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TIN

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TIN

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Tin has not been mined in the United States since 1993; consequently, the country is reliant on imports and recycling for its tin needs. In 2005, twenty-five firms consumed 88% of the reported primary tin used domestically. The major uses were as follows: electrical solders, 26%; metal containers, 20%; transportation, 14%; construction, 11%; and other, 29%. The estimated value of primary tin metal consumed domestically was about $341 million. Industry stocks declined by about 8% compared with those at yearend 2004 (table 1).

Approximately 14,000 metric tons (t) of tin, most of it from old scrap, was recycled (table 5). About one-third of the tin consumed in the United States was recycled metal produced at 2 detinning plants and 91 secondary nonferrous metal processing plants. The recycling rate for steel cans was 63%, compared with 62% in 2004, 56% in 1995, and 15% in 1988 (Steel Recycling Institute, 2006).

The Defense Logistics Agency (DLA), which manages the National Defense Stockpile (NDS), sold 10,800 t of pig tin from the stockpile during 2005. World primary tin mine output declined about 2% from that in 2004 (tables 1, 9). Industry observers considered the world tin market in 2005 to be in slight oversupply. World primary tin smelter production rose by about 11% compared with that of 2004. The composite tin price declined by 12% from that of 2004. The price decline was attributed to the slight world supply excess. Of the 21 countries in which tin was mined, the top 5 accounted for 94% of the world total of 292,000 t. China was the leading producer (41% of world output) and was followed by Indonesia (27%), Peru (14%), Bolivia (6%), and Brazil (4%). World tin reserves were estimated to be 6.1 million metric tons (Mt). Assuming that world primary tin consumption to be about 350,000 metric tons per year (t/yr), these reserves would last 17 years. Most tin reserves are in Asia and South America.

In Alaska, Solomon Resources Ltd. and Brett Resources Ltd., both based in Vancouver, British Columbia, Canada, signed a letter of intent to grant Brett an option on Solomon's 100%-owned Sleitat Mountain tin-silver-tungsten deposit, located in the Taylor Mountains quadrangle in southwestern Alaska. The Sleitat Mountain Project covers 1,425 hectares (3,500 acres) located about 135 kilometers northeast of the coastal town of Dillingham, AK. The deposit outcrops on Sleitat Mountain, where tin, tungsten, and silver mineralization occur in an east-west trending, steeply dipping zone that extends at least 975 meters along the trend (TIN World, 2006).

Legislation and Government Programs

In 2005, the DLA sold 8,364 t of tin under the basic ordering agreement (BOA) and the long-term negotiated contract formats. The effect of proposed NDS tin sales on domestic markets is assessed by the Market Impact Committee comprised of several Federal agencies, including the U.S. Geological Survey (USGS).

The DLA Annual Materials Plan proposed amount of material to sell is 12,000 t per fiscal year. The remaining inventory is stored at the Hammond, IN, depot. The Defense National Stockpile Center (DNSC) expects the inventory to be exhausted by the end of fiscal year 2007 through BOA sales. Under the BOA approach, DNSC posts the amount of tin it wants to sell on its Web site every Tuesday. Interested and qualified companies submit quotes and DNSC makes a determination to award by the end of that business day.

Production

Mine.—Tin was not produced at any domestic mine in 2005. Until 1993, a few small tin mines had operated sporadically in the United States. However, the USGS canvasses confirm that there has been no primary domestic tin production since that year.

Secondary.—Industry analysts considered the United States to be the world's leading producer of secondary tin. Most secondary tin has been produced in the United States from various scrapped alloys of tin and recycled in those same alloy industries. Secondary tin from recycled fabricated parts has been used in many kinds of products and is a particularly important source of tin for the manufacture of solder and brass/bronze.

The Steel Recycling Institute, funded by the domestic steel industry, continues to promote the collection, preparation, and transportation of steel can scrap. The domestic recycling rate for steel cans, most of which are made from tinplate, was 63% in 2005, up slightly from 62% in 2004 (Steel Recycling Institute, 2006).

Consumption

In 2005, consumption of primary tin decreased by 12% (tables 1, 2). Domestic consumption data for tin were developed by the USGS from a voluntary survey of tin consumers. Of the 156 firms to which a survey form was sent, 100 responded, including the major consumers.

The total number of metal cans shipped was 133 billion in 2005 compared with 135 billion in 2004. The Can Manufacturer's Institute no longer provides a categorization by types of can (for example, aluminum versus steel). Steel (essentially tinplate and tin-free steel) dominated in the food, pet, and the "general line" can markets, and aluminum held 100% of the beverage can market (Can Manufacturer's Institute, 2005).

