

Adsorbent loading recommendations

The procedures outlined below are intended as a general guide to good practices for the loading and commissioning of typical adsorbents used in the purification of olefins like PuriStar® adsorbents, Selexsorb® adsorbents or others. Special considerations may be necessary for unusual or atypical applications.

- 1. Conditioning of vessel** – before unloading, the adsorbent may need to be pre-treated (please refer to specific instructions) or simply needs to be purged free of any hydrocarbon vapors, condensed water or hydrocarbons. The purging is typically done with an inert gas.
- 2. Isolation of vessel** – Take out of service and safely separate from the rest of the unit by either closing the respective isolation valves or putting in blinds.)
- 3. Inspect bed support system** (grids and support screens) to assure their integrity (i.e., no tears or holes). Personnel lowered into vessel should wear appropriate breathing (or dust mask) equipment.
- 4. Install canvas loading sock on loading port** – purpose of loading sock is to break the free fall of the adsorbent to prevent attrition of the desiccant and Selexsorb® beads.
- 5. Minimize contact of adsorbents to the atmosphere.** Ambient air contains both H₂O and CO₂, which will be adsorbed by Selexsorb beads, thereby reducing their effective capacity for other contaminants.
- 6. Install bed support balls**, then level this layer.
- 7. Hoist up drums of desiccants /Selexsorbs to loading platform** around loading port on top of vessel and begin pouring adsorbent, through loading sock, into the vessel.
- 8. Level each adsorbent type** (in combination adsorbent bed) prior to loading the next adsorbent.
- 9. Level top layer of adsorbent, purge vessel** with inert gas, then isolate vessel (to prevent moist, CO₂-containing air migration into adsorbent bed).

(Do not load desiccants or Selexsorb beads during a rainstorm.)

In Figure 1, a general scheme for loading larger vessels is shown:

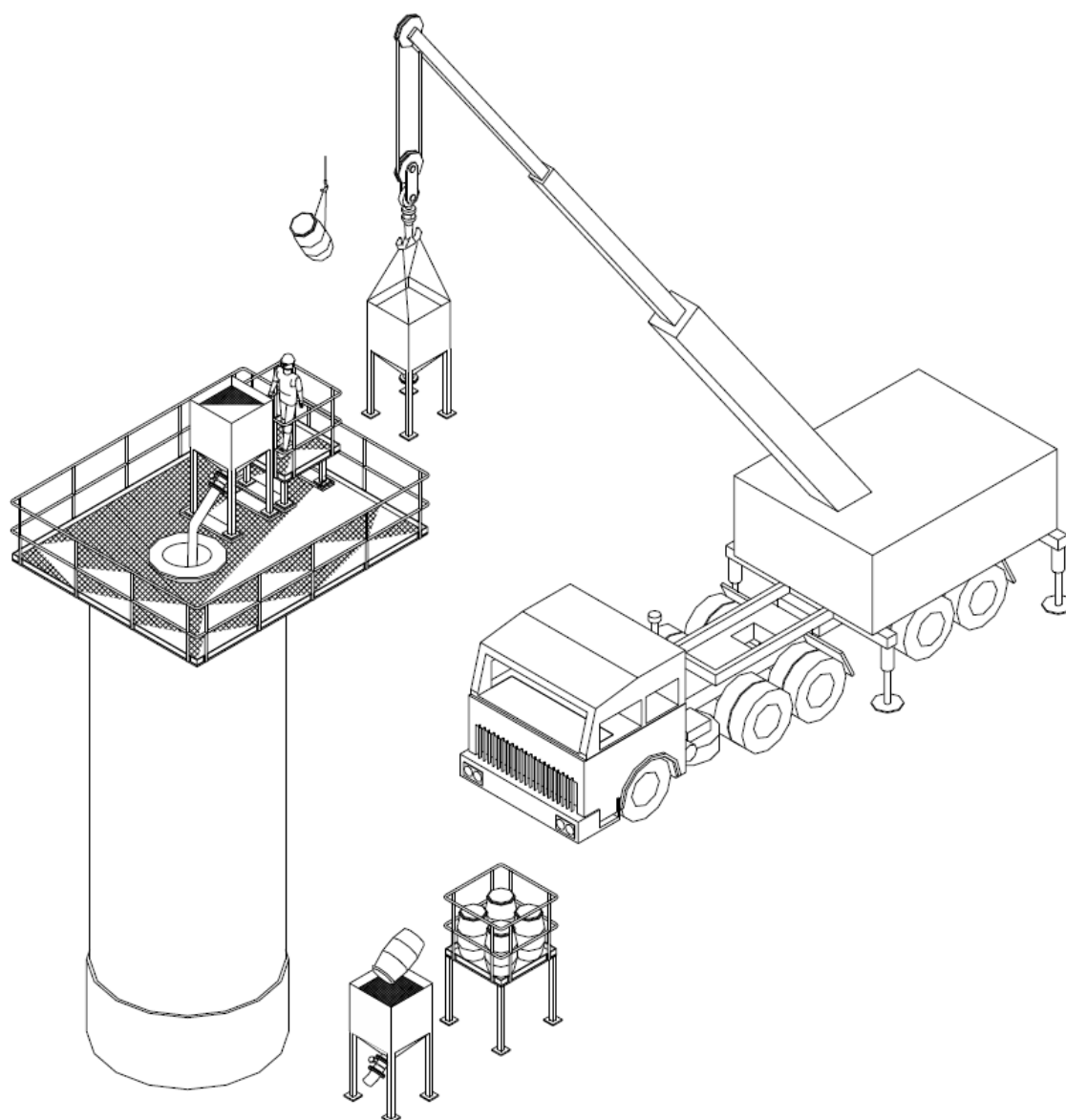


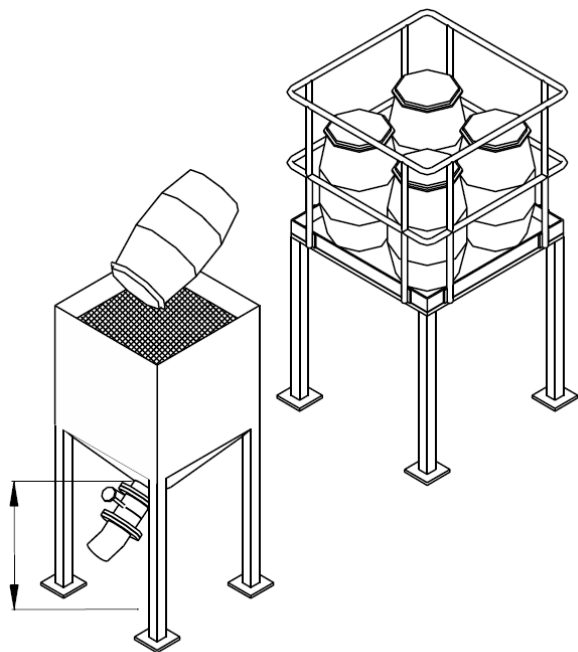
Figure 1 – Equipment needed for loading adsorbents

The equipment needed consists of the following parts:

- A crane to lift either single drums, hoppers or big-bags
- A station to transfer material from drums into hoppers (or flow bins)
- A loading station at the top of the vessel consisting of a hopper connected to a loading sock.

Not shown are a fork lift, which might be needed to move drums or big-bags on the ground. Not shown is a funnel, which is used in case big-bags are directly loaded into a vessel. In this case, the funnel is directly connected to a loading sock.

Figure 2 shows the transfer station

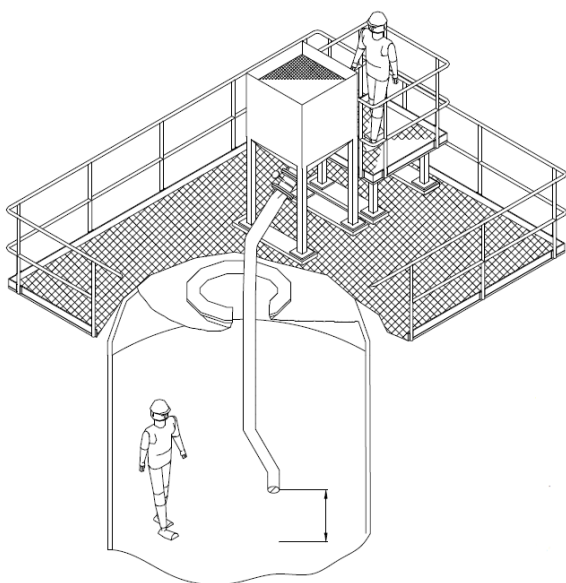


The transfer station consists of the following elements:

- A platform onto which the drums are lifted, e.g. with a fork lift
- A hopper into which the drums, located on the platform, are emptied into one by one.

As indicated in the drawing the hopper needs to be equipped with an outlet valve specific for solids (e.g. in the form of a gate valve) and to which a sock can be fixed in case the hopper is directly emptied into the vessel.

Figure 3 shows an impression on how the material flows into the vessel



The loading sock leads from the hopper or the funnel, if installed, to the top of the bed. The length of the loading sock is adjusted during the loading. The end of the loading sock is moved in such a manner as to evenly distribute the adsorbent across the cross section of the vessel. To avoid breakage of the adsorbent, a maximum free fall height of more than 1 m /3 ft should be avoided.

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Americas

BASF Corporation
25 Middlesex/Essex Turnpike
Iselin, New Jersey, 08830, USA
Tel : +1-732-205-5000
Fax: +1-732-205-7725
Email: catalysts-america@basf.com

Asia Pacific

BASF (China) Company Limited
300 Jiang Xin Sha Road,
Pudong, Shanghai 200137
P.R. China
Tel: +86-21-2039 2549
Fax: +86-21-2039 4800-2549
Email: catalysts-asia@basf.com

Europe, Middle East, Africa

BASF De Meern BV Catalysts
The Netherlands
Tel: +31-30-666 9437
Email: catalysts-europe@basf.com

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