Vapor Technologies Inc.

OPERATION MANUAL

NOVAC 1000

Carbon Absorption Unit

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Introduction

The NOVAC 1000 is a cone bottomed vertical vessel designed to remove contaminants contained in a vapor stream. This is achieved through the use of activated carbon that's placed in the vessel adsorbing the vapors. The carbon container holds approximately 1000 lbs. (453.5 KG) of activated carbon.

Note: Due to the weight of carbon varying from 25 lbs. (11.34 KG) per cubic foot to 40 lbs. (18.15 KG) per cubic foot the height of carbon in the vessel will vary depending on the weight in lbs. or KG per cubic foot of the carbon.

The NOVAC 1000 was designed to be easier to evacuate the spent carbon media by using a forklift or crane to lift the unit and then open the 6" Carbon Drain Valve on the bottom of the cone.

During the operation of the carbon vessel, the air stream exhausted from the carbon container will need to be monitored periodically using the Inlet & Outlet sample ports to check for breakthrough of vapors. Once break through occurs at or above the limit set by the operating company, the air stream should be shut down and carbon should be evaluated and changed out if deemed necessary.

System Components

- 20" Flanged Manway (Buna gasket)
- Temperature Gauges
- Access Ladder
- Carbon Drain Valve
- 12" Access Port. (Buna gasket)
- Vapor Inlet
- Vapor Outlet
- 2" flanged Auxiliary Port
- Liquid Quench Valve
- Vapor Inlet Screen
- Lifting Points
- Liquid Drain Valve
- Vapor Sample Ports

Initial Set-Up

1. Place the unit on a firm level surface in the vicinity of the tanks that will be vented through the unit.
2. Unbolt the 20" Manway on top of the unit. Inspect the inside of the vessel to make sure the liquid quench nozzle and piping are in the correct position and undamaged.

3. Use a fork lift or other load rated equipment to load carbon media into the 20" Manway on top of the vessel. (See loading procedure below.)
4. Use a shovel, rake or broom to level out the carbon media inside the vessel. (See the MSDS for appropriate personal protective equipment when coming in contact with the carbon.)

5. Locate a dependable water source with 20 GPM @ 40PSI and connect a water hose from it to the Liquid Quench Valve located on the side of the Vessel . Have the Liquid Quench Valve handle in the closed position and turn on the water source to the water hose, pressurizing the hose. This will ensure water is available to cool down the carbon in the event the carbon temperature exceeds the recommended operating temperature.

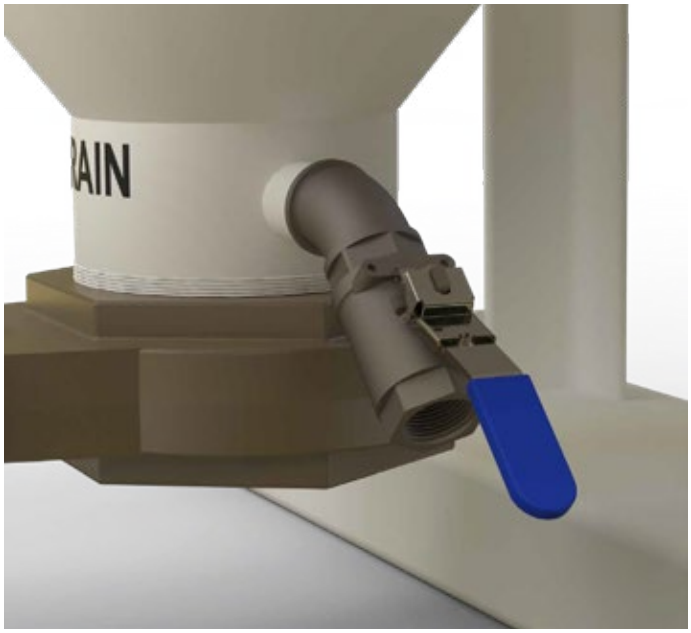
Carbon Unit Operation

1. Before operating carbon vessel, make sure that there are no closed valves or any restrictions to maintain atmospheric pressure throughout the carbon vessel.
2. Introduce the vapor air stream to the carbon unit. Monitor the temperature of the carbon at the temperature gauges on the side of the vessel. It is also recommended to use a point of use infrared thermometer to check other areas of the vessel.
3. If the temperature climbs above 140°F, (60°C), monitor very closely the temperature increase. If the temperature continues to rise open the valve on the Liquid Quench piping and disconnect the 6" hose from the vapor inlet and direct the hose away from personnel.
4. Monitor the temperature as the water is quenching the carbon. The temperature should decrease as the water is flowing into the vessel.
5. Once the temperature has decreased to 90°F (32°C) remove the 20" manway cover on top of the unit and inspect the carbon. (Wear appropriate personal protective equipment while inspecting carbon. See MSDS)
6. **Note: Installations where the ambient temperature is at or above 90°F, (32°C), it would be beneficial to build a structure above and around the unit to shade it from the sun. Even without any added heat generated by the adsorption of hydrocarbons the sun can elevate the temperature of the unit to undesirable levels.**
7. Note: The use of a blower or venturi to draw the vapor air stream through the unit along with a fresh air inlet tied into the vapor inlet hose would also be beneficial in maintaining a lower temperature level in the unit. (Consult the factory for additional information.)
8. **NEVER** allow vapors containing **ketones** or **aldehydes** to enter carbon unit. These compounds can easily cause a fire in the carbon bed.

