WASTE PLASTIC OIL REFINERY

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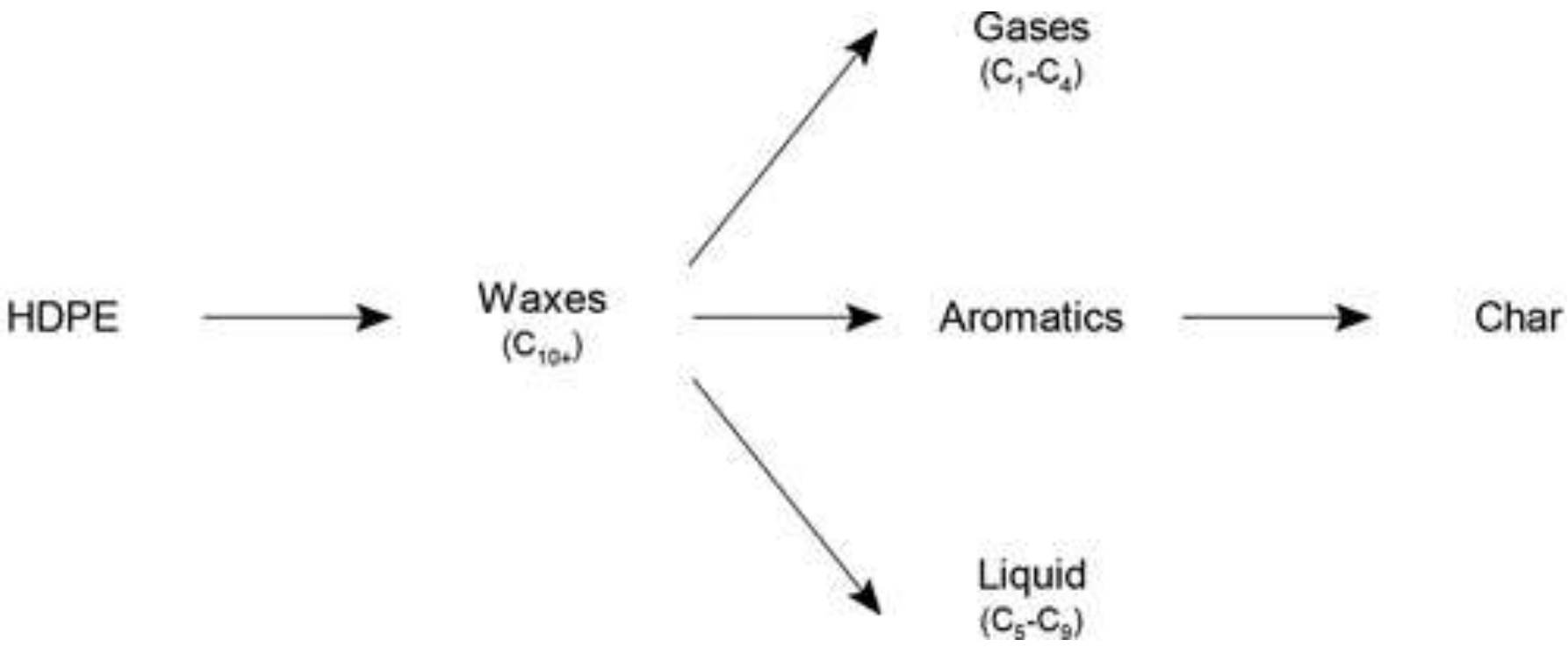
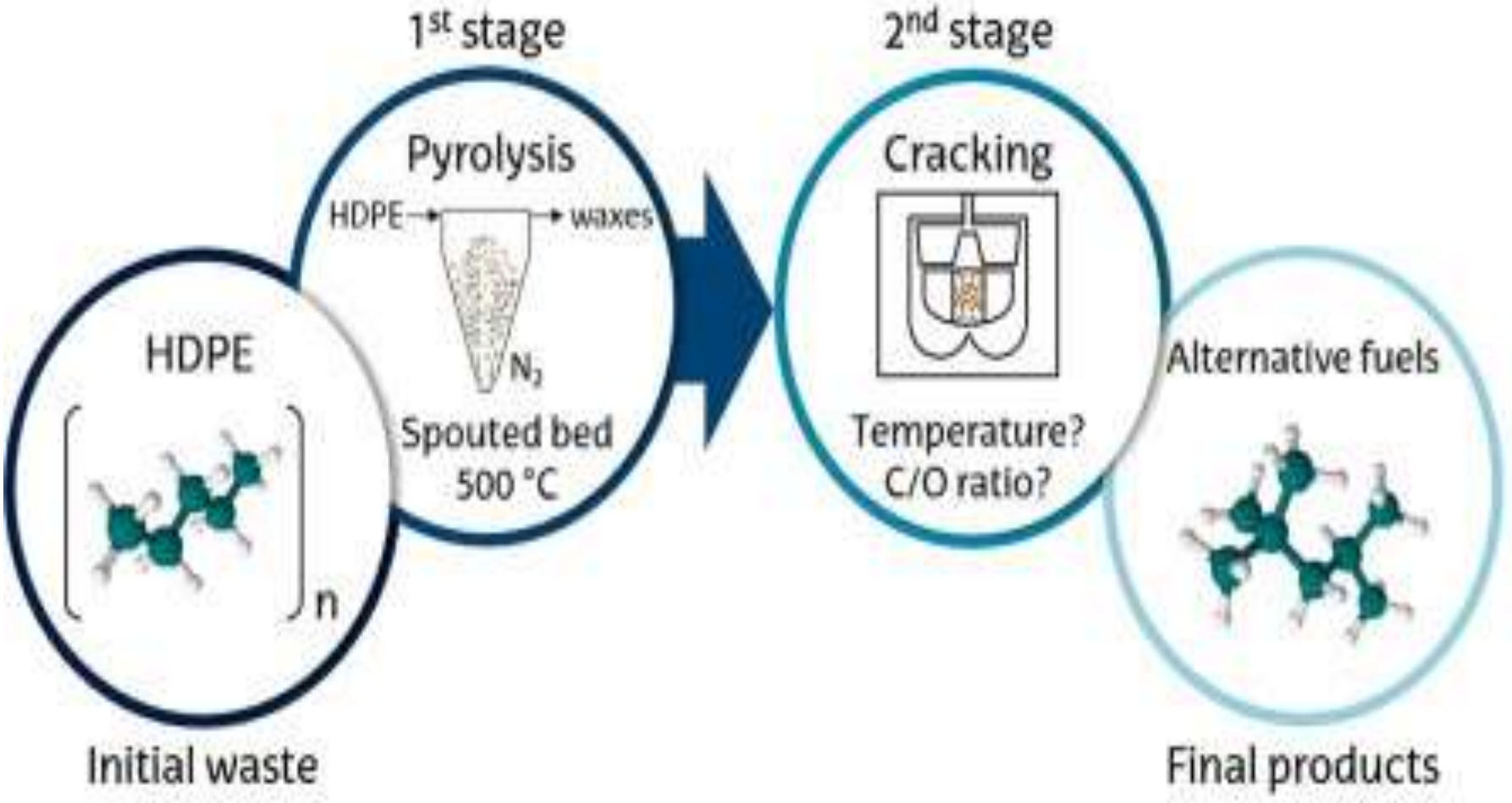
WASTE PLASTIC OIL REFINERY

