



Republic of Iraq
Ministry of Higher Education
and Scientific Research
Al-Mustaqbal University College
Chemical Engineering and Petroleum Industries
Department

Subject: Oil and Gas Field Processing
3rd Class

Lecture 5

Storage Tanks

Storage tanks for crude oil are needed in order to receive and collect oil produced by wells, before pumping to the pipelines as well as to allow for measuring oil properties, sampling, and gauging.

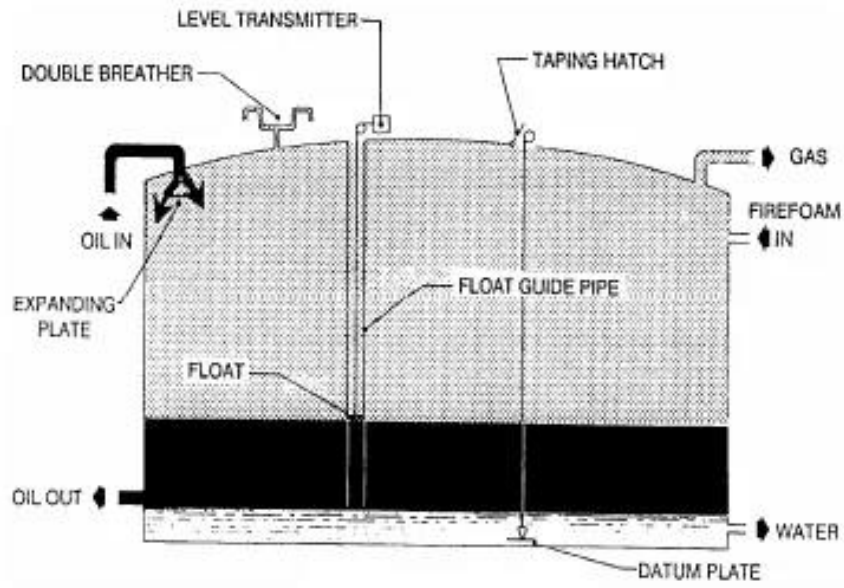
The design of storage tanks for crude oil and petroleum products requires, in general, careful consideration of the following important factors:

- the vapor pressure of the materials to be stored;
- the storage temperature and pressure;
- toxicity of the petroleum material.

