HiTorQ LUBRICANTS

A DIVISION OF
SPECX TECHNOLOGIES PVT. LTD.

SPECX TECHNOLOGIES
Xtending Engineering Possibilities



TECHNOLOGY & PLANT CATALOGUE · 2026

PROCESS PLANTS FOR LUBRICANTS, RE-REFINING & REFINING

Nine process technologies and one EPCC team, from feed analysis to commissioning.

01 USED OIL RE-REFINING
02 REFINERY & MASS TRANSFER
03 GREASE PLANTS
04 LUBE OIL BLENDING
05 TRANSFORMER OIL
06 SLOP OIL (MARPOL)
07 JELLY, LOTION & SHAMPOO
08 ETHANOL PLANTS
09 PAINT RECYCLING

WHO WE ARE

ENGINEERING PLANTS THAT GIVE OIL A SECOND LIFE

HiTorq Lubricants is the lubricants, recycling and process-plant technology division of **Specx Technologies Pvt. Ltd.** We design and build plants that re-refine used oil, refine light crude and mixed hydrocarbons, blend and pack lubricants, and recover value from waste streams.



FIG. 0.1 DISTILLATION AND PROCESS STRUCTURE, SITE VIEW

Every project starts with the feed: what comes in, what it contains, and what the customer wants to sell at the end. From that we choose the process route, size the equipment, and carry the job through fabrication, erection and commissioning. The aim is a plant that gives steady yield and product quality, and that the customer's own team can run.

The portfolio covers **nine process technologies**. They range from high-vacuum re-refining of spent lube and slop-oil separation to grease, petroleum jelly, ethanol and paint-recycling plants. All of them can be delivered as an **EPCC package** under one contract.

THE SPECX GROUP BEHIND US

Specx Technologies (*Xtending Engineering Possibilities*) brings design, fabrication and project resources to every HiTorq plant. The group's fabrication arm, **Shree Shakti Engg Works**, builds process plant equipment such as reactors, heat exchangers, storage tanks and U-stamp pressure vessels, and also handles turnkey projects. It runs two manufacturing units in Gujarat.

9
Process technology lines in one portfolio

1
EPCC contract covering design to commissioning

2
Group manufacturing units in Gujarat

4
Locations: Bharuch, Vadodara, Mumbai, Noida

WHY HITORQ

SIX REASONS PLANT OWNERS WORK WITH US

01

We start with the process

Material and energy balances, PFDs and P&IDs come first. Equipment is then sized to the duty, not picked from a fixed list.

02

A choice of routes

Re-refining can finish with clay and carbon, regenerable adsorbent beds or solvent extraction. We match the route to your feed, your market and your operating budget.

03

Group fabrication

Columns, vessels, reactors, heat exchangers and tanks come from our group's own workshops in Gujarat, so we control quality and delivery dates.

04

One point of responsibility

Under EPCC, one contract covers engineering, procurement, construction and commissioning. You deal with one team and one schedule.

05

Cost-optimised design

We look for energy savings, less waste and fewer consumables, because these decide operating cost over the plant's life.

06

Support after start-up

Operator training, preventive maintenance routines and technical support continue once the plant is running.

HOW A PROJECT MOVES

STEP 01	STEP 02	STEP 03	STEP 04	STEP 05	STEP 06
Feed study	**Process design**	**Engineering**	**Fabrication**	**Site work**	**Start-up**
Sample analysis, target products, capacity	Route selection, PFD, mass balance	P&ID, equipment, civil, electrical	Columns, vessels, skids, inspection	Erection, piping, instrumentation	Commissioning, training, handover

> “A plant is only as good as the feed it was designed for.”

Used oils, slop oils, condensates and waste solvents vary from one source to the next. That is why every HiTorq proposal starts with your feed data and states the assumptions behind it. Yields and product qualities can then be checked against your own laboratory results, not against generic brochure figures.

Any ranges in this catalogue are indicative only. Capacities, yields and product qualities are engineered to each client’s requirement and confirmed during the design stage.

TECHNOLOGY PORTFOLIO

WHAT'S INSIDE

Each section below is also published as a **standalone brochure** with its own cover and contact page. You can share one technology with a client, or send the full catalogue.

> Ask for a section by its number, for example **"Brochure 05 — Transformer Oil"**, at connect@specxtech.com.

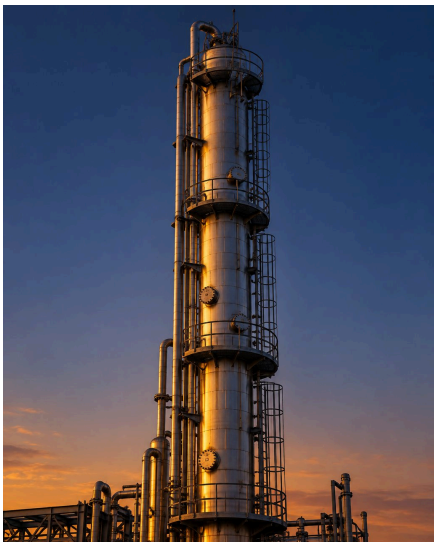


FIG. 0.2 DISTILLATION COLUMN, THE HEART OF MOST OF OUR PLANTS

01 **USED OIL RE-REFINING** 05
Pre-treatment, vacuum and wiped film distillation; clay, adsorbent and solvent finishing

02 **REFINERY PROJECTS & MASS TRANSFER** 09
Light crude, condensate, mixed hydrocarbon, solvent and glycol refineries; packings, trays and internals

03 **GREASE MANUFACTURING PLANT** 14
Reaction, finishing, milling, de-aeration, filling and packaging

04 **LUBE OIL BLENDING PLANT** 17
Base oil and additive storage, blending, QC, filling and packaging

05 **TRANSFORMER OIL RECYCLING** 20
Purification, regeneration and online degassing systems

06 **SLOP OIL & WASTE FUEL OIL (MARPOL)** 23
Emulsion breaking, three-phase decanting and fraction recovery

07 **PETROLEUM JELLY, LOTION & SHAMPOO** 26
Jelly and white-oil processing, emulsions, filling and packaging

08 **ETHANOL MANUFACTURING PLANT** 29
Fermentation, distillation, dehydration and waste treatment

09 **PAINT RECYCLING PLANT** 32
Waste paint recovery, re-manufacture, solvent recovery and ETP

EPCC **PROJECT EXECUTION** 35
Engineering, procurement, construction and commissioning

\+ **QUALITY, SAFETY & SERVICES** 38
Feasibility, installation, training and after-sales support



01

USED OIL RE-REFINING

USED OIL · BLACK OIL · SPENT LUBE RECYCLING

Turnkey re-refining plants that recover base oil from spent lubricants: pre-treatment, vacuum distillation and a finishing step chosen to suit the feed and the market.

COVERED IN THIS SECTION

- Chemical pre-treatment
- Dehydration & light-ends removal
- High vacuum distillation
- Wiped film / short-path evaporation
- Clay & carbon finishing
- Adsorbent or solvent polishing

FEEDSTOCKS & APPLICATIONS

USED ENGINE OIL | BLACK OIL | SPENT INDUSTRIAL LUBE | HYDRAULIC & GEAR OIL | RECOVERED BASE OIL

PROCESS OVERVIEW

SPENT LUBRICANT IS MOSTLY GOOD BASE OIL

A lubricant wears out long before its base oil does. In service it collects water, fuel dilution, wear metals, soot and oxidation products, and its additives are used up. Re-refining strips away those contaminants and returns the hydrocarbon backbone to the market as base oil, which can be blended into new lubricants.

