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03 GREASE MANUFACTURING PLANT

MANUFACTURING · FILLING · PACKAGING

Batch grease plants from reaction to filled pack: kettles or contactors, finishing, milling, de-aeration and filling, laid out as one integrated line.

- Pressurised contactor / open kettle
- Finishing & cooling kettles
- Homogeniser / colloid mill
- De-aerator & filtration
- Cartridge, tin & drum filling
- Utilities & thermic fluid system

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HOW GREASE IS MADE

OIL, HELD IN PLACE BY A THICKENER

Grease is a lubricating oil locked inside a thickener structure, usually a metallic soap formed in the plant itself. The base oil does the lubricating. The thickener holds it where it is needed and releases it under load. Additives then adjust the grease for pressure, water, rust or temperature.

Product quality comes from controlling the reaction, the heating and cooling curve and the shear given to the finished grease. A HiTorq grease plant is laid out around those three controls, from raw-material charging to the filled pack.

01 **Charging**
Base oil, fatty acid and alkali are metered into the reactor.

02 **Saponification**
Soap is formed in a pressurised contactor or an open kettle, heated by thermic fluid.

03 **Dehydration**
Reaction water is driven off to build the thickener structure.

04 **Finishing & cooling**
Cut-back with base oil, controlled cooling and dosing of additives.

05 **Milling & de-aeration**
Homogeniser or colloid mill sets texture; vacuum de-aerator removes entrained air.

06 **Filtration & filling**
Strained grease goes to cartridge, tin, bucket or drum filling.

TABLE 3.1 PLANT SECTIONS AND MAIN EQUIPMENT

SECTION	MAIN EQUIPMENT	WHAT IT CONTROLS
Raw material handling	Base oil tanks, fatty acid melting, alkali preparation, transfer pumps	Correct charge and temperature at the start of each batch
Reaction	Pressurised contactor or open soap kettle with scraper agitator	Speed and completeness of the soap reaction
Finishing	Finishing / cooling kettles with counter-rotating agitators	Thickener structure, consistency and additive dispersion
Shear & de-aeration	Homogeniser or colloid mill, vacuum de-aerator	Smooth texture, stable consistency, no air pockets
Filtration	Inline grease filters / strainers	Removal of hard particles and lumps
Filling & packing	Cartridge, tin, bucket and drum fillers; capping and labelling	Accurate fill weight and clean, sealed packs
Utilities	Thermic fluid heater, cooling water, compressed air, vacuum system	Stable heating and cooling curves batch after batch

ROUTE A

Pressurised contactor

Closed reactor with high internal circulation. Shorter reaction time and good heat transfer; suited to plants that make soap greases in volume.

ROUTE B

Open kettle

Jacketed kettle at atmospheric pressure. Simple to run and flexible for a wide product mix and smaller batches.

SIZING

Built to your batch

Kettle volume, number of finishing vessels and filling speed are sized to your product list and target output.

PRODUCT RANGE

ONE PLANT, MANY GREASES

The same reaction and finishing train can make several grease families. The thickener you choose decides the reaction chemistry, the temperature profile and the equipment duty, so we size the plant around your product list rather than a single grade.

TABLE 3.2 COMMON GREASE FAMILIES A PLANT CAN BE DESIGNED FOR

THICKENER FAMILY	TYPICAL USE	PLANT NOTE
Lithium soap	Multipurpose automotive and industrial greases	Contactor or kettle route
Lithium complex	Higher-temperature wheel-bearing and industrial duty	Extra complexing step
Calcium soap	Water-resistant general-purpose greases	Lower process temperature
Calcium sulphonate	Heavy-duty, wet and corrosive service	Longer conversion cycle
Aluminium complex	Food-processing and water-exposed equipment	Kettle route
Clay (bentonite)	High-temperature, non-melting greases	No reaction; dispersion and milling

FILLING & PACKAGING

FROM KETTLE TO CARTON

- **Cartridge filling** for grease-gun packs, with capping.
- **Tin and bucket filling** by weight, with lid pressing.
- **Drum and barrel filling** for bulk customers.
- **Labelling, coding and cartoning** to close the line.
- Semi-automatic or automatic lines, chosen to suit output and pack mix.

QUALITY CONTROL

TESTED BEFORE IT IS PACKED

- **Cone penetration** to confirm consistency (NLGI grade).
- **Dropping point** for the temperature limit of the thickener.
- **Water washout and corrosion** checks for wet service.
- **Mechanical stability** after working.
- Lab layout and test equipment list supplied with the plant.

SIZING INPUTS

What we design your plant from

- Grease families and grades
- Target output per shift
- Batch size per grade
- Pack types and mix
- Available utilities
- Building and site layout

The thickener holds the oil; the process decides how well it holds it. We engineer the heating, cooling and shear, not just the vessels.

> HiTorq delivers grease plants as complete packages: process design, vessel fabrication through our group workshops, utilities, piping, electricals and automation, installation, commissioning and trial batches.

LET'S TALK ABOUT YOUR PLANT

FROM A FEED SAMPLE TO A RUNNING PLANT.

Share your feedstock, the products you want and the capacity you have in mind. Our process team will come back with a technical route, a block flow diagram and the next steps.

01 · Send

Feed details

Feedstock type, source, analysis if available, and the volume you expect per day.

02 · Define

Target products

The grades or cuts you need, the quality they must meet, and site constraints.

03 · Receive

Technical proposal

Process route, equipment scope and an execution plan for your review.

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