The consolidation of the domestic steel industry continued, but at a slower rate than in recent years. There was one major acquisition—Mittal Steel Co. NV (Rotterdam, Netherlands),

owner of Mittal Steel USA, acquired the International Steel Group (ISG) (Cleveland, OH) for $4.5 billion. ISG was comprised of a series of major domestic steel producers who had entered into bankruptcy, such as Acme Steel Corp., Bethlehem Steel Corp., LTV Steel Corp., and Weirton Steel Corp. ISG was the second-ranked integrated steel producer in the United States behind U.S. Steel Corp., with a capacity of 23 Mt. Mittal's purchase of ISG made it the world's leading steel and tinplate producer. Mittal's tinplate production which includes production sites in Algeria, Kazakhstan, South Africa, and the United States, has capacity of 2.5 million metric tons per year (Mt/yr) of tinplate.

Price

The Platts Metals Week average composite price for tin metal declined by 12% compared with that of 2004. The Platts Metals Week average composite price was $5.04 per pound in January and rose to $5.44 per pound in March. It declined fairly steadily to finish December at $4.43 per pound. Industry analysts attributed the price decline to a moderate-size global excess supply of tin.

The London Metal Exchange (LME) remained the primary trading site for tin. Tin is one of only six metals traded on the LME. The other metals are aluminum, copper, lead, nickel, and zinc.

Trade

U.S. imports of refined tin, which supplied most domestic tin requirements, decreased by 21% compared with those of 2004. Imports of tin in all forms (metal, ore and concentrate, scrap, and waste) remained duty free (tables 7, 8). The tin was imported from many countries and was held in U.S. warehouses by trading firms until sold to customers. Foreign-owned trading firms tended to dominate the marketing of imports. United States imports of refined tin came mostly from Peru, Bolivia, Indonesia, China, and Brazil, in descending order. Refined tin exports were small compared with imports (table 6).

World Review

Argentina.—Silver Standard Resources Inc. (Vancouver) announced plans to restart the Pirquitas silver and tin project in Argentina. The company aimed to update the project's 1999-2000 feasibility study and expected to invest $100 million in the restart. The feasibility study was expected to be completed by 2006. The previous feasibility study, carried out by Sunshine Mining Co. (Kellogg, ID) projected production of 343,000 kilograms per year (kg/yr) of silver and 3,000 metric tons per year (t/yr) of tin during an 8-year mine life (CRU Week in the News, 2005g§[1]).

Australia.—Bluestone Tin Ltd. (Perth) became a member of the International Tin Research Institute (ITRI) (Frogmore, United Kingdom). ITRI does research work on behalf of the global tin industry. By becoming a member, Bluestone (the owner of the Renison Bell Tin Mine on its land in Tasmania) also became a member of the ITRI's sister organization, Tin Technology. ITRI membership now includes most major producers and represents about 70% of global tin production (Platts Metals Week, 2005a).

Bluestone commissioned the 3,500-t/yr Collingwood tin mine in Queensland and expected to make its first shipment of concentrates to Malaysia Smelting Corp. (Butterworth, Malaysia) in January 2006 (CRU Week in the News, 2005h§).

Van Dieman Mines Plc (Sydney) announced plans to establish tin mining operations in Tasmania, Australia, by the end of 2005. Initially, attention was focused on the Scotia and Endurance projects, but the firm has applied to develop other tenents in the area. The firm planned an initial tin production capacity of 1,700 t/yr. Van Dieman owns the right to 13 exploration and retention licences in Tasmania. Historically, records show that the island of Tasmania produced a total of more than 40,000 t of tin from its alluvial operations (CRU Week in the News, 2005c§).

Van Dieman signed an agreement to supply Thailand Smelting and Refining Co. Ltd. (Thaisarco) (Phuket, Thailand) with its entire tin concentrate output. The 6-year contract with Thaisacro is based on the LME tin price at the time of the delivery of the concentrate. At current tin prices, the total value of the contract to Van Dieman reportedly is about $60 million (Metal Bulletin, 2005b).

The Tasmanian State Government granted a lease to Van Dieman to mine tin and sapphires north of Gladstone in northeast Tasmania. Tasmanian Government officials announced that the tin and sapphires were contained within alluvial wash from an old river channel near the historic Scotia Lead alluvial tin mine. In the 1920s, the Scotia Mine sluiced material from the banks of the Ringarooma River to extract tin. The new mine will use conventional excavation equipment, processing the material through crushing and screening plants (TIN World, 2005).

