



**Labour and Workforce Development**  
**OCCUPATIONAL HEALTH AND SAFETY DIVISION**

## **Handling and Storage of Material**

**A guide to Part 5 of the**

**Occupational Safety General Regulations**

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## **A GUIDE TO PART 5 – Handling and Storage of Material - of the OCCUPATIONAL SAFETY GENERAL REGULATIONS**

The information contained in this publication is a guide only and should be read with the *Occupational Safety General Regulations* for specific requirements. The Regulations are available through our [web site](#) or copies may be requested by calling the Information Specialist at 902-424-5400 or toll-free 1-800-952-2687. For your reference and convenience the section of the Regulations has been included where possible.

The guide is divided into two parts:

Part 1 - General Requirements- contains information on the general handling of materials and objects

Part 2 - Specific Requirements- contains specific information on the handling and storage of:

- Bulk material in bins, hoppers and tanks
- Piled material
- Hazardous substance
- Rechargeable storage batteries
- Compressed gas including portable compressed gas cylinders

## **Part 1 – General Requirements**

### **General handling of objects and material (Section 26-29)**

#### **What do I need to do when working with construction debris?**

The employer has to take care that material from the demolition is moved or carried in appropriate containers. In some cases a chute or trough may be used to slide the debris into a container.

#### **When do I have to use a chute?**

If debris is being dropped from a height of 6 meters (vertical) or about 20 feet, the employer must ensure a chute or something similar is used.

#### **What if I'm using heavy equipment for demolition?**

Requirements for chutes or containers for the movement of debris do not apply where a bulldozer, wrecking ball and crane or similar piece of heavy equipment is used.

#### **Can I use a “tarp” as a chute?**

A chute is a sloped structure that allows material to pass through it or over it. A chute has to meet these three conditions: it has to be well made and fixed firmly; if the angle is more than 45 degrees it has to be enclosed on all sides; and there needs to be a satisfactory gate at every loading entrance and at the bottom.

So, a tarp, in good condition, could be used as a chute where the angle is less than 45 degrees it is firmly attached and there is a gate at the loading entrance and the bottom.

There are also requirements for the entrance to a chute: if the entrance to the chute is at or below floor level a ridge or barrier of at least 4 inches by 4 inches is needed. The bottom part of the entrance cannot be more than 4 feet above a floor; and the entrance must be kept closed when the chute is not being used.

## **Part 2 – Specific Requirements**

### **Bulk material in bins, hoppers and tanks (Section 30-31)**

#### **How should burnable bulk material be stored?**

Bins, hoppers, tanks or other containers that hold burnable bulk material (sawdust for example) must have: a lid, be fire resistant, and have good air circulation. The employer may use something else that offers the same level of safety.

This also applies to a garbage bin at a project site that is being used to store burnable bulk material.

### **What do I do when there is jam in the bin or hopper?**

The employer must have a written work procedure for the safe break-up of jams and clogs if a person is at risk from trying to break-up the jam; also, a copy of it must be available near where the problem could occur.

Note: the employer may also need to consider the requirements for confined space entry (part 12 of the Occupational Safety General Regulations.)

### **Piled Material (Section 32)**

#### **What is piled material?**

Piled material refers to things like boxes, pallets, barrels, sacks, or uncontained bulk material.

#### **What do I have to think about when stacking material?**

The regulations require an employer to ensure piled material does not interfere with: lighting, ventilation, entry and exit, any passage ways or traffic lanes, the operation of machinery, sprinklers or other fire fighting equipment, or electrical panels and energized power lines.

Also the structure where the material is stored must have a foundation able to support the load and have partitions or walls designed to support the load if it is going to be resting against them.

Finally when piling the material the employer needs to ensure the material is arranged in a stable manner, protected from conditions that could damage the material container (leaks, humidity etc) and regularly inspected for possible hazards.

#### **What about material that can roll?**

When storing pipes, tubes, rebar or other materials that create a hazard by rolling, the employer must store them in such a way that prevents rolling. Available options include: racks that slope upward from a wall, or racks with vertical bars at the open ends.

### **Unconsolidated Material (Section 34)**

#### **What is meant by unconsolidated material?**

Unconsolidated material is any material that is loose or not in any container. Examples of this would be: sand, gravel, sawdust etc.

### **What should be done so someone can work on or near stockpiles?**

An employer must have a competent person inspect the stockpile and make sure it is in a safe condition before anyone can work on, or close to the pile.

### **Are there safety requirements for using heavy equipment (front end loader for example) to work the stockpile?**

When using heavy equipment to remove material from the stockpile an employer has to make sure the side of the material being worked on (working face) is sloped to its “angle of repose”. The angle of repose is the angle where the material would no longer flow down.

