

PLANT LOCATION AND LAYOUT

Plant Location and Site Selection

The major requirements for an Ethylene Glycol plant are ethylene oxide and water. Glycol plants are almost always located very close to Ethylene oxide plants to reduce transportation expenses, as the transportation of ethylene oxide is expensive due to its explosive tendencies. The plant considered here is located adjacent to a Ethylene oxide plant. The most optimum location would be in a petrochemical industrial area where there is a market for fiber grade glycol. The other considerations are as follows:

1. Location, with respect to the marketing area
2. Raw material Supply
3. Transport facilities
1. Availability of labor
2. Availability of utilities: water, fuel, power
3. Environmental impact, and effluent disposal
4. Local community considerations.
5. Climate
6. Availability of suitable land
7. Political and strategic considerations

Plant Layout

A schematic plant layout of the Glycol plant is shown in fig 7.1

The parameters considered to arrive at the plant layout are:

1. Economic considerations: Construction and operating costs

The cost of construction can be minimized by adopting a layout that gives the shortest run of connecting pipe between equipment and the least amount of structural steel work

2. Process Requirements

The location of certain pieces of equipment are based on the process requirement. For example, a condenser is placed sufficiently high so as to have a barometric leg.

3. Operation

Equipment that needs to have frequent operator attention should be located convenient to the control room. Valves, sample points and instruments should be located at convenient positions and heights. Sufficient working space and headroom must be provided to allow easy access to equipment.

4. Maintenance

Heat exchangers need to be sited so that the tube bundles can easily be removed. Vessels that require frequent replacement of catalyst or packing should be located on the outside of buildings. Equipment that requires dismantling for maintenance, such as compressors and large pumps, should be placed under cover.

5. Safety

Blast walls may be needed to isolate potentially hazardous equipment, and confine the effects of an explosion. At least two escape routes for operators must be provided from each level in process buildings.

6. Plant Expansion

Equipment should be located so that it can be conveniently tied in with any future expansion of the process. Space should be left on pipe alleys for future needs, and service pipes over-sized to allow for future requirements.

7. Modular Construction

In recent years, there has been a move to assemble sections of the plant at the plant manufacturer's site. These modules will include the equipment, structural steel, piping and instrumentation. The modules are then transported to the plant site, by road or sea.