

## LUBE OIL BLENDING PLANT PROJECT

### PROJECT DETAILS

Project Report and Plant Layout Designing to Commissioning are planned as per client's project capacity and requirement

**LINUS PROJECTS (INDIA)** is an ISO9001:2015 certified Turnkey Project Management Company with expertise in Manufacturing Machinery for Lube Oil Blending Plant and Grease Manufacturing Plant.

*Professional Automation Programming*  
for  
**LUBRICANT OIL PLANT**



**PROGRAMMING**

**CHECKING**

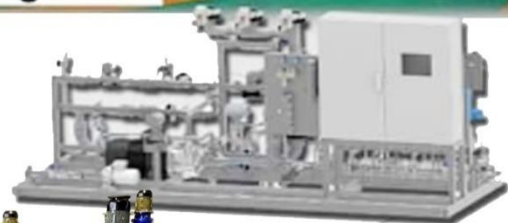
**COMMISSIONING**

## INTRODUCTION:

World's primary energy consumption is attributed to friction, wear loss and corrosion. Lubricant oil is a type of petroleum product that is used to reduce friction between moving parts in machines and engines. Lubricating oil reduces overheating, scuffing, rubbing, and corrosion due to its special properties. Lubricants therefore helps in increasing the equipment lifetime, extending the use of valuable resources, improving fuel economy and ultimately reducing greenhouse gas emissions. This industry has lot of potential for sale and profits. Market demand for Lube Oil is large and never ending.

There are two main raw materials for the production of lubricants:

- Lube base stock
- Additives



**LUBE BASE STOCK:** One of the products is base stock, which processed further, provides us with base oil. The base oil is the lubricant that is used to lubricate machines. This base oil needs to have certain chemicals called additives added to it to enhance its performance as a good lubricating agent. These additives together perform diverse functions but each additive has a specific use and together they give the lubricant its character. Depending on the engine the lubricants are to be used; the ratio of base oil to additives varies from 85:15 to 90:10.

**BASE OILS:** Base oil is highly refined crude oil or in some cases a synthetic composition and they account for roughly one present of the total output of petroleum products from crude. It is essentially a by-product obtained during the refining of crude and is obtained along with the heavier ends. Different operating conditions like moisture, dust, exposure to air, high/low temperature, high pressure, corrosion, etc. dictate which base oil and which additives should be used.

## TYPES OF BASE OILS

- Group 1
- Group 2
- Group 3
- GTL
- SN500
- SN 150
- SN 70
- BS

## PRODUCT OUTPUT:

- Engine Oil
- Gear Oil
- Marin Oil
- Hydraulic Fluid
- Speciality Lubricants
- Turbine Oil
- Agriculture Machine Oil
- Cutting Fluid

## INDUSTRIAL DEMAND FOR PRODUCTS:

- Automotive
- Railways
- Road Construction
- Earth Moving Equipment Rental
- Stone Crusher
- Machine Shops
- Power Plant
- Shipping Lane
- Engineering Companies

## Blending Plant typically includes five main areas, all the equipment can be skid mounted:

- Storage of Raw materials
- Blending units
- Storage of Finished product
- Filling and loading in drums and cans
- Packed finished products warehouse and dispatch.

## FILTRATION SOLUTION:

Unfiltered liquid enters the basket housing and passes down them. Solids are retained inside of basket mesh which is removed when the unit is serviced. Basket Filters and strainers are normally supplied with a spring arrangement at the top of the filter element.



This will ensure any type of bypass & confirm the position of the basket filter even in case of reverse flow. A fluid bypass around the basket is prevented by an optional “O” ring seal between the basket rim and the housing inside diameter.

For base oil basket filter provided with 200-micron mesh and for blending vessel basket filter provided with 50-micron mesh

## LUBRICANT OIL BLENDING SOLUTION:

Blending vessel fabricated out of Mild Steel / Stainless steel IS 2062 material having an open top and partially dished bottom.

Blender is designed for different grades of lubricant as per ASME standards; all products can be manufactured in the same blender such as engine oil, gear oil, hydraulic oil, special purpose oil, marine oil, and viscosity improver.



Blender is provided with an additive dozing bunker. Drive consists of electric motor coupled to a heavy-duty gearbox by couplings. Output shaft of the gearbox is coupled to stool housing complete with bearings, oil seals, and gland packing's. The blending vessel can withstand a temperature of 200°C. It is duly insulated with rock wool and cladded with GI sheets.

## Key Equipment developed to meet specific requirements of lubricants companies.

1. **Automatic Batch Blender (ABB)**
2. **In-Line Blending System (ILB)**
3. **Simultaneous Metering Blending System (SMB)**
4. **Drum Decanting System (DDU)**
5. **Pigged Pipe Lines**
6. **Pigged Manifold**

## **AUTOMATIC BATCH BLENDING SYSTEM (ABB)**

Automatic Batch Blending (ABB) unit provides a competent and up-to-date technology to blend Lube oil in a range (3 to 30m<sup>3</sup>) / batch.