Imagine a large pile of sand; as more sand is piled on, the sides will shift and slide downward spreading the base out further. When it stops, the pile has reached its angle of repose. Note: weather conditions can affect the angle of repose by temporarily making the material less slippery or just stick together.

### **What other requirements are there?**

Before working or removing material from a stockpile using heavy equipment, the employer is responsible for making sure the vertical height of the working face is not more than 1.6 meters or 5 feet above the maximum reach of the equipment.

Work has to be done based on certified written specifications and written safe work procedure. These procedures need to be certified by an engineer if there is the chance the material could collapse on the equipment or a person. If there is no danger of a collapse on a person or equipment, the safe work procedure can be certified by a competent person.

### **What if we work the material by undercutting it?**

Undercutting material must meet three conditions, it is to be done only: to the depth of the bucket on the equipment being used; when the undercutting equipment is at right angles (90 degrees) to the face of the pile being undercut; and done based on certified written specifications and work procedures. An engineer must certify the procedures if there is a danger of the material collapsing on a person or equipment. A qualified person can certify the procedures if there is no danger of material collapsing on a person or equipment.

### **What about loading and unloading of trucks?**

The employer has to make sure enough safety measures are in place to ensure the trucks, vehicles, and equipment do not overturn when being loaded or unloaded.

## **Hazardous Substance Storage (Section 36)**

### **What should we consider when storing hazardous materials?**

There are several things the employer must consider when storing hazardous materials. First the container used in storing the material has to be in good condition and adequate to storing the substance.

The employer will also consider:

- the material safety data sheet for the substance (if it exists);
- any information from the supplier of the substance;
- if there is some way of being able to quickly find a leak should it happen – this could be an alarm, sensor or regular visual inspections;
- the location of the stored substance: is the foundation, floor, shelving etc. able to resist interaction with the substance, is there a need for some way to contain leaks (catch basin, over flow pipes);
- the container's ability to resist corrosion from being exposed to the substance.

### **What should I do with the empty containers?**

As soon as possible, if the container is not going to be refilled with the same or a compatible substance, it should be sufficiently cleaned. Cleaning is not necessary if the employer makes certain the container is made unusable by crushing, cutting in pieces, cutting holes, removing top and bottom, etc.

The employer should also note any disposal instructions made by the manufacturer and also be aware of any environmental issues.

### **Are there requirements for a “carboy”?**

A carboy means a bottle or container of 20 liters (about 4.4 gallons) or more, but less than 75 liters (about 16.5 gallons), that holds liquids. The carboy can be made of glass, plastic or metal.

When using carboys the employer has to make sure:

- when transporting glass carboys they are packed in individual containers and are properly cushioned using non-burnable material;

- stored with compatible material in an area that has flooring resistant to the chemical being stored;
- not piled on top of another carboy, unless done according to the manufacturer's specifications;
- placed in an appropriate storage rack or on strips laid on the floor;
- stored according to the manufacturer's specifications;

Finally the employer has to make sure the carboy is in good condition.

### **Can I store different substances together?**

If there is a chance of a dangerous reaction between the stored substances, the employer has to make sure they are stored separately. This does not have to be separate rooms. Separately means the substances are far enough apart so that no reaction would occur if an accident or leak happened.

### **What about pipes carrying hazardous substances?**

The employer has to make sure the pipes and any related equipment are made of material appropriate to the substance in them and maintained in good operating condition. Also the employer has to make sure each pipe has an inspection schedule and carry out inspections based on that schedule.

### **Are there requirements for spills?**

Yes, if a substance is used in quantities that could affect the health and safety a person.

The employer has to make sure: only working amounts of the substance are kept in the area a person is working in; there is a written emergency procedure that includes the use of emergency equipment; and spills are cleaned up immediately.

### **Rechargeable Storage Batteries (Section 42)**

#### **What safety measure do I need when working with rechargeable batteries?**

Rechargeable batteries may be made of many materials and have the ability of be recharged, i.e. vehicle batteries, nickel cadmium (NiCADS), or lithium batteries. The recharging of batteries must be done following the battery manufacturer's specifications.

**We regularly recharge batteries as part of our business. What safety measures should we be taking?**

If there is a possibility that gases may be generated in the recharging process the employer will need to get a written assessment from a competent person. The assessment is done in consultation with the joint occupation health and safety committee, or representative, if you have them, and will determine if the recharging is likely to cause an explosive mixture of hydrogen or the release of another substance.