- **PLASTIC TO OIL PROCESS**



WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROCESS



WASTE PLASTIC OIL REFINERY

- **PLASTIC TO PRODUCTS CONVERSIONS**

Polyolefin	Temperature (°C)	Total Yield (%)	Conversions to liquid, gas, and residue (%)		
			Liquid	Gas	Solid residue
Polypropylene	250	86.32	57.27	29.05	13.68
	300	98.66	69.82	28.84	1.34
	350	97.74	67.74	30.00	1.56
	400	94.3	63.23	31.07	5.7
Polyethylene	250	ND	ND	ND	ND
	300	66.95	30.70	36.25	33.05
	350	98.12	80.88	17.24	1.88
	400	99.46	54.17	45.29	0.54

ND: Not Determined

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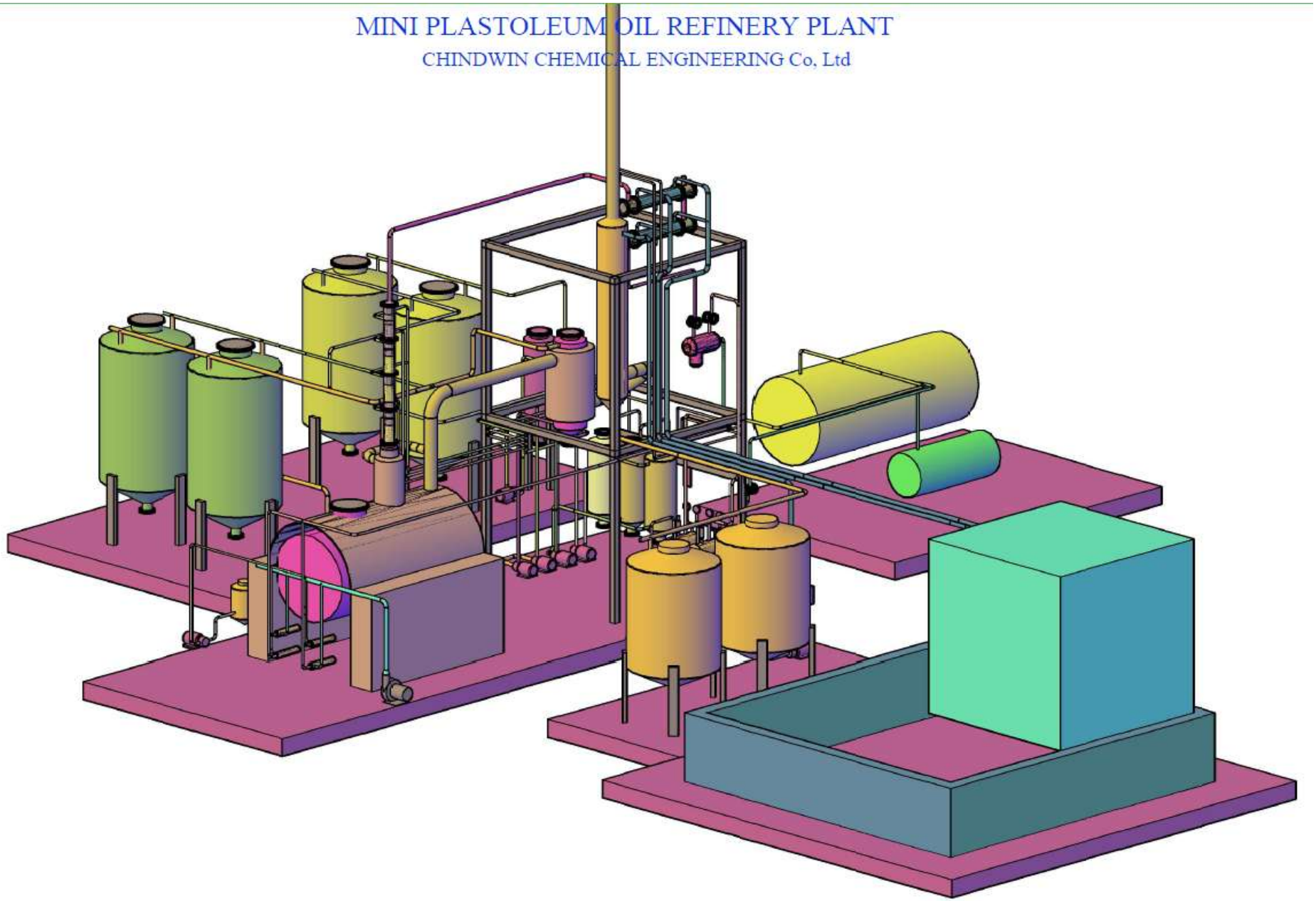
WASTE PLASTIC OIL REFINERY