### **ABB unit is basically made of four modules:**

1. An Additive dosing and base oil blending vessel which is equipped with heating coils.
2. The specially designed mixing system (Agitator, dispersing mixer).
3. Load Cells.
4. Dosing header.

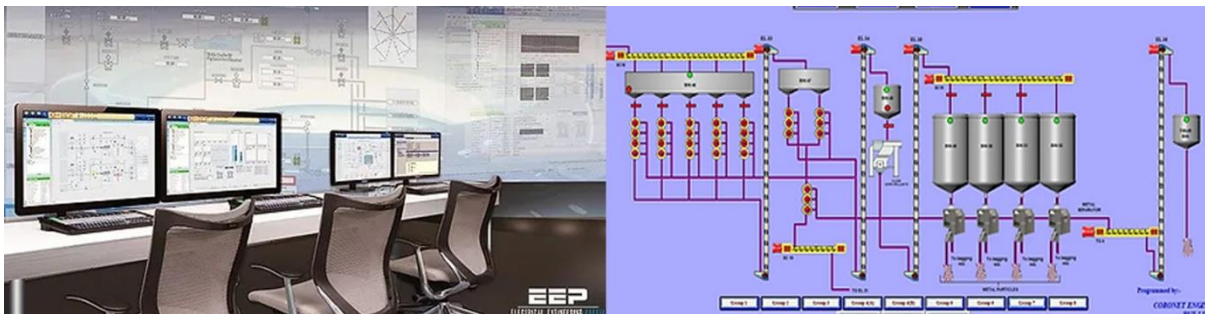
The blending vessel can be heated with steam or hot oil to heat up the content of the blending vessel with external heating. With the option of using either steam or hot oil, the blending vessel can be externally heated to raise the temperature of its contents. By employing systems like double jackets or welded half pipe coils, the heating system can be divided into multiple zones, enabling precise temperature control and minimizing heat transfer to the uncovered vessel wall, thereby ensuring superior quality for your lubricants. To reduce contamination within the blending vessel, a conical bottom and an efficient spray nozzle system are utilized to thoroughly flush the vessel after each batch blending.



### **The Automatic Batch Blending System (ABB) offers numerous benefits for lubricant blending plants:**

- Enhanced Product Quality: Utilizing computerized technology ensures consistent product quality.
- Compliance: ABB facilitates ISO 9002 and ISO 14000 compliance.

- Optimum Production: The system optimizes production quality with excellent dosing accuracy and repeatability.
- Process Flexibility: ABB enables meeting just-in-time requirements and offers process flexibility.
- Waste Minimization: ABB helps minimize waste generation, reducing environmental impact.
- Lower Maintenance Costs: The system lowers maintenance expenses and is designed specifically for unit requirements.
- Improved Profitability: ABB enhances plant profitability through efficient operations.
- Reduced Manpower Costs: Semi-skilled labor can efficiently run the plant, lowering manpower expenses.
- No Re-blending: ABB eliminates the need for re-blending, saving time and resources.
- Accurate Management Budgeting: The system allows for accurate planning of grades and production volumes before real-time processing.



### **FULL AUTOMATION CONTROL OF PLANT:**

LINUS PROJECTS (INDIA) supplies a centralized automation system for the entire plant which is controlled by one person inside the control room with almost zero human interference involved. PLC based SCADA is provided for monitoring and controlling the flow of base oils to the Blenders. The implementation of computerized technology has revolutionized lubricant blending processes, ensuring consistent product quality and tight control of additives, crucial for long-term survival in the competitive market. The system's accuracy minimizes re-blending and laboratory costs, maximizing blend vessel utilization.

## INLINE BLENDING SYSTEM (ILB)

ILB (Inline Blending System) is composed of several dosing modules they are used for blending large batches that require consistent quality ILB is connected to input and output lines, where input line are connected with raw material storage tanks that is base oil & additives and output lines are connected with lube oil storage tanks or filling areas. ILB mixing technology eliminates the need for bulk storage tanks and speeds up the rate of production, reducing capital cost and making consistent quality of finished products, easy to pack and ready to be shipped.



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### Advantages of ILB (Inline Blending System)

- Large Blending Volumes.
- Consistent quality
- Minimum contamination occurs
- Operated by smart phone or built-in touch screen
- Quick turnover and less time consuming.
- Blends have the option to be directly dispatched to the packing or shipping area.

LINUS PROJECTS (INDIA) expertise in ILB (Inline Blending System) lube oil blending plant machines is fully automatic with continuous blender and auto-cleaning system. The system uses a group of VFD (Variable Frequency Drive) controlled pumps, flow meters and automated valves. The entire process is automated and PLC controlled with SCADA interface Inline Blending System can be operated by smart phone or built-in touch screen with Wi-Fi connected to computer system. The whole process of ILB (Inline Blending System) is accurate and very easy to operate.