Australia Oriental Minerals NL (AOM) (North Sydney) announced that it had begun exploration work at two tin deposits. The Tingha property was considered a resource which could support a 4,000-t/yr operation with a 10-year life, and the Emmaville property could support a 3,000-t/yr mine with a 5-year life. Drilling programs would begin in 2006 to confirm these expectations. The major shareholder in AOM was Malaysia Smelting Corp. (CRU Tin Monitor, 2005a).

Bolivia.—Glencore International AG (Baar, Switzerland) purchased Cia. Mineral del Sur (Comsur) for $220 million. Comsur mines gold, lead, silver, tin, and zinc in Argentina and Bolivia. Glencore intends to make immediate investments in the company to improve mining operations. A $20 million project will be undertaken in the region to recover metal from 40 years worth of tailings. A program will be started to upgrade equipment and processes at Empresa Metalurgica Vintos (a subsidiary of Comsur) 11,000-t/yr tin smelter in Oruro in Southwest Bolivia. The smelter is coowned by Commonwealth Development Corp. plc. (London, United Kingdom) (American Metal Market, 2005a).

The state mining organization, Corporation Minera de Bolivia, announced the reactivation of two metallurgical plants. One of the two plants was the La Palca tin facility. Built during

[1]References that include a section mark (§) are found in the Internet References Cited section.

the 1980s with aid from the former Soviet Union, La Palca never operated satisfactorily owing to a lack of suitable ores (Platts Metals Week, 2005b).

Brazil.—Grupo Paranapanema (Sao Paulo), the country's leading producer of nonferrous metals, announced plans to expand its production of tin. It intended to double production at its Mamore division to more than 15,000 t/yr from the 7,500 t of tin reported for 2004. Completion was scheduled for late 2007 (Metal-Pages, 2005a§).

Cesbra, controlled by the Brascan Group (Toronto, Ontario, Canada), announced plans to double tin production at its Itapua do Oeste Mine in Rondonia from 3,000 t/yr to 1,500 t/yr by 2007. About 70% of the capital expenditure would be financed by the BNDES development bank (CRU Tin Monitor, 2005c).

Canada.—Dofasco Inc. (Toronto), a major Canadian steelmaker, accepted an acquisition offer from ThyssenKrupp AG (Düsseldorf, Germany). The German steelmaker agreed to pay $4.1 billion for Dofasco. Dofasco produces tinplate at its steel plant in Hamilton (American Metal Market, 2005c).

A new firm is pursuing a unique recycling niche market. Original Bottle Cap Lure Co., Quebec, formed in 2001, collects bottle caps from bars, restaurants, and trade shows, and makes fishing lures from them. Most bottle caps are made from tinplate (American Metal Market, 2005b).

China.—Reports indicated that China, the world's leading tin producer from mine and smelter sources, was experiencing a steady rise in tin imports in 2005 as the supply of domestic tin concentrate remained tight. Chinese tin smelters were reportedly importing pig tin mainly from Indonesia and Malaysia and then refining it to 99.85% tin.

Yunnan Tin Company Group Ltd. (YTL) announced that Yufeng Mining Co. would soon launch a tin mining and concentrating project at the Wuchangping Tin Mine in Chenzhou City (Hunan Province). According to a geologic report prepared by the Hunan Province Xiangnan Bureau of Geology and Mineral Exploration, Wuchangping was estimated to hold 7.6 Mt of tin ore, containing about 47,700 t of metal at a grade of 0.63% tin. In March, YTL purchased 65% of the stock of Shenzhen Juhui Mining Investment Co. Ltd. that controls most of Yufeng Mining Co., so YTL indirectly obtained a 5-year mining right over the Wuchangping Tin Mine (China Metal Market, 2006b). YTL announced that its tin output was expected to reach 60,000 t in 2006. In 2005, YTL set up joint ventures for a crude tin smelter, expected to come online in June 2006 (China Metal Market, 2006a).

Liuzhou China Tin, which is the second-ranked tin producer in China, has had difficulty securing sufficient tin concentrate feedstock in recent years and has been subject to several takeover bids. Liuzhou announced two cooperation agreements with major Indonesian companies. An agreement with the AG Group covered joint exploration in Indonesia, with the AG Group providing funding for some investment projects in Guangxi, China (CRU Week in the News, 2005g§).

