

Storage & Transport of Crude Oil and Petroleum Products



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References

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Types of Petroleum and Gas Industry Sector

Upstream



- Exploration & Production (E&P)
- Firms explore new hydrocarbon fields
- Discovered fields developed and petroleum produced

Midstream

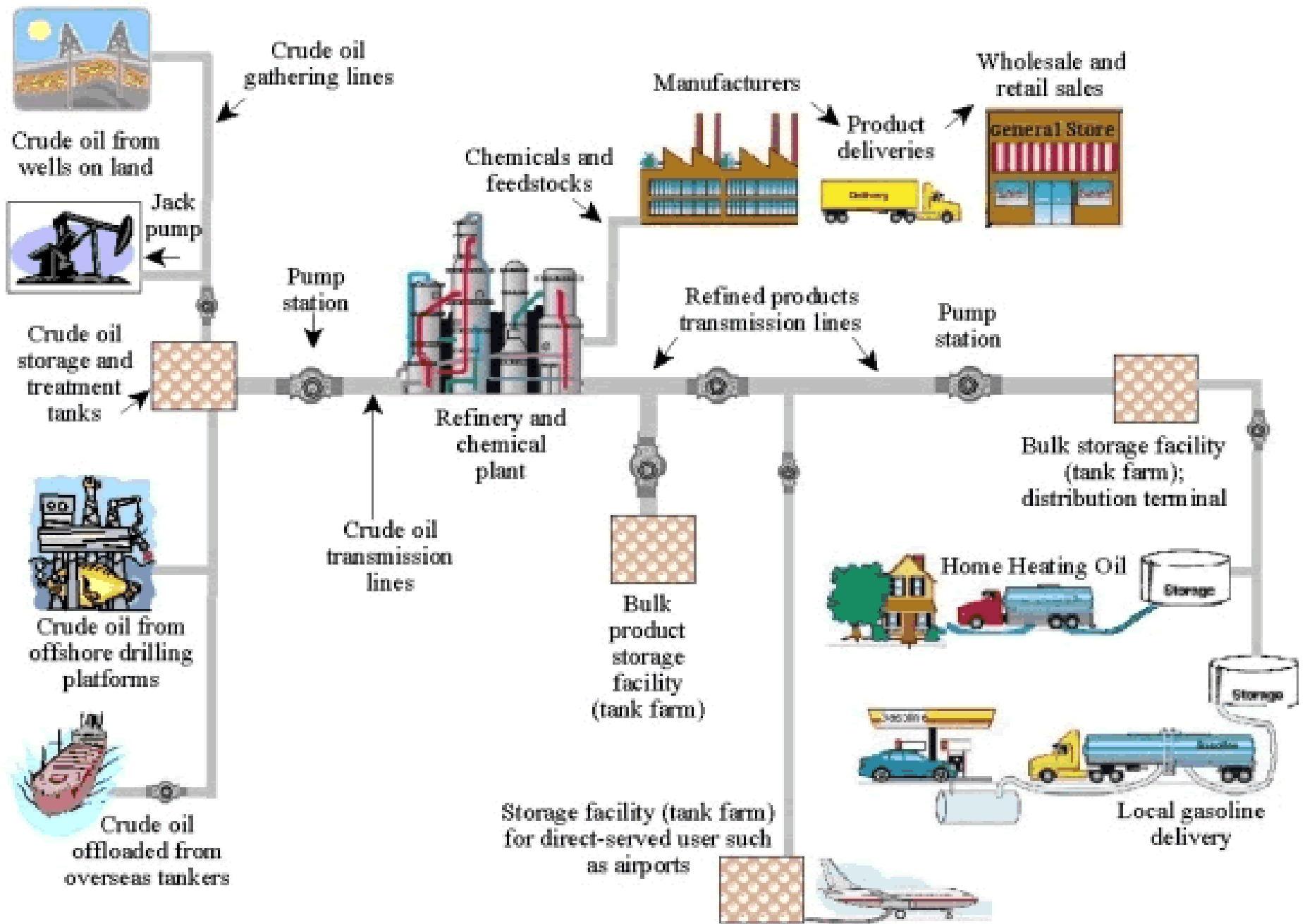


- Transportation of oil and natural gas
- Shipping
- Pipelines
- LNG Terminals

Downstream



- Refinery processes crude oil to produce different products
- Petrochemical plants
- Polymers, Plastics and other products



Different Products of Petroleum

Natural gas NG:

Liquid petroleum gas (LPG):

Naphtha:

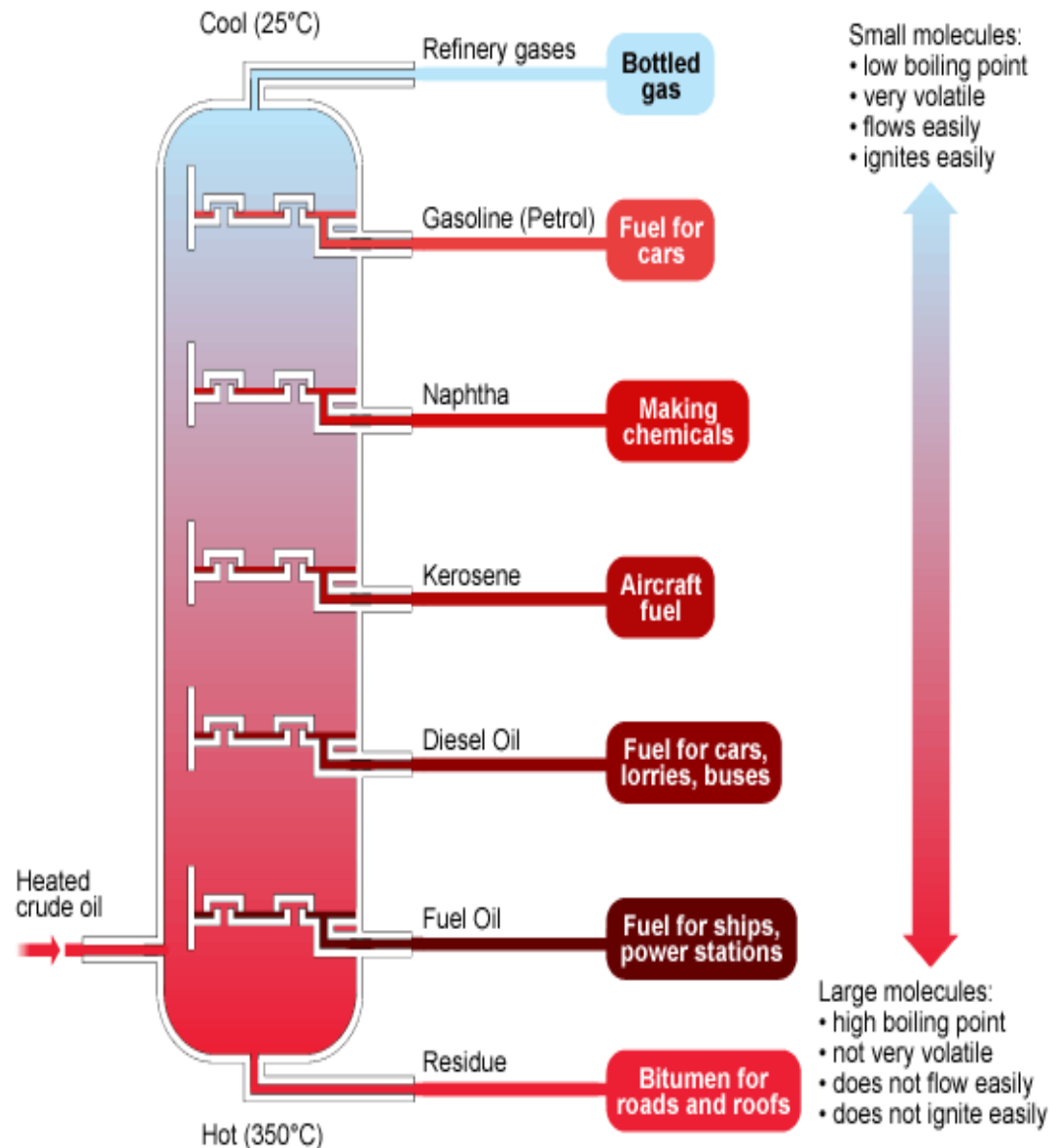
Kerosene:

Diesel fuel:

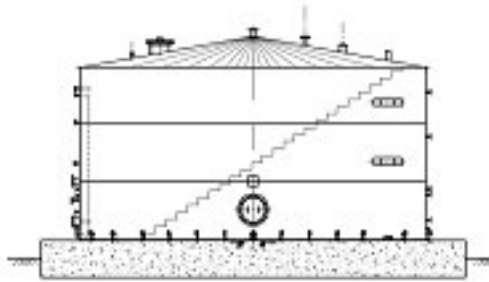
Fuel oils:

Asphalt and Tar:

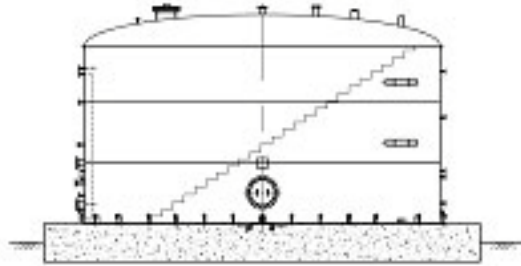
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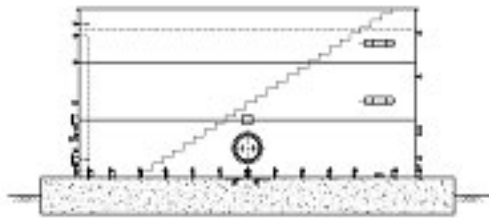
Types of Petroleum Storage Tanks



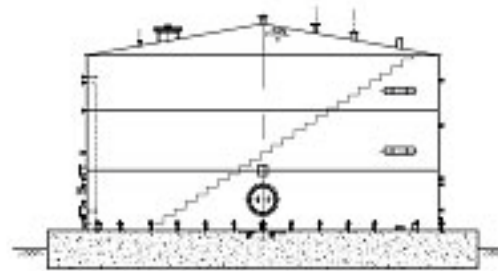
Umbrella Roof



Dome Roof



Floating Roof



Cone Roof

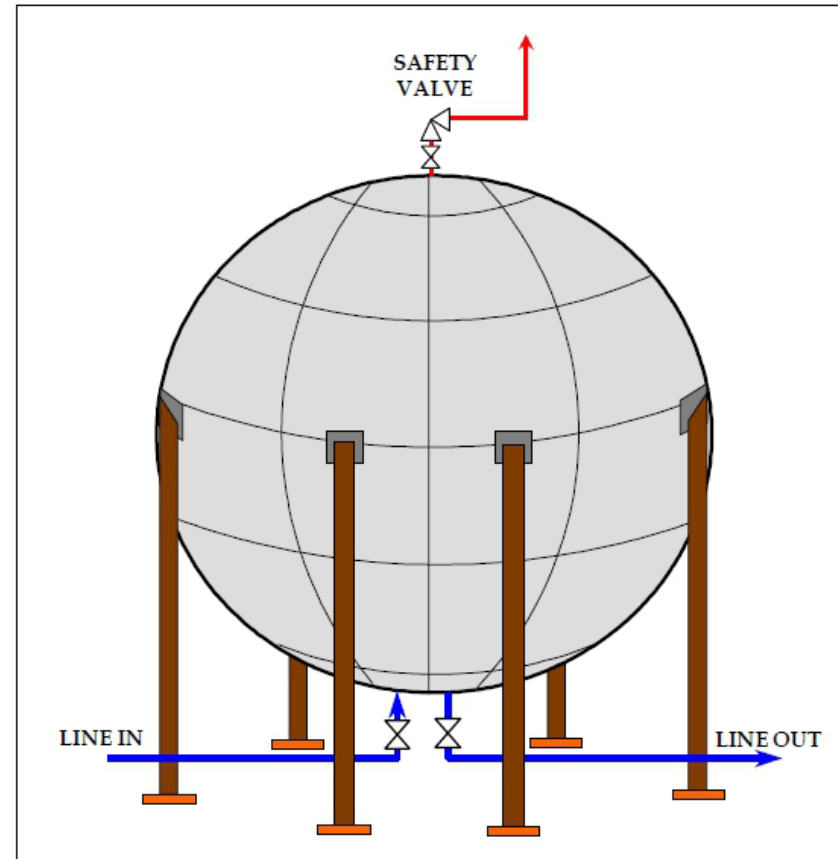
The major parts in storage tanks to which calculations apply, include shell, roof and bottom plate respectively.

Based on the shape of the roofs, storage tanks are classified to four major categories as flowing:



Spherical Storage Tanks for N.G and LPG

This type of storage vessel is preferred for storage of high pressure fluids. A sphere is a very strong structure. The even distribution of stresses on the sphere's surfaces, both internally and externally, generally means that there are no weak points.



Pipeline Transportation

- ❑ **Transportation Pipeline:** Long pipe with large diameter, moving products (natural gas, petroleum products) between cities, countries, continents.
- ❑ Pipelines are owned by shippers or operating companies
- ❑ Land is owned by corporate, private (right-of-way) and public (federal, state, local)
- ❑ Material in pipeline is owned by the shipper.



Pipelines System:

- **Crude Oil Transportation**
- **Gas Transportation**

Advantages of Using Pipelines

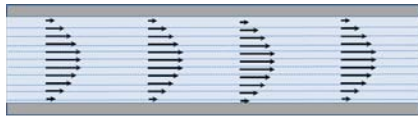
They are insensitive to surface conditions such as storms, inclement weather, etc.

High fixed versus low variable. Operating costs are low.

They are environmentally friendly.

Unique mode of transportation as the equipment is fixed in place and the product moves through it in high volume.





Laminar



Turbulento

Types of Fluid Flow