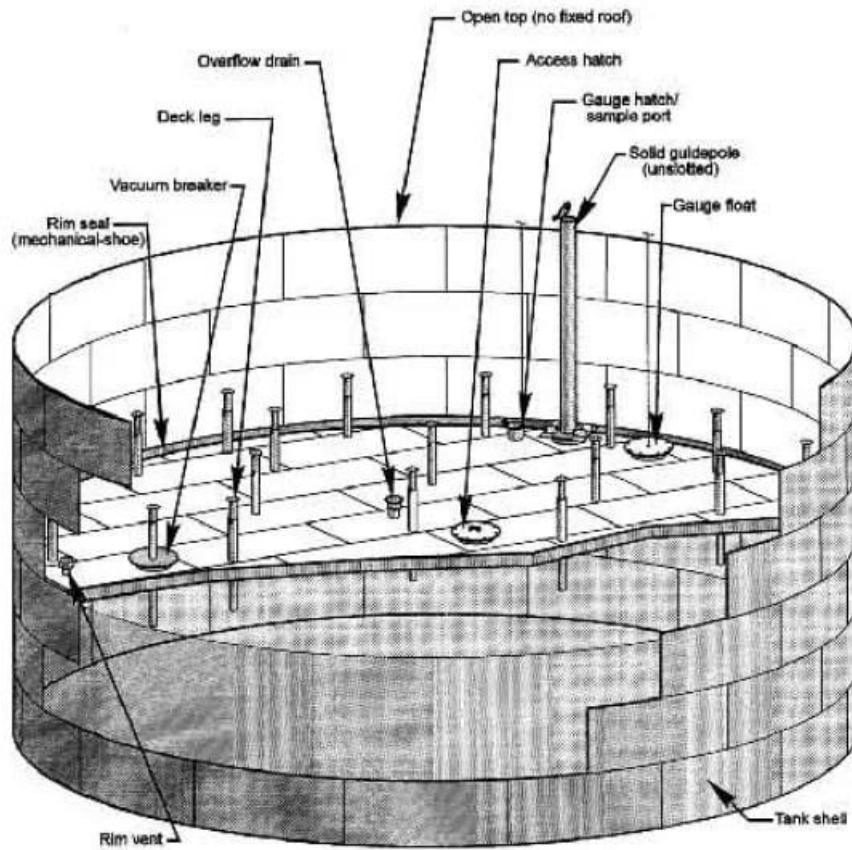
Types of Storage Tanks

Basically there are eight types of tanks used to store liquids:

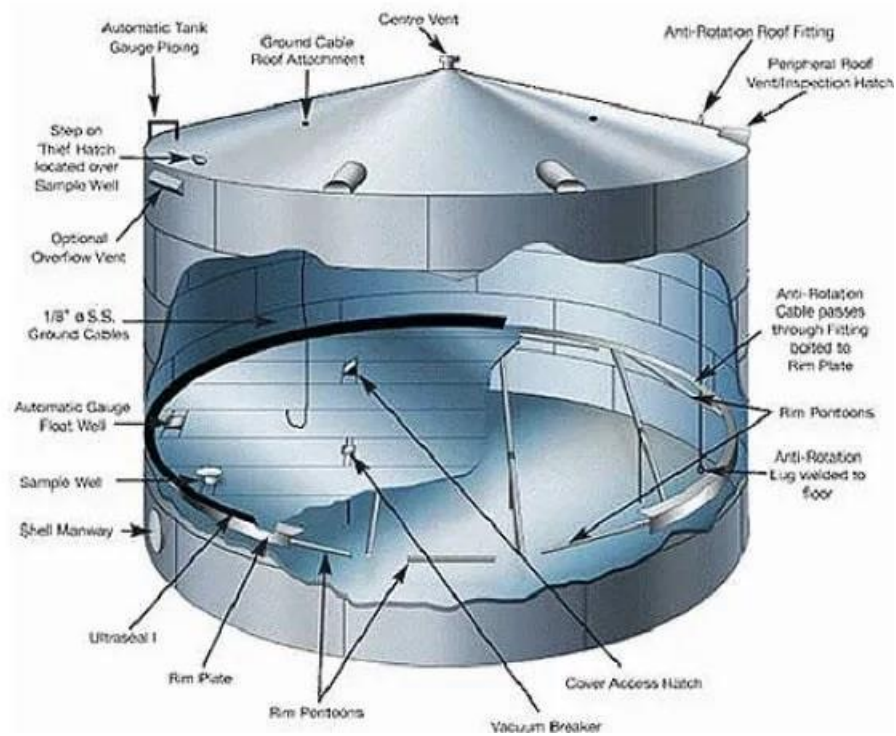
1. Fixed roof tanks
2. External floating roof tanks
3. Internal floating roof tanks
4. Domed external floating roof tanks
5. Horizontal tanks
6. Pressure tanks
7. Variable vapor space tanks
8. Liquefied natural gas (LNG) tanks.



Fixed Roof Tank



external floating roof tank



Internal floating roof tank

Vapor Recovery Units

The loss of hydrocarbon vapors formed above crude oil or its products—when stored—could be minimized using what is called vapor recovery units (VRUs). If allowed to escape to the atmosphere, these vapors will not only cause a loss of income due to loss of hydrocarbon volume and change in the API of the oil but will also lead to pollution and fire hazards.

The three main functions for the vapor recovery system are as follows:

- 1) to collect vapor from storage.
- 2) to reliquefy vapors.
- 3) to return liquid hydrocarbons to storage.

Basically, what is required of these units is to make the system work safely, and in the following way:

- during the day, when the temperature rises and vaporization of the hydrocarbons occur, excess vapors can be released and collected by the VRU;
- at night, when the vapors cool and condensation takes place leading to partial vacuum, vapors from the VRU will be admitted into the tanks;
- while pumping in and pumping out liquids to and from the storage tanks, vapors could be vented, [i.e., collected and drawn in, respectively, by such a breather system (VRU)].