Turn Key Plants for Manufacturing
Industrial & Automotive Lubricants

- Industrial Oils
- Brake Fluids
- Automotive Oils
- Synthetic Lubes
- Gear Oils
- Coolants
- Transformer Oils
- V.I. Improvers

**Total package from a single source**

- Concepts
- Basic and detailed engineering
- Tank farm design
- Building design
- Equipment supply
- Intrumentation and Automation
- Erection and commissioning
- Training and Lab set up
- Formulations
- Vendor development

Plants offered by Frigmaires are designed and tailor made to suit local conditions and customer requirements. Basic plants can range from simple manually operated plants to highly sophisticated automated plants.

**Introduction**

A typical Blending Plant comprises of the following sections,
- Tank farm
- Blending area
- Storage, Filling and Packing

Base Oils from the tank farm are pumped into the blending vessels and mixed with additives at the required temperature to obtain a homogeneous mix. There are several methods to achieve and optimum blend depending on the product and plant requirements. The blended product is then filtered and transferred to storage tanks from where it is taken to the filling station and packed in containers or barrels. The entire process can be carried out in a basic manually operated plant or automated PLC controlled plants.

The lubricants are manufactured to API or other required specifications.

**Blending: Types of systems offered**

**CONVENTIONAL BLENDING:**
A manual operation where all components are weighed or metered into the Blender. The Blender is heated and mixing is achieved using an agitator. The finished product is filtered and packaged directly from the kettle.
Automatic batch blending (ABB)

Automatic Batch Blenders are designed for manufacturing simple as well as complex formulations with batch sizes ranging from 10-25 MT. The design of these Blenders is based on automatic dosing of base oils and additives. The Blender is mounted on load cells and is provided with a dosing header line, electro pneumatic valves and mass flow meters. The additives are pre-blended and precisely dosed into the Blender. During the Blending process the vessel is heated and the agitator is in continuous motion to ensure thorough homogenisation of the blend. Small additives can be added manually from top into the Blender. The finished product is then transferred to the filling station via filters. The entire process is PLC controlled and provided with a recipe management system.

The control system can also perform automated pigging control and higher plant-level functions; such as bulk inventories, laboratory data handling, interfaces to scheduling and customer service.

Advantages are:
- High accuracy
- Reduced labour
- Quick blend
- Turn around
- Low contamination & flexibility.

In-line blending (ILB)

An ILB is a pipeline blending system using computer-controlled valves and flow meters to introduce blend components into a line or header in a proportional manner. 5-6 components are simultaneously heated and mixed and transferred to the finished product tank. Small quantities of additives can be automatically dosed into the blender during this process. This type of blender is capable of delivering homogeneous, on-test product directly to a finished product tank with no requirement for additional mixing.

Advantages are:
- Large production & consistent quality.

Simultaneous metering blending (SMB)

In a SMB a small quantity of the base oil is metered along with the small components as per the recipe into the homogenisation tank after dosing all components the final base oil added and the blend is homogenised. It is possible to correct the blend by dosing small quantities of the balancing material. The finished product is then filtered and transferred to the filling station. The entire process is PLC controlled and provided with a recipe management system.

The control system can also perform automated pigging control and higher plant-level functions; such as bulk inventories, laboratory data handling, interfaces to scheduling and customer service.

DMB (Dissolving mixer blender)

Used for production of synthetic lubricants where solid powdery and liquid additives have to be evenly distributed and homogenised in the oil. The DMB technology stabilises the blend and prevents the additives from reagglomerating.
Drum decanting units (DDU)

These units are designed for emptying of additives from drums and small containers. The additives in containers are handled by folk lifts and placed on conveyors which moves into the heating oven. Containers are then placed under the discharge head of the decanter and transferred to the blender. The system comprises of a heating oven, weighing platform, conveyor and decanting station.

Advantages: - Capacity upto 3 m³/hr - Viscosity upto 5000 cst - Skid mounted units to integrate with existing plant

Mobile plants

Frigmaires offers Mobile plants ranging from 5-20 MT/Capacity based on a single shift of 8 hrs. These plants are modularly placed in 20 or 40 ft containers and have just to be connected to the main power supply and base oil feed lines. The Mobile units can be supplied with automatic or gravity filling machines, recommended for growing markets having small or limited demand.

Lube filling line

Frigmaires offers automatic and semi-automatic filling lines to meet the requirements of large as well as medium to small Lubricant manufacturers. The filling lines are available from 1 head to 8 head filling stations. Containers ranging from 250 ml to 25 Litres can filled in our lines with capacities ranging from 900-7200 Ltrs/Hr. The filling lines are complimented by capping and induction sealers. Optional attachments we offer are labelling, leak detection and bar code printing machines to complete the filling lines. For small operations we offer gravity filling stations which requires no power and are suitable for filling containers from 2 to 25 Ltrs to an output of 1550 Ltrs/Hr.

Pigging

A pigging system is used for cleaning of pipelines to avoid contamination and reduce effluents. Pigging systems in a lube oil plant allows faster change over between products and reduces the number of pipelines in a plant. The principal of Pigging consists of a rubber pig which is propelled along the length of the pipe using a neutral oil, air or a flushing agent. As it moves along the line the left over residue in the line is pushed out and collected at the receiver end. A pigging system ensures high product quality with considerable savings in time labour and money. Frigmaires offers manual, semi automatic and fully automatic PLC controlled pigging systems integrated with the Blending plant.

Automation

AutoLube has been designed for controlling flow of lube oils and additives into the processing Blenders and Kettles. Every project is designed to meet specific customer requirements and budgets. We offer distributed software solutions for basic applications as well as for complex plant wide control upto product dispatch. AutoLube helps the user to achieve total production control of the plant from raw material reception and storage right upto product dispatch. PLC and SCADA based systems using hardware from reputed firms such as Siemens/Allen Bradley or Equivalent are incorporated in the package.