UNIVERSITY OF TOLEDO

SUBJECT: HAZARDOUS MATERIAL FIRE SAFETY Procedure No: HM-08-027

PROCEDURE STATEMENT

Use of flammable or combustible hazardous materials shall comply with NFPA Standard 30 (Flammable and Combustible Liquids Code), NFPA Standard 99 (Fire Protection for Healthcare Facilities), Standard 45 (Fire Protection for Laboratories Using Chemicals), or Standard 101 (Life Safety Code), as applicable.

PURPOSE OF PROCEDURE

To provide a fire-safe environment at the University of Toledo and ensure compliance with external codes and standards.

PROCEDURE

I. Definitions (Department of Transportation DOT Class 3.0 Materials)

A. Flammable liquids are:

- A liquid having a flash point of ≤ 60.5º C (141º F)
- Any material in a liquid phase with a flash point ≤ 37.8º C (100º F) that is intentionally heated and offered for transport or transported at or above its flash point in bulk packaging.

Combustible liquids are a liquid that does not meet the definition of any other hazard class and has a flash point of > 60.5º C (141º F) and ≤ 93º C (200º F).

The following are **exceptions** to the Class 3 definition:

- Liquids meeting the definition of Class 2 gases
- Mixtures in which 99% of the contents have a flash point of ≥ 60.5º C (141º F) that are not transported at or above flash point
- Liquids with a flash point > 35º C (95º F) that do not sustain combustion according to ASTM 4206
- Liquids with a flash point > 35º C and a fire point > 100º C according to ISO 2592
- Liquids with a flash point > 35º C that are in a water miscible solution with a water content > 90% by mass.

II. Storage and Use

A. The storage of liquid flammable hazardous materials shall be limited to quantities and locations as set forth by the NFPA.

B. Liquid flammable or combustible hazardous materials shall be used from and stored in approved containers.

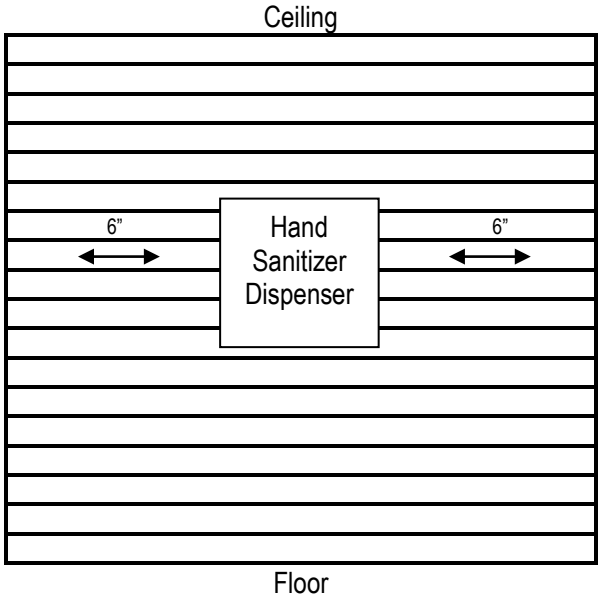
C. Alcohol based hand rubs (sanitizers)

- The maximum quantity of alcohol-based hand sanitizer in one smoke compartment is 5 gallons in storage and an additional 10 gallons out of storage (installed). No more than one dispenser in each patient room is not counted in the total allowable 10 gallon maximum.
- The maximum quantity per dispenser in a room, corridor or an area open to a corridor is 0.32 gallons (1.2 liters).
- The maximum quantity per dispenser in a suite of rooms is 0.53 gallons (2 liters).

- Storage of greater than 5 gallons in a single smoke compartment requires a UL or FM listed flammable liquid storage cabinet compliant with NFPA 30.

2. A dispenser will only be placed in a corridor if the corridor is at least 6 feet wide.
3. A dispenser will only be placed in an exit corridor if the corridor is sprinklered or has smoke detectors.
4. A dispenser will only be placed directly above carpeted floors if the entire smoke compartment is fully sprinklered.
5. Dispensers will not be attached to or hung from electrical beds.
6. Dispensers will be spaced a minimum of 48" apart horizontally.
7. There will be at least 1" clearance between a dispenser and any ignition source. There will be no ignition source directly below a dispenser or the dispenser's horizontal clearance area (see Figure 1).