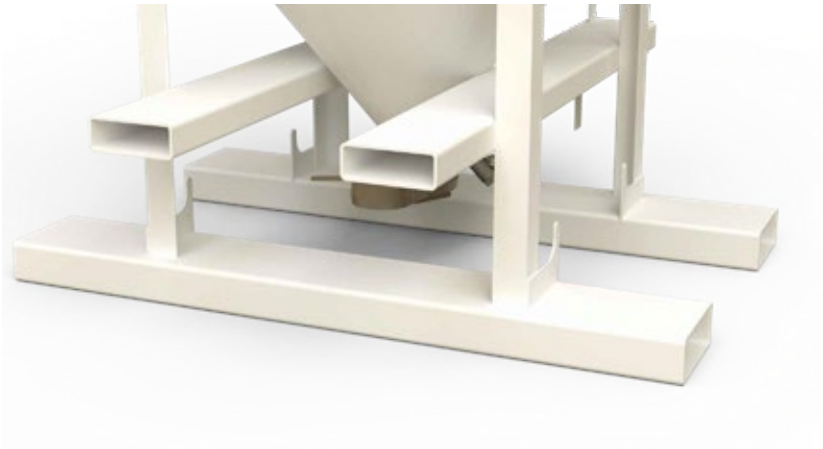
Carbon Removal

Video Demonstration

1. Isolate the unit from the vapor air stream, disconnect the hose from the vapor inlet and vapor outlet.
2. Open the Liquid Drain Valve on the bottom of the vessel cone and capture any liquid that drains out and dispose of properly.



3. There are several ways to remove the spent carbon from the vessel:
   - Use a crane and connect lifting shackles and straps to the lifting points on top of the unit to lift the vessel above a disposal container. Open the carbon drain valve on bottom of the unit.



   - Use a forklift to extend the forks through the slots in the base of the unit and lift the vessel above a disposal container. Open the carbon drain valve on bottom of the unit.
   - Use a vacuum device to vacuum the carbon either out of the top manway or out the bottom carbon drain valve.
4. With the Vessel lifted in the air, attach an empty Carbon Sack to the Bag Hooks on the bottom rectangular legs & open the 6" Brass Gate Valve allowing the spent carbon to fill the Carbon Sack.
5. With the unit sitting on the ground remove the Access Port Cover and inspect the inside of the vessel. If there is still carbon media inside the vessel that needs to be removed close the 6" carbon drain valve on the bottom of the unit and use a broom or other tool to loosen the carbon and direct it towards the bottom of the cone, either through the 20" manway on top or the 12" access port on the side.

6. Dispose of all waste carbon in an approved manner.

Carbon Re-Fill

1. Make sure carbon drain valve is closed and the 12" Access Port is in place and secured with the 3-Wing nuts.
2. Open 20" manway on top of Carbon vessel.
3. Use an appropriate lifting device to lift the containers of new carbon media above the 20" manway and fill the vessel with appropriate amount of carbon media. Approximately 1000 lbs. of activated carbon. Note: Due to the weight of carbon varying from 25 lbs. (11.34 KG) per cubic foot to 40 lbs. (18.15 KG) per cubic foot the height of carbon in the vessel will vary depending on the weight in lbs. or KG per cubic foot of the carbon.
4. From the 20" manway use a shovel, rake or broom to level out the carbon inside the carbon vessel.
5. Close 20" manway, check to make sure the lid and gasket are seated properly on the flange and install fasteners.
6. Connect hose to the vapor inlet and outlet fittings.
7. Introduce the vapor air stream to the carbon unit. Monitor the temperature of the carbon at the temperature gauges on the side of the vessel.
8. Use only 4X8 or 4X 10 mesh size carbon media in the unit.

Maintenance

- Grease threads on manways and bottom valves regularly.
- Check bottom drain for liquid regularly and drain if necessary.
- Inspect manway gaskets regularly and replace if necessary.

Vapor Technologies Inc.
vapor-tech.net
PO Box 107, Hitchcock, TX 77563
877.840.0646 | 409.316.0173
281.754.4876
salesandinfo@vapor-tech.net