.4.3.2.**)

13. Does the door have a three-point lock and is the doorsill raised at least 2 inches above the bottom of the cabinet? (Reference **22.4.4.3.2.**)

14. Do existing wood cabinets meet the requirements of **22.4.4.3.1**?

Inside Storage Rooms:

15. Are inside storage rooms constructed to meet the fire-resistive test specifications of NFPA 251? (Reference **22.4.5.1.**)

16. Do openings to other rooms or buildings have noncombustible liquid-tight raised sills or ramps at least 4 inches in height or, as an alternate; is the floor in the storage area at least 4 inches lower than the surrounding floors? (Reference **22.4.5.1.**)

17. Are rooms liquid-tight where walls join the floor? (Reference **22.4.5.1.**)

18. Is the wood used for shelves, racks, dunnage, scuffboards and floor overlays at least 1 inch nominal thickness? (Reference **22.4.5.1.**)

19. Are self-closing fire doors meeting the requirements of NFPA 80 used? (Reference **22.4.5.1.**)

20. Are Class I liquids prohibited from being stored or handled within building having a basement or pit unless ventilation is provided? (Reference **22.4.5.2.**)

Electrical:

21. Does electrical wiring and equipment located within flammable or combustible storage rooms meet the requirements of NFPA 70 for hazardous location as determined by the class of materials stored? (Reference **22.4.6.**)

22. Are containers used for dispensing or transferring of liquids electrically interconnected (bonded) to prevent static discharges? (Reference **22.4.6.2.**)

Ventilation:

- 23.** Is every inside storage room provided with a gravity or mechanical exhaust ventilation system? (Reference **22.4.7.**)
- 24.** Are areas in which flammable or combustible liquids are transferred simultaneously of quantities greater than 5 gallons from one container to another separated from the other operation by 25 feet or by fire-resistant construction of at least 1 hour? (Reference **22.4.7.**)
- 25.** Is drainage provided in locations where dispensing or transfers are accomplished? (Reference **22.4.7.**)
- 26.** Is exhaust air taken from a point near a wall and within 1 foot of the floor on one side of the room with one or more make-up air inlets on the opposite side of the room within 1 foot of the floor? (Reference **22.4.7.1.**)
- 27.** Is the location of both the make-up and exhaust air openings arranged to provide, as practical, air movement across all portions of the floor, to prevent the accumulation of vapors? (Reference **22.4.7.1.**)
- 28.** Does exhaust air from the room go directly to the exterior of the building; and if ducts are used, are they not used for any other purpose? (Reference **22.4.7.1.**)
- 29.** Is duct construction and air movement according to AFOSH Standard 48-2? (Reference **22.4.7.4.**)

Additional Requirements for Inside Rooms:

- 30.** Are storage and fire resistive rating in compliance with **Table 22.2?** (Reference **22.4.8.**)
- 31.** Are 3-foot aisles maintained in all inside storage areas? (Reference **22.4.8.**)
- 32.** Are containers over 30-gallon capacity not stacked one upon the other? (Reference **22.4.8.**)
- 33.** Is there at least one 40-B portable fire extinguisher located outside of, but not more than 10 feet from the door opening into an inside liquid storage area? (Reference **22.4.8.2.**)
- 34.** Is there at least one portable fire extinguisher rated not less than 40-BC located within 30 feet of any Class I or Class II liquid storage area outside of a storage room but inside a building? (Reference **22.4.8.2.**)

Storage Inside Buildings:

