



Industrial Performance Services



Industrial Tubular Catalyst Services



# MATERIAL HANDLING AND DRUM TIPPING PROCEDURE

# Material Handling and Drum Tipping Procedure

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## Purpose

This procedure outlines the basic principles of drum handling and the usage of drum tippers in a safe and effective manner.

## General

Use proper equipment to lift and move drums. "Man-Handling" of drums is NEVER an acceptable practice. Rolling drums on and off pallets, trucks or docks by hand is a sure way to cause an accident. Crushed hands, feet and back injuries are all too common in this situation. In areas where manual movement of drums must be accomplished, a vertical, positive engagement lifting device is essential for operator and product safety. A capable operator with a proper drum handling attachment can safely load about 80 drums into a truck or container in less than 30-minutes with no manual movement of the drums involved.

Be aware of the danger of unsecured drums on forklifts. Imagine a forklift operator moving a pallet of four drums through a warehouse when suddenly, the operator must stop short to avoid a collision with other equipment. Without proper safeguards in place, NOTHING is left holding those 4 drums and they will (and do) lunge off the pallet, causing potential injury and product loss. A mechanical forklift attachment for handling drums is a much safer option. Positive engagement devices are available for handling 1-4 drums at a time and those attachments are available to efficiently fit on and be removed from the lift truck.

When using pallets, inspect them carefully first. Stacking drums on old or splintered pallets can cause punctures and leaks. Most pallets are held together with nails that can work their way through the wood and puncture drums, causing leaking and other damage. If you must use pallets, be sure they are strong and level, and do not have any sharp points or edges beneath a drum.

Many products that are stored and transported in drums are corrosive and/or flammable. Always identify the materials in the drum and then find out what precautions should be taken during the material handling process. For example, if you are working with flammable substances, make sure you're using spark-resistant drum handling equipment for the job at hand.

## Training

Operators must be trained on proper drum handling safety and Drum Tipping Machine Usage.

Prior to any movement of drums or containers containing hazardous materials or otherwise posing a threat to the safety of employees, all employees are required to be informed of the potential hazards associated the contents of the drums or containers. The employer must conduct periodic review and discussion of information provided on material safety data sheets, or review other sources of adequate information (i.e., the NIOSH Pocket Guide to Chemical Hazards) with employees when the material of storage is routinely stored in containers on site. When the material being stored in a drum or container is not routinely handled by employees, such as at an emergency response location, the review of hazard information needs to encompass all potentially affected employees prior to handling a drum or container of known contents. Where the contents of a drum or container are unknown or unconfirmed, employees need to be instructed to wear a level of PPE corresponding to the highest level of potential exposure until the contents of the drum or container have been successfully identified.

Where spills may occur, employees need to be informed of the procedures contained in the employer's spill containment program so that they can implement controls to contain and isolate the entire volume of any hazardous material being transferred. Additional areas requiring appropriate training of employees include:

- Sampling procedures,
- Communication methods,
- Methods for relieving pressure from drums and containers or for shielding when pressure cannot be relieved from a remote location,
- Emergency response to accidents on site,

The training outlined above represents the minimum set of topics to be considered when employees will be required to handle drums and containers. Some of the topics may not be applicable to certain circumstances and other situations will require training in addition to the topics provided herein.

### **Labelling of Drums and Containers**

Drums and containers are required to be identified and classified prior to packaging for shipment. Manufacturers and other shippers and distributors are required to include information about the material being shipped on a Safety Data Sheet (SDS) in addition to the requirement for labelling of drums and containers. Labelling clearly identifies the product stored within the drum or container while classification provides information about the level of fire hazard, degree of health hazard, how reactive the material is, etc.

It is important to caution that the presence of a label or other chemical information on the drum or container does not preclude the possibility that the stored material is some other substance than the one described. This is especially true with drums at abandoned waste sites or where drums have been disposed of illegally. In such instances, it is not uncommon for the entity disposing of the waste to have chosen any container based solely on availability and without any regard for proper labelling of the contents. In other instances, labels are purposely removed to make it difficult or impossible to trace the material to its source of origin.