HiTorq plants follow a proven sequence: clean the feed, distil it gently under vacuum, then finish the distillate to the colour, odour and stability your customers expect. The finishing step is the part we tailor most closely to each project.

01 **Receipt & settling**
Collected oil is heated and settled; free water and sludge are drawn off.

02 **Pre-treatment**
Chemical and thermal treatment drops out metals, ash and carbon ahead of distillation.

03 **Dehydration & light ends**
Remaining water and fuel-range hydrocarbons are flashed off and recovered.

04 **Vacuum distillation**
Lube-range fractions are vaporised at low temperature and condensed as clean cuts.

05 **Finishing**
Clay, adsorbent or solvent treatment brings the cuts to final specification.

WHY PRE-TREATMENT MATTERS

PROTECT THE HOT SECTION

Metals, additive ash and fine carbon are the main causes of fouling and coking in heaters, evaporators and vacuum systems. Removing them before the oil is heated keeps heat-transfer surfaces clean, stretches run lengths between cleanings and gives a lighter, more stable distillate.



FIG. 1.1 RECOVERED BASE OIL AFTER FINISHING

BENEFITS ENGINEERED IN

- **Longer run lengths** between shutdowns for cleaning.
- **Lower heater duty** because fouling does not insulate the tubes.
- **Better distillate colour**, which eases the load on the finishing step.
- **Saleable by-products**: fuel-range oil and a heavy residue suited to bitumen blending or similar uses.
- **Feed flexibility** for mixed engine, industrial and hydraulic oils.
- Chemistry selected to avoid banned or hazardous reagents and to meet local discharge rules.

PRODUCT STREAMS FROM A RE-REFINING PLANT

Base oil
Light and heavy lube cuts, the main product

Fuel oil
Gas-oil range light ends, used as plant fuel or sold

Residue
Heavy bottoms for bitumen and similar applications

Water
Separated and sent to effluent treatment

Yields depend strongly on the feed collected and are established from your samples during the design stage.

DISTILLATION TECHNOLOGY

LOW PRESSURE, LOW TEMPERATURE, CLEAN CUTS

Lube-range hydrocarbons boil at temperatures where they would start to crack at atmospheric pressure. Reducing the pressure lowers their boiling points, so they can be vaporised without thermal damage. The deeper the vacuum and the shorter the time the oil spends hot, the better the colour and stability of the distillate.

We offer three distillation configurations. The choice depends on plant size, the cut points you want, the share of heavy material in the feed and how much operating flexibility you need.

TABLE 1.1 DISTILLATION CONFIGURATIONS COMPARED (QUALITATIVE)

CONFIGURATION	HOW IT WORKS	WHERE IT FITS
Fractionating vacuum column	Heated oil enters a packed column under vacuum; side draws give separate light and heavy lube cuts	Larger plants needing several sharp cuts
Wiped film evaporator	Rotor blades spread the oil as a thin film on a heated wall; vapour forms in seconds and is condensed outside	Heat-sensitive feeds, low coking, compact layouts
Short-path evaporator	Wiped film with an internal condenser for the deepest vacuum and lowest temperature	Heavy cuts and premium quality targets



FIG. 1.2 FROM BLACK FEED TO CLEAR BASE OIL: SAMPLES ARE CHECKED AT EVERY STAGE

HEATING

Indirect or direct

Thermic fluid circuits give gentle, even heat. Direct firing suits larger units where fuel economy leads.

VACUUM

Matched to the cut

Steam ejectors, liquid-ring and dry pumps, or combinations, sized to the operating pressure needed.

CONTROL

Stable operation

PLC/HMI control of temperatures, vacuum and levels for consistent product from shift to shift.

FINISHING & POLISHING

CHOOSE THE FINISH YOUR MARKET PAYS FOR

Distilled oil still carries traces of colour bodies, odour, nitrogen and sulphur compounds and oxidation products. A finishing step removes them. Each route below is well established in the industry; we help you choose by comparing product quality, consumables, waste and capital cost for your situation.

TABLE 1.2 FINISHING ROUTES FOR DISTILLED LUBE OIL

ROUTE	PRINCIPLE	WASTE / CONSUMABLE	MODE
A · Clay & carbon	Polar impurities and colour bodies adsorb onto activated clay and carbon, which are then filtered out	Spent clay for disposal	Batch
B · Regenerable adsorbent	Oil flows through fixed beds of mineral adsorbent; when loaded, the beds are regenerated in place and reused	Minimal; media replaced after long service	Semi-continuous
C · Solvent extraction	A selective solvent such as NMP extracts aromatics and polar compounds; the solvent is recovered and recycled	Small extract stream	Batch or continuous
D · Hydrofinishing	Hydrogen over a catalyst saturates and removes sulphur, nitrogen and oxygen compounds	Hydrogen supply needed	Continuous



FIG. 1.3 SKID-MOUNTED ADSORBENT POLISHING UNIT WITH REGENERABLE BEDS

CAPACITY

ENGINEERED TO YOUR REQUIREMENT

Plant capacity, number of cuts and finishing route are sized to your collection volume and product plan, from compact modular units to larger continuous plants.

WHAT WE NEED TO SIZE YOUR PLANT

- Expected feed types and monthly volumes
- Sample analysis, or samples we can test
- Target base oil grades and buyers' specifications
- Site, utilities and environmental conditions



02

REFINERY PROJECTS & MASS TRANSFER

PETROLEUM · CRUDE OIL · MIXED HYDROCARBON

Compact refineries for light crude, gas condensate and mixed or contaminated hydrocarbons, built around distillation columns we design and fit with our own internals.

COVERED IN THIS SECTION

- Light crude oil refinery
- Light gas condensate refinery
- Mixed hydrocarbon refinery
- Solvent & aromatics recovery
- Glycol (MEG/DEG/TEG) separation
- Packings, trays & internals

FEEDSTOCKS & APPLICATIONS

LIGHT CRUDE | GAS CONDENSATE | MIXED HYDROCARBONS | KEROSENE & WHITE SPIRIT | AROMATICS & WASTE SOLVENTS | MEG / DEG / TEG

COMPACT REFINERIES

TURNING HYDROCARBON FEEDS INTO SALEABLE CUTS

Not every refinery needs to be a giant. Light crudes, gas condensates, off-spec fuels and recovered solvents can be processed profitably in compact plants close to where the feed is produced or collected. The core of each plant is the same: heat the feed, separate it by boiling range, then treat each cut to specification.

Crude oils differ mainly in density (API gravity), sulphur content and acidity. Lighter, sweeter feeds give more naphtha, kerosene and diesel and need less downstream treatment, which is why they suit smaller plants. We design around a full assay of your feed, not a generic crude.

TYPICAL CUTS BY BOILING RANGE



Illustrative order of cuts from top to bottom of a column. Cut points are set per project.

