

Oil Processing Design Principles

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A project to build a new refinery or to upgrade an existing one starts with the design of the block diagram. The block diagram is the basis for the initial investment and operational costs estimates required to support the business case. This simplified process flowsheet does not contain any details of the process steps but it specifies the process flow, required capacities, first indications of storage capacities, and utility requirements.

The design of the block diagram starts with estimated product volumes and the development of these volumes over the following years. Also flexibility to longer term market changes should be considered. A systematic approach, to design the block diagram and obtain the information needed in the initial phase of the project, includes the following steps:

1. Selection of the refining and modification process routes that will deliver the required products, starting from the available raw materials.
2. Design of the oil processing block diagram based on selected process routes. This will require decisions on working pattern, flexibility (batch or continuous), etc.
3. Calculate the required capacities of the equipment used in the various process steps on basis of the effective operational time.
4. Determine the design basics of crude, intermediate, and refined oil storage from internal and external logistics.
5. Estimate utilities consumptions and effluent productions to include the capacities of the utility units in the block diagram and as a first input for the operational costs calculation.

The presentation gives an overview of the principles of each of these design steps.