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# PURPOSE

This standard establishes the minimum requirements for chemical management (storage, use, spill prevention, and spill control and containment) to minimize the occurrence and impact of uncontrolled spills and leaks to the environment at TI sites worldwide.

# SCOPE

The provisions of this standard apply to all TI sites worldwide where **hazardous chemicals and materials** are used, loaded, unloaded, transferred, or stored.

# reference documents

## TI Standard Policy and Procedure (SP&P) 04-04-01: "Environmental, Health and Safety"

## TI ESH Standard 03.01, “[Hazardous Chemicals And Materials](https://sps01.itg.ti.com/sites/wwf/esh/standards/Knowledge_Bank/03-01.doc)”

## TI ESH Standard 05.01, “[Egress and Evacuations](https://sps01.itg.ti.com/sites/wwf/esh/standards/Knowledge_Bank/05-01.doc)"

# Definitions

[TI ESH Standards Glossary of Definitions](https://sps01.itg.ti.com/sites/wwf/esh/standards/Knowledge_Bank/00.01.xlsx)

# Requirements

Sites shall develop and implement a chemical storage, spill control, and spill response **program** to effectively prevent spills and leaks and ensure that **secondary containment structure**s are properly designed and operated.

## The **program** shall include the following elements:

###  Inventory of Chemical Storage and **Spill Control Facilities**, including:

#### Type and storage capacity,

#### Location,

#### Containment capacity, and

#### Containment construction materials

###  Assessment

Sites shall perform and document assessments for all installations to determine if any environmental, health, and safety hazards related to potential releases exist. The assessments shall be performed initially and upon changes in hazards related to potential releases at the facility. The assessments shall include the following:

####  Facilities and equipment

#### Activities and/or events (i.e., chemical movement, fire protection water containment, etc.) that may have a potential to cause, or allow, a release to the environment;

#### Review of the **hazardous chemicals and materials** being stored and environmental impact;

#### Determination of adequate containment capacity as defined in this specification;

#### Review of the compatibility of containment structure materials, liners and / or coatings with the chemicals intended to be stored;

#### The appropriate training requirements and recommended work practices for safely using, handling and storing **hazardous chemicals and materials**;

#### Any engineering controls for safely using, handling and storing **hazardous chemicals and materials**, and

#### The type of personal protective equipment (PPE) necessary for protecting persons from exposure to **hazardous chemicals and materials**.

###  Spill Control Operating Procedures

#### Procedures for the proper operation and maintenance of **spill control facilities** including the following where applicable:

##### Routine handling of products including loading, unloading, and facility transfers.

##### Valve operations;

##### Piping and / or hose connections;

##### Spill response;

##### Inspection requirements, and

##### Security to prevent the unauthorized or unintentional release of a regulated substance (e.g., fence, locked gate, etc.).

## General Requirements for Chemical Storage

### Chemical **containers** shall be compatible with the material stored and conditions of storage such as pressure and temperature;

### Chemical **containers** shall be stored in an upright position, and only with other compatible chemicals;

1. Non-compatible chemicals may be stored inside the same area or room when individual cabinets, barriers or separation distances (in accordance with local, state or national laws, codes or regulations) are provided.

### When not in use, chemical **containers** shall be closed (i.e. container lids, covers, bungs, etc. secured in place);

### When not stored in areas designed for chemical storage, flammable and combustible liquids shall be stored in cabinets or workstations designed for flammable or combustible storage;

### Chemicals shall not be stored under pressure in **tanks** or **containers**, unless the tank or container has been designed for such use and allows emergency venting in the event of over-pressurization;

### Residue-empty chemical **containers** shall be managed with the same safety requirements as when they were full, and stored accordingly, until disposed or recycled. See the exception for spill control at 5.6.2.1.

### When not in process use, chemical drums shall be placed on and secured to pallets (or equivalent unitizing devices), or placed on fixed storage shelving and secured;

Note: Chemical drums on pallets, if stacked, shall be no more than two levels high.

### Chemical quantities in individual work areas shall be limited to the smallest reasonable quantity to allow efficient shift operations.

## Chemical Storage and Dispensing Rooms

### Sites shall ensure that chemical storage and dispensing rooms:

### Limit access by unauthorized personnel;

### Containing Hazardous Production Materials (HPMs) shall be provided with two or more exits as necessary to provide safe and effective egress during an emergency and meet the requirements set forth in TI ESH Standard 05.01: “Egress and Evacuations”.

#### Exit doors shall open in the direction of travel from the room;

#### Exit doors shall have automatic closing devices;

#### Exit doors shall be provided with **panic hardware**.

### Are provided with emergency control systems, such as leak detection and fire protection;

### Are provided with ventilation, at a rate not less than one cubic foot per minute per square feet of floor area (0.30 cubic meters per minute per square meter) or six air changes per hour, whichever is greater, to prevent the accumulation of vapors or fumes, when they contain HPMs;

### Shall be located a minimum of 50 feet (15.2 meters) away from property lines, or at distances approved by the local **Authority Having Jurisdiction** (**AHJ**).