TABLE 2.1 REFINERY PROJECT TYPES WE ENGINEER

PROJECT	TYPICAL FEED	PURPOSE
Light crude refinery	Light, low-sulphur crude	Naphtha, kerosene, diesel and fuel oil for local markets
Condensate refinery	Natural gas condensate	Stabilised naphtha, solvents and middle distillates
Mixed hydrocarbon refinery	Off-spec fuels, contaminated or blended hydrocarbons	Recover on-spec fuels and solvents from mixed streams
Solvent recovery	Spent solvents, white spirit, aromatics, kerosene	Distil back to reusable solvent grades
Glycol recovery	Used or wet glycols	Dehydrate and separate MEG, DEG and TEG for reuse

MODULAR

Skid-built sections

Shop-assembled modules shorten site work and simplify later expansion.

FLEXIBLE

Feed changes handled

Operating windows are designed to cope with varying feed quality.

CAPACITY

To client requirement

Throughput and product slate are engineered to your feed and market.

HOW A COLUMN WORKS

VAPOUR UP, LIQUID DOWN, SEPARATION IN BETWEEN

When a liquid mixture boils, the vapour carries more of the lighter components than the liquid it came from. A distillation column repeats this effect many times over. Rising vapour and falling liquid meet on trays or across packing, exchange components at each contact, and the column gradually separates the feed into a light top product and a heavy bottom product.

Two choices decide most of a column's cost and performance: the number of separation stages and the reflux ratio. More stages mean a taller column; more reflux means more energy. Good design finds the economic balance for your product purity.

BATCH

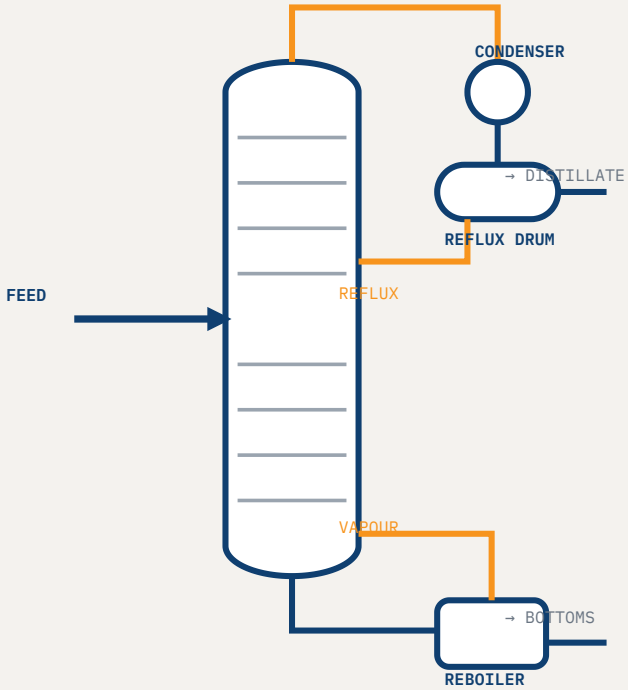
Batch columns

One charge is processed at a time; ideal for varied feeds and small volumes.

CONTINUOUS

Continuous columns

Steady feed and draw-offs; best for larger, consistent throughputs.



Schematic of a continuous column with condenser, reflux drum and reboiler.

THE MAIN ELEMENTS

FEED
Introduced at the stage that best matches its composition

REBOILER
Boils part of the bottom liquid to drive vapour up

CONTACT
Trays or packing bring vapour and liquid together

CONDENSER
Turns the overhead vapour back into liquid

REFLUX
Returned liquid sharpens the top product

PRODUCTS
Distillate, side draws and bottoms

Typical applications range from fuel and solvent fractionation to alcohol, aromatics and glycol separation, in both new columns and revamps of existing ones.

COLUMN INTERNALS

WHAT IS INSIDE DECIDES WHAT COMES OUT

A column shell is only a pressure container. Capacity, efficiency and pressure drop are set by the internals. We select and supply complete internals for new columns and for revamps that need more capacity or purity from an existing shell.



FIG. 2.1 RANDOM PACKING ELEMENTS IN METAL AND CERAMIC

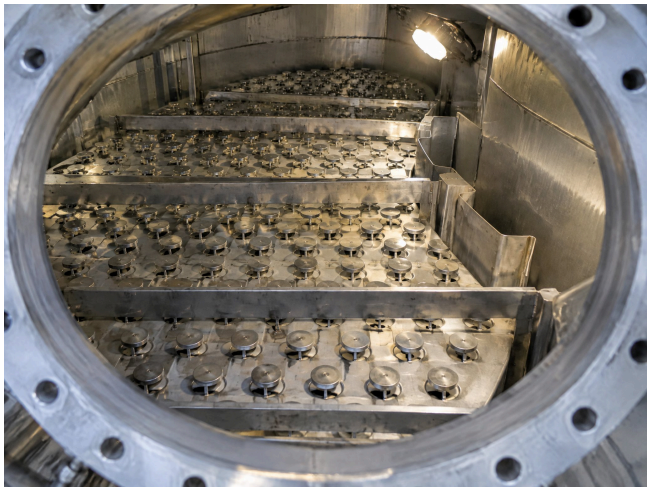


FIG. 2.2 VALVE TRAY DECKS SEEN THROUGH A COLUMN MANWAY

PACKINGS

- **Random packings** in metal, plastic or ceramic: low cost, simple installation, good for corrosive and smaller columns.
- **Structured packings** in corrugated sheet or wire gauze: high efficiency and very low pressure drop, the first choice for vacuum service.
- **Grid packings**: rugged and open, for fouling, coking or solids-laden duties.

TRAYS

- **Sieve trays**: simple perforated decks, economical for steady loads.
- **Valve trays**: movable valves widen the operating range for varying loads.
- **Bubble-cap trays**: hold liquid at low rates; used where turndown is extreme.

TABLE 2.2 CHOOSING BETWEEN PACKINGS AND TRAYS (GENERAL GUIDANCE)

CONSIDERATION	PACKINGS TEND TO SUIT	TRAYS TEND TO SUIT
Operating pressure	Vacuum and low-pressure service	Moderate to high pressure
Column diameter	Small to medium diameters	Medium to large diameters
Fouling or solids	Grid packing only	Generally more tolerant
Heat-sensitive products	Preferred, thanks to low pressure drop	Less suited

DISTRIBUTION

Liquid distributors and redistributors keep packed beds evenly wetted.

SUPPORT

Support plates, hold-down grids and bed limiters keep packing in place.

SEPARATION

Mesh-pad demisters, collectors and chimney trays for draws and entrainment control.

PROCESS DESIGN & ENGINEERING

DESIGNED AS A SYSTEM, BUILT AS ONE



FIG. 2.3 FEED AND PRODUCT STORAGE IS ENGINEERED TOGETHER WITH THE PROCESS UNITS

Our process engineers take a refinery or column project from first idea to construction drawings, and support revamps of existing units.

01 **Feed assay review & feasibility**

02 **Process simulation, heat & mass balance**

03 **PFDs, P&IDs and equipment sizing**

04 **Column hydraulics & internals selection**

05 **Detailed mechanical design**

VESSEL FABRICATION

BUILT IN GROUP WORKSHOPS

Columns, pressure vessels, reactors, heat exchangers and storage tanks are fabricated by our group company Shree Shakti Engg Works at its two manufacturing units in Gujarat, including U-stamp pressure vessels.

