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2006 Minerals Yearbook

EXPLOSIVES

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EXPLOSIVES

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In 2006, U.S. explosives sales were 3.16 million metric tons (Mt), a slight decrease from those in 2005; sales of explosives were reported in all States except Delaware. Coal mining, with 65% of total consumption, continued to be the dominant use for explosives in the United States. Wyoming, West Virginia, and Kentucky, in descending order, led the Nation in coal production, accounting for 60% of the total. These States were also the leading explosives-consuming States, accounting for 48% of total U.S. explosives sales.

Legislation and Government Programs

The Secure Handling of Ammonium Nitrate Act, which was introduced in the House of Representatives (H.R. 3197) in 2005, was unanimously approved by the House Homeland Security Committee in 2006 and was sent to the House of Representatives for approval. The Act would give the U.S. Department of Homeland Security (DHS) the authority to regulate entities and individuals that produce, sell, or distribute ammonium nitrate-base fertilizer. This bill would also allow the DHS, working with the U.S. Department of Agriculture, to develop regulations to create a registry of those who handle ammonium nitrate-base fertilizer. Only facilities and people registered with the DHS would be able to legally access ammonium nitrate-base fertilizer. Anyone purchasing ammonium nitrate would be required to have a registration number, and retailers would be required to keep records of ammonium nitrate sales for at least 3 years. At yearend, the bill had not been passed (Fertilizer Institute, The, 2006).

Production

Sales of ammonium nitrate-base explosives (blasting agents and oxidizers) were 3.12 Mt, which was a slight decrease from those in 2005, and accounted for 99% of U.S. industrial explosives sales. Sales of permissibles were slightly higher than those in 2005, and sales of other high explosives increased by 17% (table 1). Figure 1 shows how sales for consumption have changed since 1997.

Companies contributing data to this report, including those that are not members of the Institute of Makers of Explosives (IME), are as follows:

Accurate Energetic Systems LLC
Apache Nitrogen Products Inc.*[1]
Austin Powder Co.
Baker Atlas International (a division of Baker Hughes Inc.)
Daveyfire Inc.
Douglas Explosives Inc.
Dyno Nobel Inc.
D.C. Guelich Explosives Co.
Jet Research Center (a division of Halliburton Co.)
Mining Services International Inc. (a division of MaxamCorp S.A.)
Nelson Brothers LLC *
Orica USA Inc.
Owen Oil Tools Inc. (a division of Core Laboratories N.V.)
Schlumberger Perforating Center
Senex Explosives Inc.
Titan Specialties Ltd.
Vet's Explosives Inc.
Viking Explosives and Supply Co.
W.A. Murphy Inc.

In October, Dyno Nobel Ltd. announced that it would relocate a portion of its nonelectric detonator assembly production from Wolf Lake, IL, to its Mexico operations. The associated detonator and delay production also will be relocated from Simsbury, CT, to Mexico. Dyno Nobel cited cost savings as the reason for the relocations, which were expected to be completed by June 2007 (Dyno Nobel Ltd., 2006b). Dyno Nobel also announced that it was expanding its ammonium nitrate facility in Cheyenne, WY. The company planned to spend $50 million to increase production capacity by 50%, or about 136,000 metric tons per year (t/yr). The expansion was expected to be completed by October 2007, using an existing ammonium nitrate and nitric acid plant that would be dismantled and shipped to the Wyoming site. Increased demand for explosives from Powder River basin coal producers was mentioned as the reason for the capacity increase (Green Markets, 2006a).

Consumption

Coal mining, with 65% of total explosives consumption, remained the principal application for explosives in the United States (table 2). In 2006, U.S. coal production increased by 2.5% to another record level of 1.05 Mt, according to preliminary data from the U.S. Department of Energy, Energy Information Administration (EIA). Coal production increased in the interior and western regions by 1.5% and 5.9%, respectively, from those in 2005 and decreased by 1.7% in the Appalachian region (Freme, 2007). Wyoming, West Virginia, and Kentucky, in descending order, led the Nation in coal production, accounting for 62% of the total. These States were also the leading explosives-consuming States.

Quarrying and nonmetal mining, the second ranked consuming industry, accounted for 14% of total explosives sales; construction, 11%; metal mining, 8%; and miscellaneous uses, 2%. Wyoming, West Virginia, Kentucky, Virginia, Alabama, and Indiana, in descending order, were the leading consuming States, with a combined total of 63% of U.S. sales (table 3).

The value of new construction in 2006 increased by 5.3% compared with that in 2005 (U.S. Census Bureau, 2007). Based on monthly data, the seasonally adjusted industry growth rate from 2005 to 2006 for metal mining was 1.4%, and the growth rate for nonmetallic mineral mining and quarrying was -2.0% (Federal Reserve Board, 2007).

[1]Companies denoted by an asterisk are not members of the IME.