## Chemical Dispensing

Sites shall ensure that chemical dispensing complies with the following:

### Chemicals shall only be dispensed in areas provided with adequate ventilation as described in section 5.3;

### Flammable or combustible liquids shall be dispensed from locations conforming to **Class I Division 2** requirements per National Fire Protection Association (NFPA) codes, or equivalent local, state or national laws, codes or regulations;

### Flammable or combustible liquids shall not be dispensed by gravity from or to **tanks**, drums, barrels or similar **containers**;

### Vessels used for mixing or blending of flammable or combustible liquids shall be provided with self-closing, tight fitting, noncombustible lids that will control a fire within such vessel, and

### Flammable and combustible liquid **containers** shall be in accordance with Appendix A, except that glass or plastic **containers** of no more than 1-gallon (3.8 liters) capacity may be used for a Class IA or IB flammable liquids.

#### Where utilized, glass chemical **containers** shall be coated to prevent shattering.

### Flammable liquids shall not be transferred into **containers** unless the transferring nozzle and container are electrically bonded and the container is grounded.

## Chemical Storage Cabinets

Sites shall ensure that chemical storage cabinets comply with the following:

### The cabinets are compatible with the chemicals they contain and are approved for the specific use;

### Cabinets shall be made of metal unless otherwise approved by the local **AHJ** (cabinets used to store flammable or combustible chemicals must be constructed of non-combustible materials);

### The doors must be equipped with a latching mechanism to keep doors closed (this does not include sliding doors); and

#### Cabinet doors must remain closed, except when removing or replacing chemical **containers**;

#### The doors must be maintained in good working condition (handles, hinges, materials of construction);

### The cabinets shall be capable of retaining a spill (i.e. a full release) from the largest container within the cabinet;

### Chemical storage cabinets shall be marked with the category of chemicals allowed to be stored in the cabinet (e.g. Flammables and Combustibles, Acids, etc.).

## General Requirements for **Spill Control Facilities**

### Design

#### **Secondary containment structure** materials, liners and/or protective coatings shall be compatible with the contained chemicals and impermeable to leakage or migration of any spills through to the ground or support foundation.

#### **Secondary containment structure**s shall be designed in a manner that facilitates removal of liquid.

#### **Tank systems** installed after 9/01/1984 shall be aboveground and provided with secondary containment.

##### Exception: **tank systems** for dispensing motor vehicle fuels, when equipped with secondary containment and leak detection systems.

### Practices

#### **Hazardous chemicals and materials** shall be stored in secondary containment when they are not in the process of movement between internal warehouses, building docks, storage areas, and / or points-of-use. Exception: Residue-empty **containers**.

#### Leaks shall be stopped immediately upon discovery or when safe to do so, using appropriate isolation methods (e.g., valve isolation, blind flanges, material flow diversion, unit shutdown).

#### Spills or releases of **hazardous chemicals and materials** into a **secondary containment structure** shall be removed thoroughly and promptly, and equipment repairs completed as soon as practical, with the consideration of increased hazards for any repair delays.

#### Storm water that collects in **secondary containment structure**s shall be evaluated and removed so that the secondary containment is **emptied** as soon as practical following the storm event, and no later than 24 hours after the storm event.

#### Outdoor **secondary containment structure**s and the **tanks** or **containers** they enclose shall be inspected daily for the presence of spills, leaks or releases and conditions which would prevent the proper function of the **secondary containment structure**.

1. Inspections may be accomplished by various approaches or method(s): physical inspections by personnel, liquid level switches/alarms, surveillance cameras, sensors in combination with response procedures, etc. The approach/method(s) should be tailored to address the risk appropriate to the site conditions.

#### Periodic maintenance shall be performed to ensure **secondary containment structure**s are free of cracks or defects that would allow the migration of **hazardous chemicals and materials**. Repairs shall be made promptly to maintain secondary containment integrity.

#### Where drainage valves are present on secondary containment, such valves shall remain in the closed position to prevent uncontrolled releases.

#### Any existing or acquired underground **tanks** without secondary containment shall:

* + - * be removed completely, or
			* be cleaned, filled with inert material, plugged, and secured in place.

## Specific Requirements for Indoor or Roofed **Spill Control Facilities**

### See Containment Capacities Table for containment volume.

### If a building structure is used for secondary containment, appropriate design features, such as berms, dikes, floor joint seals, perimeter wall seals, etc., shall be implemented to prevent the migration of a spill to the exterior of the building.

## Specific Requirements for Outdoor **Spill Control Facilities**

### See Containment Capacities Table for containment volume.

### In-ground wastewater pH neutralization **tanks** shall be chemically compatible with the wastewater.

### In-ground wastewater pH neutralization **tanks** shall:

#### Be surrounded by a **French drain** which allows for the detection of leaks; or

#### Have an external leakage monitoring system; or

#### Have secondary containment protection, which allows for the detection of leaks.

### Existing **tanks** installed in below-grade, open-top (pits), or enclosed (vault style) **secondary containment structure**s shall allow for easy visual inspection and detection of leaks.