- 35.** Does inside storage comply with the following basic conditions where approved storage cabinets or rooms are not provided? (Reference **22.4.9.**)
- 36.** The storage of any flammable or combustible liquids does not physically obstruct a means of egress from the building or area? (Reference **22.4.9.1.**)
- 37.** Containers of flammable or combustible liquids remain tightly sealed except when transferred, poured, or applied? Only that portion in the storage container required to accomplish a particular job is removed? (Reference **22.4.9.2.**)
- 38.** Leaking containers are removed to a safe location outside the building and the contents transferred to an undamaged container? (Reference **22.4.9.3.**)
- 39.** If a flammable or combustible storage building is used, it is a one-story building devoted principally to the handling and storing of flammable and combustible liquids? Does the building have a 2-hour fire rated exterior wall having no openings within 10 feet of such storage? (Reference **22.4.9.4.**)
- 40.** Are flammable paints, oils, and varnishes in 1 to 5 gallon containers, used for building maintenance purposes, only stored temporarily in closed containers outside approved storage cabinets or rooms if kept at the job site for less than 10 calendar days? (Reference **22.4.9.5.**)
- 41.** Water reactive materials are not stored in the same room with flammable and combustible liquids? (Reference **22.4.9.7.**)
- 42.** Do base supply warehouses, Base Exchange storage rooms, and Commissary storage areas comply with **Table 22.3**? (Reference **22.4.9.8.**)
- 43.** Are buildings or portions of buildings used for the storage flammable or combustibles storage isolated by standard fire walls approved for the type and quantity of liquids being stored? (Reference **22.4.9.8.**)
- 44.** If the storage building is located 50 feet or less from a building or adjoining property line that may be built upon, is the wall facing the building or property line a blank wall having a fire-resistance rating of at least 2 hours? (Reference **22.4.9.9.**)
- 45.** Does the arrangement of storage within a building comply with **Table 22.3** and **Table 22.4**? (Reference **22.4.9.10.**)
- 46.** Are stacked containers of flammable liquids separated by pallets or dunnage, where necessary, to provide stability and to prevent excessive stress on container walls? (Reference **22.4.9.11.**)
- 47.** Are portable tanks that are stored over one tier high designed to nest securely without dunnage? (Reference **22.4.9.12.**)

48. Is adequate material handling equipment available to handle tanks safely at upper tier levels? (Reference **22.4.9.12.**)

49. Is no stack closer than 3 feet to the nearest beam, chord, girder, or other obstruction and at least 3 feet below sprinkler deflector or discharge orifices of water spray or other installed fire protection system? (Reference **22.4.9.13.**)

50. Are aisles at least 3 feet wide provided for clear access to doors, windows, or fire department standpipe connections? (Reference **22.4.9.14.**)

51. Do containers bear clearly legible labels to identify contents and indicate hazards? (Reference **22.4.9.15.**)

Outside Storage: Refer to tables **22.5** and **22.6** for maximum quantities and separation distance criteria for outside storage of flammable and combustible liquids. (Reference **22.4.10.**)

52. If 1,100 total gallons (maximum) of flammable or combustible liquids are located adjacent to another building, is:

a. A minimum distance of 10 feet between buildings and the nearest flammable or combustible liquid maintained? (Reference **22.4.10.1.1.**)

b. The storage area graded according to paragraph **22.4.10.3**?

c. The storage area protected against tampering or unauthorized entry when necessary? (Reference **22.4.10.1.3.**)

d. The storage area kept free of weeds and other combustible material not necessary to storage? (Reference **22.4.10.1.3.**)

53. Where the quantity of stored material exceeds 1,100 gallons do the separation distances comply with **Table 22.6**? (Reference **22.4.10.2.**)

54. When curbs are used, are provisions made for draining accumulations of ground or rainwater or spills of flammable or combustible liquids? (Reference **22.4.10.3.**)

55. Do drains terminate at a safe location and are they directly accessible to the fire department? (Reference **22.4.10.3.**)

56. Is at least one portable fire extinguisher rated not less than 20-B located not less than 10 feet, nor more than 25 feet, travel distance of any Class I or Class II liquid storage area outside of a storage room? (Reference **22.4.10.4.**)

57. Are installed fire suppression systems of an approved type? (Reference **22.4.10.5.**)

58. Are containers and portable tanks used for Class I liquids grounded and bonded during liquid transfer? (Reference **22.4.10.6.**)

59. Are containers having flammable or combustible liquids protected from external heat sources? (Reference **22.4.10.7.**)

60. Are open flame devices or smoking prohibited within 50 feet of the flammable or combustible storage area? (Reference **22.4.10.7.**)

61. Are welding, cutting, and brazing operations accomplished according to AFOSH Standard 91-5? (Reference **22.4.10.8.**)

Handling Flammable and Combustible Liquids:

62. Are flammable or combustible liquids drawn from or transferred into vessels, containers, or portable tanks within a building only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container or portable tank by gravity through an approved closing valve? (Reference **22.4.11.**)

