Flammable Combustible Liquids and Spray Finishing Program

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1. PURPOSE

To establish and maintain rules and practices to ensure that the hazards associated with flammable liquids, combustible liquids and spray finishing operations are recognized and the necessary safeguards, education and protective equipment are provided.

2. SCOPE

This Program applies to all use and storage of flammable and combustible liquids at Mosaic Operations facilities with the exclusion of fixed storage tanks. The Program also applies to all classical spray finishing operations, including the use of spray cans, at Mosaic Operations facilities. The Program does not include provisions for electrostatic or powder coating operations.

3. DEFINITIONS

3.1 Approved – Unless otherwise indicated, approved, or listed by a nationally recognized testing laboratory (such as UL or Factory Mutual).

3.2 Closed Container – A container sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

3.3 Combustible Liquids – Any liquid having a flash point at or above 100 degrees F. Combustible liquids shall be divided into two classes as follows:

3.3.1 Class II liquids shall include those with flashpoints at or above 100 degrees F and below 140 degrees F.

3.3.2 Class III liquids shall include those with flashpoints at or above 140 degrees F. (Class III liquids are further subdivided into three subclasses.)

3.4 Container – An Approved closed container, such as a drum, whose individual capacity does not exceed 60 gal.

3.5 Fire Resistance Rating – The time, in minutes or hours, that an assembly of materials will retain its protective characteristics or structural integrity upon exposure to fire.

3.6 Flammable Liquids – Any liquid having a flashpoint below 100 degrees F. Flammable Liquids shall be known as Class I liquids. Class I liquids are further subdivided into three classes.

3.6.1 Class IA shall include liquids having flashpoints below 73 degrees F and having a boiling point below 100 degrees F.

3.6.2 Class IB shall include liquids having flashpoints below 73 degrees F and having a boiling point at or above 100 degrees F.

3.6.3 Class IC shall include liquids having flashpoints at or above 73 degrees F and below 100 degrees F.

3.7 Flash Point – The minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

3.8 NFPA - National Fire Protection Association.

3.9 Portable Tank – An Approved closed container having a liquid capacity over 60 U.S. gallons but not exceeding 660 gal. Capacity, and not intended for fixed installation.

3.10 Safety Can – An approved container of not more than 5 gallons capacity having a spring closing lid, vent screen, and a spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

3.11 Service Station – That portion of property where Flammable or Combustible Liquids used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles.

3.12 Spray Area - Any location where flammable or combustible liquid spraying processes are conducted on a routine or periodic basis. A spray area may be located indoors or outdoors and may be enclosed or in an open area.

3.13 Spray Booth - A structure to enclose or contain flammable or combustible liquid spraying processes.

3.14 Spray Room – An enclosed room where flammable or combustible liquid spraying processes are conducted on a routine or periodic basis.

3.15 HazCom – Hazard Communication

3.16 SDS – Safety Data Sheet

4. PROCEDURE REQUIREMENTS

4.1 Flammable Liquids, Combustible Liquids

4.1.1 Anyone having exposure or potential exposure to a chemical must follow procedures outlined in the HazCom program and review SDS on such chemical.

4.1.2 Hazards shall be communicated as outlined in the Hazards Marking-Tags Program.

4.1.3 There shall be no open flames, sparks or other ignition sources in the area when Flammable or Combustible Liquids are in use.

4.1.4 Safety Cans shall be used for all Flammable or Combustible Liquids in quantities of five (5) gallons or less, with the exception of those in their original shipping container. An exception is made for labs where small quantities of flammable and combustible liquids are used.

4.1.5 Flammable or Combustible Liquids shall be kept in closed containers when not actually in use. All spills shall be cleaned up immediately.

4.1.6 Adequate ventilation shall be provided when using Flammable or Combustible Liquids.

4.1.7 Suitable fire control devices, such as small hose or portable fire extinguishers, shall be available at locations where Flammable or Combustible Liquids are stored.

4.1.8 Flammables shall not be used as general purpose cleaners.

4.1.9 Metal to metal contact shall be maintained or a bonding wire must be attached between Containers when transferring Flammable or Combustible Liquids from a drum. All drums shall be grounded.

4.1.10 Removal of Flammable or Combustible Liquids from a tank or drum shall be from the top with a pump, or by gravity through an approved self-closing device.