MATERIALS

- Carbon steel
- Stainless steels
- Alloy steels on request

INSPECTION

- Design to recognised codes
- Stage-wise QC
- Third-party inspection on request



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.

COVERED IN THIS SECTION

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

FEEDSTOCKS & APPLICATIONS

LITHIUM & CALCIUM GREASES | AUTOMOTIVE GREASES | INDUSTRIAL GREASES | CARTRIDGES, TINS, BUCKETS, DRUMS

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.



04

LUBE OIL BLENDING PLANT

BLENDING · FILLING · PACKAGING

Blending plants that combine base oils and additives to a formula, with storage, mixing, quality control and filling planned as a single process line.

COVERED IN THIS SECTION

- Base oil & additive tank farm
- Batch & in-line blending
- Additive dosing & heating
- QC laboratory interface
- Small-pack to drum filling
- Packaging & palletising

FEEDSTOCKS & APPLICATIONS

ENGINE OILS | GEAR OILS | HYDRAULIC OILS | INDUSTRIAL LUBRICANTS | RETAIL & BULK PACKS

WHAT A BLENDING PLANT MAKES

A RECIPE, REPEATED EXACTLY

A finished lubricant is mostly base oil. The rest is an additive package that gives the oil its working character: keeping engines clean, protecting gears under load, resisting oxidation, flowing in the cold. The share of additives varies widely, from very little in some industrial oils to a substantial portion of heavy-duty engine oils.

The blending plant's job is simple to state and demanding to deliver: combine the right base oils and additives in the right proportions, at the right temperature, without contamination, and prove it with a lab result before the product is packed.



FIG. 4.1 FINISHED LUBRICANT

TABLE 4.1 COMMON ADDITIVE TYPES AND WHAT THEY DO

ADDITIVE TYPE	FUNCTION IN THE FINISHED OIL
Detergents & dispersants	Keep soot and deposits suspended so surfaces stay clean
Anti-wear & extreme pressure	Form protective films on metal under heavy load
Antioxidants	Slow oil breakdown at high temperature and extend drain intervals
Viscosity modifiers	Reduce thinning with heat, enabling multigrade oils
Pour point depressants	Help the oil flow at low temperatures
Corrosion & rust inhibitors	Protect metal surfaces from moisture and acids
Anti-foam & demulsifiers	Release entrained air and separate water

TABLE 4.2 BASE OIL CATEGORIES A PLANT MAY HANDLE (API CLASSIFICATION)

GROUP	GENERAL DESCRIPTION
I	Conventional solvent-refined mineral oils
II	Hydrotreated mineral oils with low sulphur
III	Hydrocracked mineral oils with high viscosity index
IV	Synthetic polyalphaolefins (PAO)
V	Other base stocks, e.g. esters and naphthenic oils

THE BLENDING PLANT

ACCURATE BLENDS, CLEAN PACKS

01 **Tank farm** Base oils received, stored and heated

02 **Additives** Drum decanting, heating and day tanks

03 **Metering** Load cells or flow meters, recipe control

04 **Blending** Heated kettles with agitation

05 **QC release** Lab approval of every batch

06 **Filling** Filtration, filling and packing

TABLE 4.3 BLENDING METHODS

METHOD	BEST FOR	NOTE
Batch kettle blending	Wide grade range, smaller batches, simple operation	Lowest entry cost
Simultaneous metering	Faster batches with components dosed together	Shorter cycle times
Automated in-line blending	High-volume grades blended straight to tank or filler	Highest throughput

The method is chosen from your grade list, batch sizes and growth plan. Many plants start with batch kettles and add automated metering later. Capacities are engineered to client requirement.

PROCESS

- Base oil and additive storage with heating
- Drum handling and decanting
- Blending kettles, mixers and transfer pumps
- Line flushing and pigging to limit cross-contamination
- Finished product tanks

FILLING & PACKAGING

- Bottle filling for retail packs
- Pail and bucket filling
- Barrel and drum filling
- Capping, induction sealing, labelling
- Batch coding and cartoning

CONTROL & QUALITY

- Recipe management and batch records
- PLC / HMI control of dosing and transfers
- Lab for viscosity, flash point, pour point and more
- Sampling points at every stage
- Safe handling of additive concentrates

WHY BLEND IN-HOUSE

Control over every litre

- Own formulations and private-label brands
- Consistent quality, batch records for every lot
- Base oil bought in bulk, packed close to market
- Flexible grade and pack changes

Viscosity gets the attention. The additives decide the performance. Our plants are built to dose both precisely.



05

TRANSFORMER OIL RECYCLING

PURIFICATION · REGENERATION · ONLINE DEGASSING

Systems that restore insulating oil and extend transformer service life, from multi-stage vacuum purification to adsorbent reclamation and on-load treatment.

COVERED IN THIS SECTION

- Transformer oil purification
- Transformer oil regeneration
- On-load treatment while energised
- Skid or containerised builds
- Mobile & permanent options
- Commissioning & training

FEEDSTOCKS & APPLICATIONS

POWER UTILITIES | SUBSTATIONS | INDUSTRIAL PLANTS | RENEWABLE SUBSTATIONS | RAILWAYS & DATA CENTRES

INSULATING OIL, BROUGHT BACK INTO SPECIFICATION

TREAT THE OIL, PROTECT THE TRANSFORMER

Insulating oil does two jobs at once: it carries heat away from the windings and keeps the electrical stress in check. Over years of service it ages. Water enters through breathers and seals, the oil oxidises, acids form, and fine sludge settles on the paper insulation. Each of these lowers the oil's electrical strength and shortens the life of the cellulose it surrounds.

Most of that damage is reversible. HiTorq builds treatment units that take aged oil back towards new-oil properties, so the charge can stay in the transformer instead of being drained and replaced. The right route depends on what an oil test shows.



FIG. 5.1 CONTAINERISED OIL TREATMENT UNIT (ILLUSTRATIVE)

ROUTE A

DRY & FILTER

Heating, fine filtration and vacuum dehydration.

- Takes out water, fibres and suspended particles
- Strips dissolved gases under vacuum
- Recovers breakdown voltage (BDV)

ROUTE B

RECLAIM

Percolation through regenerable adsorbent.

- Removes acids, polar ageing products and colour
- Raises interfacial tension (IFT), lowers acidity
- Inhibitor can be re-dosed after treatment

ROUTE C

ON-LOAD TREATMENT

Connected while the transformer is energised.

- Gradual drying and cleaning of oil and paper
- Suited to assets that cannot be switched off
- Requires suitable safety interlocks

TABLE 5.1 MATCHING THE ROUTE TO THE OIL TEST RESULT

FINDING IN THE OIL TEST	DRY & FILTER	RECLAIM	ON-LOAD
High moisture, low BDV	•	–	•
Particles, fibres, sludge	•	•	–
Dissolved gases	•	–	•
High acidity, low IFT	–	•	•
Dark colour, oxidation products	–	•	•
No outage window available	–	–	•

• main purpose of the route. Equipment is selected after reviewing oil analysis and the asset's condition.