Classification of Industrial Explosives and Blasting Agents.—Apparent consumption of commercial explosives used for industrial purposes in this report is defined as sales as reported to the IME. Commercial explosives imported for industrial uses were included in sales. The principal distinction between high explosives and blasting agents is their sensitivity to initiation. High explosives are cap sensitive, whereas blasting agents are not. Black powder sales were minor and were last reported in 1971. The production classifications used in this report are those adopted by the IME.

High Explosives.—*Permissibles.*—The MSHA approved grades by brand name as originally established by NIOSH testing.

Other High Explosives.—These include all high explosives except permissibles.

Blasting Agents and Oxidizers.—These include ammonium nitrate-fuel oil (ANFO) mixtures, regardless of density; slurries, water gels, or emulsions; ANFO blends containing slurries, water gels, or emulsions; and ammonium nitrate in prilled, grained, or liquor (water solution) form. Bulk and packaged forms of these materials are contained in this category. In 2006, about 94% of the total blasting agents and oxidizers sales was in bulk form.

World Review

In June, Orica Ltd. completed the transfer of the remaining acquired Dyno Nobel Holding ASA businesses in Africa, Asia, Europe, Latin America, and the Middle East. With the businesses transferred earlier in 2006, this transfer of businesses in 28 countries completed the acquisition announced in September 2005 (Orica Ltd., 2006).

After the sale of some of its assets, Dyno Nobel chose to reenter some geographical areas that it lost as a result of the sale. The terms of the sale agreement stipulated that Dyno Nobel could reenter these areas only under another brand. As a result, a new brand, dnx, was formed. In April, Dyno Nobel established a dnx office in Indonesia, and the company was planning to reenter the Latin American market under the dnx name (Dyno Nobel Ltd., 2007, p. 4).

Australia.—Orica Inc. announced that it was expanding its ammonium nitrate production capacity by 100,000 t/yr at its Kooragang Island, New South Wales, facility at a cost of $12 million. The first 30,000 t/yr of additional capacity was operational in June. The company also added 277,000 t/yr of capacity at its Yarwun, Queensland, facility in August, bringing total capacity to 580,000 t/yr (Green Markets, 2006b).

After receiving the results of a feasibility study, Dyno Nobel and CSBP Ltd. decided not to build a new 250,000-t/yr ammonium nitrate plant at the existing Queensland Nitrates plant in Moura, Queensland. High steel prices and labor costs were cited as reasons for the decision. Dyno Nobel, however, was continuing to evaluate the construction of an ammonium nitrate complex in Moranbah, Queensland. The project would include an ammonia plant, nitric acid plant, and ammonium nitrate plant sited near much of Queensland's mining activities (Dyno Nobel Ltd., 2006c). In August, Dyno Nobel signed a heads of agreement with United Group Ltd. for engineering, construction, and precommissioning of the 330,000-t/yr Moranbah ammonium nitrate plant. This agreement included a plant completion date of the fourth quarter of 2008 (Dyno Nobel Ltd., 2006a).

India.—Deepak Fertilisers and Petrochemicals Corp. Ltd. began construction of a 300,000-t/yr low-density ammonium nitrate plant at Paradip, Orissa. By May, the nitric acid plant for the project had arrived and the detailed engineering design contract and key technology supply contracts were signed. The new plant was expected to be completed by the fourth quarter of 2007 at a total cost of about $90 million (Deepak Fertilisers and Petrochemicals Corp. Ltd., 2006).

Outlook

According to the EIA, U.S. coal production was expected to fall by 2.9% in 2007 and fall again by 1.2% in 2008, which would bring supply back into balance with consumption. Western coal production, which represented slightly more than one-half of total domestic coal production, was expected to decline by 2.5% in 2007 and by an additional 0.8% in 2008 (U.S. Department of Energy, Energy Information Administration, 2007). Based on the coal production projections, explosives consumption is expected to decline in 2007 and 2008.

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TABLE 1
SALIENT STATISTICS OF INDUSTRIAL EXPLOSIVES AND BLASTING AGENTS SOLD FOR CONSUMPTION IN THE UNITED STATES[1]

(Metric tons)

Class	2005	2006
Permissibles	1,240	1,260
Other high explosives	32,100	37,400
Blasting agents and oxidizers	3,170,000	3,120,000
Total	3,200,000	3,160,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: Institute of Makers of Explosives.

TABLE 2
ESTIMATED INDUSTRIAL EXPLOSIVES AND BLASTING AGENTS SOLD FOR CONSUMPTION IN THE UNITED STATES, BY CLASS AND USE[1, 2]

(Thousand metric tons)

Class	Coal mining	Quarrying and nonmetal mining	Metal mining	Construction work	All other purposes	Total
2005:						
Permissibles	1	(3)	(3)	(3)	--	1
Other high explosives	4	13	1	13	1	32
Blasting agents and oxidizers	2,080	435	236	339	77	3,170
Total	2,090	448	237	352	78	3,200
2006:						
Permissibles	1	(3)	(3)	(3)	--	1
Other high explosives	4	14	1	17	1	37
Blasting agents and oxidizers	2,060	413	233	343	75	3,120
Total	2,070	427	234	360	76	3,160

-- Zero.