## Simultaneous Metering Blending System (SMB)



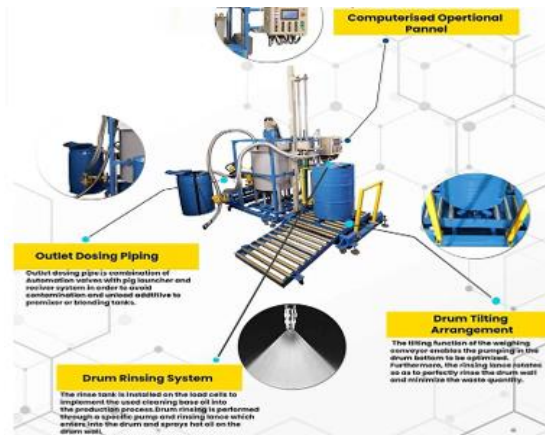
Simultaneous Metered Blending unit (SMB) are a turnkey blending system it's much more advanced system of processing lubricants and greases manufacturing plants It's a combination of high volume production capacity of In Line Blending units (ILB) with operating flexibility of Automatic Batch Blending (ABB) Instead of

blending in a kettle Components are simultaneously dosed into a header before discharging to tank for final mixing. SMB systems are engineered to concurrently gauge liquids using a Coriolis flow meter and ensure their precise proportional mixture via a central conduit. These Simultaneous Metered Blenders are compact modular setups that employ Micro Motion technology for accurate measurement and control. They function by accurately dispensing the appropriate proportions of various components into the central conduit, which then directs the blended mixture for subsequent homogenization.

### **Benefits of Simultaneous Metered Blending Unit (SMB)**

1. Dosing is done at faster speeds and with higher accuracies. Accuracy not limited by batch size.
2. Mass flow measurement.
3. Improve installation flexibility with compact skid.
4. Reduce cross-contamination it is possible to correct the blend by dosing small quantities of the balancing material. Minimize contamination with pigging and flushing.
5. Efficient for any blend size - limited only to size of destination tank.
6. Increases Blend capacity and efficiency compared to traditional batch blending method.
7. Generate zero slop or waste fluids, decrease overall mixing time.

## DRUM DECANTING UNIT (DDU)



Drum Decanting Unit (DDU) represents a mechanized and automated solution for introducing small-volume additives into blends. These units come equipped with conveyor belts, load cells, control systems, rinse tanks, and swivel lances. What sets LINUS PROJECTS (INDIA) apart is its distinctive design, enabling the transfer of even the most viscous

additives. Through the automation of dosing, rinsing, and transfers, our Drum Decanting Units contribute to heightened efficiency and safety. The DDU is meticulously engineered for pumping and precisely dosing highly viscous liquids from drums, seamlessly integrating them into formulation processes. This technology is particularly recommended for scenarios demanding the utmost accuracy in dosing and repeatability.

### FEATURES:

1. Enhance safety and efficiency through a fully automated system, incorporating Clean-In-Place technologies, thus eliminating manual dosing, cleaning, and over-treating.
2. Optimize product retrieval and discharge by utilizing tilting mechanisms for thorough drum emptying.
3. Boost versatility by accommodating additives spanning a wide viscosity spectrum or enabling manual component addition as per recipe needs.
4. Ensure precise dosing measurement to prevent over-treatment of components.
5. Elevate Health, Safety, and Environment (HSE) standards by automating the decanting process.
6. Facilitate direct blending of components contained in drums or totes. Minimize space requirements with an enhanced, more compact unit design.
7. Enhance operational efficiency by selecting from up to 9 distinct control phases tailored to recipe specifications.

## **PIGGED PIPELINES AND PIGGED MANIFOLD:**

Utilizing pigged pipeline technology proves advantageous for the transfer of a diverse range of products. Addressing a significant challenge in Lube Oil Blending Plants, pigged manifolds seamlessly interconnect numerous source tanks with various destinations like filling and loading. This innovative approach enhances efficiency and resolves complexities associated with managing multiple product transfers within the blending facility.

## **AUTOMATIC FILLING MACHINE LUBRICANT OIL**



Linus Projects (INDIA) machines for the Lube oil and Grease industry, one of the leading Indian manufacturers of filling and automatic filling machines like as a filling, capping, and labelling line guides, organizes, fills, and then releases bottles in an automatic bottle packaging line.

One of the biggest challenges faced by modern LOBPs is ensuring that they can deliver the precise quantity of lubricants required to their customers quickly. This requires a well-optimized LOBP design and efficient management of the blending process to achieve the best product quality and maximum cost savings.



**LINUS PROJECTS (INDIA)**  
 Leaders in Turnkey Projects management and manufacturing services























**VALUED CLIENTS**

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