

## **ODOR CONTROL TECHNOLOGY SUMMARY**

### **Technology: COVERS / ENCLOSURES**

#### **Description:**

Odor control often requires the use of covers or enclosures to collect and contain the odors prior to treatment and dispersion. The major objectives of good containment design include:

- Prevent escape of odorous gasses to atmosphere
- Minimize volumes of odorous air to be treated
- Allow for reasonable access to covered processes for inspection and maintenance
- Ensure worker safety

Alternative containment designs include:

- Flat plates
- Flat plates with external reinforcement
- Full domes
- Low-profile domes
- Domes with suspended ceilings
- Equipment enclosures

Flat plates are generally used for relatively short spans such as grit chambers, raw sewage channels, clarifier effluent channels, etc. Flat plates are typically constructed from aluminum or fiberglass. Longer spans of flat covers can be accomplished with external truss systems for structural support.

Flat plates minimize the volume of air to be treated, reducing the size and cost of odor control systems. They are generally used where routine access to the process is not required, although hatches should be provided for regular inspection and maintenance.

Domes may be used to cover circular clarifiers, sludge holding tanks, sludge thickeners, and other larger odor sources. Most conventional domes provide for routine entry for inspection and maintenance.

Good engineering practice dictates 12 air changes per hour within the domes when worker entry is routine, resulting in larger volumes of air requiring treatment. This increases the size and cost of odor control systems.

Aluminum, fiberglass, and concrete are the most common materials used for dome construction. Fiberglass can be molded into a myriad of configurations, and is typically used to construct low-profile domes. These enclosures are only slightly domed to minimize air volumes to be treated. They are normally used in applications where routine entry is not required, with hatches employed for inspection and maintenance.



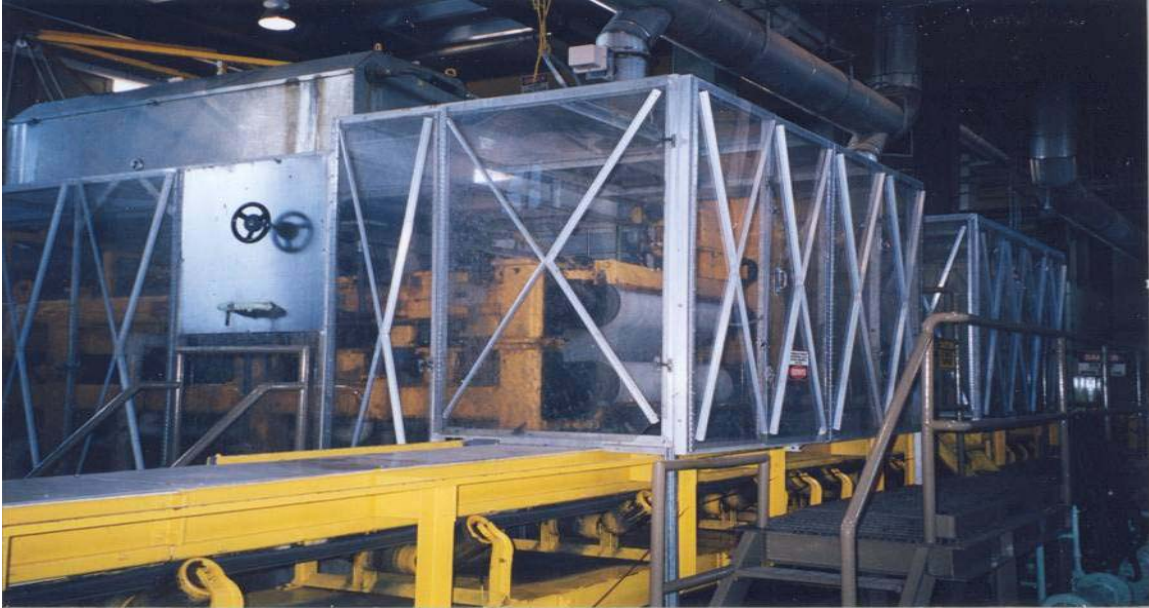
**Examples of flat aluminum plate covers**



**Examples of flat aluminum plate covers with external reinforcement**



**Examples of aluminum dome covers**



### **Example of custom equipment enclosure**

Another approach to minimize air volumes is to provide suspended ceilings within a conventional dome. This approach minimizes air volume, maintains good access to the process, but increases the cost of the enclosure.

Custom equipment enclosures are generally used for equipment such as belt presses, sludge conveyors, sludge degritting equipment, and wastewater screens. These enclosures isolate the odorous process and improve working conditions in the room.

The most common materials used for enclosures are aluminum and FRP. These materials are lightweight, corrosion-resistant, durable, and versatile. Stainless steel is also an excellent material, but may be cost prohibitive. Some flexible materials such as Hypalon, PVC, and vinyl have also been used. These materials are lightweight and low cost, but do not possess the structural qualities of the other materials. They can be supported by stainless steel cables or aluminum trusses.

#### **Applicable Treatment Processes:**

All odorous liquid treatment plant processes, pump stations, sludge processing and storage.

#### **Typical Design Criteria:**

Size of area to be covered

Structural qualities must match span length

Corrosion Resistance

Where high H<sub>2</sub>S exists, corrosion-resistant materials must be selected

## **Major Design Considerations:**

a. Access to process

Flat plate designs may be used where routine access is not required. Domes may be used to provide for improved access to the process.

b. Air treatment volumes

Flat plate designs and equipment enclosures minimize air volumes to be treated, decreasing size and cost of odor control systems.

c. Materials

Material selection should be based on cost, structural qualities, and durability.