### Connections used at all outdoor liquid transfers shall be drip-free (dry-type, double valve, etc.).

### All **tanks** which store **hazardous chemicals and materials** shall have a means for readily determining their liquid level (for example: sight glass, remote level sensor, etc.) and immediately stopping the transfer of liquid in the event of a leak, overfill, or other problem. To prevent overfilling **tanks**, sites shall either:

#### Equip each **tank** with automatic liquid level controls, or

#### Develop a procedure for the manual filling of each **tank**, including a requirement for constant monitoring of liquid level and controls during the transfer process.

Containment Capacities Table

|  |  |  |
| --- | --- | --- |
| **Hazardous Chemical and Material Areas**  | **Containment capacity for outdoor locations exposed to weather and rain (see Figure 1)** | **Containment capacity for indoor or roofed locations protected from weather and rain** |
| Tank or Tank Farms (tanks are fixed in place) | 150% of the largest tank in the containment area; the 50% excess capacity must be at least 3 inches (7.6 cm) of depth.  | 110% of the largest tank in the containment area |
| Chemical docks where containers are stored and/or staged for shipping | 150% of the largest tank or container volume stored; the 50% excess capacity must be at least 3 inches (7.6 cm) of depth. | 110% of the largest tank or container volume stored |
| Tank or container storage and/or dispensing rooms inside building structures | Not applicable | 110% of the largest tank or container volume stored |
| Container loading and unloading areas outside of building structures (transfer containers from trucks into a building storage area) | 150% of the largest container being loaded or unloaded; the 50% excess capacity must be at least 3 inches (7.6 cm) of depth.  | 110% of the largest container being loaded or unloaded  |
| Bulk tank vehicle loading and unloading areas (for loading or unloading fixed tanks) | Determine volume from tank vehicle offloading hose connection failure scenario; or from a site-determined spill risk scenario. | Determine volume from tank vehicle offloading hose connection failure scenario; or from a site-determined spill risk scenario. |



Figure 1: Graphic describing outdoor containment capacity for outdoor locations constructed after the 2014 effective date of the standard. *Elevation view, not to scale.*

## Record Keeping

### Spill control facility inspections, storm water or residue analyses, and maintenance records shall be kept at the site for a minimum of three years.

## Training

### Sites shall provide initial training and refresher training every three years for personnel responsible for the maintenance, operation, and management of the site's **spill control facilities**.

#### Training shall include the components of the site’s spill control program.

#### Each site shall ensure that affected employees are trained on their roles and responsibilities.

# STANDARD Approval

This standard has been approved by David Thomas, TI Vice President.

# Revision history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Rev#** | **Date** | **Nature of Revision** | **Author/Editor** | **Approver** |
| A | 12/31/2006 | Major periodic review; merger of 03.01E Chemical Storage, ENV01.02 Spill Control Plans, 03.08 Chemical Spill Response; | Mike Alton, Kim Dawson | Brenda Harrison |
| B | 11/06/2008 | Updated link in Appendix A | John Willis | Brenda Harrison |
| C | xx/xx/2012 | Reformatted and renumbered. Removed certain US regulatory requirements; aligned with worldwide standards; spill control sections placed in sequence; created new table for spill control capacities; removed redundant requirements appearing in other TI standards. | John Willis |  |
| D | 05/24/2017 | No changes – administrative only | John Willis | ELC |
|  |  |  |  |  |

1. Maximum Allowable Size of Containers and Portable Tanks

|  |  |  |
| --- | --- | --- |
| **Container Type** | **Flammable Liquids** | **Combustible Liquids** |
|  | **Class 1A** | **Class 1B** | **Class 1C** | **Class II** | **Class III** |
| Glass or approved plastic | 1 pint (0.475 liters) | 1 quart (0.95 liters) | 1 gallon (3.8 liters) | 1 gallon (3.8 liters) | 1 gallon (3.8 liters) |
| Metal (other than UN drums) | 1 gallon (3.8 liters) | 5 gallons (19 liters) | 5 gallons (19 liters) | 5 gallons (19 liters) | 5 gallons (19 liters) |
| Safety cans | 2 gallons (7.6 liters) | 5 gallons (19 liters) | 5 gallons (19 liters) | 5 gallons (19 liters) | 5 gallons (19 liters) |
| Metal drums (UN) | 60 gallons (228 liters) | 60 gallons (228 liters) | 60 gallons (228 liters) | 60 gallons (228 liters) | 60 gallons (228 liters) |
| Approved portable tanks | 660 gallons (2508 liters) | 660 gallons (2508 liters) | 660 gallons (2508 liters) | 660 gallons (2508 liters)  | 660 gallons (2508 liters) |