If the assessment determines there is a likelihood of an explosive mixture of hydrogen or the release of another substance the employer must make sure electric charging is done in a specific area or room and has:

- a notice at the entrance prohibiting smoking or open flames;
- ventilation to prevent build up of flammable gases;
- a floor made of non-sparking material;
- non-sparking tools available for the connecting and disconnecting of batteries; and
- level trays or racks made of non-sparking materials (if using trays or racks)

**I had an assessment done two years ago, is this ok?**

No, the employer needs to make sure a competent person reviews the assessment annually or when there is a change in the process or volume of charging, whichever is the shorter period of time.

**What should I do with electrolyte spills?**

The electrolyte needs to be neutralized and cleaned up immediately.

**Can anyone work at recharging batteries?**

An employer has to make sure the person working on recharging batteries has an adequate combination of experience, training, certification and knowledge of the health and safety laws related to the battery charging.

**Is there personal protective equipment that should be used for recharging batteries?**

Rechargeable batteries that use an electrolyte require the person doing the job to wear appropriate personal protective equipment. The employer must provide the employee with goggles and a face shield (chemical splash proof if needed), acid resistant gloves, an acid resistant apron, and appropriate footwear; and makes sure the employee wears the provided

equipment.

**Are there requirements regarding the battery that is to be recharged?**

The battery has to be satisfactorily secured while being used or being recharged, and ventilation openings must be free. If the battery contains electrolyte and is no longer useful it must be disposed of so no electrolyte can spill accidentally.

**Compressed Gas (Section 45)**

**Is there a standard I can follow for storing and handling compressed gas?**

The regulation requires the employer to use, store and handle compressed gas in a container in an adequate manner. Specifically the Compressed Gas Association standard CGA P-1-1991 “Safe Handling of Compressed Gases in Containers” can be followed to indicate reasonable care (copies of the standard are available at the regional libraries). An employer does have the ability to prove following the standard is not reasonable in their specific circumstance.

**Can regulators for one type of gas be used for another?**

There are several pieces of equipment that may be appropriate only for certain types of container or gases. The equipment to consider includes: regulator, automatic reducing valve, gauge, hose line or other equipment provided.

**What other requirements are there when using a compressed gas cylinder?**

The employer has to make sure cylinder components, like regulators, connections to piping, etc. are kept tight to prevent leaking. Also, regardless of whether the tank is full or empty, valves are to be kept closed at all times, unless: gas is flowing from the cylinder, the gas in the cylinder is maintaining pressure in a supply line, or the cylinder is on stand-by between operations using gas.

The employer has to make sure that hose lines carrying burnable gas or oxygen to torches have threads designed in agreement with Compressed Gas Association standard ANSI/CGA V-1-1994 “American National Standard/Compressed Gas Association Standard for Compressed Gas Cylinder Valve and Inlet Connections”.

**Portable Compressed Gas Cylinders (Section 47)**

**What is a portable compressed gas cylinder?**

Sections 47, 48 and 49 of the regulations treat compressed gas cylinders as having a water capacity of 450 kilograms (about 450 liters or 100 gallons) or less as portable.

## **How can I store portable compressed gas cylinders?**

The regulation has some requirements, but an employer should note the Fire Safety Act might also impose restrictions. For greater certainty contact the Fire Marshal's office.

An employer has to make certain:

- the portable cylinder is stored in a well-aired storage area where the temperature does not rise above 52 degrees (centigrade);
- the cylinder is grouped by type of gas and the groups arranged to account for the gasses they hold;
- full and empty containers are to be stored separately or far enough apart so as not to confuse one for the other;
- containers must be stored a safe distance from operations that produce, flames, sparks, or molten metal that could cause too much heating of the cylinders; finally
- the cylinders are to be stored securely and have protective devices (caps) in place.

## **What about the condition of the portable compressed gas cylinders?**

The employer has to make sure the cylinder is not exposed to corrosive material, or corrosion-aiding substances and protect them from falling or having something fall on them.

## **Are signs needed?**

Yes, the names of the gases stored and signs prohibiting smoking have to be prominently displayed.

## **Can I roll the cylinders from one place to another?**

No, no one may roll a cylinder on its side; cause it to be roughly handled (throwing, dragging); or move a cylinder with a lifting magnet.

If appropriate lifting mechanisms are not provided on the cylinder, the employer has to make sure an appropriate cradle or platform for holding the cylinder is used to lift it.

## **What requirements are there for transporting portable compressed gas cylinders?**

Before transporting cylinders an employer must make sure they:

- are upright and securely fastened, unless designed to be transported in a different manner
- have a protective cap on the cylinder or positioned to offer the same level of safety
- are transported in a way that prevents damage to the cylinder and its parts.

## **What requirements are there for refueling?**

A refueling system has to be developed, adopted and followed when refueling any equipment with an internal combustion engine.