

2000 Worldwide Refining Survey

Jeannie Stell
Survey Editor

All figures are
as of January 1, 2001

All figures in barrels per calendar day (b/cd)

LEGEND

Numbers identify processes in table

Coking

1. Fluid coking
2. Delayed coking
3. Other

Thermal process

1. Thermal cracking
2. Visbreaking

Catalytic cracking

1. Fluid
2. Other

Catalytic reforming

1. Semiregenerative
2. Cyclic
3. Continuous regen.
4. Other

Catalytic hydrocracking

1. Distillate upgrading
2. Residual upgrading
3. Lube oil manufacturing
4. Other
- c. Conventional (high pressure) hydrocracking: (>100 barg or 1,450 psig)
- m. Mild to moderate hydrocracking (<100 barg or 1,450 psig)

Catalytic hydrotreating

1. Pretreatment of cat reformer feeds
2. Other naphtha desulfurization
3. Naphtha aromatics saturation
4. Kerosine/jet desulfurization
5. Diesel desulfurization
6. Distillate aromatics saturation
7. Other distillates
8. Pretreatment of cat cracker feeds
9. Other heavy gas oil hydrotreating
10. Resid hydrotreating
11. Lube oil polishing
12. Post hydrotreating of FCC naphtha
13. Other

Alkylation

1. Sulfuric acid
2. Other

Polymerization/Dimerization

1. Polymerization
2. Dimerization

Aromatics

1. BTX
2. Hydrodealkylation
3. Cyclohexane
4. Cumene

Isomerization

1. C4 feed
2. C5 feed
3. C5 and C6 feed

Oxygenates

1. MTBE
2. ETBE
3. TAME
4. Other

Hydrogen

- Production:
1. Steam methane reforming
 2. Steam naphtha reforming
 3. Partial oxidation
 - a. Third-party plant
 4. Pressure swing adsorption
 5. Cryogenic
 6. Membrane
 7. Other

NOTES		G	Previously listed as Mobil Schmierstoff GmbH	N	Previously listed as Tonen Corp	U	Previously listed as Atlantic Richfield Co.	AA	Previously listed as Farmland Industries Inc.	AG	Previously listed as Fina Oil & Chemical Co.
A	Previously listed as Mobil Oil Australia	H	Previously listed as Wintershall AG	O	Previously listed as Esso Benelux BV	V	Previously listed as Mobil Oil Corp.	AB	Previously listed as National Cooperative Refinery Association	AH	Previously listed as Exxon Co. USA and Mobil Oil Corp.
B	Previously listed as Esso Benelux BV	I	Previously listed as Madras Refineries Ltd.	P	Previously listed as Esso Norgre AS	W	Previously listed as Tosco Refining Co.	AC	Previously listed as BP Amoco	AI	Previously listed as Clark Refining & Marketing
C	Previously listed as Universal Refining NV	J	Previously listed as Cochin Refineries Ltd.	Q	Previously listed as Mobil Oil Singapore Ltd.	X	Previously listed as Exxon Co. USA	AD	Previously listed as Exxon Co. USA and Mobil Oil Corp.	AJ	Previously listed as Inland Refining Inc.
D	Previously listed as Ste. Raffinerie BP et Elf	K	Previously listed as Esso Italiana SpA	R	Previously listed as Raffinerie de Cressier SA	Y	Previously listed as Mobil Oil Corp.	AE	Previously listed as Exxon Co.	AK	Previously listed as Atlantic Richfield Co.
E	Previously listed as Esso SAF	L	Previously listed as Nippon Oil Co. Ltd.	S	Previously listed as Mobil Oil Co. Ltd	Z	Previously listed as Clark Refining & Marketing	AF	Previously listed as Clark Refining & Marketing	AL	Previously listed as Equilon Enterprises LLC
F	Previously listed as Esso AG Inaalstadt	M	Previously listed as General Sekivu Seisei KK	T	Previously listed as Esso Petroleum Co. Ltd.						

Capacity definitions:

Capacity expressed in barrels per calendar day (b/cd) is the maximum number of barrels of input that can be processed during a 24-hour period, after making allowances for the following: (a) Types and grades of inputs to be processed, (b) Types and grades of products to be manufactured, (c) Environmental constraints associated with refinery operations, (d) Scheduled downtime such as mechanical problems, repairs, and slowdown. Capacity expressed in barrels per stream day (b/sd) is the amount a unit can process when running at full capacity under optimal feedstock and product slate conditions. An asterisk (*) beside a refinery location indicates that the number has been converted from b/sd to b/cd using the conversion factor 0.95 for crude and vacuum distillation units and 0.9 for all downstream cracking and conversion units.

Hydrogen:

Hydrogen volumes presented here represent either generation or upgrading to 90+% purity.

Catalytic reforming:

1. Semiregenerative reforming is characterized by shutdown of the reforming unit at specified intervals, or at the operators's convenience, for in situ catalyst regeneration.
2. Cyclic regeneration reforming is characterized by continuous or continual regeneration of catalyst in situ in any one of several reactors that can be isolated from and returned to the reforming operation. This is accomplished without changing feed rate or octane.

plished without changing feed rate or octane.

3. Continuous regeneration reforming is characterized by the continuous addition of this regenerated catalyst to the reactor.
4. "Other" includes nonregenerative reforming (catalyst is replaced by fresh catalyst) and moving-bed catalyst systems.

REFINERY SHUTDOWNS

Name	Location	Country	Crude b/cd
Georgian American Oil Refinery	Georgia	FSU	24,000
Grozneft	Grozny	Russia	389,595
Grozneft	Grozny	Russia	40,164
Grozneft	Grozny	Russia	0
Norske Shell AS	Sola	Norway	53,000
Pennzoil-Quakker State Co.	Rouseville, Pa.	US	15,700

NEW REFINERIES

Name	Location	Country	Crude b/cd
Formosa Petrochemical Co.	Mailiao	Taiwan	150,000
Middle East Oil Refinery	Alexandria	Egypt	100,000
Pak-Arab Refinery (PARCO)	Punjab	Pakistan	100,000
Tyumen Oil Co.	Nizhnevartovsk	Russia	40,000