

## BP OIL -- TOLEDO REFINERY

<b>Certified</b>	<b>Area:</b>  Refinery Wide	<b>Procedure No.:</b> SAF 050
<b>Effective Date:</b> December 9, 2005	Safe Handling of Drums	<b>Rev. No.:</b> 1  Revised 08/2007
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<b>SCOPE</b>	In those situations where the use of a mechanical device is not feasible, manual handling can be a safe operation if done properly. This procedure describes safe handling methods for drums and barrels.
<b>HEALTH</b>  Special PPE & Special Hazards	Excessive weight Odd shapes Hazardous Material
<b>SAFETY</b>	Standard PPE
<b>REFERENCE DOCUMENTS</b>	Hazardous Waste Disposal (ENV 04.001) Spill Cleanup Procedure (HSE 002)
<b>SPECIAL MATERIALS &amp; EQUIPMENT</b>	Drum Up enders Hand Cart Cradle Trucks
<b>QUALITY</b>	N/A
<b>ENVIRONMENTAL</b>	Spill Cleanup

## OVERVIEW

Many materials used in the refinery operations are supplied in drums or barrels weighing from 350 to 600 pounds. Such weights and container shapes can create hazardous manual handling situations. In these cases, improper handling methods may result in serious hand, foot and back injuries. The use of mechanical handling devices greatly reduces the chances for injury, and these devices should be used wherever it possible to do so. Even these devices must be used properly to avoid injury.

- 1.0 Mechanical Handling
- Most mechanical drum handling devices require a certain amount of manual lifting effort. Therefore, to avoid back strain, use the “squat-leg lift” method. Mechanical devices also involve the use of the hands, so it is essential to avoid “hand traps” and wear gloves. Feet, too, need to be protected against “toe-traps” by safety shoes and careful placement.
  - Drum up enders are simple leverage devices which enable one person to raise a horizontal drum to the upright position with low lifting effort. Care is needed to retain control of the drum as it tips backward to rest position. Drum up enders are not designed to safely lower upright drums to horizontal position.
  - Drum hand trucks enable one person to pick up an upright drum and transport it to a storage or dispensing location. Dispensing hand trucks permit a drum to be retained in horizontal position for dispensing its contents.
  - Drum cradle trucks are designed to pick up an upright drum, then move it in an elevated horizontal position for dispensing into buckets, cans or piping.
  - Drum lift trucks are probably the safest one-person device to pick-up upright drums, transport, tilt and turn them upside-down for emptying. This hand device requires the least lifting and turning effort.
  - Crane or monorail drum carriers and lifting hooks require no manual lifting effort and low moving effort to transport and pour contents. These devices are designed to handle drums where rough terrain makes wheeled transport impractical.
- 2.0 Two-person Manual Handling
- Manual handling of drums makes backs, hands and feet more liable to injury than mechanical methods. When help is not available, one person using the proper precautions can safely handle some drums. But, optimum safety requires the use of two people for most drum handling situations. Safety shoes and gloves are essential articles of personal protection. Use the “squat-leg” method of lifting to avoid back strain.
  - For two people to raise a horizontal drum or barrel to upright position:
    - a) Both people stand on opposite sides of the drum facing each other.
    - b) Each person grasps the rim (chime) at each end of the drum near its highest point
    - c) Lifting together, they raise one end while pressing down on the opposite chime.
    - d) As the raised end is brought up to the balance point, each person releases his/her grip on the bottom chime, stands upright and pulls the drum to vertical position with his/her other hand. During this action, make sure hands are not caught in “pinch-traps”.

- For two people to lower an upright drum or barrel in an open area to horizontal position:
  - a) Make sure there is room to lower the drum.
  - b) Both people stand close together facing the drum.
  - c) Each person grasps the nearest edge of the top chime with both hands, resting the palms against the side of the drum.
  - d) Both people push forward until the drum balances on its lower chime. Then, while keeping their grip on the top chime with one hand, they release their other hand and step forward a short distance.
  - e) Each person now grasps the top edge of the bottom chime with his/her free hand to steady the drum while they lower the opposite end to horizontal with their other hand.
  