### **Drum Tipping**

the drum tipper allows the tilting of your drums while guaranteeing the safety of the operator. The locking system prevents the cycle from starting.

For your safety:

- Protective grid: positioned on the motor side of the tipper, it guarantees the safety of the operator.
- Locking system: it prevents the cycle from starting
- Control system: the control is carried out by pushbutton switches.
- Safety space: between the operator and the tipper, it avoids any risk of collision and ensures the reliability of the operation

### **Manual Material Handling**

When moving materials manually, workers should attach handles or holders to loads. In addition, workers should always wear appropriate personal protective equipment and use proper lifting techniques. To prevent injury from oversize loads, workers should seek help in the following:

- When a load is so bulky that employees cannot properly grasp or lift it,
- When employees cannot see around or over a load, or
- When employees cannot safely handle a load.

When using Drum Tippers, workers may get their hands caught in nip points where the Tipper runs near the frame or over support members. Workers also may be struck by material falling off the Drum Tipper or they may get caught in the Drum Tipper and drawn into the dump path as a result. To prevent or reduce the severity of an injury, take the following precautions to protect workers:

- Install an emergency button or pull cord designed to stop the drum tipper at the employee's workstation.
- Install emergency stop cables that extend the entire length of continuously accessible loading area so that the cables can be accessed from any location of the Drum Tipper.
- The emergency stop switch is designed so that it must be reset before the drum tipper can be restarted.
- Ensure that the supervisor inspect the drum tipper and clear the stoppage before restarting a drum tipper that has stopped due to an overload.
- Employees are prohibited from riding on a materials-handling drum tipper.
- Guards are placed to keep employees from being struck by falling material. (If the crossover is low enough for workers to run into it, mark the guard with a warning sign or paint it a bright color to protect employees.)

### **Procedures for Handling Drums and Containers**

It is important to establish standard operating procedures for handling drums and containers. Planning is an essential element necessary to minimize the number of drum or container movement as is required by OSHA regulations and to ensure an appropriate response if a spill might occur. Proper firefighting equipment needs to be on hand and ready to use when handling drums or containers that store flammable, combustible, or unknown substances to control any incipient fires.

One aspect of drum and container handling that often gets overlooked is the proper opening of the drum or container. It only takes a couple of pounds of pressure to cause a loosened fitting to fly into the air like a rocket. This projectile can cause injury to site workers on either the way up or the way down. The projectile can puncture adjacent containers or drums, causing rupture and leakage. If the drum or container is filled to or near the level of the opening, product can spew from the opening (think of a soda can after shaking) causing injury to site personnel, formation of hazardous/flammable atmospheres at the work site and/or environmental damage. The procedure for opening of drums and containers needs to incorporate the minimum safeguards listed below:

- Employees not actually involved in the opening of the drum or container must be kept a safe distance from the drum or container during the process of opening it.
- If an employee's duties require him to remain in the vicinity of a drum or container that is being opened, shielding that does not interfere with the work operation must be placed between the employee and the drum or container being opened to protect that employee from any potential explosion.
- The controls for equipment (including monitoring equipment and fire extinguishing/suppression equipment) used to remotely open drums and containers must be located behind an explosion resistant barrier.

- Where there is the reasonable probability of a flammable atmosphere being present or developing on site, all equipment and tools must be of a type to prevent sources of ignition (non-sparking, explosion proof, intrinsically safe) and grounding/bonding needs to be considered.
- If the pressure within a drum or container cannot be relieved from a remote location, the employee opening the drum or container needs to be protected by an appropriate shield to reduce the risk of injury.
- Drums and containers are not step ladders. Employees are not allowed to stand on or work from drums or containers.
- Material handling equipment used to move drums and containers needs to select, positioned, and operated in a manner that minimizes the potential for the equipment to act as a source of ignition in the event that a drum or container should rupture.
- When handling shock-sensitive wastes, all non-essential employees must be evacuated from the potential impact area.
- Equipment operators need to be protected from explosions by protective shields or containment devices.
- When a drum or container exhibits signs of over-pressurization such as swelling or bulging, the drum or container is not to be moved until the cause of the over-pressurization has been determined and proper containment procedures have been implemented.
- It is necessary to limit the number of areas where drums and containers are staged to identify and classify them.
- Areas where drums and containers are staged need to be provided with adequate routes for access and egress from the staging area.