Congo (Kinshasa).—A report by the nongovernmental monitoring organization Global Witness estimated that output of tin-in-concentrate in Congo (Kinshasa) rose to 8,300 t in 2004 from 2,900 t in 2003, with a significant proportion of production exported illegally via neighboring Rwanda. Rwanda's concentrate exports were thought to be more than five times local mine production, estimated to be about 300 t/yr. The report indicates that Congo (Kinshasa) tin concentrate was either flown to Kigali in Rwanda for transport to Mombassa or Dar se Salaam, or processed at the Metal Processing Association smelter just inside the Rwandan border at Gisenyi. The smelter currently produces about 200 t/yr of refined tin, all of which goes to the tinplate industry in South Africa, although the company is planning to expand its capacity to 5,000 t/yr (CRU Week in the News, 2005d§).

Egypt.—Gippsland Ltd. (Claremont, Australia) announced that it planned to carry out additional pilot-plant test work related to the financing of its Abu Dabbab tantalum-tin project in Egypt. The company hoped to achieve 10% to 20% higher head grades than those used in its November 2004 feasibility study, increasing planned capacity to 330,000 kg/yr (720,000 pounds per year) of tantalum and 1,700 t/yr of tin (CRU Week in the News, 2005f§).

Germany.—Steel producers Thyssenkrupp AG (Düsseldorf) announced plans to complete a 240,000-t/yr expansion of its Rasselstein tinplate operation by the end of 2005. In 2004, the firm stated its objective of spending $197 million on increasing capacity at its only tinplate facility at Andernach to 1.44 Mt/yr making it the world's leading single-plant producer of tinplate. With the expansion, Rasselstein will have five electrolytic tinning lines and three continuous annealing lines. Demand for tin mill products for beverage cans in Germany, Europe's leading beverage market, declined sharply during the 2 years following the introduction of a mandatory deposit system. Company officials were optimistic, however, that an increase in tinplate demand in Eastern Europe and the Commonwealth of Independent States would offset the decrease in German demand (Platts Metals Week, 2005e).

Indonesia.—The Government announced plans for a joint venture between Indonesia's PT Koba Tin [Malaysia Smelting Corp. Bhd's (MSC) 75%-owned Indonesian subsidiary], state-owned PT Timah TGK, and the local government of Bangka Belitung. Indonesia's tin smelters have a capacity of 98,000 t/yr, but some analysts estimate the country's tin mine production to be 110,000 t/yr. As a result, some of Indonesia's tin is smelted in other countries (Platts Metals Week, 2005d).

The country's major tin producer, Timah, started up its new tin smelter on Kundar Island, part of the Riau Islands, in June. The smelter was expected to produce 5,000 to 6,000 t/yr of refined tin, freeing up capacity at Timah's main smelter at Mentok on Bangka Island to treat slags which have been stockpiled in the past few years. Timah's total refined tin production capacity is now estimated to be 53,000 t/yr, although current production is 42,000 t/yr. Currently, 6 of Timah's 15 operating offshore dredges are located near Kundar, which is much closer to Singapore than Bangku (CRU Tin Monitor, 2005c).

The Indonesian small tin mines on Bangku and Belitung Islands, known locally as "tambang unconventional," were estimated to be producing about 84,000 t/yr of tin-in-concentrate, or about one quarter of world production. About one-half of this material was delivered to Timah and PT Koba, and the balance to the small independent tin smelters, which

have started up since late 2003, and may number about 20. Any changes in these volumes are likely to have a major influence on the world supply and demand position. There are almost 6,000 small tin mines operating on the two major companies' leases (about 4,500 on Timah land and 1,400 on PT Koba property). These mines typically employ five to six workers and produce one metric ton of tin grade each month (20% tin) concentrate using simple hydraulic separation. There also has been a substantial rise in activity elsewhere in Bangku (the Timah and Koba Tin leases cover only 20% to 25% of the land area), particularly on the beaches and in shallow water offshore on the north coast of the island. Mining is also done in rivers. These small producers sell their output to collectors/traders who often upgrade the concentrates to 70% tin content (CRU Tin Monitor, 2005b).

Malaysia.—MSC (Butterworth) signed cooperation agreements with several Indonesian companies that hold exploration permits on Bangka Island, the country's tin production center. The agreements are between its 100%-owned subsidiary PT MSC Indonesia and PT Mutiara Prima Sejahtera, PT Permuta Mustika Rajawali, and PT Prima Stania Nusantara which together hold permits covering nearly 6,000 hectares. MSC has budgeted about $3 million for exploration in the area and would take a 75% share in any mining operations developed. MSC's 75%-owned Indonesian subsidiary PT Koba Tin produced 23,400 t of refined tin in 2004. This new agreement is part of the company's plan to expand its mining interests, moving away from its traditional role as a custom smelter (CRU Week in the News, 2005d§).

