Distillation Process of Crude Oil

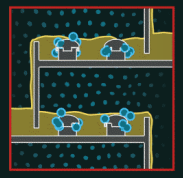
Crude oil contains a variety of hydrocarbons that have different boiling points. To saperate these compounds, the oil is first sent to a boiler where it is heated into a super hot mixture of liquid and vapour called the feed.

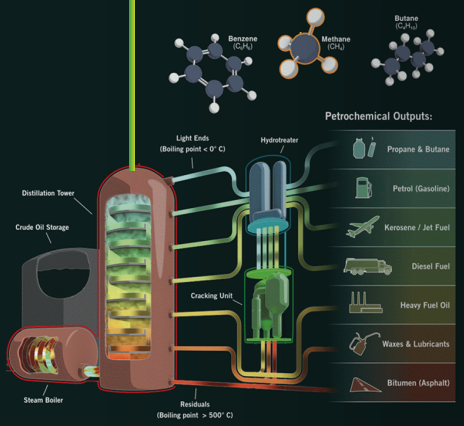
The mixture is then fed into a distillation tower . In there, the compounds with a lower boiling point rise up as vapours, while the compounds with a hiher boiling point fall downward as liquids.

The tower contains trays that allow the vapour to buble upwards through the liquid, helping to exchange heat and resulting in more effective seperation.

The distilled products are then piped off from the different levels of the tower. These seperated products are called fractions or distillates.

This process may take place along multiple distillation towers.



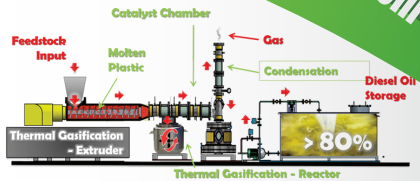


Gas Composition (wt%)

	H_2	CH_4	C_2H_6	C_2H_4	C_3H_8	C_3H_6	C_4H_{10}	C_4H_8
HDPE	0.12	1.90	2.21	6.08	1.31	4.56	0.22	0.36
PE	0.8	23.8	6.7	20.0	0.08	5.6		0.6
LDPE	0.05	1.14	1.67	4.00	1.33	4.00	0.32	2.00
LDPE		22		28		18		
LLDPE		4.6	2.2	19.4	0.8	12.0	13.1	
PP	0.05	0.93	1.45	3.52	1.00	3.53	0.23	1.29
PP	0.7	28.2	4.0	13.9	0.09	3.7		0.4
PS	0.04	0.53	0.08	0.26	0.02	0.05	0.00	0.06
PS		0.06		0.04				

"Yield and composition of Gases and Oils/Waxes from the Feedstock Recycling of Waste Plastic"
-PAUL T. WILLIAMS

Syngas Conversion System



Residue Composition

No	Test Parameter	Unit	Result
1	Silver (Ag)	ppm	<1
2	Potassium (as K_2O)	%wt	0.03
3	Aluminium (as Al_2O_3)	%wt	1.26
4	Cadmium (Cd)	ppm	<1
5	Chromium (as Cr)	ppm	27
6	Copper (as Cu)	ppm	89
7	Iron (as Fe)	%wt	0.55
8	Manganese (as MnO)	%wt	0.04
9	Molybdenum (as Mo)	ppm	2
10	Sodium (as Na)	%wt	0.14
11	Nickel (as Ni)	ppm	8
12	Lead (as Pb)	ppm	17
13	Silicon (SiO_2)	%wt	2.47
14	Suphur (S)	%wt	0.012
15	Titanium (as TiO_2)	%wt	0.34
16	Vanadium (as V_2O_5)	ppm	1
17	Barium (as Ba)	%wt	0.01
18	Calcium (as Ca)	%wt	16.8
19	Magnesium (as MgO)	%wt	0.41
20	Zinc (as Zn)	%wt	0.13
21	Phosohorus (as P_2O_5)	%wt	0.1

Output Composition

Product yields for liquification (wt%)

	Temp.	Distillate	Residue	Gas
PE	470°C	87.3	9.7	3
PP	450°C	85.0	14.0	1.0
PS	450°C	92.1	7.9	0

Heat Calorific Value

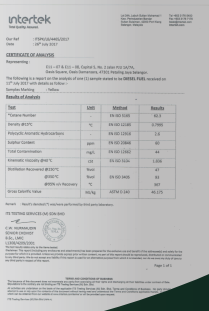
Fuel	MJ/kg
Methane	55.5
Petrol	48
Syngas Diesel	**44.48**
Natural Gas	43
Alcohol	30
Coal	27
Rice Husk	18
Wood	17.5
Palm Kernel Shell	23.6
Oil Palm Fibre	14.5

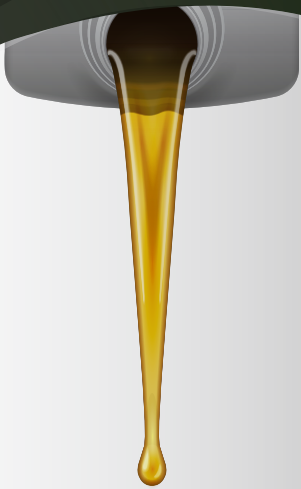
Conformance Test & Analysis

EN590- Euro V Standard

Test	Unit	ASTM Method	Commercial Diesel	Syngas Diesel
Cetane Number	min	D613	50	57.8
Cetane Index	min	D4737	45	64.3
Net Calorific Value*	MJ/kg	D240	44.8	44.48
Cloud Point	°C	D2500	Low	> -51°C
Sulphur	ppm	D2622	300 - 500	7
Lubricity*, HFRR	µm	D6079-4	< 460	349

Intertek





syngas

Plastic-to-Fuel Technology

Model: Syngas X2LQ DEPOLIMERISER

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Company Background

Syngas Sdn Bhd (Syngas) is a Manufacturing Research and Development company registered in Malaysia.

