



PALM KERNEL



SOY BEAN



RICE BRAN



SUNFLOWER SEED

# SOLVENT EXTRACTION FROM OILSEEDS



RAPE SEED

## ***JJ-Lurgi***

*Engineered for you*

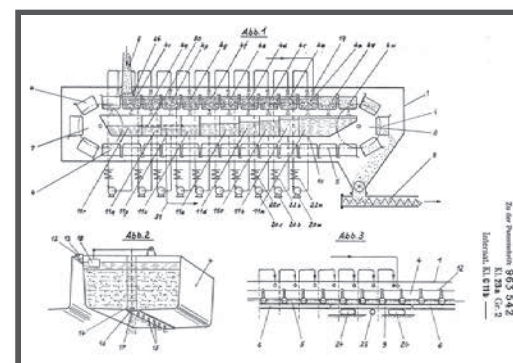




# OIL SEED EXTRACTION TECHNOLOGY

## JJ-LURGI

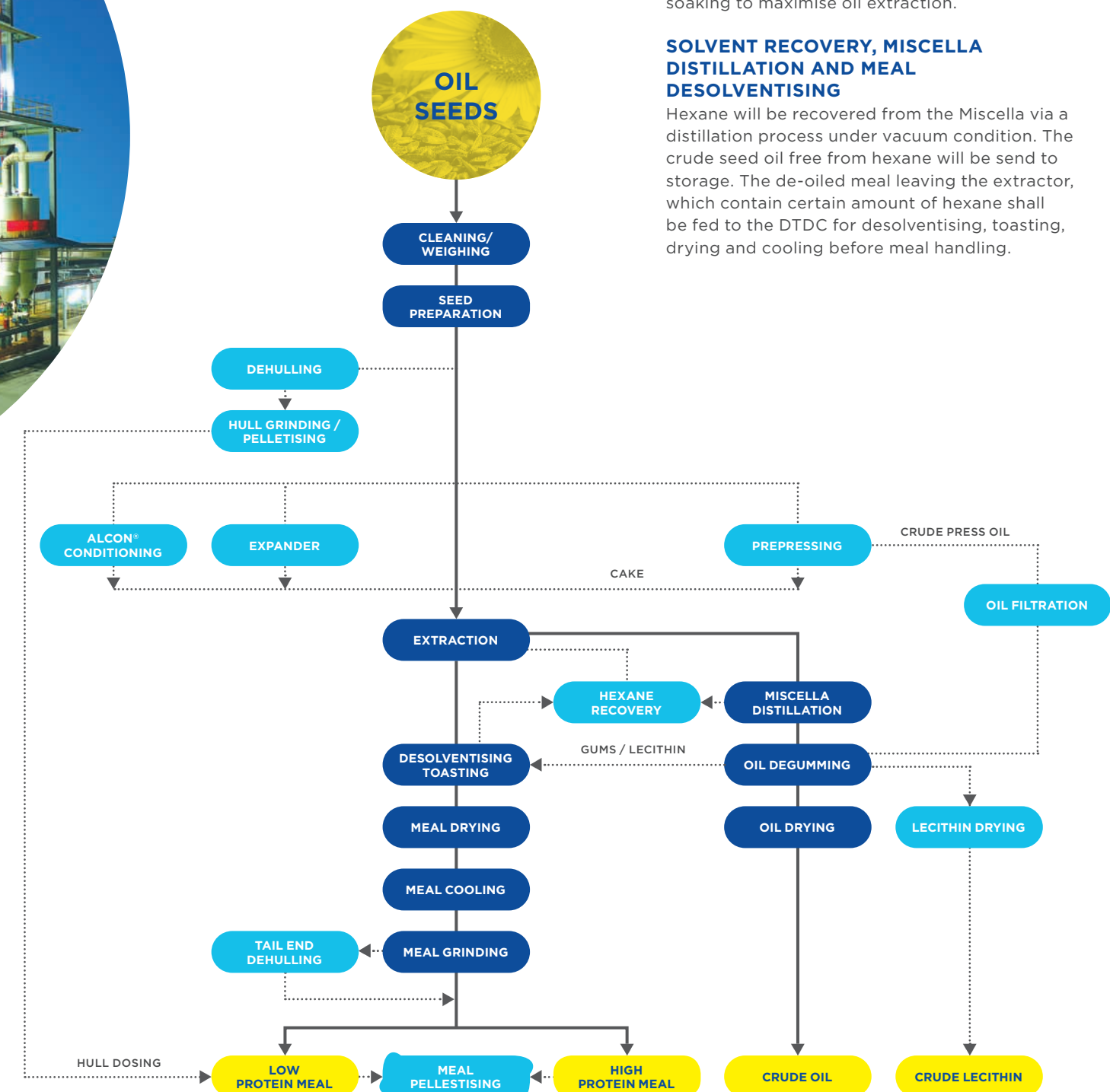
JJ-Lurgi Engineering is a joint venture between Jebesen & Jessen (SEA) and Air Liquide (Germany), formerly known as LURGI. Our engineering roots are in Germany; in Asia we have established a strong network to support our key clients around the Asia Pacific region. With a combined experience of more than 200 years, JJ-Lurgi has a strong track record as a reliable technology partner.