Peru.—Minsur S.A. (Lima) announced a small increase in capacity at its Funsur tin smelter and refinery near Pisco. Minsur is aiming to step up production to some 42,000 t in 2005. Minsur is in the process of switching to natural gas from oil to generate power for the smelter, and may import about 3,000 t of tin concentrates to supplement material from its own San Rafael Mine. Until now its refined tin production had been constrained by the capacity of its own mine, which produced 41,400 t of tin-in-concentrate in 2004 (CRU Week in the News, 2005b§).

Minsur announced plans to build a tailings retreatment plant at its large San Rafael tin mine by 2007. The proposed new facility could treat about 5,000 metric tons per day of tin tailings to 9,000 t/yr of tin (CRU Week in the News, 2005d§).

Philippines.—Global Steel Philippines (GSP) (Manila) became the country's sole tinplate producer at its Iligan steel plant on the island of Mindanao. GSP's tinplating capacity is 150,000 t/yr. GSP is owned by Global Steel Holdings Ltd., the international investment arm of Ispat Group (India) (Metal Bulletin, 2005a).

Russia.—The Russian Economic Development and Trade Ministry has been considering abolishing the import duty on tin ore and concentrates. The 5% tariff was suspended at the beginning of 2005 for a period of 9 months (Metal Pages, 2005b§).

South Africa.—Centurion Gold Holdings Inc. (Johannesburg) signed a memorandum of understanding to acquire the assets of Zaaiplaats Tin Mining Pty. Ltd. (South Africa). The Zaaiplaats Mine was formerly operated by a subsidiary of Anglo American Plc (London, United Kingdom) and ceased production owing to low tin prices in 1992. The Ziaaiplaats mines are located in the Limpopo Province of South Africa, in the northern Bushreld complex. The tin mines have produced in excess of 17,000 t of tin in their history. Centurio is considering producing up to 2,500 t/yr by a combination of mining and tailings retreatment. The firm anticipated developing the project jointly with Mine Waste Management (Ottawa, Ontario, Canada) which specializes in tailings treatment and mine rehabilitation (CRU Week in the News, 2005a§).

Spain.—Goldtech Mining Corp. (Alberta, Canada) was proceeding toward reopening the Golpejas tin property, located west of Salamanca, Spain. Drilling to help evaluate the property is in progress, and if it shows good results, Goldtech plans to install a pilot plant and eventually a full-sized plant, or rehabilitate the old mill already on the property, to recover tin and tantalite (Platts Metals Week, 2005c).

Thailand.—Mine production of tin in Thailand leveled off in 2005 after a long decline. Production was about 600 t, compared with 586 t in 2004, 793 t in 2003, and 1,130 t in 2002. Tongkah Harbour Plc (Bangkok) was the main producer, using contractors to operate dredges in offshore operations. The number of dredges dropped from three in 2002 to one in 2003. Production ceased altogether in April 2005, and this was attributed to the Government's 20% royalty on tin sales. The royalty was being renegotiated, and if it is revised downwards, Tongkah expected to proceed with exploration of a new offshore area that was expected to contain almost 50,000 t of tin (Mining Journal, 2005).

The Thailand Smelting and Refining Co. Ltd. tin smelter in Phuket, which became part of Billiton Ltd. in 1972, more recently became part of the Amalgamated Metal Corp. Group. The smelter has a production capacity of 36,000 t/yr of refined tin, but output has been low in recent years primarily as a result of a shortage of concentrates from Indonesia and Peru, as production in those countries has become more fully integrated. In 2004, however, production increased to 20,800 t from 15,400 t in 2003 (Mining Journal, 2005).

Current Research and Technology

Aguila Technologies Inc. (San Marcos, CA) announced the development of a lead-free solder that may provide manufacturers with a more cost-effective and easier-to-use option. The major hurdle in moving to lead-free solders has been that alternatives melt at higher temperatures, forcing other nearby materials to have to withstand higher temperatures. Traditional lead-base solder is an alloy of tin and lead, melting at nearly 183° C to 190° C. The most common lead-free solders are alloys of tin and silver (and sometimes copper) which melt between 217° C and 229° C. The new solder reportedly does not require any flux or cleaning and leaves no residue (Advanced Materials & Processes, 2006).

Outlook

Domestic demand for primary tin is expected to increase moderately in the next few years, at a rate of about 2% per year. That rate, however, will probably double in a few years if new

applications—especially those in which tin is substituted for toxic materials, such as lead-free solders—find acceptance in the marketplace.