4.1.11 Flammable or Combustible Liquids should not be stored in direct sunlight.

4.1.12 Flammable or combustible storage areas shall be conspicuously posted with warning signs.

4.1.13 Access to flammable liquid storage areas should be limited to authorized personnel.

4.2 Flammable Storage Cabinets

4.2.1 Flammable Storage Cabinets shall be grounded to control the discharge of static electricity.

4.2.2 Flammable Storage Cabinets shall be used for storage of Flammable or Combustible Liquids and aerosol cans containing flammable material.

4.2.3 Flammable Storage Cabinets shall be labeled in conspicuous lettering “Flammable, Keep Fire Away”.

4.2.4 Not more than 60 gallons of Class I or Class II liquids, or more than 120 gallons of Class III liquids may be stored in a storage cabinet.

4.2.5 When twelve or more aerosol cans containing flammable material are present in a Work Area they shall be stored in a Flammable Storage Cabinet.

4.2.6 Before storing multiple types of flammables or chemicals in the same storage cabinet, compatibility must be checked to assure there are no chemical reactions created.

4.3 Containers and Portable Tanks Storage

4.3.1 Only Approved Containers and Portable Tanks shall be used.

4.3.2 Metal containers and Portable Tanks that meet the specifications of 49 Code of Federal Regulations (CFR) Part 178 of the Hazardous Materials Regulations.

4.3.3 Each Portable Tank shall be provided with one or more devices installed in the top with sufficient emergency venting capacity to limit internal pressure under fire exposure conditions.

4.4 Service Stations

4.4.1 An Approved manual or automatic-closing type hose nozzle valve shall be provided. Manual-closing type valves shall be held open manually during dispensing. Automatic-closing type valves require the operator to be in attendance at all times.

4.4.2 There shall be no smoking or open flames in the areas used for fueling, servicing fuel systems for internal combustion engines, receiving or dispensing Flammable or Combustible Liquids.

4.4.3 Conspicuous and legible signs prohibiting smoking or open flames shall be posted within sight of the customer being served.

4.4.4 No delivery of fuels shall be made into Portable Containers unless the container is constructed of metal, has a tight closure with screwed or spring cover, vent screen, and is fitted with a spout or so designed so the contents can be poured without spilling (Safety Can).

4.4.5 In the event of an emergency a clearly identified (labeled) and easily accessible switch or a circuit breaker shall be provided at a remote location to shut off the power to all pumps.

4.4.6 The fuel dispensing units shall be mounted either on a concrete island or otherwise protected against damage.

4.4.7 Electrical wiring and equipment within and outside of a Service Station shall be installed and grounded as per the provisions of NFPA 70 (National Electrical Code) for Class I, Division D locations.

4.5 Spray Finishing

4.5.1 Housekeeping

a. No food or drink shall be brought into, stored or consumed in any other locations where chemicals are used or stored.
b. All spraying areas shall be kept as free from the accumulation of deposits of combustible residues as practical, with cleaning conducted daily if necessary.
c. Scrapers, spuds, or other such tools used for cleaning purposes shall be of non-sparking material.
d. All solvent or paint soiled rags shall be placed in Approved self-closing metal containers plainly marked to indicate the contents. These containers shall be emptied or removed to an approved location for pickup and disposal at the end of each day or shift.
e. All discarded filter pads and filter rolls shall be immediately removed to a safe, well-detached location or placed in a metal container and disposed of at the close of the day's (or shift) operation unless maintained completely in water.
f. Solvents used for general cleaning operations in Spray Finishing operations and equipment shall have flashpoints not less than 1000 F.
g. Disposal of Aerosol can(s) must be in approved containers which are so labeled, and contents will be disposed of according to Mosaic policy.