63. Transferring by means of air pressure on the container or portable tanks is prohibited. (Reference **22.4.11.**)

64. Are approved safety cans used for transporting and dispensing flammable liquids in quantities of 5 gallons or less? (Reference **22.4.11.1.**)

65. Are flammable liquids kept in covered containers when not actually in use? (Reference **22.4.11.2.**)

66. Are plans made and means available to promptly clean up or remove spills? (Reference **22.4.11.3.**)

67. Are Class I liquids used only where there are no open flames or other sources of ignition within the area or possible path of vapor travel? (Reference **22.4.11.4.**)

68. Are safety cans or portable containers of flammable liquids, having a flashpoint at or below 80 degrees F, painted red with some additional clearly visible identification in a yellow band around the can or the name of the contents conspicuously stenciled or painted on the can in yellow? (Excluded are shipping containers.) (Reference **22.4.11.5.**)

Incidental Storage of Flammable Liquids in Industrial Areas:

69. Is incidental storage of flammable liquids only authorized in industrial areas if: (Reference **22.4.12.1.**)

70. Storage cabinets are stenciled “Flammable - Keep Fire Away” (Metal wall lockers meet this requirement)? (Reference **22.4.12.2.**)

71. Storage is limited to 1 gallon of Class I or 10 gallons of class II and Class III liquid, not exceeding 10 gallons total per cabinet, in closed containers? (Reference **22.4.12.3.**)

72. Storage is limited to a 5-day supply of flammables in metal cabinet, and in closed containers not to exceed limits specified in paragraphs **22.4.8** and **22.4.10**? (Reference **22.4.12.3.**)

73. Each work center is limited to only one cabinet? (Reference **22.4.12.3.**)

Laboratories:

74. Has a list of working supplies and operating instructions on handling of flammable and combustible liquids been developed? (Reference **22.5.1.2.**)

75. Does the aggregate total outside of storage cabinets not exceed 10 gallons of flammable or combustible liquids? (Reference **22.5.1.2.**)

76. If the total quantity of flammable or combustible liquids exceeds 10 gallons, are they stored in an approved storage cabinet or storage room? (Reference **22.5.1.2.**)

77. Are flammable or combustible liquids prohibited from being stored or transferred from one vessel to another in any exit way, corridor, or passageway leading to an exit? (Reference **22.5.1.2.**)

78. Is a minimum of one approved storage room available within any building housing a laboratory that regularly maintains a reserve storage capacity in excess of 300 gallons? (Reference **22.5.1.2.**)

79. Are flammable and combustible liquids prohibited from receiving, storage areas, or storage facilities unless adequately approved design, construction, and fire protection requirements are suitable for the hazard and quantity involved? (Reference **22.5.1.3.**)

80. Are approved plastic, metal, or glass container used when appropriate? (Reference **22.5.1.3.**)

81. Are containers used to draw from an original container marked to identify its contents? (Reference **22.5.1.3.**)

82. Are refrigerators or cooling equipment used to store flammable liquids of the approved type for the material being stored? (Reference **22.5.1.3.**)

83. Are refrigerators or cooling equipment labeled or stenciled “Approved for Flammable Liquid Storage”? (Reference **22.5.1.3.**)

84. Are flammable and combustibles kept away from open flames, hot surfaces, steam pipes, or other heat sources? (Reference **22.5.1.4.**)

85. Do all laboratories have fire protection appropriate for their fire hazard classification? (Reference **22.5.2.**)

Military Exchanges, Commissaries, and Associated Retail Stores:

86. In rooms or other areas accessible to the public, is storage limited to quantities needed for display and normal merchandising purposes not to exceed 2 gallons per square foot of gross floor area? (Reference **22.6.**)

87. Is the gross floor area used for computing the maximum quantity permitted that portion of the store actually being used for merchandising flammable and combustible liquids? (Reference **22.6.**)

88. Are Class IA flammables prohibited in basement areas and limited to 1 gallon per square foot on any other floor? (Reference **22.6.1.**)

89. Are Class IB, IC, and II liquids in areas not protected limited to 1 gallon per square foot of gross floor area? (Reference **22.6.1.**)

