GARAGES

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1.0 SCOPE

There are two general types of garages covered by this data sheet. *Storage garages* are buildings, structures, or portions of buildings used for storage of motor vehicles. They may include public parking facilities, private facilities, or areas used for storage of automobiles, trucks, buses, tractors, etc. Servicing of vehicles is not done except for refueling facilities that may be present. Parking on a roof or open lot is not covered by this data sheet.

Repair garages are areas where motor vehicles are serviced or repaired. They may be public garages where work is done on vehicles that are the property of others. They may also be areas, usually within a larger industrial facility, where maintenance and repair work is done on vehicles that belong to the facility.

1.1 Changes

May 2010. Replaced all references to Data Sheet 2-8N, *Installation of Sprinkler Systems (NFPA)*, with references to Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*.

2.0 LOSS PREVENTION RECOMMENDATIONS

2.1 Parking Garages

2.1.1 Protection

2.1.1.1 Automatic sprinklers installed in accordance with Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers,* should be installed throughout all parking structures. Sprinklers may be omitted in open-air (at least two walls and 25% of the total wall area open) parking structures that conform to the following:

1. Used for parking of automobiles or other vehicles not significantly larger than automobiles.

2. Vehicles are parked with normal access aisles so that any vehicle may be removed without moving other vehicles.

3. Structure is noncombustible, not exceeding 75 ft (22.5 m) in height, or fire resistant, not exceeding 100 ft (30 m) in height, and in either case the distance from any point to an open wall does not exceed 200 ft (60 m).

4. Standpipes with 2 ½ in. (65 mm) hose connections are provided in any structure exceeding 50 ft (15 m) in height.

5. Water supplies of at least 750 gal/min (2850 L/min) are available for hydrants or standpipes.

6. Adequate fire department protection is provided.

7. Automatic sprinklers are provided in service, repair, fuel dispensing, and parts storage areas.

2.1.1.2 Water supplies should be in accordance with Data Sheet 3-26, *Fire Protection Water Demand for Nonstorage Sprinklered Properties.*

2.1.1.3 Small hose stations or portable fire extinguishers should be provided throughout all parking structures.

2.1.2 Construction and Location

Unsprinklered parking structures should be cut off from other important areas by fire resistant construction of at least one hour. If an unsprinklered parking structure has other important areas on floors above, supporting members should have at least two-hour fire resistance.

2.1.3 Ignition Source Control

Open flames or other ignition sources on heating or other equipment should be at least 18 in. (0.45 m) above the floor.

2.1.4 Utilities

All enclosed, basement, and underground parking structures should have mechanical ventilation from near floor level of at least six air changes per hour.

2.1.5 Occupancy

2.1.5.1 Dispensing of fuel should be safeguarded as follows:

1. Gasoline for refueling should not be transported within the building. If emergency refueling is necessary, approved safety cans of not more than 5-gal (18.7-litre) capacity should be used.

2. Bulk storage of fuel should be in buried tanks in accordance with Data Sheet 7-88, *Storage Tanks for Flammable Liquids.*

3. Construction, including interior finish in the dispensing area, should be noncombustible.

4. The dispensing area should be located at street level, with no dispenser located more than 20 ft (6 m) from the entrance or exit of the building.

5. Electrical equipment in dispensing areas should be in accordance with Data Sheet 5-1, *Electrical Equipment in Hazardous Locations.* Other ignition sources should be prohibited from the area designated as Class I, Division 1 or 2 in Data Sheet 5-1, *Electrical Equipment in Hazardous Locations.*

6. Flammable liquid piping and pumping systems should be in accordance with Data Sheet 7-32, *Flammable Liquid Operations.*

7. The floor in the dispensing area should be liquid-tight and drained, with curbs, ramps, or grated trenches surrounding the dispensing area.

8. The dispensing area should be protected with automatic sprinklers installed in accordance with Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers,* with water supplies in accordance with Data Sheet 3-26, *Fire Protection Water Demand for Nonstorage Sprinklered Properties.*

2.2 Repair Garages

2.2.1 Protection

Automatic sprinklers in accordance with Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers,* and water supplies in accordance with Data Sheet 3-26, *Fire Protection Water Demand for Nonstorage Sprinklered Properties,* should be provided throughout all repair garage areas.