World tin reserves appear to be adequate to meet foreseeable demand. Secondary sources of tin are likely to remain an important component of supply, especially in the United States. NDS tin stocks are expected to be exhausted within about 2 more years at the current rate of sales. Domestic tin requirements will probably continue to be met primarily through imports.

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TABLE 1
SALIENT TIN STATISTICS[1]

		2001	2002	2003	2004	2005
United States:						
Production, secondary, contained tin[e]	metric tons	6,700	6,760	5,500	5,240 [r]	11,800
Exports, refined tin	do.	4,350	2,940	3,690	3,650	4,330
Imports for consumption, refined tin	do.	37,500	42,200	37,100	47,600	37,500
Consumption, contained tin:						
Primary	do.	34,200	34,000	32,900	36,700 [r]	32,200
Secondary	do.	7,630	5,830	4,510	7,990 [r]	9,170
Stocks, yearend, U.S. industry, contained tin	do.	9,620	8,930 [r]	7,960	8,980 [r]	8,270
Prices, average, contained tin:						
New York, NY market	cents per pound	211.48	194.75	232.36	409.37	360.93
Platts Metals Week composite	do.	314.88	291.97	339.78	547.30	483.04
London, United Kingdom	do.	203.00	184.00	222.00	385.00	334.00
Kuala Lumpur, Malaysia	do.	200.77	184.35	221.67	385.11	333.55
World, production, contained tin:						
Mine	metric tons	246,000 [r]	233,000 [r]	258,000 [r]	298,000 [r]	292,000 [e]
Smelter:						
Primary	do.	272,000 [r]	266,000 [r]	268,000 [r]	297,000 [r]	329,000 [e]
Secondary	do.	16,200	14,200	11,900	11,700 [r]	20,200 [e]
Undifferentiated	do.	--	70 [r, e]	200 [r]	200 [r, e]	200 [e]

[e]Estimated. [r]Revised. -- Zero.
[1]Data are rounded to no more than three significant digits, except prices.

TABLE 2
U.S. CONSUMPTION OF PRIMARY AND SECONDARY TIN[1]

(Metric tons of contained tin)

	2004	2005
Stocks, January 1[2]	7,680 [r]	8,070
Net receipts during year:		
Primary	40,800 [r]	33,400
Secondary	4,160 [r]	5,790
Scrap	4,350	3,840
Total receipts	49,300 [r]	43,000
Total available	57,000 [r]	51,100
Tin consumed in manufactured products:		
Primary	36,700 [r]	32,200
Secondary	7,990 [r]	9,170
Total	44,700 [r]	41,400
Intercompany transactions in scrap	496	407
Total processed	45,200 [r]	41,800
Stocks, December 31 (total available less total processed)	11,800 [r]	9,280

[r]Revised.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes tin in transit in the United States.

TABLE 3
U.S. CONSUMPTION OF TIN, BY FINISHED PRODUCT[1]

(Metric tons of contained tin)

Product	2004			2005		
	Primary	Secondary	Total	Primary	Secondary	Total
Alloys, miscellaneous[2]	W	W	W	W	W	W
Babbitt	728 r	W	728 r	554	W	554
Bar tin	680	W	680	707	W	707
Bronze and brass	1,230	1,840	3,070	1,240	1,960	3,200
Chemicals	9,120	W	9,120	8,360	W	8,360
Collapsible tubes and foil	W	W	W	W	W	W
Solder	13,100 r	5,890 r	19,000 r	9,630	7,040	16,700
Tinning	798	--	798	790	--	790
Tinplate[3]	7,700	--	7,700	7,250	--	7,250
Tin powder	W	W	W	W	W	W
Type metal	W	W	W	W	W	W
White metal[4]	937	W	937	W	W	W
Other	2,370	254	2,630	3,680	172	3,860
Total	36,700 r	7,990 r	44,700 r	32,200	9,170	41,400

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Other." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes terne metal.
[3]Includes secondary pig tin and tin acquired in chemicals.
[4]Includes pewter, britannia metal, and jewelers' metal.

TABLE 4
U.S. INDUSTRY YEAREND TIN STOCKS[1]

(Metric tons)

	2004	2005
Plant raw materials:		
Pig tin:		
Virgin[2]	6,660 r	6,390
Secondary	595 r	660
In process[3]	892	863
Total	8,150 r	7,910
Additional pig tin:		
Jobbers-importers	762	278
Afloat to United States	62	80
Total	824	358
Grand total	8,980 r	8,270

rRevised.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes tin in transit in the United States.
[3]Data represent scrap only, tin content.

