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NICKEL IN JULY 2003

In July, reported domestic nickel consumption on a daily average basis was 5% less than that of June, according to the U.S. Geological Survey. Average daily nickel consumption of cathode, pellets, briquets, and ferronickel for stainless steel was 44.9 metric tons per day (t/d)—slightly less than the 45.1 t/d (revised) for June and 39% less than the 73.8 t/d for July 2002. Consumption of elemental nickel to make superalloys increased by 3% from June levels, but consumption to make corrosion-resistant nickel alloys decreased by 8%. Sales to plating companies averaged 29.0 t/d, about 6% less than the revised June sales figure of 31.0 t/d.

On July 31, U.S. consumer stocks of cathode, pellets, briquets, and powder totaled 1,270 metric tons (t)—23% less than the 1,650 t (revised) on June 30 and 19% less than the 1,570 t reported for yearend 2002. Stocks in London Metal Exchange (LME) warehouses worldwide totaled 19,848 t—19% less than the 24,468 t on June 30. Preliminary data collected by the International Nickel Study Group indicated that, at the end of June, world nickel producers (excluding those in Austria, China, the former Yugoslavia, and the Ural area of Russia) had approximately 85,400 t of nickel in primary products in stock, of which 61,000 t or 71% was Class I materials. Class I materials are refined products with a nickel (Ni) content of 99% or greater (electrolytic cathode, pellets, briquets, rondelles, powder, etc.). Class II materials include ferronickel, oxide sinter, and East Asian utility nickel—products with a Ni content of less than 99%.

Percentages reported in the above paragraphs may not be verifiable owing to concealment of individual company proprietary data and late reporting of data.

The United States imported 68,700 t of primary nickel in the first half of 2003, 21% more than the 56,900 t for the corresponding half of 2002. Class I materials accounted for 87% of total primary imports received during the first half of 2003. Trade data for July 2003 will appear in a subsequent report.

Canada—Additional production projected to come from the Sudbury District

Exploration and development work continues at the McCreedy West Mine.—Dynatec Corp. and FNX Mining Inc. have found additional resources of platinum-group elements (PGE) together with copper, nickel, and gold at the McCreedy West Mine in the Sudbury District of northeastern Ontario. Inco Limited operated McCreedy West from 1973 to 1999 and has since optioned the property to Dynatec and FNX Mining. The two companies have been exploring the "Precious Metals"(PM) deposit, which lies at depth near existing underground workings. Exploratory drilling indicates that the PM deposit extends from the 900 Level to the 2200 Level[1]. Crews have begun drilling the deposit from a reconditioned haulage drift on the1600 Level. The ongoing infill drilling and exploration program is being used to establish resource estimates for the PM deposit. An exploration ramp is being driven from the 1600 Level toward the deposit, whose edge is calculated to be only 229 meters (750 feet) away. The new ramp, which now extends 40% of the way, will be used to extract bulk samples for the current feasibility study. Bulk sampling was scheduled to begin in January 2004. Development work also was underway on the 1450 Level to provide drill access to the upper part of the deposit (Dynatec Corporation, 2003a§[2]).

The PM feasibility study is part of a much larger exploration program funded by the Sudbury Basin Joint Venture—an enterprise owned by FNX Mining (75%) and Dynatec (25%). The joint venture was formed in January 2002 and is evaluating five properties in the Sudbury District. The five properties—McCreedy West, Levack, Norman, Kirkwood, and Victoria—all have produced copper, nickel, and PGE in the past. [The properties are listed in order of location going clockwise around the perimeter of the Sudbury Basin.]

The distribution of cobalt (Co) in the Sudbury ores appears to be much more variable than that of nickel. The bulk of the cobalt occurs in pentlandite [$(Fe,Ni,Co)_9S_8$]. Ni/Co ratios in the

[1]The level designation represents the approximate distance in feet from the surface to the level.

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

ores can range from 15:1 to 96:1, but typically average about 25:1. Cobaltite [CoAsS] and gersdorffite [(Ni,Co)AsS] are largely restricted to ores of the southern perimeter of the basin and are especially rare in the Onaping-McCreedy-Levack area.

Exploration and evaluation of the five properties were being carried out as part of a long-term agreement with Inco, their owner. Because the properties were optioned, the joint venture did not have to make a large up-front payment. To acquire a 100% interest in the five properties, the joint venture must incur exploration and development costs of C$30 million over a 52-month period that began in January 2002. Some C$14 million was spent in the first 16 months of exploration and rehabilitation. Inco has the right to process all the ore produced from the properties and has an option to buy back a 51% interest in any deposit discovered that contains more than 270,000 t of nickel equivalent.