90. On floors above ground level, is storage or display of Class I and Class II liquids limited to 60 gallons in unprotected occupancies and 120 gallons in protected occupancies? (Reference **22.6.2.**)

91. Are containers in a display not stacked more than 3 feet or two containers high, whichever is greater? (Reference **22.6.3.**)

92. Is shelving capable of supporting the load and are containers on the shelves arranged so that are not easily knocked off the shelves to the floor? (Reference **22.6.4.**)

93. Are leaking containers removed to a safe location and the contents transferred to an undamaged container, appropriately labeled, and the leaking container disposed of in a safe manner? (Reference **22.6.5.**)

94. Is storage of flammable and combustibles according to **Table 22.3**? (Reference **22.6.6.**)

95. If the storage building is located less than 50 feet from another building or property line that may be built upon, is the wall facing the building or property line blank and have a fire-resistive rating of at least 2 hours? (Reference **22.6.7.**)

96. Is the storage of flammable and combustibles in compliance with **Table 22.3**? (Reference **22.6.8.**)

97. Are stacked containers separated by pallets or dunnage where necessary, to provide stability and to prevent excessive stress on the containers? (Reference **22.6.9.**)

98. Are stacks no closer than 3 feet from the nearest beam, chord, girder, or other construction object, and no closer than 3 feet below sprinkler deflector or discharge orifices of water spray or other installed fire protection system? (Reference **22.6.10.**)

99. Are 3-foot aisles provided for clear access to doors, windows, or fire department connections? (Reference **22.6.11.**)

100. Do all containers bear clearly legible labels to identify contents and indicate hazards? (Reference **22.6.12.**)

Small Gasoline Engine Powered Equipment:

101. Are fueling operations conducted in outside areas free from ignition sources? (Reference **22.7.1.**)

102. Are fuel tanks not filled or drained inside buildings or other facilities where vapors can accumulate? (Reference **22.7.1.**)

103. Are refueling operations conducted after engines have had a minimum of 5 minutes of cooling? (Reference **22.7.2.**)

104. Are refueling operations accomplished using a safety can with pouring spout or funnel? (Reference **22.7.3.**)

105. Are fuel spills appropriately cleaned up before attempting to start any engine? (Reference **22.7.3.**)

106. Is equipment serviced after use? (Reference **22.7.4.**)

107. Prior to extended off-season storage, is the equipment thoroughly cleaned and the fuel tank drained? (Reference **22.7.4.2.**)

108. Are storage facilities protected against tampering or unauthorized entry and the area around the facility free of weeds, debris, and other combustibles? (Reference **22.7.4.3.**)

109. Are all storage areas or facilities inspected frequently by supervision or building custodian? (Reference **22.7.4.4.**)

110. Is gasoline powered equipment not stored in military housing living areas including basements, unless the storage room has a wall to separate it from the living by an unpierced 1-hour rated fire-resistant partition and ceiling? (Reference **22.7.5.**)

111. Are storage areas in military family housing inspected and approved by the installation fire authorities prior to use? (Reference **22.7.5.**)

112. Do custodians of dormitories, multiple living quarters, assembly, institutional, military exchanges, commissary, and warehouse facilities store small gasoline equipment in an enclosed 1-hour fire-rated storage room? (Reference **22.7.6.**)

113. Are boiler rooms, equipment rooms and other utility rooms not utilized as storage areas? (Reference **22.7.6.**)

114. Are only cleaned and drained small gasoline powered equipment stored during the off-season in inspection and testing facilities, munitions maintenance facilities, fire stations, shops and maintenance facilities? Are there restrictions on storing this equipment in hangars, nose docks, corrosion control, fuel cell repair, or missile assembly and repair facilities? (Reference **22.7.7.**)

115. When stored in approved facilities is the equipment isolated from potential ignition sources? (Reference **22.7.7.**)

116. Is storage limited to 10 gallons of Class I and II liquids and 20 gallons or less of Class III liquids in theaters, conference facilities, open messes, clubs, recreation facilities, dormitories, temporary quarters, multiple unit housing, buildings containing more than three dwelling units, and hotels? (Reference **22.7.8.**)

117. Is storage of Class I, II, III liquids limited to 10 gallons per resident unit in single residences and those dwellings containing not more than three dwelling units with detached garages? (Reference **22.7.9.**)