### **Use of Approved Drums or Containers**

Drums and containers are required to meet the appropriate DOT, OSHA, and EPA regulations for the materials that they contain. Additionally, there are some instances where approval by a nationally recognized testing laboratory such as Underwriters Laboratories (UL) or Factory Mutual (FM) is recognized. As an example, under regulations of 29 CFR Part 1910.106, windshield solvents (35% methanol/65% water = class 1C flammable) must be stored in metal containers at designated volume thresholds. Since the time of the last amendments to that section of regulations, large plastic drums and containers have been approved for this purpose. These large containers or drums will carry either a DOT approval or a nationally recognized testing laboratory approval or both. The use of approved drums and containers provides some assurance that the drum or container will not fail due to incompatibility with the stored material and that the drum or container is structurally suitable for designated duty.

### **Drum Condition**

Improperly abandoned drums in warehouses, fields and other locations result from illegal disposal and from businesses that ceased to exist and left their wastes and process chemicals behind. When approaching such a site, one of the first concerns is whether the drum is leaking or has leaked. If the drum is found to be intact, one of the next questions is the ability of the drum to withstand movement. The following apply to the assessment of drum condition:

- 1) When practical, drums and containers must be inspected, and their integrity assured prior to being moved. Drums and containers that cannot be inspected prior to being moved due to storage conditions (i.e., buried, in a pile, stacked several tiers high, etc.) must be moved to an accessible location and inspected prior to further handling.
- 2) Drums and containers that cannot be moved without risk of rupture, leakage or spillage must be emptied into a sound container using a device classified (i.e., intrinsically safe or explosion proof for the class of flammable material) for use around the material being transferred.
- 3) Drums and containers are to be opened in a manner that safely relieves excess internal pressure. (See procedures above).
- 4) If crystalline material is noted on any container, the contents of the container are to be handled as a shock-sensitive waste until positive identification of the contents determines otherwise.

### **PPE For Drum Tipping and Material Handling**

Using the following personal protective equipment prevents needless injuries when manually moving materials:

- Hand and forearm protection, such as gloves, for loads with sharp or rough edges.
- Eye protection.
- Steel-toed safety shoes or boots.

### **Blocking**

Employees should use blocking materials to manage loads safely. Workers should also be cautious when placing blocks under a raised load to ensure that the load is not released before removing their hands from under the load. Blocking materials and timbers should be large and strong enough to support the load safely. In addition to materials with cracks, workers should not use materials with rounded corners, splintered pieces, or dry rot for blocking.

### **Precautions When Moving Materials Mechanically**

Using mechanical equipment to move and store materials increases the potential for employee injuries. Workers must be aware of both manual handling safety concerns and safe equipment operating techniques. Employees should avoid overloading equipment when moving materials mechanically by letting the weight, size, and shape of the material being moved dictate the type of equipment used. All materials handling equipment has rated capacities that determine the maximum weight the equipment can safely handle and the conditions under which it can handle that weight. Employers must ensure that the equipment-rated capacity is displayed on each piece of equipment and is not exceeded except for load testing.

### **Forklift Operations for Material Handling Around Drum Tippers**

Although workers may be knowledgeable about powered equipment, they should take precautions when stacking and storing material. When picking up items with a powered industrial truck, workers must do the following:

- Center the load on the forks as close to the mast as possible to minimize the potential for the truck tipping or the load falling,
- Avoid overloading a lift truck because it impairs control and causes tipping over,
- Do not place extra weight on the rear of a counterbalanced forklift to allow an overload,
- Adjust the load to the lowest position when traveling,
- Follow the truck manufacturer's operational requirements, and
- Pile and cross-tier all stacked loads correctly when possible.





