

The infrastructure and the existing equipment of LEFH can be divided in the following categories:

1. Analytical equipment and methods
2. Laboratory Units
3. C. Pilot Plant Units



A. ANALYTICAL EQUIPMENT AND METHODS

Equipment		Year of purchase	
1.	Gas Chromatographer / Mass Spec	1993	CPERI method
2.	H PLC	1998	IP 391
3.	Gas Chromatographer with chemiluminescence detector	2000	ASTM D 5623
4.	Gas Chromatographer for qualitative analysis of hydrocarbons in gasoline	2000	ASTM D 5443
5.	Refinery gas analyzer	1989	ASTM D 5134
6.	Gas Chromatographer for GASOLINE analysis	1995	UOP 539
7.	GC-Simulation Distillation	2001	ASTM D2887
8.	Atmospheric distillation	1994	ASTM D 86
9.	Distillation at reduced pressure	1994	ASTM D 1160
10.	Crude oil distillation ASTM D 2892	1992	ASTM D 2892
11.	Elementary Analyzer (C, H, N)	2000	ASTM D 5291
12.	Elementary Analyzer (C, H)	1986	ASTM D 5291

13.	Determination of density and specific gravity	1994	ASTM D 4052
14.	Automatic Titrator	1994	ASTM D 1744
15.	Refractometer	1991	ASTM D1218
16.	S-N Analyzer	1998	ASTM D 5453,
ASTM D 5762			
17.	S Analyzer	1994	ASTM D 4294
18.	Viscometer	1995	ASTM D 445
19.	Determination of vapor pressure of petroleum products	1995	ASTM D 5191
20.	Isoperibol Bombcalorimeter	1995	ASTM D 4809
21.	Determination of flash point	1998	ASTM D 93
22.	Determination of pour point, cloud point and cold filter plugging point	1998	ASTM D 2500
23.	Micro Carbon Residue Tester (MCRT)	1994	ASTM D 4530
24.	Determination of furfural byproduct	1998	Pr EN 214
25.	Laboratory centrifuge	1999	ASTM D 1744
26.	Colour Determination	1999	ASTM D 1500
27.	Stability determination during diesel oxidation	1999	ASTM D 2274
28.	Stability determination during gasoline oxidation	1999	ASTM D 525
29.	Sediment Tester	1999	ASTM D 4870
30.	Determination of Copper Corrosion	1999	ASTM D 130
31.	Aniline Point	1999	ASTM D 611
32.	Existent Gum Analysis	1999	ASTM D 381
33.	Rotary Evaporator	2001	GRACE method
34.	Inductively Coupled Plasma Analyzer (ICP)	2004	-
35.	Hydrogen determination by Nuclear Magnetic Resonance NMR	2004	

36.	Upgrade of high pressure liquid Chromatograph	2004	IP 391/95
37.	Upgrade of Gas Chromatograph with chemiluminescence Sulfur detector	2004	
38.	X-Ray Sulfur Determination	2003	ASTM D 4294
39.	S-N Analyzer	2003	-
40	.	Automatic Titrator	2003

B . BENCH-SCALE UNITS

Equipment	
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1.	MicroActivity Testing, MAT unit	1990	ASTM-D32
2.	Fixed bed reactor for evaluation of cracking catalysts	1999	CPERI Tech (SOT-MAT)
3.	Steam deactivation of FCC (Steamer)	1995	CPERI Technology
4.	Continuous cyclic deactivation unit (CDU)	1996	Akzo Nobel
5.	Cyclic Propylene Steaming (CPS) deactivation unit	2004	-
6.	Fixed and fluid bed batch reactor systems for DeNO _x and DeSO _x studies		
7.	Attrition Unit	2004	-
8.	Gas flow calibration control system	2003	-
9.	Gas low flow calibration control system	2004	-
10.	Portable multifunctional calibrator	2003	-
11.	Small-scale hydrodesulphurization unit	-	-
12.	A fluid bed (ACE type) Microactivity test (MAT) unit (Automat unit)		

C. PILOT PLANT UNITS

Equipment		
1.	A riser based continuous pilot plant unit for catalytic cracking	1994 CPERI Technology
2.	A two stage high pressure hydrogen processing pilot plant	1994 ?????
3.	Four parallel reactor hydrogen processing pilot plant	2000 BP / AMOCO
4.	FCC cyclic deactivation unit	2001 Grace Davison
5.	A high pressure unit for natural gas conversion to synthesis gas and hydrocracking	1998 CPERI Technology
6.	Cold Flow Alkylation unit	1996 CPERI Technology
7.	Cold Flow FCC unit	1996 CPERI Technology
8.	A retort unit for studies related to the upgrading of biomass for bio-fuels and production of organic chemicals	
9.	A special designed bench scale unit for catalytic biomass flash pyrolysis studies	