4.5.2 Airless Paint Spraying

a. Equipment must be inspected before use and taken out of service if not safe to operate.
b. Spray guns shall not be pointed at any part of the body; operator must be alert to surrounding to assure no one comes in contact with spray from guns.
c. Spray guns shall not be disconnected from the fluid hose or the hose from the pump until the pressure (stored energy) has been released from the hose.
d. Spray guns shall be equipped with trigger guards and a safety lock. The lock shall be in the non-operating position except when the gun is actually in use.
e. All hose connections and fittings shall be checked prior to use to assure there is no deterioration caused by exposure to chemicals, worn spots, and that connections are tight and not leaking. Only fluid hose designed to withstand the high pressure to which it is subjected shall be used.
f. A relief valve shall be installed in the discharge line to the spray gun to prevent overpressure.
g. Fingers or any other body parts shall not be passed or placed over the gun orifice at any time. The cleaning procedures specified by the manufacturer shall be followed.
h. The spray gun operator shall wear eye protection, hand protection or any other clothing necessary to guard against accidental contact with the spray. Appropriate respiratory protective equipment shall be worn if exhaust ventilation is not available.

4.5.3 Pressure Equipment

a. A pressure regulator valve shall be installed in the air line between the compressor and painting equipment on all air-type spraying equipment. A pressure relief valve and a pressure gauge shall be installed between the pressure regulator and pressurized paint containers and/or spray guns. Pressure relief valves shall be set to open at pressures not more than 10 pounds above the required working pressure.

b. When separate paint pressure tanks are used, they shall be equipped with a gauge and a relief valve to prevent overpressure. Hoses shall be rated for the maximum working pressure of the system.

4.5.4 Fire Control and Suppression

a. There shall be no open flame, spark producing equipment or other heat source within 35 feet of any spraying area, unless separated by a partition

Reference: EHS-Phos Program Hot Work

b. Fire suppression sprinklers or systems installed in spray areas shall conform to NFPA 13.All-purpose ABC Dry Chemical, Carbon Dioxide or Foam portable fire extinguishers shall be installed near all paint spraying areas and included as part of the workplace inspection.

c. Spray booths, rooms, or other enclosures used for spraying operations shall not be used for the purpose of drying by any arrangement which will cause an increase in the surface temperature of the spray booth, room, or enclosure.

4.5.5 Storage and Handling of Materials

a. The quantity of paints, lacquers, thinners, solvents and other flammable and combustible liquids kept near spraying operations shall be the minimum required for operations and shall not exceed 1 day's supply.

b. Open containers may only be used for cleaning of painting materials after which the solvent shall be transferred back to a closed container for re-use or disposal.

c. Original closed containers, approved portable tanks, and Safety Cans shall be used for bringing Flammable or Combustible Liquids to spraying operations.

4.5.6 Construction

a. Walls and ceilings of spray areas shall be constructed of noncombustible or limited-combustible materials and shall be securely and rigidly mounted or fastened.

b. The interior surfaces of spray areas shall be smooth, and designed and installed to prevent pockets that can trap residues, and designed to facilitate ventilation and cleaning.

c. The floor of spray areas shall be constructed of noncombustible material or completely covered by noncombustible material of such character as to facilitate the safe cleaning and removal of residues.

d. Spray rooms shall be constructed of and separated from surrounding areas of the building by construction assemblies that have a fire resistance rating of 1 hour.

e. Enclosed spray booths and spray rooms shall be provided with means of egress that meet the requirements of the Walking & Working Surfaces Program and NFPA 101.

f. Spray booths shall be so installed that all portions are readily accessible for cleaning. A clear space of not less than 3 feet on all sides shall be kept free from storage or combustible construction.

g. Spray booths shall be substantially constructed of rigidly supported steel, concrete, masonry or other approved non-combustible materials.

4.5.7 Ventilation Systems

a. Each spray booth and room shall be equipped with a ventilation system capable of controlling hazardous concentrations of vapors.

b. A preventive maintenance program shall be implemented to cover periodic inspection and testing of all ventilation system components.

c. Adequate conditioned make-up air must be provided. Air intake openings to rooms containing spray finishing operations shall be adequate for the efficient operation of

exhaust fans and shall be so located as to minimize the creation of dead air pockets.