THE CASE FOR TREATING INSTEAD OF REPLACING

HEALTHIER OIL, LONGER-LIVED INSULATION

01
Properties recovered
Electrical and chemical values brought back within the limits of the applicable oil standard.

02
Lower oil spend
The existing charge is reused, cutting the cost of fresh oil and of disposing of the old.

03
Paper protected
Dry, acid-free oil slows the ageing of cellulose insulation, the part that limits transformer life.

04
Less downtime
Treatment can be planned around outages, or carried out on load where permitted.

05
Mobile or fixed
Trailer, skid, container or workshop installations to suit the fleet.

06
Smaller footprint
Reusing oil means less hazardous waste and fewer fresh barrels to transport.



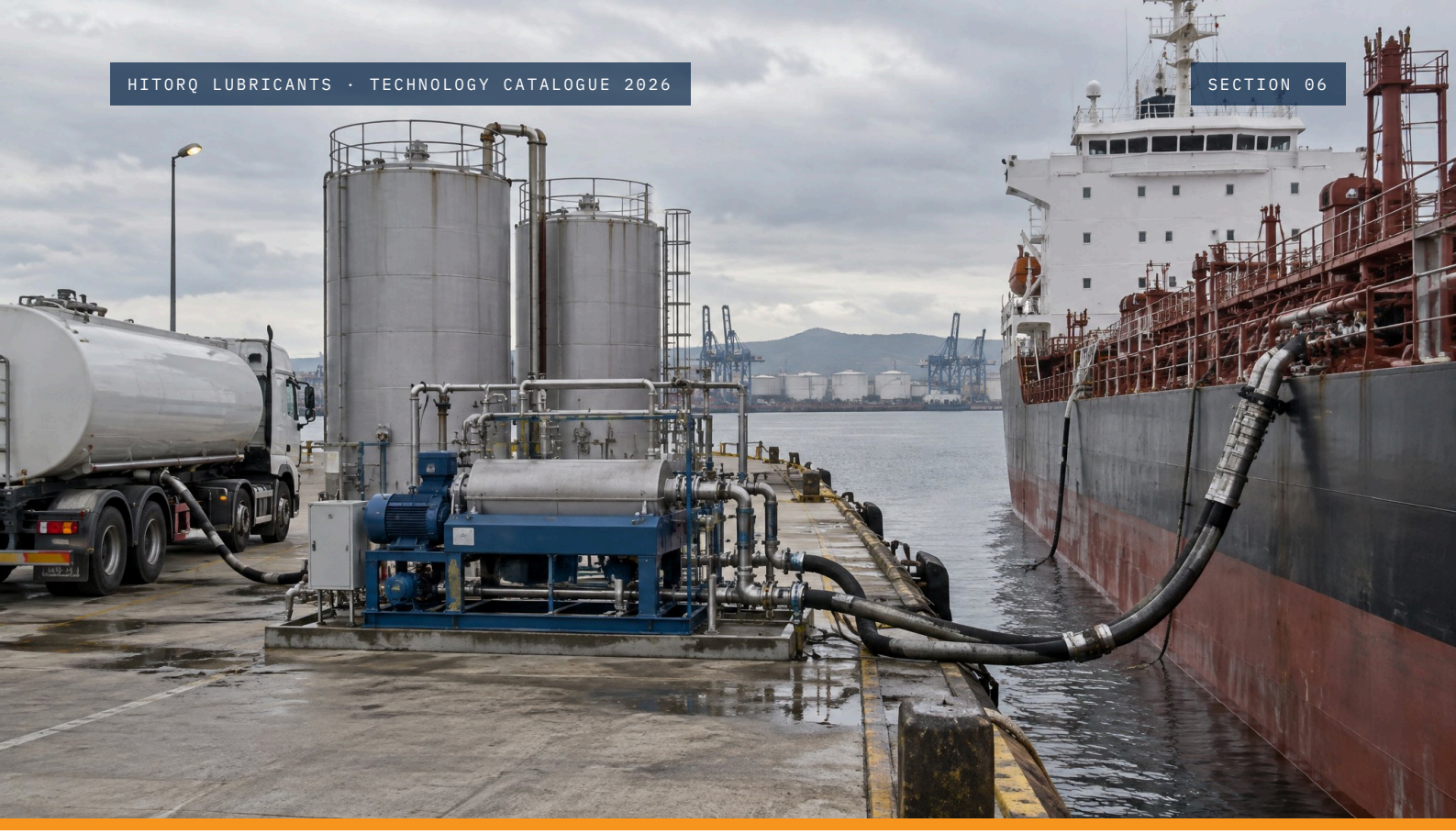
FIG. 5.2 TREATMENT SKID HOOKED UP TO A SUBSTATION TRANSFORMER (ILLUSTRATIVE)

WHERE IT IS USED

- Utility and distribution substations
- Generator step-up and power-plant transformers
- Industrial plants with in-house substations
- Solar and wind collector substations
- Traction, data-centre and other critical supplies

WHAT WE SUPPLY

- Sizing and process design for your fleet
- Fabricated units: skid, trailer or container
- Instrumentation, PLC control and interlocks
- Erection and commissioning at site
- Training for operators and maintenance staff
- After-sales service and spares



06

SLOP OIL & WASTE FUEL RECYCLING

SLOP OIL · WASTE FUEL OIL · MARPOL

Separation systems that break stable oil, water and solids emulsions and send the recovered oil to re-refining or back to crude processing.

COVERED IN THIS SECTION

- Heating & demulsifier dosing
- Three-phase centrifugal separation
- Dehydration & flash evaporation
- Light-ends recovery
- Routing to re-refining or crude
- Skid-mounted packages

FEEDSTOCKS & APPLICATIONS

REFINERY SLOP | TANK BOTTOMS | SHIP SLOPS (MARPOL) | SLUDGE PITS | WASTE FUEL OIL

OILY RESIDUES, EXPLAINED

OIL WORTH RECOVERING, LOCKED IN AN EMULSION

Wherever oil is produced, stored, transported or refined, some of it ends up mixed with water and dirt. Tank bottoms, interceptor skimmings, line flushings and recovered spills all produce the same kind of material: an off-spec mixture that no buyer will accept as it is, yet still contains a large share of usable hydrocarbon.

Left untreated, these residues occupy tank space, carry disposal charges and pose an environmental risk. Treated properly, the oil can return to a refinery or re-refinery as feedstock, the water can go to effluent treatment and the solids can be handled as a much smaller waste stream.

WHY SIMPLE SETTLING IS NOT ENOUGH

Fine droplets of water are held inside the oil by natural surface-active compounds and fine particles that coat each droplet. These films stop droplets from merging, so gravity alone works slowly and leaves a stubborn middle layer.

3
Phases to split: oil, water and solids

2
Process stages: phase separation, then fractionation

WHAT A TYPICAL SAMPLE LOOKS LIKE AFTER STANDING



Schematic only. Proportions vary widely from one source to another; a lab bottle test on each feed guides heating and chemical dosing.