2.2.2 Ignition Source Control

Open flames or other ignition sources on heating or other equipment should be at least 18 in. (0.45 m) above the floor.

2.2.3 Occupancy

2.2.3.1 Spray painting and metal cleaning should be in accordance with Data Sheets 7-27, *Spray Application of Flammable and Combustible Materials* and 7-97, *Metal Cleaning.*

2.2.3.2 Vehicles scheduled for repair should be prepared for safely undergoing servicing before being brought into repair garages. This includes the following:

1. Where fuel tanks or fuel systems below the level of the fuel tank are to be worked on, fuel tanks should be drained and purged.

2. Flammable liquids should be removed from cargo tanks of tank trucks. If the tank is to be worked on, it should be purged.

3. Combustible storage should be removed from truck storage compartments.

2.2.3.3 Flammable solvents should not be used for cleaning the structural interior of the repair garage.

2.2.3.4 Small hose as well as fire extinguishers suitable for flammable liquids should be provided.

2.2.4 Human Element

Cutting and welding should be limited to a designated safe area in the repair shop. Any work done outside of this area should be done on a written permit basis with suitable precautions taken.

3.0 SUPPORT FOR RECOMMENDATIONS

3.1 Parking Garages

Public parking garages may include underground or basement parking areas; open-air parking structures; areas for employees or visitors above, below, or beside office or manufacturing areas; and enclosed buildings for public parking, usually in congested, urban areas. Private parking facilities include buildings or portions of buildings used for storage of new or used vehicles, fleet parking facilities for trucks or buses, and indoor areas used for storage of finished vehicles manufactured at the facility. Parking may be done with normal access aisles, so that any vehicle may be moved without moving other vehicles; or storage may cover the full floor area.

3.2 Repair Garages

The chief fire and explosion hazard in repair garages is flammable liquids. The most common flammable liquid involved is the fuel present. Fires or explosions often result if the fuel tank or fuel line is repaired without adequate safeguards. Other flammable liquids are solvents used for parts cleaning, floor cleaning, and painting; tank vehicle contents; hydraulic fluids; and lubricating oils. The fires are often aggravated when concealed from sprinklers by the body of the vehicle. Rubber tires are another hazard often present. Losses can often be prevented or minimized by taking proper precautions before and during maintenance work.

Often large numbers of sprinklers operate in fires in repair garages. Usually this is due to gasoline vapors or to shielded fires underneath or inside vehicles where they are out of reach of sprinklers.

4.0 REFERENCES

4.1 FM Global

Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers.*

Data Sheet 3-26, *Fire Protection Water Demand for Nonstorage Sprinklered Properties.*

Data Sheet 5-1, *Electrical Equipment in Hazardous Locations.*

Data Sheet 7-27, *Spray Application of Flammable and Combustible Materials.*

Data Sheet 7-32, *Flammable Liquid Operations.*

Data Sheet 7-88, *Storage Tanks for Flammable Liquids.*

Data Sheet 7-97, *Metal Cleaning.*

4.2 NFPA Standards

NFPA No. 88A, *Parking Structures.*

APPENDIX A GLOSSARY OF TERMS

Storage garages: buildings, structures, or portions of buildings used for storage of motor vehicles.

Repair garages: areas where motor vehicles are serviced or repaired.

APPENDIX B DOCUMENT REVISION HISTORY

May 2010. Replaced all references to Data Sheet 2-8N, *Installation of Sprinkler Systems (NFPA)*, with references to Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*.

May 2008. Clarification was made to recommendation 2.1.1.1.

January 2000. This revision of the document has been reorganized to provide a consistent format.

APPENDIX C COMPARISON WITH NFPA STANDARDS

Parking structures are covered by NFPA 88A. There is no NFPA standard on repair garages. There is no conflict with the NFPA standard.