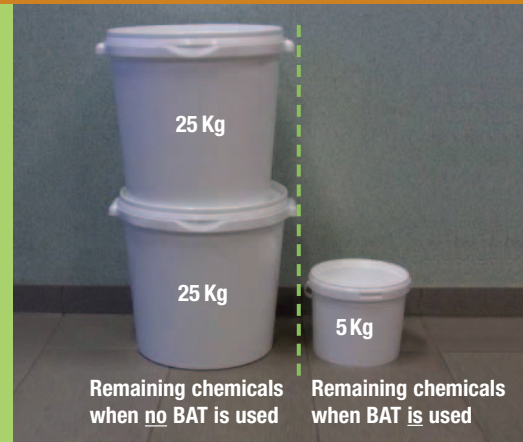


## RESULTS: COMPARISON OF REMAINING RESIDUES IN IBC COMPARED WITH EACH OTHER



If you do not use these simple techniques to correctly empty the IBC, you may lose between 25 kg and 50 kg of remaining product in each IBC.

In the diagram, to the left the two buckets represent 50 kg of remaining compounds, because best practices were not applied.

Whereas, the bucket to the right contains 5 kg of remaining compound, because best practices were applied.

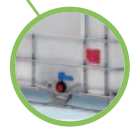


### TYPES OF INTERMEDIATE BULK CONTAINERS (IBC) ALLOWING TO REDUCE WASTE MATERIAL

There are two available types of IBCs, one for non-viscous material and another for highly viscous material. The latter is advised by IBC suppliers, as it has a bigger opening, a larger discharge valve and the bottom part of the container is tilted.

In both cases, to improve further the drainage, the valve can be taken off to increase the opening. Below you will find a detailed overview of both types of containers.

#### IBC for non-viscous liquid



#### IBC for viscous liquid



For further information:

Contact the VECAP Product Steward at [info@vecap.info](mailto:info@vecap.info) or visit [www.vecap.info](http://www.vecap.info)

VECAP is a voluntary initiative of member companies of the European Flame Retardants Association (EFRA) together with the industry's global organisation, the Bromine Science and Environmental Forum (BSEF).



CONTROLLING EMISSIONS  
PROTECTING THE ENVIRONMENT  
CONTINUOUS IMPROVEMENT

# Best Available Technique

## to empty Intermediate Bulk Containers (IBC) drums or small containers containing chemicals

An appendix to the Code of Good Practice





## WHAT IS THE BEST TECHNIQUE TO EMPTY IBCs OR DRUMS?

This document is to be added as a guideline to the Code of Good Practice. It is valid for all processes using substances delivered in Intermediate Bulk Containers (IBCs), drums or small containers. The objective is to have the lowest possible emissions during the emptying process.

**The type of packaging influences the amount of emissions emitted during the emptying process and the quantity of remaining liquid.**

- Always wear the appropriate protective clothing like gloves or respirator if required in the Safety Data Sheet (SDS).
- It is important to realize that remaining product in the container or liquid spilled on the floor can be a source of significant emissions.
- It is recommended to implement procedures requiring immediate cleaning of the work place after finalisation of a batch.

### Best available techniques (BAT) for IBC and drums

By using simple techniques users can reduce waste and product emissions by 90%. There are four different recommended manners of emptying an IBC of the material :

- 1 Heat the material in order to reduce its viscosity and enable the material to flow out of the container more easily.
- 2 Tilt the IBC, either manually or mechanically.
- 3 Use a shovel to scrape out the remaining material. When the material is highly viscous it may cling on the sides of the IBC.
- 4 Use vacuum on the dip pipe within the IBC.

In each case please send remaining sludge after cleaning to incineration or controlled landfill.

## 1. PRE-HEATING TO REDUCE VISCOSITY



1

### Oven with an IBC inside

If the product is very viscous, the emptying of the IBC is made easier if the product is pre-heated before emptying the container. In this photograph, the IBC is placed in an oven. The temperature of the oven is around 50-60°C.



2

### Steam pipes which form heating system

The heating system is a steam pipe underneath the floor of the oven. The cap of the IBC is open to allow the IBC to vent pressure during the heat up.

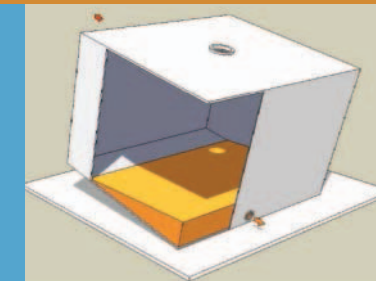
## 2. MINIMISE REMAINING PRODUCT: TILTING



1

### Tilting the IBC manually

Tilting the IBC and using a series of shocks to increase flow.



2

### The movement of tilting the IBC



3

### Mechanical tilting

Another tilting technique is to change the IBC at an early stage and then use the appropriate equipment to complete the drainage into the next IBC. The upper IBC is restrained to prevent over tipping.



4

### Remaining product after tilting the IBC

The picture shows the inside of the IBC after it has been tilted. The IBC contains now less than 2 kg remaining material in a 1000 kg IBC (0.2%). By using simple techniques we can reduce waste and/or emissions by 90%.

## 3. MINIMISE REMAINING PRODUCT: USING A SHOVEL



1

### Scraping the IBC with a shovel

If the compound has a high viscosity it may cling to the sides of the IBC. A simple constructed scraping device (such as a flat bottom shovel) is highly effective in gathering most of the residues into the outlet tap area.



2

### The shovel

## 4. MINIMISE REMAINING PRODUCT: USING VACUUM VIA THE DIP PIPE



1

### The IBC being vacuumed

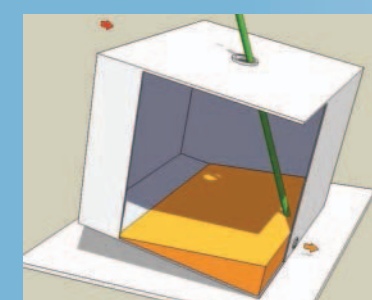
The product is removed from the IBC under vacuum until it is almost empty (vacuum: 0.1-0.2 bar atmosphere if 1 bar atmosphere is the atmospheric pressure).



2

### IBC tilted after vacuuming

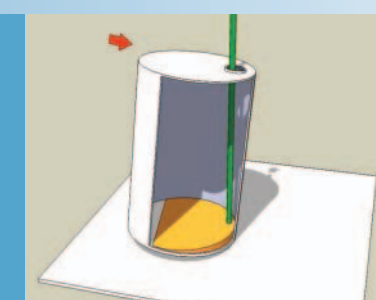
The IBC is tilted with care to allow access to the remaining product.



3

### Vacuum dip pipe in the IBC when tilted

When the IBC is tilted, the vacuum dip pipe is placed in the opposite corner to draw up the remaining material.



4

### A drum emptied by using the vacuuming method

The same technique can be applied for emptying drums. With this technique, the remaining product in the IBC or drum fluctuates between 0.1 and 0.3% depending on the viscosity of the product.