TABLE 6.1 SEPARATION TECHNIQUES AND HOW THEY HELP

TECHNIQUE	HOW IT WORKS	WHERE IT FITS
Heating	Warmer oil is thinner, so droplets move and merge more easily	Always applied ahead of separation
Emulsion breakers	Chemicals displace the stabilising film on droplets so they can coalesce	Dosed upstream; selected by bottle test
Gravity settling	Time in a tank lets free water and heavy solids drop out	Bulk pre-separation and buffering
Three-phase decanter centrifuge	Rotating bowl multiplies gravity and splits oil, water and solids in one pass	Main separation step in HiTorq units
Disc-stack polishing	High-speed separator removes the last fine water and particles	Optional, when a drier oil is needed

FROM RESIDUE TO FEEDSTOCK

SPLIT THE PHASES, THEN RECOVER THE CUTS

HiTorq treatment trains are configured around the feed: its water and solids content, how stable the emulsion is, and where the recovered oil will go next. The aim is a clean oil that can be blended into a refinery feed or sent on to a used-oil re-refining plant.

STAGE 1 · PHASE SEPARATION

1A — Reception & screening
Coarse debris removed; feed homogenised in a heated tank.

1B — Conditioning
Feed warmed and dosed with emulsion breaker.

1C — Decanter centrifuge
Continuous split into oil, water and a solids cake.

STAGE 2 · FRACTIONATION (OPTIONAL)

2A — Dehydration
Remaining moisture flashed off under heat.

2B — Light-end recovery
Lighter hydrocarbons evaporated and condensed as fuel cuts.

2C — Heavy oil to further processing
Heavier fraction sent to vacuum distillation and finishing.

DESTINATION OF EACH STREAM

WATER	SOLIDS	LIGHT CUTS	OIL
Separated water	**Dewatered cake**	**Fuel fractions**	**Recovered oil**
To the effluent plant	Reduced volume for disposal	Reused as fuel or blendstock	Refinery feed or re-refining

Stored residue costs money every month. Separated, it becomes saleable oil.

SHIP-GENERATED OILY WASTES (MARPOL)

Vessels produce sludge from fuel and lube oil purifiers and oily bilge water. Under MARPOL Annex I these must be discharged ashore to port reception facilities. Terminals, depots and tank-cleaning operators handle comparable waste fuel oils. All of these can be processed on the same kind of separation and recovery train, so material that would otherwise be a disposal burden is turned back into oil.

FORMAT
Skid or fixed plant
Mobile skids for tank cleaning, or permanent units at terminals and refineries.

CONTROL
Automated operation
Temperature, dosing and centrifuge settings managed from a PLC panel.

SIZE
Built to the feed
Capacities engineered to client requirement and feed analysis.



07

PETROLEUM JELLY, LOTION & SHAMPOO

MANUFACTURING · FILLING · PACKAGING

Plants for white and yellow petroleum jelly, technical jellies and white oils, plus emulsion lines for lotions, creams and shampoos.

COVERED IN THIS SECTION

- Wax & oil melting and blending
- Pharma, cosmetic & industrial grades
- Vacuum emulsifying mixers
- Liquid detergent / shampoo mixing
- Hot & cold filling lines
- Capping, labelling & cartoning

FEEDSTOCKS & APPLICATIONS

WHITE PETROLEUM JELLY | YELLOW JELLY | TECHNICAL JELLIES | WHITE OILS | LOTIONS & CREAMS | SHAMPOOS

PETROLATUM-BASED PRODUCTS

SIMPLE INGREDIENTS, EXACTING PROCESS

Petroleum jelly, or petrolatum, is a semi-solid blend of highly refined mineral oil and wax. Its value lies in what it does not do: it is stable, does not go rancid and does not react with most active ingredients. On skin it forms a thin protective layer that slows water loss, which is why it appears in so many care products.

The same know-how in heating, mixing and hygienic filling carries over to emulsions such as lotions and creams, and to surfactant liquids such as shampoo. A single site can therefore serve several personal-care product lines with shared utilities and packaging.

PRODUCT FAMILY

- White and yellow petroleum jelly
- Ointment and balm bases
- Body lotions and moisturising creams
- Baby and massage oils
- Shampoos and liquid cleansers
- Technical jellies and greases for industry

Product range and grades are defined with each client.

GRADE

Pharma

Highly purified material for ointments and medicated preparations, made under tight hygiene and documentation.

GRADE

Personal care

Skin, hair and baby-care products where colour, odour and texture matter to the consumer.

GRADE

Technical

Protective and lubricating compounds where appearance is secondary to performance.

TABLE 7.1 TYPICAL MARKETS FOR THE PLANT'S OUTPUT

MARKET	EXAMPLE PRODUCTS
Healthcare	Ointment bases, wound-care and barrier products
Personal care	Jelly, lip balm, lotions, creams, hair oils, shampoos
Baby care	Baby jelly, oils and mild cleansers
Industrial	Corrosion-protection coatings, release agents, light lubricants
Private label	Contract manufacturing for retail and distributor brands

> Raw materials are bought to the grade the product needs. Pharmaceutical and cosmetic grades call for certified base materials, traceable batches and a quality system that matches the target market's regulations.

THE PLANT

HEAT, MIX, FILL, SEAL



FIG. 7.1 STAINLESS-STEEL PROCESS VESSELS AND FILLING LINE (ILLUSTRATIVE)

LINE A · PETROLEUM JELLY

01 **Melting**
Wax and oil heated in jacketed tanks.

02 **Blending**
Weighed charge stirred to a uniform mix.

03 **Filtration**
Filtered hot to remove particles.

04 **Hot filling**
Jars and tubes filled, then cooled.

LINE B · LOTIONS & CREAMS

01 **Phase preparation**
Oil and water phases heated separately.

02 **Emulsifying**
Vacuum mixer with high-shear homogeniser.

03 **Cool-down**
Heat-sensitive ingredients added cool.

04 **Filling**
Bottles, tubes and jars.

LINE C · SHAMPOO

01 **Mixing**
Surfactants dispersed in water at low shear.

02 **Adjustment**
Viscosity, pH, colour and fragrance set.

03 **De-aeration**
Trapped air released before storage.

04 **Filling**
Bottles and sachets, capped and labelled.

Polished stainless-steel contact surfaces, drainable vessels and clean-in-place connections for hygienic grades.

Turnkey supply: process vessels, mixers, utilities, filling, capping and labelling. Capacities engineered to client requirement.



08

ETHANOL MANUFACTURING PLANT

FERMENTATION · DISTILLATION · DEHYDRATION

Turnkey ethanol plants for sugar-based feedstocks, from fermentation to fuel-grade dehydration, engineered for low steam use and minimal waste water.

COVERED IN THIS SECTION

- Feedstock preparation
- Fermentation
- Multi-column distillation
- Dehydration to fuel grade
- Potable alcohol option
- Evaporation & effluent treatment

FEEDSTOCKS & APPLICATIONS

SUGARCANE JUICE | MOLASSES | SWEET SORGHUM | FUEL ETHANOL | POTABLE ALCOHOL

SUGAR TO FUEL

COMPLETE ETHANOL DISTILLERIES

Ethanol is made by letting yeast convert sugar into alcohol, then separating that alcohol from water. The chemistry is old; the economics depend on doing it with as little steam, power and water as possible. HiTorq engineers distilleries as one integrated system, from feed handling through fermentation, distillation and dehydration to the treatment of spent wash.