Rehabilitated McCreedy West Mine begins shipping ore to Inco.—The venture rehabilitated parts of the old McCreedy West workings in 2002 and early 2003, and in May began shipping about 400 metric tons per day (t/d) of ore to Inco's Clarabelle mill for processing. Initial production was coming from remnants and extensions of previously mined ore bodies. Shipments are expected to reach 1,000 t/d by mid-2004. The 3-month-long labor dispute that shut down Inco's Sudbury operations during the summer forced the venture to temporarily suspend shipments to Clarabelle and led to a buildup of ore stocks at the mine. The dispute, however, did not interrupt underground development of the McCreedy Inter Main and East Main deposits (Dynatec Corporation, 2003d§).

According to officials of the venture, the Upper Main, Inter Main, and East Main deposits have a total of 1.24 million metric tons (Mt) of probable reserves averaging 1.91% Ni and 0.23% Cu. The 1.24 Mt of reserves is sufficient to sustain mining operations through 2007 (Dynatec Corporation, 2003b§, d§).

Feasibility study initiated at the Levack Mine.—In September, the Sudbury Basin Joint Venture initiated a feasibility study of the Levack Mine. The mine currently is estimated to have 2.66 Mt of measured resources averaging 1.9% Ni and 1.0% Cu plus 2.40 Mt of indicated resources averaging 1.8% Ni and 0.9% Cu. The proximity of the Levack Mine to the McCreedy West Mine may help enhance the economic viability of both projects. Dynatec and FNX Mining expect to complete their feasibility study of the Levack Mine sometime in 2004 (Dynatec Corporation, 2003c§).

Feasibility study of Nickel Rim South nears completion.—Falconbridge Limited was hoping to complete the bankable feasibility study of its Nickel Rim South property by yearend. The property is approximately 3 kilometers north of the Sudbury airport on the eastern edge of the basin. Project managers expect to present the results of the study to Falconbridge's board of directors sometime in the first quarter of 2004. Surface diamond drilling indicates that the mineralization is extremely high grade. Geologists estimate that the deposit contains more than 6.3 Mt of resources grading 1.7% Ni, 3.4% Cu, and 0.03% Co. Precious metal grades were estimated to average 2.5 grams per metric ton (g/t) for palladium, 2.2 g/t for platinum, and 1.5 g/t for gold (Falconbridge Limited, 2003, p. 10-11, 25-27).

Reference Cited

Falconbridge Limited, 2003, Annual report—2002: Toronto, Ontario, Canada, Falconbridge Limited, 56 p.

Internet References Cited

Dynatec Corporation, 2003a (September 18) Drilling continues to intersect high-grade copper, platinum, palladium and gold values in the McCreedy West PM deposit, feasibility study underway, accessed October 10, 2003, at URL http://www.dynatec.ca/lpress/Press_20030917.pdf.

Dynatec Corporation, 2003b (July 24), McCreedy West resources increased and upgraded to reserves, accessed October 21, 2003, at URL http://www.dynatec.ca/press/20030724.html

Dynatec Corporation, 2003c (September 4), Mineral resources estimates announced and feasibility study initiated at Levack Mine, accessed October 20, 2003, at URL http://www.dynatec.ca/press/Press_20030904.pdf.

Dynatec Corporation, 2003d (September 12) Production restarted at McCreedy West and regular ore shipments commenced, accessed October 20, 2003, at URL http://www.dynatec.ca/press/Press_20030912.pdf.

TABLE 1
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE[1]

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total	Total year to date
2002:					
July	4,990 r	730	266	5,990 r	41,200 r
August	4,890 r	843	230	5,960 r	47,200 r
September	4,790 r	754	59	5,600 r	52,800 r
October	5,150 r	750	62	5,960 r	58,700 r
November	4,640 r	632	58	5,330 r	64,000 r
December	4,550 r	505	53	5,110 r	69,100 r
January-December	57,800 r	9,080	2,270	69,100 r	XX
2003:					
January	4,820 r	529	75	5,420 r	5,420 r
February	4,410 r	390	23	4,830 r	10,300 r
March	4,420 r	653	42	5,110 r	15,400 r
April	4,790 r	400	46	5,230 r	20,600 r
May	4,330 r	524	351	5,200 r	25,800 r
June	4,130 r	271	43	4,440 r	30,200 r
July:					
Steel:					
Stainless and heat resisting	729	664	W .	1,390	11,900
Alloy (excludes stainless)	W	--	--	W	1,460
Superalloys:	836	--	W	836	5,840
Copper-nickel alloys	W	--	--	W	W
Electric, magnetic, and expansion alloys	9	--	--	9	115
Other nickel & nickel alloys	W	--	W	W	W
Cast iron	W	--	--	W	W
Electroplating (sales to platers)	899	--	--	899	6,300
Chemical and chemical uses	W	--	--	W	W
Other uses	1,220	--	24	1,250	8,980
Total reported	3,700 [2]	664	24	4,380	34,600
Total all companies (calc)[3]	XX	XX	XX	6,740	53,200
2003: January-July	30,600	3,430	605	34,600	XX
2002: January-July	33,800	5,590	1,810	41,200	XX