TABLE 5
U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF NEW AND OLD SCRAP AND TIN RECOVERED, BY TYPE OF SCRAP[1]

(Metric tons)

	Gross weight of scrap								
	Stocks,		Consumption			Stocks,	Tin recovered[e]		
Type of scrap	January 1	Receipts	New	Old	Total	December 31	New	Old	Total
2004:									
Copper-base scrap:									
Ingot makers	4,030 [r]	73,800 [r]	17,900	55,800 [r]	73,700 [r]	4,140 [r]	712	2,290 [r]	3,000 [r]
Brass mills[2]	--	22,800	22,800	--	22,800	--	469	--	469
Foundries and other plants	1,940	27,600	17,300	10,800	28,100	1,420	W	397	397
Total	XX	XX	XX	XX	XX	XX	1,180	2,680	3,870 [r]
Lead-base scrap	27,500 [r]	1,250,000 [r]	W	1,230,000 [r]	1,230,000 [r]	30,300 [r]	W	2,560 [r]	2,560 [r]
Tin-base scrap[3]	W	W	W	W	W	W	2,410	W	2,410
Grand total	XX	XX	XX	XX	XX	XX	3,590	5,240 [r]	8,830 [r]
2005:									
Copper-base scrap:									
Ingot makers	4,140	68,300	17,100	51,400	68,500	3,960	W	2,130	2,130
Brass mills[2]	--	W	W	--	W	--	1,740	--	1,740
Foundries and other plants	1,420	26,700	W	W	W	1,490	W	460	460
Total	XX	XX	XX	XX	XX	XX	1,740	2,590	4,330
Lead-base scrap	30,300	1,360,000	W	1,340,000	1,340,000	28,700	541	9,170	9,710
Tin-base scrap[3]	W	W	W	W	W	W	W	W	W
Grand total	XX	XX	XX	XX	XX	XX	2,280	11,800	14,000

[e]Estimated. [r]Revised. W Withheld to avoid disclosing company proprietary data. XX Not applicable. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Consumption is assumed to be equal to receipts.
[3]Includes tinplate and other scrap recovered at detinning plants.

TABLE 6
U.S. EXPORTS OF TIN IN VARIOUS FORMS[1]

	Tinplate and terneplate		Ingots and pigs		Tin scrap and other tin-bearing material except tinplate scrap[2]	
Year	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
2004	262,000	$169,000	3,650	$25,700	16,800	$42,900
2005	252,000	188,000	4,330	30,500	32,800	51,200

[1]Data are rounded to no more than three significant digits.
[2]Includes rods, profiles, flakes, tubes, and pipes.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF TIN IN VARIOUS FORMS[1]

		Dross, skimmings, scrap residues, tin alloys, n.s.p.f.[2]		Tinplate and terneplate		Tin compounds		Tinplate scrap	
Year	Miscellaneous,[3] value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
2004	7,080	5,790	$24,500	328,000	$215,000	635	$6,030	9,650	$2,020
2005	8,010	9,930	28,500	391,000	300,000	564	5,720	16,800	3,160

[1]Data are rounded to no more than three significant digits.
[2]Not specifically provided for.
[3]Includes tinfoil, tin powder, flitters, metallics, manufactures, and n.s.p.f.

Source: U.S. Census Bureau.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF UNWROUGHT TIN METAL,
BY COUNTRY[1]

Country	2004 Quantity (metric tons)	2004 Value (thousands)	2005 Quantity (metric tons)	2005 Value (thousands)
Australia	121	$963	--	--
Belgium	70	740	34	356
Bolivia	5,060	38,200	5,400	43,400
Brazil	4,330	33,600	2,150	16,100
Canada	58	480	13	89
Chile	281	1,950	20	171
China	5,310	44,800	4,510	34,700
Indonesia	4,660	37,300	5,220	37,200
Japan	540	4,320	--	--
Malaysia	6,600	56,900	1,530	12,200
Peru	19,600	163,000	18,300	138,000
Taiwan	21	419	--	--
Thailand	500	4,510	45	358
United Kingdom	97	481	67	502
Other	380	2,680	216	1,560
Total	47,600	390,000	37,500	285,000

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

Source: U.S. Census Bureau.

