SOLVENT DEWAXING PROCESS

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Dewaxing

Process Concept :

Dewaxing is used to remove wax from waxy raffinate obtained after solvent extraction to get relatively wax free oil having low temperature flowability

Solvent Dewaxing :

Precipitation and separation of wax crystals at low temperature in presence of solvent.

- MEK : Toluene
- Propane

Catalytic Dewaxing

- Catalytic dewaxing transforms high melting point waxy molecules into low pour products of non- waxy structure.
- Concept is to selectively crack high pour straight chain paraffins and then Isomerize them into low pour iso-paraffins
- Two lincesors : Chevron, ExxonMobil
- Broad range of feed from low wax to 100% wax can be processed
- VI of the final product 95-140

MLDW – Mobil Lube Dewaxing

Straight chain and slightly branched waxy molecules selectively cracked over Zeolite catalyst (ZSM – 5).

- Applicable to wide range of raffinates
- DWO of very low pour point can be obtained but there is associated loss of VI
- Removes more paraffins to reach same pour point. That is less yield than solvent dewaxing
- By products – LPG and Naphtha.
- Reduced capital and operating cost.

MSDW – Mobil Selective Dewaxing

Development of more shape selective catalyst around Isomerization rather conversion

- Catalyst with strong Hydro-Isomerization activity transforms Waxy molecules into non-waxy isoparaffins plus small distillates
- Improved selectivity for wax conversion gives more yield and higher VI Lube compared to MLDW
- Highly refined base oils substantially reduced S & N from feed such as Lube Hydrocrakates, Fuel Hydrocracker Bottom or Hydro – converted raffinates
- Higher VI & Better yield of base oils than Solvent Dewaxing

Chemistry of MSDW

- Catalyst is More Selective than ZSM-5

– Accessible to waxy n-Paraffins

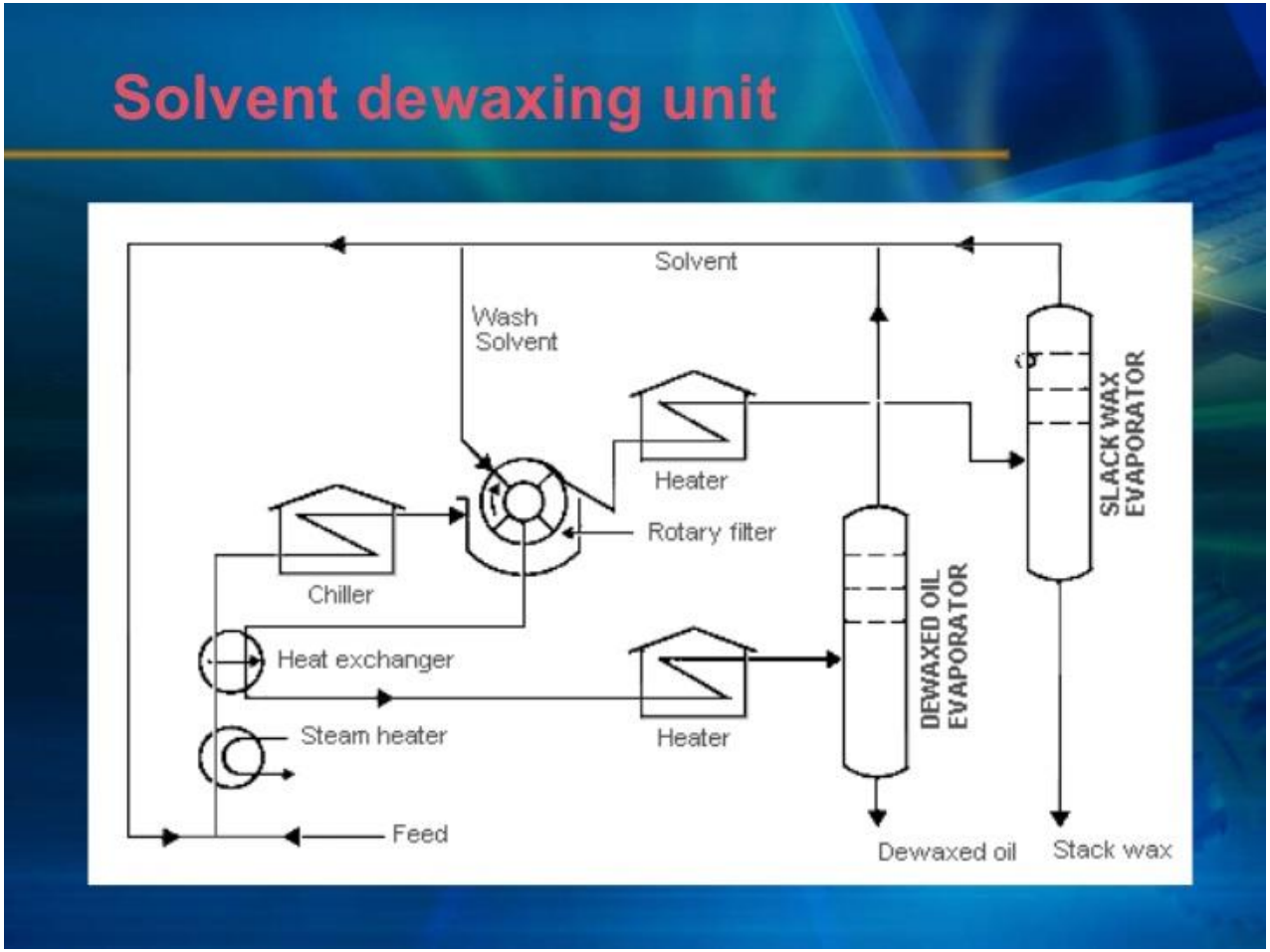
– Better at excluding non-waxy branched paraffins