[1]Distribution of industrial explosives and blasting agents by consuming industry estimated from indices of industrial production and economies as reported by the U.S. Department of Energy, the Federal Reserve Board, the U.S. Department of Transportation, and the U.S. Census Bureau.

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

[3]Less than ½ unit.

TABLE 3

INDUSTRIAL EXPLOSIVES AND BLASTING AGENTS SOLD FOR CONSUMPTION IN THE UNITED STATES, BY STATE AND CLASS[1]

(Metric tons)

	2005				2006			
	Fixed high explosives				Fixed high explosives			
State	Permissibles	Other high explosives	Blasting agents and oxidizers	Total	Permissibles	Other high explosives	Blasting agents and oxidizers	Total
Alabama	3	474	128,000	128,000	98	408	160,000	160,000
Alaska	--	759	16,800	17,500	--	997	15,800	16,800
Arizona	50	211	77,000	77,300	62	6,470	56,600	63,100
Arkansas	--	131	33,200	33,300	--	218	20,000	20,200
California	--	883	29,400	30,300	--	899	29,900	30,800
Colorado	15	1,250	21,300	22,600	17	512	33,100	33,700
Connecticut	--	449	5,650	6,100	--	392	4,760	5,150
Delaware	--	--	--	--	--	--	--	--
Florida	--	156	41,200	41,400	--	176	33,000	33,200
Georgia	--	1,380	44,400	45,800	--	1,380	44,000	45,400
Hawaii	--	5	1,260	1,260	--	34	1,200	1,230
Idaho	--	119	9,730	9,850	--	146	8,180	8,330
Illinois	1	405	53,700	54,100	(2)	471	41,000	41,500
Indiana	1	1,050	264,000	265,000	--	818	151,000	152,000
Iowa	2	802	19,800	20,600	--	686	18,200	18,900
Kansas	--	246	8,380	8,620	--	112	6,250	6,360
Kentucky	639	1,370	368,000	370,000	384	1,870	355,000	357,000
Louisiana	--	235	4,090	4,320	--	666	2,100	2,770
Maine	--	193	2,550	2,740	--	174	1,930	2,100
Maryland[3]	2	322	11,400	11,800	--	279	11,200	11,500
Massachusetts	1	444	7,130	7,570	--	348	6,180	6,520
Michigan	--	64	31,500	31,600	--	69	23,900	23,900
Minnesota	--	90	41,100	41,200	--	196	69,700	69,900
Mississippi	--	451	37	488	--	12	132	144
Missouri	61	2,530	84,900	87,500	--	1,860	49,800	51,700
Montana	--	1,880	67,500	69,400	--	1,550	61,700	63,200
Nebraska	--	44	1,230	1,270	--	81	1,790	1,870
Nevada	--	1,400	43,000	44,400	1	1,340	109,000	110,000
New Hampshire	--	620	12,100	12,800	--	482	12,500	13,000
New Jersey	--	196	5,730	5,930	--	180	6,980	7,160
New Mexico	1	313	39,300	39,600	(2)	397	33,500	33,900
New York	13	685	6,160	6,850	6	727	11,200	11,900
North Carolina	--	862	35,600	36,500	--	1,180	33,700	34,900
North Dakota	--	12	3,370	3,380	--	1	4,350	4,350
Ohio	(2)	582	45,500	46,100	(2)	464	31,600	32,100
Oklahoma	(2)	298	30,200	30,500	--	311	24,700	25,000
Oregon	--	2,250	8,300	10,600	--	2,160	20,700	22,900
Pennsylvania	43	1,540	120,000	122,000	269	1,260	78,300	79,800
Rhode Island	--	60	644	704	--	21	363	384
South Carolina	--	369	6,960	7,320	--	260	7,670	7,930
South Dakota	--	4	5,480	5,490	--	5	3,890	3,900
Tennessee	1	1,150	38,300	39,400	--	1,620	37,100	38,700
Texas	42	1,030	105,000	106,000	16	913	92,800	93,800
Utah	69	203	50,700	50,900	43	251	55,800	56,100
Vermont	--	89	1,140	1,230	4	75	1,390	1,460
Virginia	217	2,140	154,000	156,000	244	2,050	164,000	166,000
Washington	1	904	16,100	17,000	--	699	19,900	20,600
West Virginia	70	673	473,000	474,000	112	971	529,000	530,000
Wisconsin	--	388	14,500	14,900	--	436	13,100	13,500
Wyoming	--	348	582,000	582,000	--	721	628,000	628,000
Total	1,240	32,100	3,170,000	3,200,000	1,260	37,400	3,120,000	3,160,000

See footnotes at end of table.

TABLE 3—Continued

INDUSTRIAL EXPLOSIVES AND BLASTING AGENTS SOLD FOR CONSUMPTION IN THE UNITED STATES, BY STATE AND CLASS[1]

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than ½ unit.

[3]Includes the District of Columbia.

Source: Institute of Makers of Explosives.

FIGURE 1

SALES FOR CONSUMPTION OF U.S. INDUSTRIAL EXPLOSIVES