d. Ventilation and exhaust systems shall be installed and maintained in accordance with NFPA 91 (Blower and Exhaust Systems for Vapor Removal).
e. Mechanical ventilation shall be in operation while spraying operations are being conducted and for a sufficient time thereafter to assure vapors are completely exhausted.
f. The fan-rotating element and its casing shall be non-sparking. Adequate clearances shall be provided to prevent friction or scraping. Fan blades shall be mounted on a shaft rigid enough to maintain alignment when the fan is operating under full load.
g. Electric motors driving exhaust fans shall not be placed inside booths or ducts and shall conform to the electrical classification in which they are located. Drive belts shall not enter the duct or booth unless the belt and pulley within the duct or booth are enclosed or guarded.
h. Exhaust ducts shall be protected against mechanical damage, properly supported, and will have a separation of at least 18 inches from combustible materials.
i. Aluminum shall also not be used for ventilation ductwork.
j. Ducts shall be periodically inspected for accumulation of paint deposits and shall be cleaned as needed.
k. Air exhaust from spray operations shall be directed so that it will not contaminate make-up air being introduced into the spraying area or other ventilation intakes.
l. The exhaust discharge point for non-water wash type spray booths shall be at least:
    i. 25 feet from any combustible construction or unprotected opening in any noncombustible exterior wall;
    ii. 6 feet from any combustible exterior wall or roof.
m. The average air velocity over the open face of a spray booth shall be not less than 100 linear feet per minute. Visible gauges or audible alarm or pressure activated devices shall be installed to indicate or ensure that the required air velocity is maintained.

4.5.8 Electrical Wiring and Equipment

a. Electrical wiring and equipment within a spray area shall conform to the provisions of NFPA 70 (National Electrical Code) for Class I, Division 1 locations.
b. Electrical wiring and equipment outside of, but within 20 feet horizontally and 10 feet vertically, of any spraying area and not separated from it by partitions shall conform to the provisions of NFPA 70 for Class I, Division 2 locations.
c. Electrical wiring and equipment outside of an enclosed spray booth or spray room, but within 3 in. any direction from any opening in the booth or room shall conform to the provisions of NFPA 70 for Class I, Division 2 locations.
d. All metal parts of spray booths and exhaust ducts conveying Flammable or Combustible Liquids or aerated combustible solids shall be electrically grounded.

5. PERIODIC INSPECTIONS

5.1 Any changes to equipment or procedure must go through a MOC review.

5.2 Ventilation ducts shall be periodically inspected for accumulation of paint deposits in Spray Finishing Operations.

5.3 A preventative maintenance program shall be implemented to cover periodic inspection and testing in Spray Finishing ventilation system components.

6. PROGRAM REVIEW

6.1 A review of this Program shall be conducted every 7 years for accuracy and completeness and/or if there is an injury or significant near miss. The review shall be initiated by the Safety Department SME.

7. CONTRACTORS

7.1 All contractors and temporary employees shall adhere to all safety and health policies required for Mosaic employees.

7.2 Contractors must be approved through ISNetworld.

8. APPENDICES

8.1 None.

9. REFERENCES

9.1 API

9.1.1 2201, Welding or Hot Tapping on Equipment Containing Flammables

9.2 NFPA

9.2.1 30, Flammable and Combustible Liquids Code

9.2.2 33, Standard for Spray Application Using Flammables or Combustible Materials

9.3 MSHA

9.3.1 30 CFR § 56.4000 - .4104, Prohibitions/Precautions/Housekeeping

9.3.2 30 CFR § 56.4400, .4402, Flammable and Combustible Liquids and Gases

9.3.3 30 CFR § 56.4531, Surface Flammable or Combustible Liquid Storage Buildings or Rooms

9.4 OSHA

9.4.1 29 CFR 1910.106, Flammable and Combustible Liquids

9.4.2 29 CFR 1910.107, Spray Finishing Using Flammable and Combustible Liquids

9.4.3 29 CFR 1910.307, Electrical – Hazardous Locations

9.5 Other

9.5.1 49 CFR Hazardous Materials Regulations Part 178

10. REVISION LOG

Revision Log

Rev. No.	Requested By	Approved By	Revised By	Rev. Date
0	Initial Issue	S&H Dept.	Task Team	Dec., 2004
1	Logo Change	Safety and Health	J. Marshall	10/25/06
2	Minor revisions to standardize format	D. Allen	D. Allen	5/14/07
3	Reformat for ISO		D. Allen	7/7/2011
4	Mike Neal – review for compliance		Ed Thierry	12/30/ 2011
5	Reformat for ISO		R. Withers	04/20/2012
6	Review date past due	PMO	PMO	09/30/2021
7	Adjust review date	EHS PMO	EHS PMO	11/14/2024

Contact Subject Matter Expert for additional information on this program.