TABLE 9
TIN: WORLD MINE PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country	2001	2002	2003	2004	2005[e]
Australia	9,602	6,268	3,819	800	2,800 [3]
Bolivia	12,352	15,242	16,755	17,569 [r]	18,694 [3]
Brazil	13,016	12,063	12,217	12,468 [r]	12,500 [p]
Burma[4]	659 [r]	456 [r]	606 [r]	526 [r]	500
Burundi	3 [r]	--	5 [r]	10 [e]	10
China[e]	95,000	62,000	102,000	118,000 [r]	120,000
Congo (Kinshasa)[e]	50	20	40	80	80
Indonesia	61,862	88,142	71,694	65,772 [r]	80,000 [3]
Kyrgyzstan[e]	300	300	--	--	--
Laos	490	366	360 [e]	400 [r]	450
Malaysia	4,972	4,215	3,359	2,745 [r]	3,000 [3]
Mexico	8	9	21 [e]	24	17
Nambia	-- [e]	-- [e]	43	15	--
Niger	9 [e]	11	11 [e]	3,100 [r]	3,100
Nigeria[e, 5]	2,870 [3]	790 [3]	1,800 [r]	1,000 [r]	1,500
Peru	38,182	38,815	40,202	67,675 [r]	42,145 [3]
Portugal	1,174	361	200 [e]	500	200
Russia[e]	2,000	1,300	2,000	2,500	3,000
Rwanda	169	197	192 [e]	300 [r]	300
Spain[e]	2	2	2	2	2
Thailand	1,950	1,130	793 [r]	586 [r]	600 [3]
Uganda	18	--	1	2	2
Vietnam[e]	1,700 [r]	1,700 [r]	2,100 [r]	3,500 [r]	3,500
Total	246,000 [r]	233,000 [r]	258,000 [r]	298,000 [r]	292,000

[e]Estimated. [p]Preliminary. [r]Revised. -- Zero.
[1]World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.
[2]Table includes data available through July 18, 2006.
[3]Reported figure.
[4]Includes content of tin-tungsten concentrate.
[5]Concentrate gross weight reported, estimated 62% tin content.

TABLE 10
TIN: WORLD SMELTER PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country	2001	2002	2003	2004	2005[e]
Australia:					
Primary	1,171	791	597	478 [3]	600 [4]
Secondary[e]	300	300	300	300	300
Total[e]	1,471	1,091	897	778	900
Belgium, secondary[e]	8,000	6,000	5,000	5,000	7,000
Bolivia, primary	11,292	10,976	11,000 [r]	13,627 [r]	14,000
Brazil:					
Primary	12,168	11,675	10,761	11,512 [r]	11,500 [p]
Secondary[e]	250	250	250	250	250
Total[e]	12,400	11,900	11,000	11,800 [r]	11,800
Bulgaria, secondary[e]	10	10	10	10	10
Burma, primary[e]	30	30	30	30	30
China, primary[e]	105,000	82,000	98,000	115,000	124,000
Czech Republic, secondary[e]	100	100	100	100	100
Denmark, secondary[e]	100	100	100	100	100
Greece, secondary[e]	150	150	100	100	100
Indonesia, primary	53,470	67,455	66,284 [r]	49,872 [r]	65,000
Japan, primary	668	659	662	707	754 [4]
Malaysia, primary	30,417	30,887	18,250	33,914 [r]	36,870 [4]
Mexico, primary	1,789	1,748	1,769	1,775	1,700 [4]
Nigeria, primary[e]	25	26	25	25	25
Norway, secondary[e]	50	50	50	50	50
Peru, primary	27,683	35,828	39,181	41,613 [r]	36,733 [4]
Russia:[e]					
Primary	4,569 [4]	4,615 [4]	4,100 [r]	4,570 [r]	5,000
Secondary	500	500	500	500	500
Total	5,070	5,120	4,600 [r]	5,070 [r]	5,500
Rwanda	--	70 [r, e]	200 [r]	200 [r, e]	200 [4]
Spain, secondary[e]	25	25	25	25	10
Thailand, primary	22,387	17,548	15,400 [r]	20,800 [r]	29,400
United States, secondary	6,700	6,760	5,500	5,240 [r]	11,800 [4]
Vietnam, primary[e]	1,700 [r]	1,700 [r]	2,100 [r]	3,500 [r]	3,500
Grand total	289,000 [r]	280,000	280,000	309,000 [r]	350,000
Of which:					
Primary	272,000	266,000 [r]	268,000	297,000 [r]	329,000
Secondary	16,200	14,200	11,900	11,700 [r]	20,200
Undifferentiated	--	70 [r, e]	200 [r]	200 [r, e]	200 [4]

[e]Estimated. [p]Preliminary. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Whenever possible, total output has been separated into primary (from ores and concentrates) and secondary (tin metal recovered from old scrap). This table reflects metal production at the first measurable stage of metal output. Table includes data available through July 18, 2006.

[3]Exports.

[4]Reported figure.