- **PLASTIC TO OIL PROJECT (PRODUCT SPECIFICATION)**

property	TPO	gasoline	diesel
density (kg m^{-3})	830	780	838
viscosity (cSt)	4.75		2.1
flash point (°C)	65	43	54
HHV (MJ kg^{-1})	42.7	43.9	45.5
elemental analysis (wt %)			
C	79.96	85	87.4
H	10.04	14.1	12.1
N	0.94	0.02	0.04
S	0.11	0.03	0.29
O	9.3		0.29
boiling points (°C)			
IBP	38.5	34	171.5
T_{50}	174.8	92	265.6
T_{90}		154	335.8
FBP	382.4	218	364.6

WASTE PLASTIC OIL REFINERY

PLASTOLEUM OIL (DIESEL OIL) PLANT



WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT (BUDALIN)

- PILOT SCALE ,

WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT (BUDALIN)

- WASTE PLASTIC

WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT (BUDALIN)

WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT (BUDALIN)

WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT (BUDALIN)

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WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT (BUDALIN)

WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT (BUDALIN)

- CATALYST

WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT (PRODUCT OIL TESTING)

WASTE PLASTIC OIL REFINERY

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WASTE PLASTIC OIL REFINERY

WASTE PLASTIC OIL REFINERY

WASTE PLASTIC OIL REFINERY

WASTE PLASTIC TO FUEL PLANT (Process information)		
1	PROJECT NAME	WASTE PLASTIC TO FUEL OIL PLANT
2	PROCESS	PYROLYSIS PROCESS / CATALYSTIC CRACKING PROCESS / ODOR & COLOUR ABSORPTION PROCESS
3	RAW	ANY KIND OF PLASTIC / WASTE TYRE / WASTE RUBBER / WASTE ENGINE OIL
4	PRODUCT YIELD RECOVERY	3 bbls (600 L) OF FUEL OIL/1 TON OF WASTE PLASTIC O
5	PRODUCT	FUEL GAS / GASOLENE / DIESEL OIL (PREMIUM GRADE)
6	BY PRODUCT	PALLET FUEL (Coke)

WASTE PLASTIC OIL REFINERY

WASTE PLASTIC TO PRODUCT YIELD RATIO		
1	FUEL GAS	30 to 35 %
2	FUEL OIL	50 to 60 %
3	RESIDUE	5 to 10 %
4	**Losses**	**5%**

WASTE PLASTIC OIL REFINERY

SGS

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Email: thkhon@ois-ecoms.com
Attention: Mr. Thi Han

Lab Order Number

012013066

Sample Information

Bio Diesel

Sample Photo

Diagnosis: [illegible]

Date Received	30.07.2015		
Date Tested	30.07.2015		
Date Reported	02.08.2015		
Test	**Unit**	**Method**	**Results**
Physical Properties			
Appearance		Visual	Clear
Viscosity @ 40°C	cSt	ASTM D445	3.088
Total Acid Number	mgKOH/g	ASTM D664	0.11
Strong Acid Number	mgKOH/g	ASTM D974	NIL
Specific Gravity @ 60°F		ASTM D4052	0.86
Flash Point (PMCC)	°C	ASTM D93	50.0
Pour Point	°C	ASTM D97	+ 18
Sulphur Content	%wt	ASTM D4294	0.082
Water Content	%vol	ASTM D95	<0.05
Ash Content	%mass	ASTM D482	0.003
Copper Corrosion (3hrs @ 100°C		ASTM D130	1b
Colour ASTM		ASTM D1500	2.0
Micro Carbon Residue	%wt	ASTM D4530	<0.10
Sediment by Extraction	%wt	ASTM D473	<0.01
Cetane Index		Calculated	43.2
Calorific Value	Btu	Calculated	19503
Distillation			
Recovered at 300°C	%vol	ASTM D86	69.0
Recovered at 380°C	%vol	ASTM D86	95.0

the latest revision of the methods indicated, unless specifically marked otherwise on the report. Precision parameters apply in the determination of the above results. Users of the data shown on this report should refer to the latest published revisions of ASTM D 3244, IP 367 and ISO 4259 and when utilising the test data to determine conformance with any specification or process requirement. This Test Report is issued under the Company's General Conditions of Service (copy available upon request or on the company website at www.sgs.com). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. This report shall not be reproduced except in full, without the written approval of the laboratory.

