

The Use of Industrial Immersion Heater in Tank and Vessel Heating | Drywell Heating

Industrial heaters also known as immersion heaters are used within tanks and vessels to heat up different liquids like oil, chemical, water and gases. There are many types of immersion heaters with each having sub categories depending on their size, watt density and applications. The process is carried out to prevent the content within the storage tanks from getting deteriorated or freezing and to maintain viscosity. Edible oils and items are also made to come in contact with these heaters to preserve them for a longer term.

Types of Immersion Heaters and Heating Process

There exist four common types of industrial heaters namely;

- Flanged
- In-line
- Screw Plug and
- Over the side

Each of these are installed in a different way, but one thing familiar in all, is that the actual control box that houses all the panels and buttons to operate the device is kept outside of the tank. This is to protect it from being damaged from coming in direct contact with the heater and the content itself. Once installed, temperature is set in a way to disburse heat equally to every corner of the storage tank. An open space is kept in between the heater and tank to let the excess heat and bubbles to vapor out of the contraption to avoid overheating.

Why Electric Heating

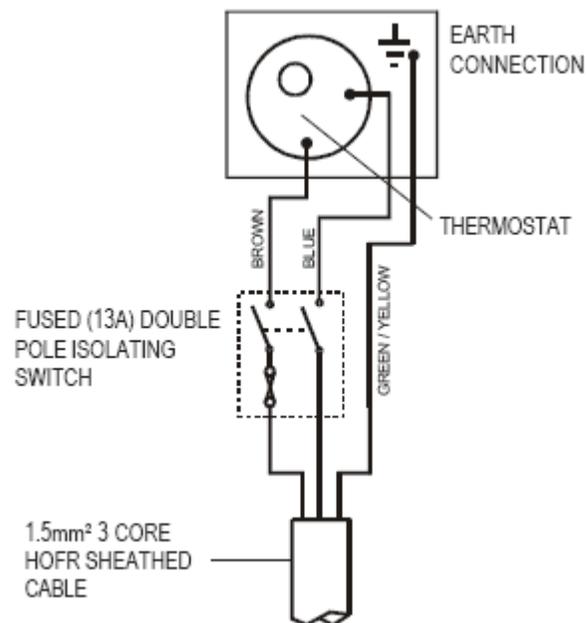
Electric heating is done when there is no direct heat source or steam available to carry the process. It is less costly as compared to other heating methods and the entire procedure is also known as heat tracing.

Heat Tracing: A Brief Introduction

Heat tracing is a method that prevents pipes, fluid lines and tanks from freezing as well as to keep the temperature constant. It provides heat externally rather than directly to the content which is why it is costly for large tanks and containers.

Direct Heating

If immersion heaters are placed directly into the tank, the entire heating process is carried out in an efficient way as energy is transferred equally to every corner. There are two ways to install the heater, that is, either directly or via external circulation loop.



- Design And Specification

An electric tubular heating element is welded to the NPT fitting or the ANSI flange itself. Appropriate nozzle with the right size and fitting is then placed around the bottom of the device. You can immerse it directly into the liquid. It needs to be kept four or five inches above the tank bottom to withhold contamination and sludge from developing in the sheath material. A minor setback of direct immersion heating is the corrosion of the heating element after a

particular time period. This is because the device is exposed directly to the tank; however, repairs and maintenance can be made by and over.

- **Overcoming Tank Drainage**

Tank drainage can pose a potential threat to the heater, while the maintenance and repairs is very costly, so it is necessary to counter this issue properly. All you have to do is install a direct immersion along with external circulation heater. This way, the tank liquid will pass through the circulation heater until the desired temperature is reached. Fluid can move in and out of the heater keeping constant warmth.

- **Minor Drawback**

One of the biggest drawbacks to the above-mentioned procedure is that whenever heater is removed for servicing or replacing, you have to empty the entire tank. The isolation valves are shut down, vessel drained and heater is removed for maintenance. The initial cost incurred during the entire process of installing is also too much.

Indirect Heating: Drywell Heaters

Drywell immersion heaters are designed in a way that you can place them directly within a pipe or tank for heating. These are also known as pipe insert heaters and available in various forms. The heating process can be compared to that of an oven in which the actual end of the device

that radiates heat is installed inside of the tank whereas controller box is kept outside.



- **Advantages**

The best part about drywell heaters is that when the need to replace or repair arises, you do not need to empty the entire tank. Also, since the heater is not entirely exposed to the tank, there is no fear for sludge or carbon contamination to develop.

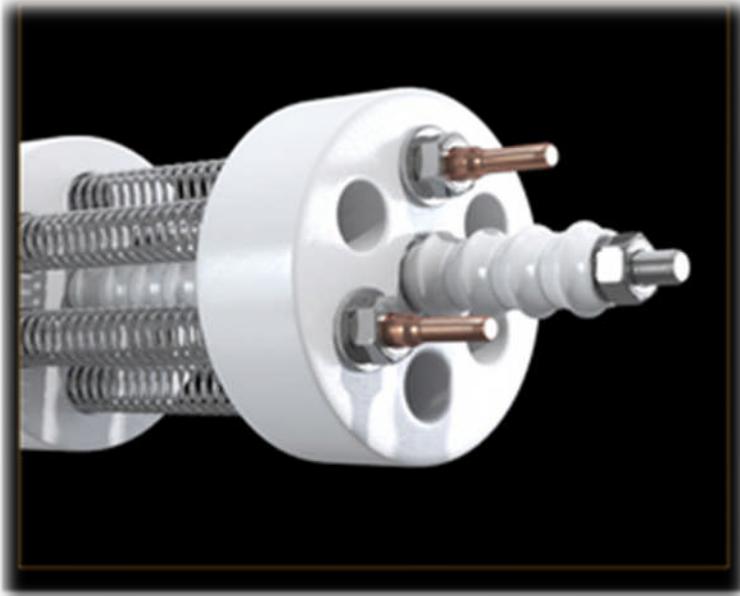
- **How To Install**

Even for this type of heaters, there are two methods to install. You can attach the nozzle directly to the tank or have it welded. Welding is more preferred as it is easy to make modifications this way simply by cutting a hole in the tank to carry the process.

Open Coil Heater

Where drywell heating method is more costly, an alternative to it is to use open coil heater in which a resistance wire is strapped along insulators made of ceramic. This process is budget friendly and is preferred by most of the industrialists.

How To Utilize Drywell Heaters



It is recommended that you take into account all the matters as to whether direct immersion heating is better or the drywell method. Budget must be checked as well as all the cost of installation. Moreover, you must also consider the after sales service requirements of the device, such as maintenance, replacement and everything else

for that matter.

Given below is some vital information with regard to the things that you need to consider when opting for a particular heating method.

- Tank size and liquid amount that is to be drained.
- Size, installation and maintenance cost, lifetime of the heater itself.
- Where to store the liquid or any content that is to be heated when repairs are being made. Find a suitable alternative.
- Check the content whether is it hazardous like chemicals, toxicants or other corrosive elements. They must be isolated far from physical contact as well as kept away from other devices and machinery.
- Heating time, handling and servicing personnel availability and all matters must be accounted for.

Both direct and indirect heating methods are beneficial in their own way but if you desire outstanding results, it is recommended to use direct immersion heaters rather than drywell.