Sugar-rich crops and the by-products of sugar mills are the natural feedstocks. For a sugar producer, a distillery turns surplus juice or molasses into a product with a large and growing market in fuel blending, alongside industrial and potable alcohol.

FEED 01

Cane juice / syrup

Fermented directly after clarification, or stored as concentrated syrup.

FEED 02

Molasses

The residual sugar from crystallisation, diluted before fermentation.

FEED 03

Other sugar crops

Juice from crops such as sweet sorghum or sugar beet, where available.

PROCESS ROUTE

01 **Feed preparation**
Dilution, clarification, sterilisation

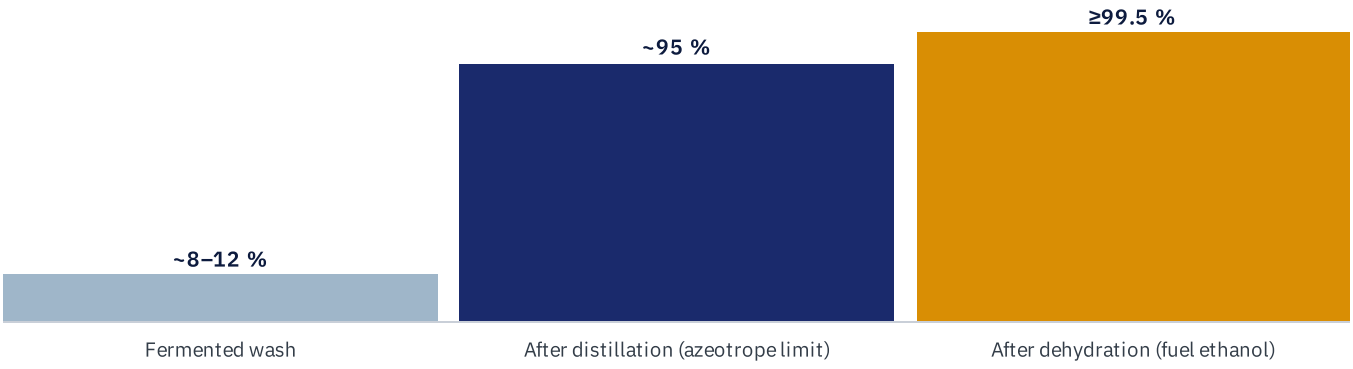
02 **Fermentation**
Yeast turns sugar into a dilute “wash”

03 **Distillation**
Alcohol stripped and concentrated

04 **Dehydration**
Last water removed for fuel grade

05 **Spent wash**
Concentrated and treated

HOW THE ALCOHOL CONCENTRATION RISES (INDICATIVE)



WHY A SEPARATE DEHYDRATION STEP

Ethanol and water form an azeotrope at roughly 95 % ethanol: beyond that point the vapour has the same composition as the liquid, so further distillation achieves nothing. Fuel blending needs almost water-free alcohol, so the final water is taken out by other means, most commonly molecular-sieve adsorption.

WHERE THE MONEY IS MADE

EFFICIENCY DECIDES THE ECONOMICS

Most of a distillery's running cost is energy, and most of that energy goes into boiling liquid in the distillation columns and evaporators. Good design reuses that heat several times: columns operated at different pressures so one condenses into the next's reboiler, vapour recompression where power is cheap, and hot product streams preheating the feed.

The second priority is water. Spent wash from the columns is the largest liquid stream on site. Concentrating it in multiple-effect evaporators recovers clean condensate for reuse and leaves a smaller, thicker stream that can be burnt in a boiler or composted, depending on local practice and regulation.

TABLE 8.1 PLANT SECTIONS IN OUR SCOPE

SECTION	WHAT IT DOES	DESIGN PRIORITY
Feed handling	Receives, dilutes and conditions juice, syrup or molasses	Hygiene, steady feed quality
Fermentation	Yeast propagation and fermenters, batch or continuous	Yield, temperature control
Distillation	Strips alcohol from the wash and concentrates it	Heat integration, steam per litre
Dehydration	Molecular-sieve units produce fuel-grade ethanol	Product dryness, regeneration energy
Rectification	Extra columns remove impurities for neutral spirit	Purity, removal of fusel oils
Evaporation & effluent	Concentrates spent wash, recovers condensate	Water reuse, compliance
Utilities & storage	Cooling water, steam, CO_2 handling, product tanks	Reliability, safety

Capacities and configurations are engineered to client requirement and feedstock availability.

ENERGY

Less steam per litre

Columns, reboilers and heat recovery designed as one system.

WATER

Condensate reused

Evaporation and recycling planned into the flow sheet from day one.

PROJECT

Single point of contact

Engineering, equipment, erection and commissioning handled by one team.

The feedstock is already growing in the fields. Careful engineering turns it into fuel at the lowest cost per litre.



09

PAINT RECYCLING PLANT

WASTE PAINT · RECOVERY · RE-MANUFACTURE

Facilities that take scrapped paints, primers, putty and thinners and turn them back into saleable paint products, with solvent recovery and an ETP included.

COVERED IN THIS SECTION

- Waste paint segregation & testing
- Dispersion & milling
- Tinting, straining & packing
- Solvent recovery
- Effluent treatment
- Container cleaning & baling

FEEDSTOCKS & APPLICATIONS

WATER-BASED PAINTS | ENAMELS & PRIMERS | WALL PUTTY | THINNERS | PIGMENTS & RESINS

PAINT RECYCLING

LEFTOVER PAINT IS A RAW MATERIAL

Large volumes of paint are never applied: surplus from projects, returned or expired stock, off-colour batches and part-used containers. Much of it is still chemically sound. A recycling plant sorts this material by type, checks what can be recovered, and reworks it into usable coatings, while solvents that cannot be reused in paint are reclaimed by distillation.

The plant therefore looks like a compact paint factory with extra front-end and back-end steps: sorting and testing at the start, solvent recovery, container cleaning and effluent treatment at the end.

THE FIRST RULE: SEGREGATE

Paint chemistries do not mix freely. Water-based and solvent-based materials, and reactive two-pack systems, follow separate routes from the moment they arrive.