## Our experience

Lurgi started building solvent extraction plant since the early 1940's with the 1st generation extraction process and design patented in 1957. In Europe, Lurgi's solvent extraction technology is mainly used for oilseeds like rapeseed, sunflower seed and cottonseed. In Asia, extracting oil from soybean, palm kernel and rice bran are the most popular applications for our solvent extraction plant. JJ-Lurgi has successfully delivered many mile stone projects including a 5000 TPD soybean extraction plant and 1100 TPD palm kernel extraction plant, the biggest capacity in the SEA region.

## Oilseeds extraction process steps



### SEED PREPARATION

The seeds have to be properly prepared to ensure that the oil cells are ruptured for the solvent to displace the oil and maximise the extraction rate of the solvent in the extractor.

### OIL EXTRACTION

Hexane is sprayed onto the product bed and is subjected to a specific retention time for optimal soaking to maximise oil extraction.

### SOLVENT RECOVERY, MISCELLA DISTILLATION AND MEAL DESOLVENTISING

Hexane will be recovered from the Miscella via a distillation process under vacuum condition. The crude seed oil free from hexane will be sent to storage. The de-oiled meal leaving the extractor, which contain certain amount of hexane shall be fed to the DTDC for desolventising, toasting, drying and cooling before meal handling.





# THE SC EXTRACTOR 3.0

The Lurgi Sliding Cell Extractor has gone through significant improvements since the 1st generation model was conceived in the early 1940's. Our latest 3rd generation model, the SC Extractor 3.0 comes with two series;

## ST series:

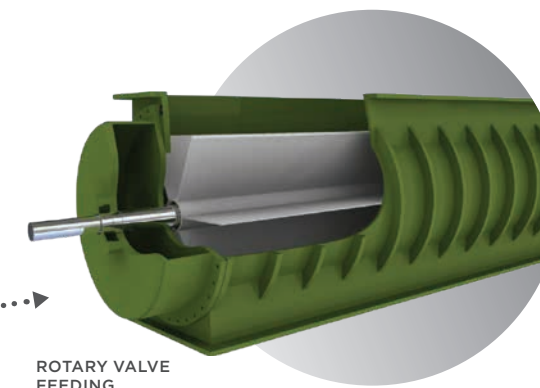
Designed for capacity up to 5000 TPD

## TT series:

Designed with a twin tracks cell system for capacity above 5000 TPD

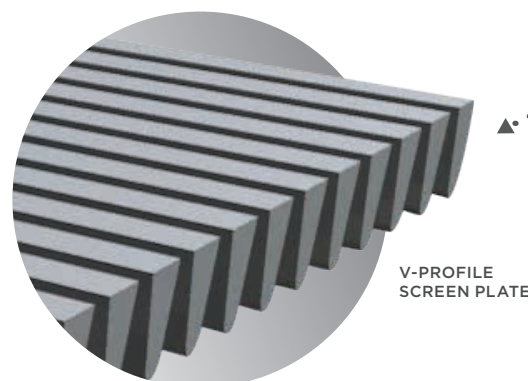
## They are designed with the following features:

- Rotary feeding design to minimise fines formation and ensure even distribution of feed into the extractor.
- Dual pass shallow bed extractor allows meal re-distribution which ensures large contact area between solvent and flakes for optimum percolation.
- Multiple solvent and miscella feed tubes per extractor stage.
- Flexibility in regulating Extraction Time (ET) and Draining Time (DT).
- Stationary screen plate and floating cells design with no friction between the flakes and extractor housing reduces wear and tear significantly.
- V-Profile screen plate design prevents the risk of clogging and does not require any cleaning mechanism.
- Dual hydraulic drive provides evenly distributed torque at the shafts for the cell movement.
- Mild vacuum condition at the drainage chamber of the extractor to pre-desolventise the meal before going to the DTDC stage. This will lower the hexane content in the wet meal and subsequently reduce the live steam consumption at the DTDC.

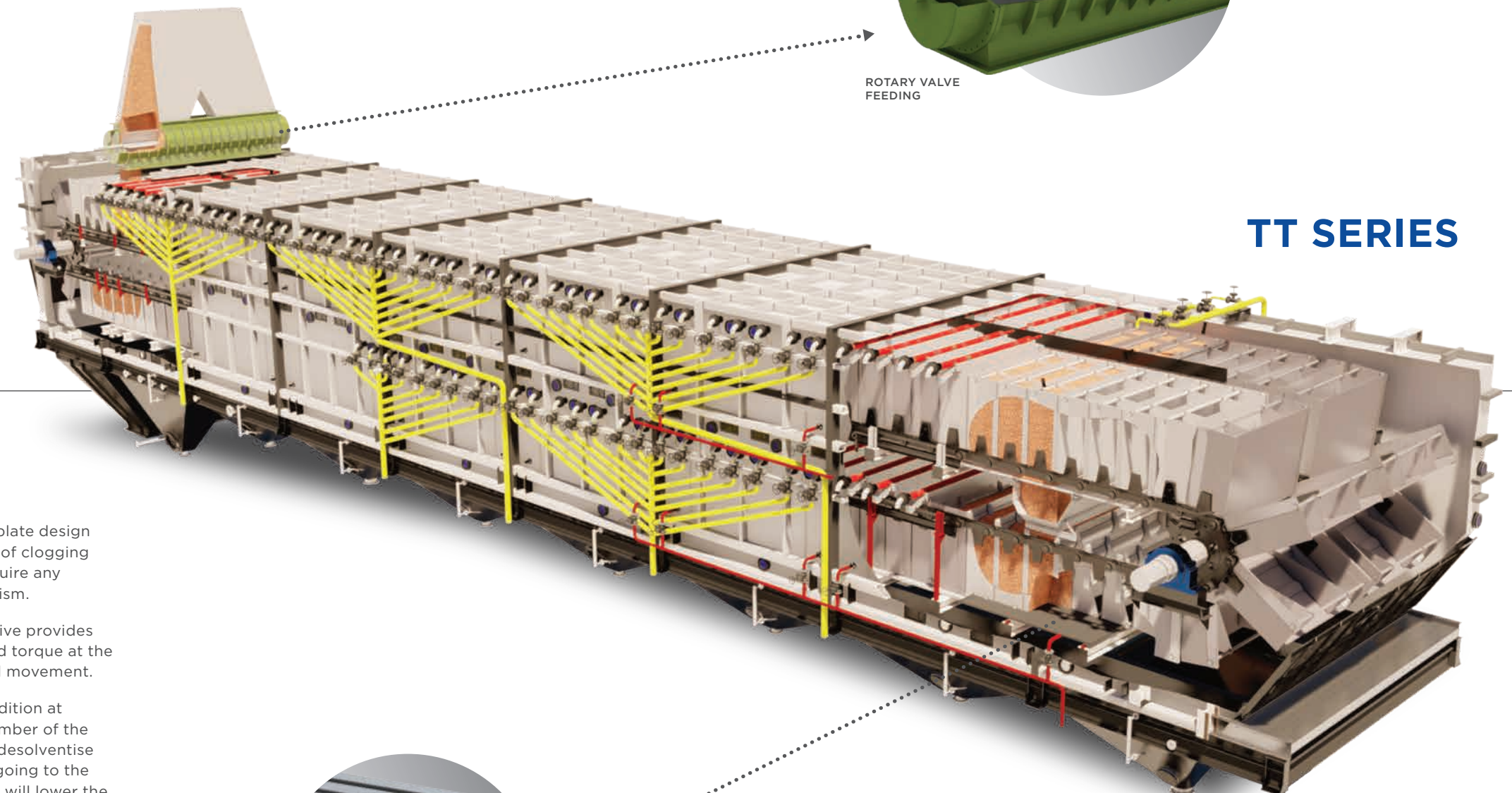


ROTARY VALVE FEEDING

## TT SERIES

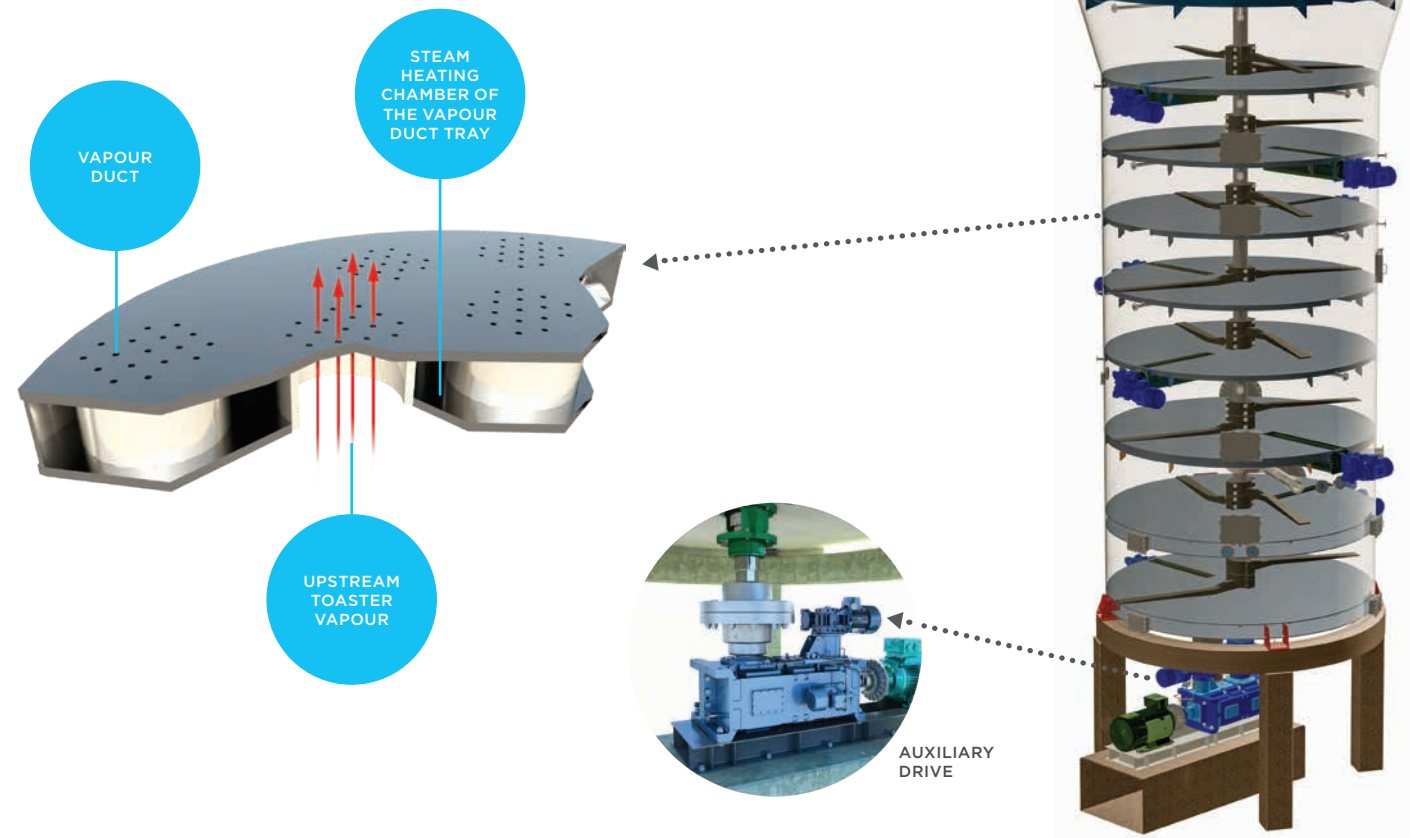


V-PROFILE SCREEN PLATE