# Competency Assessment

No.	Questionnaire	C/NYC
Q1		
A1		
Q2		
A2		
Q3		
A3		
Q4		
A4		
Q5		
A5		

Enclosed Attachments	
Risk Assessment	<input checked="" type="checkbox"/>
Environmental Aspect and Impact	<input checked="" type="checkbox"/>
Training and Competency	<input checked="" type="checkbox"/>
Measure and Evaluation Tools	<input checked="" type="checkbox"/>

# Competency Checklist

To be filled out by Trainer and signed by Employee, Assessor and Supervisor before being returned to the HSEQT Manager for recording purposes.

Procedure	Competency	Date	Competent YES / NO	Employee Signature

(please tick appropriate box)

This employee is competent in performing the job.


This employee has not attained the competency level.

\*

\* *If the employee has not attained all competency levels, the General Manager must assess the action to be taken, provide an extension of training or alternative action as listed below.*

Alternate action to be taken: \_\_\_\_\_

Signed By	Employee:		Date:	
	Trainer:		Date:	
	Assessor:		Date:	
	Regional Manager:		Date:	

# Environmental Aspects and Impacts

## Identified Environmental Aspects and Impacts

The following table is a summary of the likely environmental aspects and impacts that may be identified during site inspections. The significance of each impact needs to be assessed using the Risk Assessment Model.

Activity	Aspect	Impact
<b>Purchasing &amp; Administrative Work</b>	Consumption of goods	Conservation of natural resources
	Consumption of energy (eg. Electrical equipment and facilities)	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Habitat loss
	Generation of waste (eg. Paper)	Consumption of space for waste disposal; Habitat loss
<b>Climate Control</b>	Consumption of energy	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Habitat loss
	Generation of noise	Disturbance to community; Habitat loss
<b>Cleaning of – offices / vehicles</b>	Storage, use and release of chemicals	Contamination of air, water or soil; Risk to human health
<b>Transport (Fleet vehicles / staff travel)</b>	Consumption of energy	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Loss of habitat at all stages of generation; Light pollution
	Consumption of goods (eg. Oil)	Consumption of natural resources; Generation of waste; Habitat loss; Biodiversity impacts
	Generation of waste (eg. Oil)	Consumption of space for waste disposal; Potential contamination of water or soil; Habitat loss
	Exhaust emission	Release of greenhouse gases and atmospheric pollution
	Use of dangerous goods (eg. Batteries)	Potential contamination of air, water or soil; Risk to human health
	Generation of noise	Disturbance to community; Habitat degradation
<b>Operations</b>		

Sample only.  
To be filled in

# Risk Assessment

Risk Assessment // insert name here					
Step No: Logical sequence	Sequence of Basic Job Steps documented in the Procedure, Work Instruction and project plans. Break down Job into steps.  Each step should be logical and accomplish a major task.	Potential Safety & Environmental Hazards/Impacts at the site of the Job  Identify the actual and potential health and safety hazards and the environmental impacts associated with each step of the job.	Risk Rating  Refer to the risk matrix or HSEQT.PRO. Risk Mgt	Recommended Corrective Action or Procedure  <i>Determine the corrective actions necessary to reduce the risk to as low as reasonably practical (ALARP) refer to HSEQ.PRO.Risk Mgt. The risk must be rediced or controlled to ALARP before work commences.</i>  Document who is responsible for implementing the controls to manage each hazard identified.	Risk Rating refer to the risk matrix or HSEQT.PRO.Risk Mgt
1.					
2.					
3.					
4.					
5.					

# Audit

<b>Process:</b> insert// <b>Procedure:</b> Insert //			Date:	Audited by :
			Location of Audit:	Area Mgr/Supervisor:
Item	Question	Evidence Sited	Comments	Conformance Score 0,3,5
1.				
2.				
3.				
4.				
5.				
6.				
7.				
AUDITOR'S SIGNATURE:		CONFORMANCE SCORE:     / 25	0 – Non-Conformance	
SAFETY REP'S SIGNATURE:		CONFORMANCE %:	3 – Continuous Improvement Opportunity	
			5 – Total Conformance	