- Water-based emulsions and primers
- Solvent-based enamels and primers
- Two-pack and reactive coatings
- Thinners and wash solvents
- Putty and paste products



FIG. 9.1 DISPERSION AND LET-DOWN VESSELS IN A PAINT PROCESSING HALL (ILLUSTRATIVE)

TABLE 9.1 HOW EACH STREAM IS TYPICALLY HANDLED

INCOMING STREAM	GENERAL TREATMENT	TYPICAL OUTPUT
Water-based paints	Screening, blending of compatible lots, colour and viscosity correction	Recycled emulsions, primers
Solvent-based paints	Filtration, blending, toning and adjustment with fresh materials	Enamels, primers
Used solvents & thinners	Distillation to separate clean solvent from paint residue	Recovered thinner
Unusable residues	Dewatering or drying to reduce volume	Waste for authorised disposal or co-processing
Empty containers	Draining, washing, crushing or baling	Metal and plastic for recycling

THE PROCESS

SORT, TEST, REWORK, RECOVER

01 **Receiving**
Weighing, labelling, safe storage by type

02 **Sorting & testing**
Lab checks decide each lot's route

03 **Decanting**
Containers emptied, material screened

04 **Reworking**
Blending, dispersion and adjustment

05 **Quality check**
Colour, viscosity, drying and finish

06 **Filling**
Packed for sale or reuse

PROCESS EQUIPMENT

- Drum decanting and screening stations
- Blending tanks with agitators
- High-speed dispersers for let-down
- Bag and cartridge filters
- Paste mixers for putty-type products
- Filling and lidding machines

RECOVERY & ENVIRONMENT

- Solvent distillation units
- Container washing systems
- Crushers and balers for empty packs
- Effluent treatment for wash water
- Fume extraction and vapour control
- Hazardous waste storage area

LAB & SAFETY

- Viscosity, density and colour measurement
- Drying time and film checks
- Flameproof equipment in solvent areas
- Earthing and bonding for transfers
- Fire detection and protection
- Personal protective equipment zones

WHY RECYCLE PAINT

- Less hazardous waste sent for disposal
- Lower demand for virgin resins, pigments and solvents
- Affordable coatings for budget-sensitive markets
- Recovered solvent reused in-house

WHAT WE DELIVER

- Process design and plant layout
- Equipment supply and fabrication
- Utilities, ETP and safety systems
- Erection, commissioning and training

Plant capacity, product range and layout are engineered to client requirement, the expected mix of incoming material and local regulations. Handling of waste paint requires the applicable state and pollution-control authorisations.

Most leftover paint is not waste. It is simply paint that has not found its use yet.



EPCC

EPCC PROJECT EXECUTION

ENGINEERING · PROCUREMENT · CONSTRUCTION · COMMISSIONING

Turnkey project delivery under one agreement: design, equipment supply, construction, installation and commissioning.

COVERED IN THIS SECTION

- Process engineering & P&IDs
- Mechanical & fabrication design
- Civil & structural design
- Electrical & instrumentation
- Procurement & expediting
- Erection, commissioning & handover

FEEDSTOCKS & APPLICATIONS

GREENFIELD PLANTS | PLANT EXPANSIONS | REVAMPS | TURNKEY PACKAGES

ENGINEERING · PROCUREMENT · CONSTRUCTION · COMMISSIONING

ONE PARTY ACCOUNTABLE, FROM CONCEPT TO PRODUCTION

Building a process plant involves dozens of vendors, several engineering disciplines and many site contractors. When each is hired separately, the owner carries the risk at every interface. Under an EPCC contract, a single company designs the plant, buys and builds the equipment, erects it on site and brings it into operation.

HiTorq delivers each technology in this catalogue this way. The owner deals with one project team, one schedule and one party responsible for the plant meeting its agreed performance.



FIG. 10.1 PROCESS EQUIPMENT FABRICATION IN THE WORKSHOP (ILLUSTRATIVE)

HOW A PROJECT RUNS

E	P	C	C	+
Engineering Process design, then detailed drawings for every discipline	**Procurement** Specifications, vendor selection, expediting, inspection	**Construction** Fabrication, civil works, erection, piping and wiring	**Commissioning** Checks, start-up, performance trial, training	**Support** Operation assistance and spares on request

HOW WE WORK

01
Fit to purpose
Each design starts from your feedstock, site and budget.

02
Product-led
The quality you need to sell drives the engineering.

03
Value engineered
Choices weighed on capital and operating cost together.

04
Here after handover
Service, spares and upgrades for the life of the plant.

GROUP FABRICATION

BUILT IN OUR OWN WORKSHOPS

Process equipment is fabricated by our group company **Shree Shakti Engg Works** at two manufacturing units in Gujarat: reactors, heat exchangers, storage tanks, U-stamp pressure vessels and complete turnkey packages. Project offices in Bharuch, Vadodara, Mumbai and Noida.

ENGINEERING SCOPE

EVERY DISCIPLINE, UNDER ONE ROOF

Detailed engineering turns a process concept into documents that fabricators, vendors and site teams can build from. The outline below shows the typical coverage of each discipline; the exact document list is agreed for every project.

PROCESS

- Design basis and process flow diagrams
- Heat and mass balances
- Piping and instrument diagrams
- Equipment sizing and process data sheets
- Utility and chemical consumption
- Operating philosophy

MECHANICAL & PIPING

- Vessel, exchanger and tank design
- General arrangement and fabrication drawings
- Pump, agitator and package specifications
- Plot plan and piping layout
- Isometrics and material take-off
- Surface protection and insulation

CIVIL & STRUCTURAL

- Site grading and drainage
- Equipment and building foundations
- Steel structures and platforms
- Pipe racks and cable trenches
- Tank farm bunds and pads
- Access stairs and walkways

ELECTRICAL

- Power distribution and single-line diagrams
- Load summary and transformer sizing
- Motor control centres
- Hazardous area classification
- Earthing and lightning protection
- Cabling and plant lighting

AUTOMATION

- Control philosophy and interlocks
- Instrument selection and hook-ups
- PLC / DCS programming
- Operator screens and alarms
- Signal lists and loop checks
- Factory and site acceptance tests

AT HANDOVER

The owner receives as-built drawings, equipment documentation, operating and maintenance manuals, test certificates and commissioning records.

Design, equipment, erection and start-up, signed off by one team. That is what EPCC should mean.

BEYOND THE EQUIPMENT

WITH YOU BEFORE THE ORDER, AND LONG AFTER START-UP

A plant is only as good as the decisions made before it is built and the care it gets after. HiTorq supports owners across the full project lifecycle, from the first feed sample to years of operation.

01	02	03	04	05	06	07
Feasibility Feed analysis, route selection, budgetary cost	**Design** Process and detailed engineering	**Fabrication** Group workshops, inspection	**Installation** Erection, piping, electricals	**Commissioning** Start-up and trial runs	**Training** Operators, lab and maintenance	**After-sales** Spares, service, upgrades

QUALITY

Inspected at every stage

- Quality plans and inspection checklists for each project
- Material traceability for pressure parts
- Pressure and leak testing before dispatch
- Third-party inspection on request

SAFETY

Designed in, not added on

- Closed systems and vapour recovery where solvents are handled
- Pressure and vacuum relief protection
- Flameproof electricals for hazardous areas
- Interlocks and alarms in the control system

ENVIRONMENT & COMPLIANCE

Cleaner by design

- Effluent treatment integrated into the flow sheet
- Minimum solid waste from finishing routes
- Documentation support for statutory and environmental approvals
- Designs adapted to local norms

TRAINING

Classroom and on-site training for operators, shift engineers, lab chemists and maintenance staff during commissioning, with operating manuals and standard operating procedures.

AFTER-SALES

Spare parts, consumables such as catalyst and filter media, periodic health checks, troubleshooting and capacity or quality upgrades as your market grows.

START A PROJECT

WHAT TO SEND US FOR A PROPOSAL

- Feed type, source and any lab analysis you have
- Products you want and the specifications they must meet
- Target capacity and operating hours
- Site location, available utilities and space
- Existing equipment that could be reused

We measure a project by the day the plant makes on-spec product, and by every day after.

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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