SGS Testing & Control Services Singapore Pte Ltd

Sagar "Sameer" Palaniappan
Assistant Manager

Test	Unit	Method	Results
Physical Properties			
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Viscosity @ 40°C	cSt	ASTM D445	3,088
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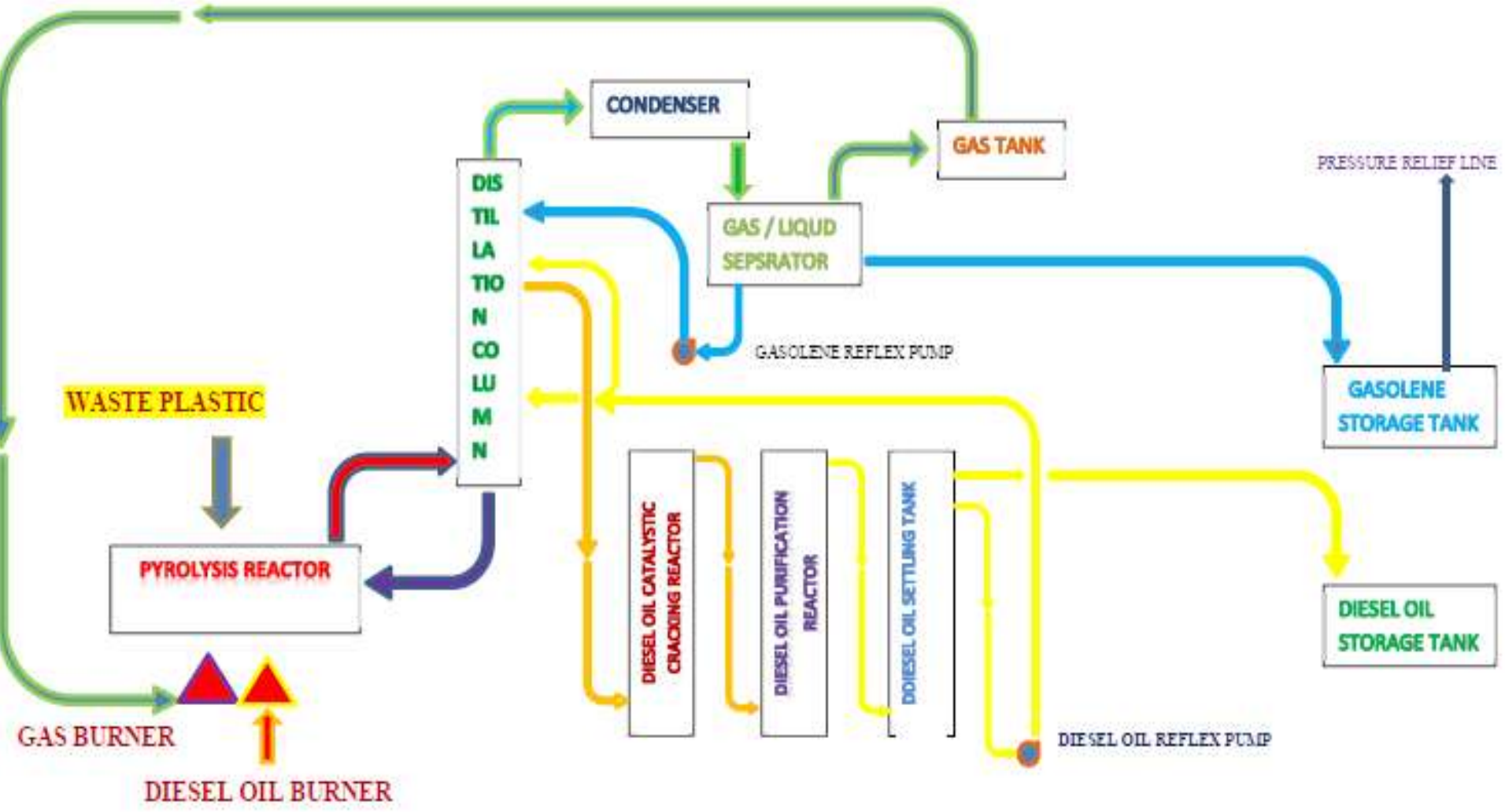
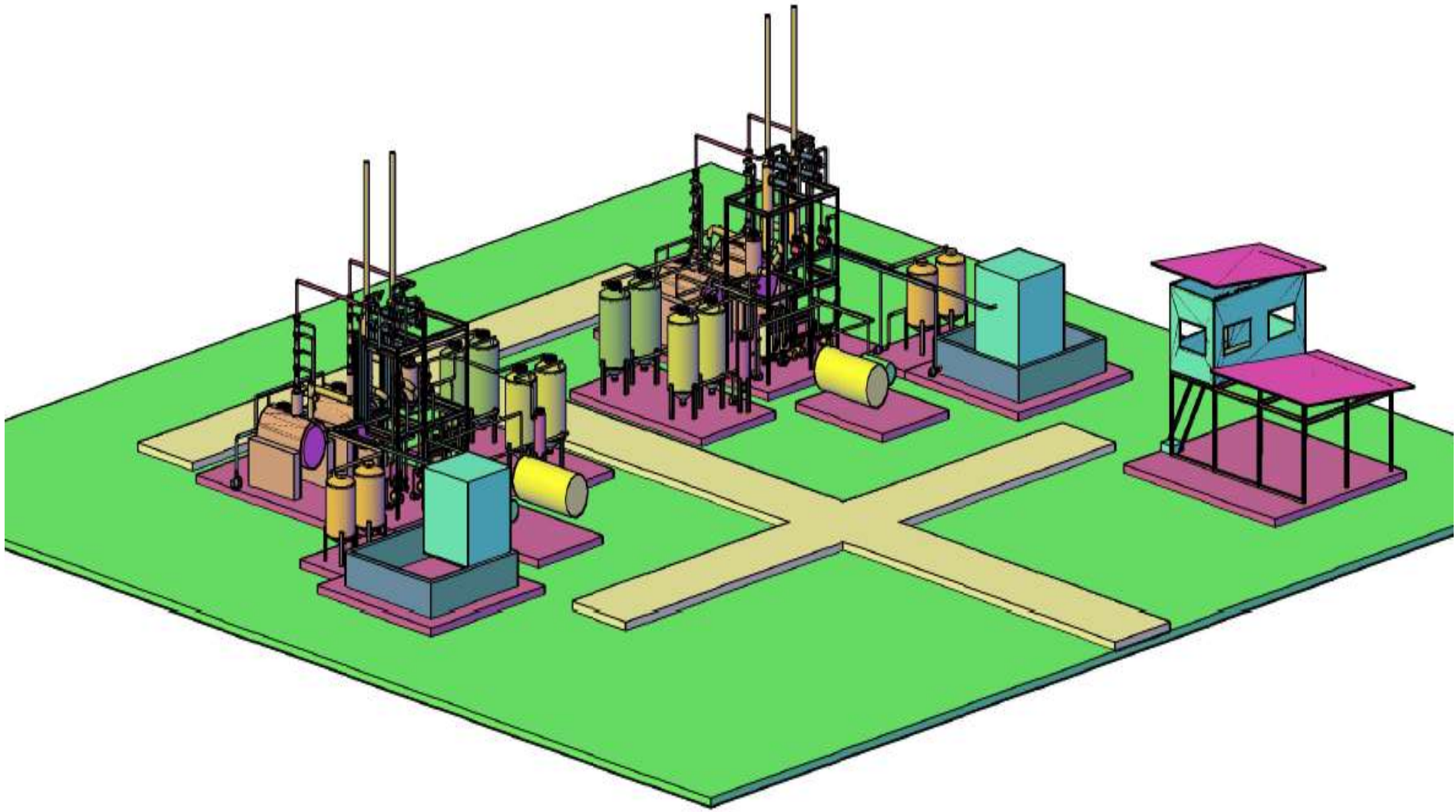
WASTE PLASTIC TO FUEL OIL REFINERY PLANT