The Syngas Conversion Machine (PTF), the machine that can convert waste plastic to diesel oil, Light Ultra Low Sulphur Diesel Fuel. PTF Technology registered with the Malaysia Commissioner of Patents and Trade Marks (MyIPO) registration No MY-150550-A on 30th January 2014. PTF also been patented in 60 countries around the world.

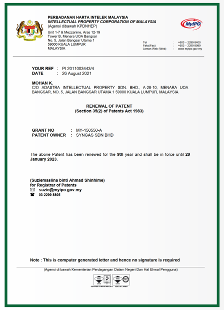
Syngas Sdn Bhd is a wholly own subsidiary of Mensilin Green Energy Sdn Bhd (MGE). The Syngas Plastic-to-Oil conversion system is an innovative, propriety process to convert waste plastics into renewable energy namely, Diesel Oil.

The System uses a process called fractional de-polymerization process to efficiently convert plastics to crude oil and further process to produce diesel oil. The system also provides an integrated plastic waste processing system which offers an alternative to landfill disposal, incineration, and recycling.

The PTF Technology offers a viable, economical and environmentally responsible alternative to current methods of recycling and disposal of plastic waste.

The PTF is modular in design. A single module can produce up to 80% of fuel oil for every ton of typical plastic waste processed. Plant capacity can range from 2 tons to more than 100 tons of plastic waste processed per day. Overall plant capacity can be easily scaled up by adding additional modules.

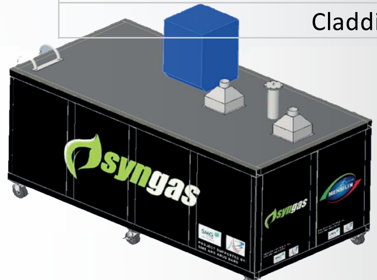
The output is high grade Low Sulphur High Cetane Green Technology Diesel Oil.



Malaysian Developed Patented Technology

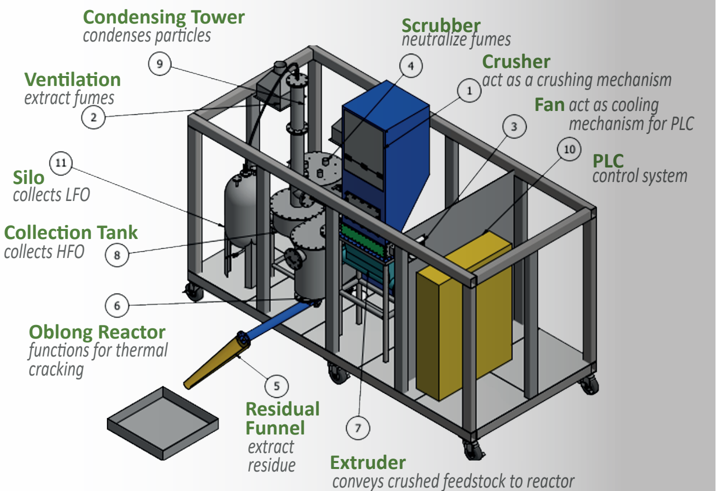
Syngas X2LQ DEPOLIMERISER

General Information	
Model	Syngas X2LQ
Overall Size	6.1 X 2.5 X 2.5
Weight (Tonne)	5
Capacity	2-5 TPD
Reactor	1
Shredder	1
Type of Fuel	Electricity (60 Amp)
Reactor Temperature (°C)	400 - 700
Cladding	Optional

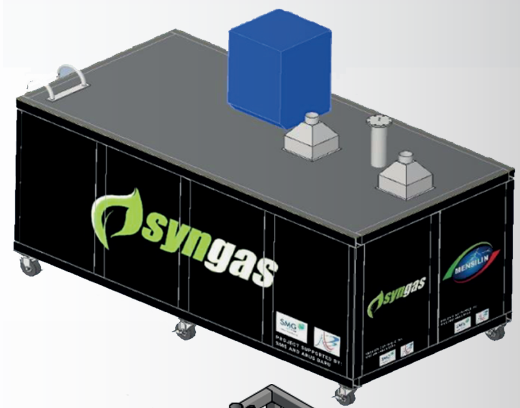


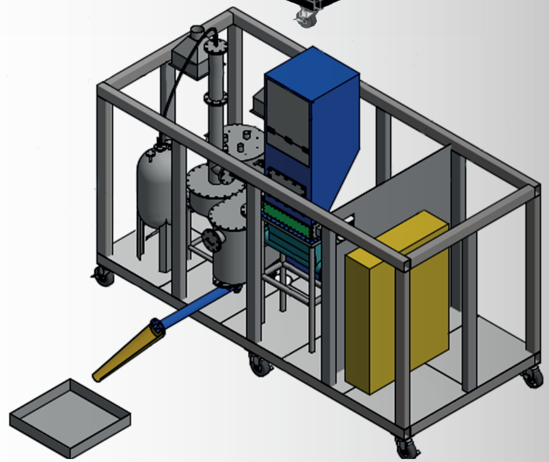
Syngas X2LQ DEPOLIMERISER SPECIAL FEATURES

- Thermal treatment process
- Special ash discharge for continuous operation
- Compliance to Emission Standard
- Very compact in size
- Low operation noise
- 12 Months Warranty
- Room temperature to 400°C at no load in 20 minutes
- After Sales Service Available 24/7



Syngas Factory @Gong Badak Industial Estate





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