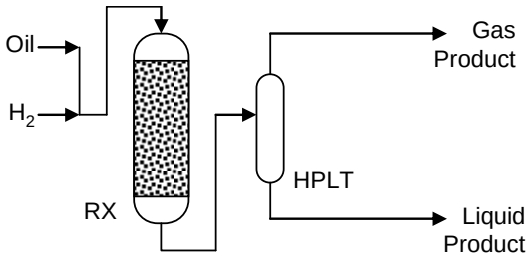
VB01 HYDROPROCESSING UNIT

The VB01 hydroprocessing unit is a single-stage, flexible small-scale pilot plant unit which enables R&D activities on hydroprocessing of liquid feedstocks. The VB01 unit has been employed for hydrotreating and hydrocracking experiments which provide technology development, catalyst evaluation and a variety of research studies. The VB01 unit has been utilized with a variety of fossil based feedstocks (gas oil, vacuum gas oil, etc) and biomass based feedstocks (raw vegetable oil, commercial vegetable oil, waste cooking oil, pyrolysis biooil etc).

The VB01 unit consists of a feed system, a reactor system and a product separation system, as schematically depicted below. The feed system effectively maintains constant feed quality and H_2-to-oil ratio via a liquid feed pump and a gas flow controller. The reactor system consists of a single fixed-bed reactor (L=70cm, ID=14.7mm) with six independent heating zones, which sustain the desired temperature profile within the reactor. The reactor product passes through the product separation system, where it is first cooled via a cooling zone and then flashed via a High Pressure Low Temperature (HPLT) separator. The gas product flow enables the system pressure control via a pneumatic control valve. The liquid product flow is controlled via a separator level control system through a second pneumatic valve right after the HPLT separator.

Variable	Range
Liquid Flow	0-120ml/h
Gas Flow	0-70 lit/h
H_2/oil	0-1600nl/l
Pressure	0-150atm
Reactor Temperatures	25-450ºC
Reactor Volume	114ml



Key technology achievements

- Hydrotreating of waste cooking oil for 2nd generation biodiesel production
- Upgrading of pyrolysis biooil via catalytic hydrotreating
- Co-hydroprocessing of gas oil – vegetable oil mixtures
- Hydrocracking of VGO for diesel and gasoline production
- Hydrodesulfurization of heavy petroleum streams
- Kinetic modeling of vegetable oil hydrotreating process

R&D services

- Study of hydrotreating of various bio-feedstocks
- Determination of H_2 consumption of various hydrotreating processes
- Commercial hydroprocessing catalyst evaluation