- For two people to lower an upright drum or barrel from its position against a wall or other container to a horizontal position:
  - a) Make sure there is room to lower the drum.
  - b) Both people stand close together facing the drum.
  - c) Each person grasps the farthest edge of the top chime with one hand (one person's left hand and the other's right hand; shoulder to shoulder).
  - d) Placing their free hands against the wall or another container, they each pull outward on the top end with their other hand until the drum balances on its bottom chime.
  - e) Each person now steps to the side of the drum and changes the position of his/her hand on the top chime to grasp its outside edge. Each grasps the bottom chime with his/her free hand to steady the drum, then lowers the top end to horizontal with their opposite hand.
  
- To roll a drum or barrel each person (or one person) pushes with the hands, not the feet, against the sides, not the chimes. To change direction, grasp a chime and pull to proper course. Do not use the feet to change direction.
  
- To move a drum or barrel down a skid, first roll it to position at top of skid. Grasp both chimes near the top, turn the drum endwise then slide it on and down the skid.
  
- To move a drum or barrel up a skid or incline, it is safer to use ropes or tackle to control motion by "snubbing". If necessary, however, two people can roll a drum or barrel up a skid. To do so, both people stand outside the skid, not inside the rails, and roll the barrel up by pushing against a side with one hand while rotating the upper part of a chime with the other hand. Make sure the feet and body are braced.
  
- 3.0 One-person Manual Handling
  - To raise a horizontal drum upright:
    - a) Bend knees and squat facing one end, keeping back straight. Grasp the lower edge of the chime on each side of its floor contact point.
    - b) Straighten the leg muscles to lift the end of the drum to the point where it balances on the bottom chime.
    - c) Shift one hand, then the other, to grasp the far end of the top chime and lower the drum to rest. Keep hands clear of pinch points at wall or other containers.

- To lower an upright drum to horizontal:
  - a) Make sure there is room to lower the drum.
  - b) Stand in front of the drum and reach over the top to grasp the farthest edge of the chime with both hands. If the drum is near a wall or other containers, pull forward on the chime with one hand then push backward with the other against a wall or a nearby drum.
  - c) Pull the top end forward until the drum balances on its bottom chime. Shift one hand and then the other to grasp the bottom edge of the top chime with both hands, keeping them far apart to avoid a “pinch-trap”.
  - d) Lower the near end to horizontal using the “squat-leg lift” method of weight handling. Keep the back straight and check the position of the hands to be sure they won’t be pinched between the chime and floor.

#### 4.0 Special Precautions

- In some cases, it is common practice to move upright drums short distances by tilting them near the balance point and rolling the drum on its bottom chime. This has to be done with great care to avoid tilting the drum past the balance point or losing control on a slippery floor. Improper actions can result in foot, leg and back injuries.
- Some drums contain corrosive, irritating or flammable materials. To avoid spillage and leakage, which could create a hazardous condition, make sure all bung and vent plugs are tight before handling. For dispensing, loosen plugs carefully to avoid spatter of volatile contents, especially in hot weather. When valves are attached to upright drums for horizontal dispensing, do not use valve as a lever for lowering drum or allow valve to strike against any objects.
- Before grasping a chime, inspect it for steel slivers or sharp edges which could cut hands.
- When practical, inspect drums and containers to assure integrity prior to moving.
- Unlabeled drums and containers shall be considered to contain hazardous substances, and handled accordingly (per ENV 04.001) until contents are identified and labeled.
- Employees handling drums should be aware of potential hazards associated with contents prior to action.
- Spills shall be handled using the Spill Cleanup Procedure (HSE 002)
- Drums and containers shall be identified and classified prior to shipping.

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