PROCESS FLOW DIAGRAM

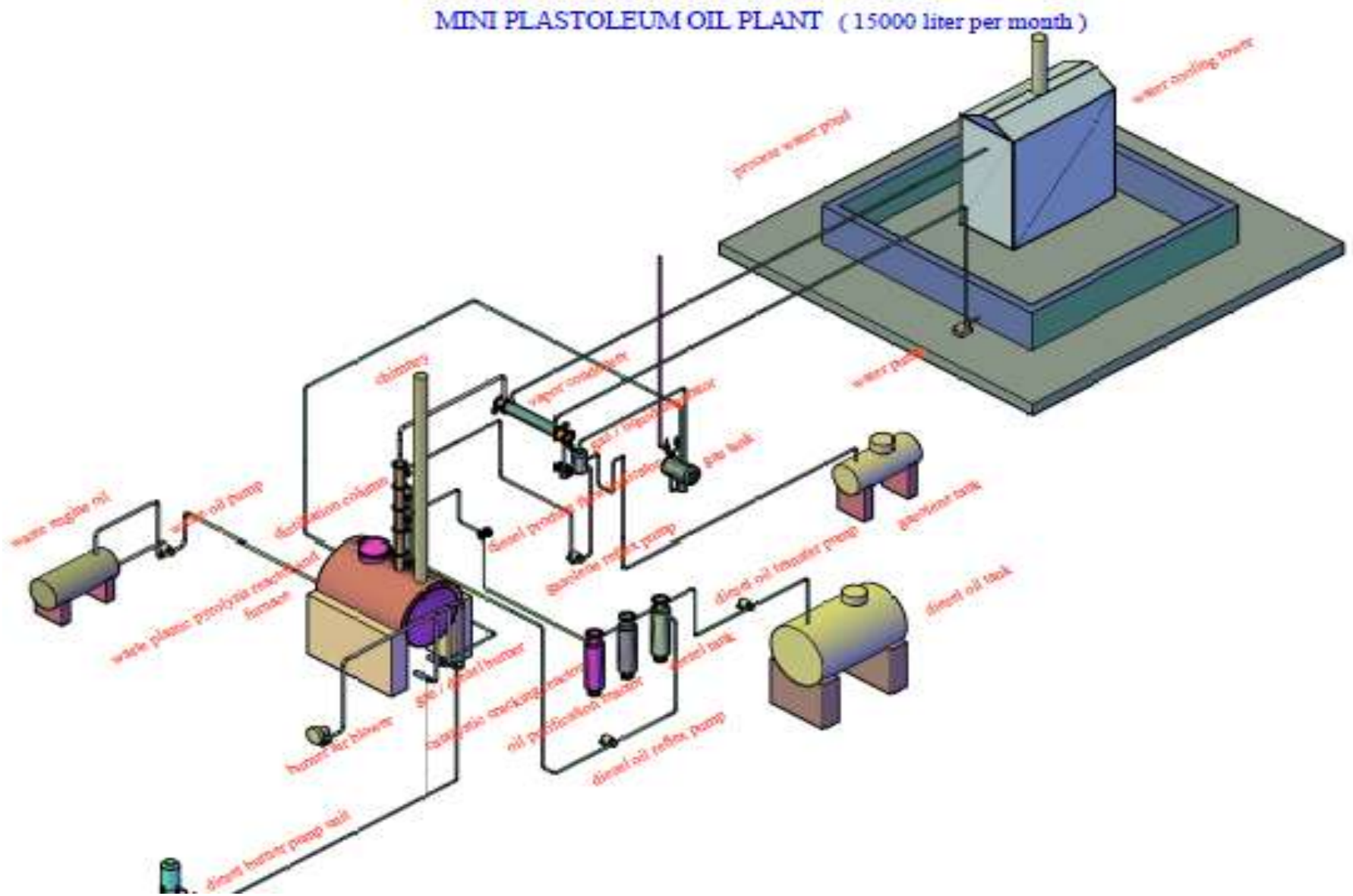


PLASTOLEUM OIL (DIESEL OIL) PLANT



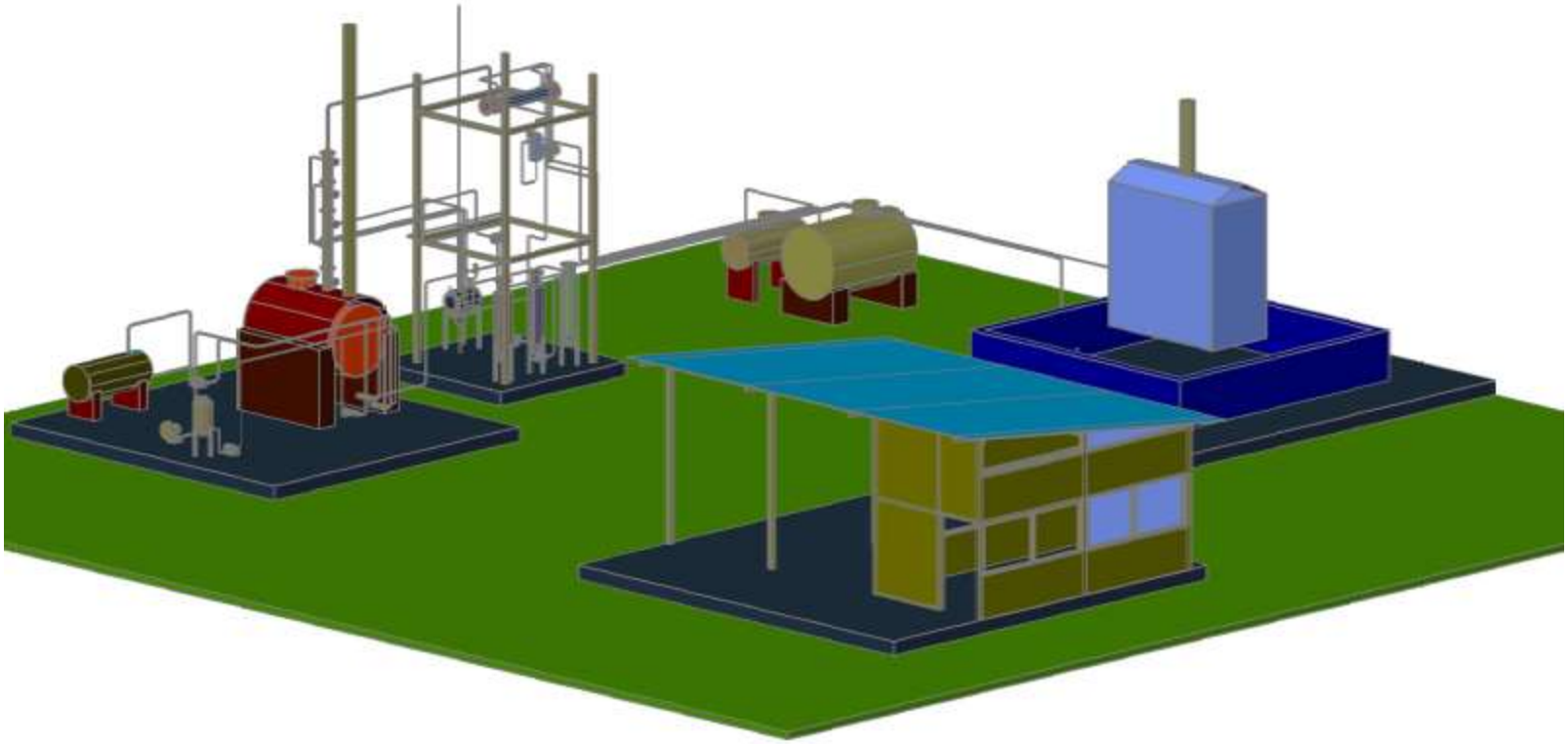
WASTE PLASTIC OIL REFINERY

- PLASTIC TO OIL PROJECT PROCESS (MINI PLANT)



WASTE PLASTIC OIL REFINERY

MINI PLASTOLEUM OIL PLANT (15000 liter per month)



WASTE PLASTIC OIL REFINERY

- THANK YOU