# LURGI DESOLVENTISER- TOASTER-DRYER- COOLER (DTDC)



At the pre-desolventising stage, indirect heating is applied to evaporate the hexane from the meal without adding moisture. Subsequent desolventising and toasting trays are designed to remove the bulk of the solvent from the meal via indirect heating and direct steam injection. Each stage is equipped with sweep arm to keep the meal moving.

During the meal desolventising process, the moisture content in the meal increases and the final stages of the Dryer/Cooler are there to reduce the moisture to an acceptable level and cool the meal to storage temperature.

## The Lurgi DTDC

### Special features :

- 💧 The DTDC agitator shaft load is supported on the top of the DTDC column ensuring zero axial load on the output shaft of the main drive gearbox.
- 💧 The Lurgi Toasting stage is specially designed to give the de-solventised meal a light golden brown colour (for soybean meal only) which is an essential characteristic for animal feed application.
- 💧 Lower steam consumption in the Drying stage as recovered steam condensate/hot air is used to heat up the incoming cool air during the drying of the meal
- 💧 The Lurgi DTDC agitator gearbox is designed with an auxiliary drive that will be in operation in the event of a power supply disruption to prevent the settling and hardening of the meal in the DTDC.
- 💧 Variable speed rotary valves and automatic level controls provides flexibility in regulating retention time/meal height in DTDC.

# MISCELLA DISTILLATION

## Falling film evaporator

Our highly efficient Falling Film evaporator is able to achieve more than 90% miscella concentration by maximising the heat exchange and recovery effectively. The falling thin film concept allows higher miscella surface area exposure to the toaster vapour via a counter flow motion with the thin film miscella descending along the inner tubes by gravity. This significantly reduces steam consumption for the distillation process.

## Distillation column

In the Lurgi Distillation Column, the hexane residue in the crude oil is further reduced via stripping steam to below 50ppm before the crude oil is pumped to storage.



FALLING FILM  
EVAPORATOR



DISTILLATION  
COLUMN



## PROJECT LOCATIONS



# ENGINEERED FOR YOU

OILSEEDS EXTRACTION

EDIBLE OILS

OLEOCHEMICALS

SPECIALTY FATS

BIODIESEL

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A joint venture between Jebsen & Jessen (SEA) and Air Liquide Global E & C Solutions Germany GmbH  
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