- Can isomerize waxy n-Paraffins to low pour/high VI branched Paraffins

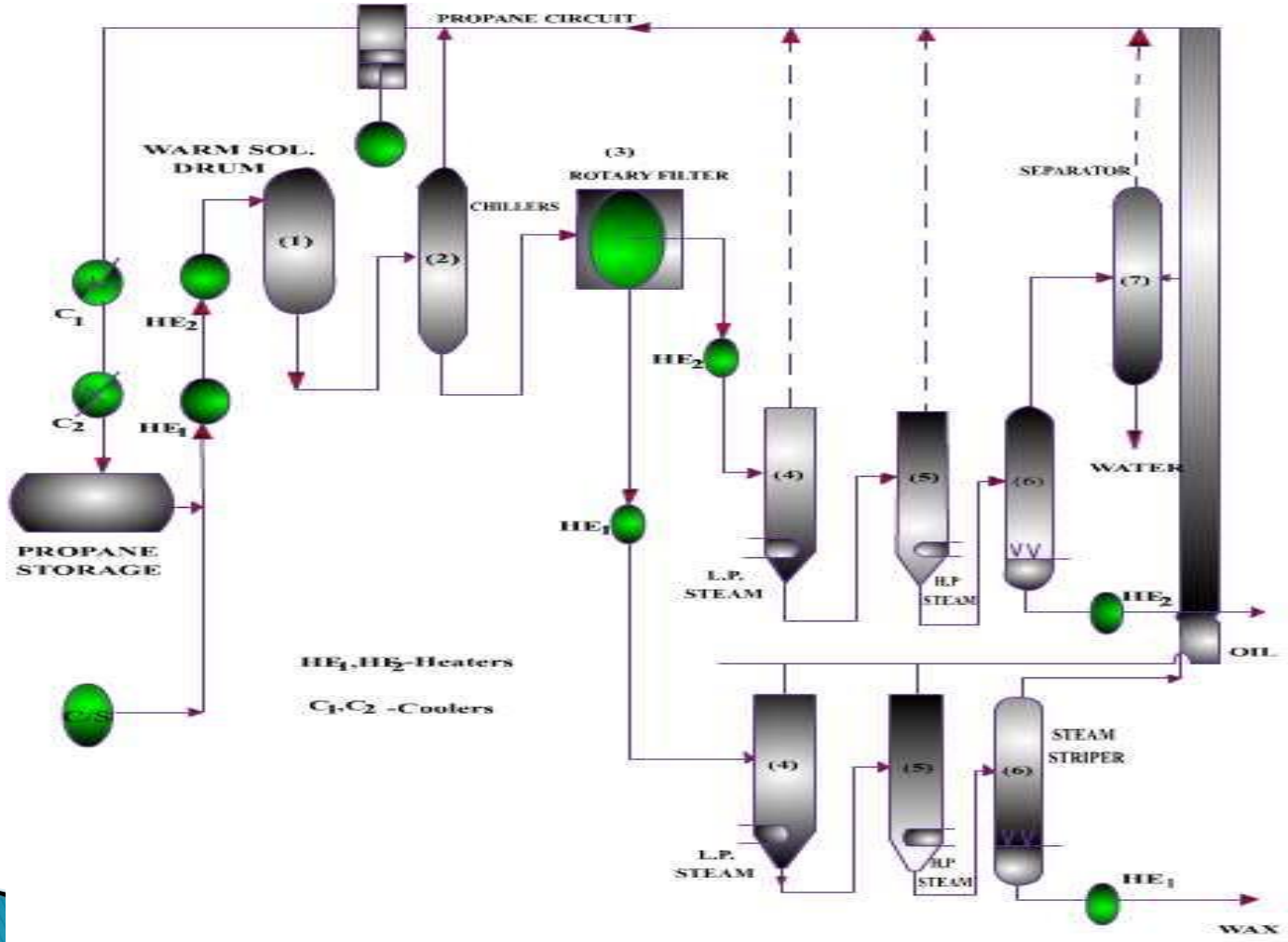
– Higher Lube Yield and VI than MLDW

$C_{26}H_{54}$ Isomers	Pour Point	VI
nC_{26}	56°C	159
C_2-C-C_{21} | C_2	30°C	158

Flow sheet


Solvent dewaxing unit
Solvent
Wash
Solvent
Heater
Rotary filter
Chiller
Heat exchanger
Steam heater
Heater
Feed
DEWAXED OIL
EVAPORATOR
SLACK WAX
EVAPORATOR
Dewaxed oil
Stack wax

Flow sheet of propane dewaxing



PROPANE DEWAXING

TREATMENT TECHNIQUES

Thanks