Figure 1: No ignition source permitted in striped area, including above or below.



Ignition sources include:

- Outlets and light switches
- Electrical cover plates
- Phones and intercoms
- Electric or electronic thermostats
- Lights of any kind
- Electrical beds (motors, foot controls, nurse call)
- Mobile electrical equipment
- Other potential sources of ignition

III. Emergency Preparedness

A. Personnel shall be knowledgeable of existing policies covering hazardous materials incidents. (Code Orange # EP-08-003; Hazardous Material Spill Procedures # HM-08-013)

B. In areas where greater than five gallon of flammable liquids are stored, appropriate spill containment materials or procedure shall be in place.

IV. Departmental managers or laboratory directors shall be responsible for the following:

A. Development and application of safe methods for carrying out procedures;

B. Training of new personnel in safe practices;

C. Continuing safety education and supervision, including review of all occurrences and development of safety check lists as assisted by the Environmental Health and Radiation Safety (EHRS) Department and University Police;

D. Providing assistance during regular inspection of work areas;

E. Ensuring provision of fire training;

F. Ensuring use of appropriate safety equipment and procurement of material containers suitable for the specific material; and

G. Ensuring the lab is not exceeding the following flammable liquid limitations per NFPA 45. All research labs are considered Class C unless EHRS has approved a higher class. The hospital lab is designated as a Class D lab per NFPA 99. Please refer to the Institutional Chemical Hygiene Plan.

Classes of Some Flammable Liquids

Class IA Liquids

Common Name	Flash Point (°F)	Boiling Point (°F)
1-1 Dichloroethylene	0	99
Ethylamine	<0	63
Ethyl Chloride	-58	54
Ethyl Ether	-49	95
Isopentane	<-60	82
Isopropyl Chloride	-26	97
Methyl Formate	-2	90
Pentane	<-40	97
Propylene Oxide	-35	93

Class IB Liquids

Common Name	Flash Point (°F)	Boiling Point (°F)
Acetone	0	134
Benzene	12	176
Carbon Disulfide	-22	115
1,2 Dichloroethylene	43	140
Ethyl Acetate	24	171
Ethyl Alcohol	55	173
Ethyl Benzene	49	277
Gasoline	-45	100-399
Hexane	-7	156
Methyl Acetate	14	135
Methyl Alcohol	52	1477
Methyl Ethyl Ketone	21	176
Methyl Propyl Ketone	45	216
VM&P Naphtha	20-45	212-320
Octane	56	257
Propyl Acetate	58	215
Isopropyl Acetate	40	192
Isopropyl Alcohol	53	180
Toluene	40	232
Butyl Acetate	72	260

Acetonitrile		
THF		

Class IC Liquids

Common Name	Flash Point (°F)	Boiling Point (°F)
Isoamyyyl Acetate	77	288
Amyl Alcohol	91	281
Butyl	84	243
Methyl Isobutyl Ketone	73	246
Naphtha (Petroleum)	85-110	302-399
Propyl Alcohol	77	208
Styrene (Monomer)	90	295
Turpentine	95	307-347
Xylene	81-115	281-291

Class II Liquids

Common Name	Flash Point (°F)	Boiling Point (°F)
Isoamyl	109	268
Cellosolve Acetate	117	313
Cyclohexanone	111	313
Fuel Oil #1 and #2	100+	-
Fuel Oil #4	110+	-
Fuel Oil #5	130+	-
Kerosene	110-150	180-300
Naphtha (coal tar)	100-110	300-400
Naphtha (High Flash)	100-110	300-400
Methyl Collosolve	115	255

Class III Liquids

Common Name	Flash Point (°F)	Boiling Point (°F)
Aniline	158	363
Butyl Collosolve	160	340
Cellosolve Solvent	202	275
Cyclohexanol	162	322
Ethylene Glycol	232	387
Furfural	140	324
Glycerine	320	554
Isophorone	184	419
Nitrobenzene	190	412

Non-Flammable Liquids

Common Name	Boiling Point (°F)
Carbon Tetrachloride	171
Chloroform	142
Ethylene Dibromide	270
Methyl Chloroform	165
Methylene Chloride	104
Perchloroethylene	248
Trichloroethylene	190

Source: Safety & Health Committee

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