[r]Revised. W Withheld to avoid disclosing company proprietary data; included in "Other uses" category. XX Not applicable. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Of consumption, 2,970 metric tons were consumed as cathodes and pellets, the remainder as briquets and powder.
[3]Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (65.01%) to apparent primary consumption for 2001.

TABLE 2
ENDING STOCKS OF NICKEL (EXCLUSIVE OF SCRAP) HELD BY CONSUMERS, BY FORM AND USE[1, 2]

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total
2002:				
July	1,500	98	97	1,700
August	1,820	112	83	2,020
September	2,270	89	78	2,440
October	1,890	140	76	2,100
November	1,700	93	84	1,880
December	1,570	60	81	1,710
2003:				
January	1,450	100	44	1,590
February	1,520	54	34	1,610
March	1,320	148	43	1,510
April	1,520	49	47	1,620
May	1,520	58	41	1,620
June	1,650	101	71	1,820
July:				
Steel (stainless, heat resisting and alloy)	439	(3)	(3)	439
Nonferrous alloys[4]	819	(3)	(3)	819
Foundry (cast irons)	(3)	--	--	(3)
Chemical (catalysts, ceramics, plating salt, etc.) and unspecified uses	16	76	56	148
Total	1,270	76	56	1,410

-- Zero.

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

[2]Stocks held by companies that consume nickel in more than one end-use category are credited to the major category. Stocks are subject to revisions owing to inventory adjustments.

[3]Included in the "Chemical and unspecified uses" category.

[4]Includes superalloys, nickel-copper and copper-nickel alloys, permanent magnet alloys, and other nickel alloys.

TABLE 3
CONSUMPTION AND ENDING STOCKS OF PURCHASED SECONDARY NICKEL, BY USE[1]

(Metric tons, nickel content)

Period	Consumption			Stocks		
	Ferrous scrap[2]	Nonferrous scrap[3]	Total scrap	Ferrous scrap[2]	Nonferrous scrap[3]	Total scrap
2002:						
July	5,900	713	6,610	3,280	90	3,370
August	6,060	662	6,720	3,110	113	3,220
September	4,770	606	5,370	3,400	120	3,520
October	5,170	660	5,830	3,540	104	3,640
November	4,590	506	5,100	3,240	104	3,350
December	3,870	641	4,510	3,210	101	3,310
January-December	61,600	8,070	69,700	XX	XX	XX
2003:						
January	4,710	645	5,350	3,420	107	3,530
February	4,030	758	4,790	3,080	96	3,180
March	6,430	650	7,080	2,930	105	3,040
April	5,310	675	5,990	3,210	93	3,310
May	4,920	774	5,700	3,150	102	3,250
June	4,040	647	4,690 r	3,100 r	109	3,210 r
July	4,340	706	5,050	3,370	105	3,480
2003: January-July	33,800	4,860	38,600	XX	XX	XX
2002: January-July	37,200	5,000	42,200	XX	XX	XX

[r]Revised. XX Not applicable.

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

[2]Nickel content is calculated from an average nickel content and the reported gross weight of scrap.

[3]Combined consumption and stocks of aluminum-base, copper-base, and nickel-base scrap.

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY[1]

(Metric tons, nickel content)[2]

Period and country of origin	Cathodes pellets, and briquets	Powder and flakes	Ferro-nickel	Metal-lurgical-grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total[3]	Total year to date[4]	Wrought nickel
2002:										
June	8,950	391	1,160	238	174	460	228	11,600	60,700	43
July	11,800	627	1,080	214	367	874	225	15,200	75,900	69
August	7,750	603	1,790	127	152	762	171	11,400	87,200	72
September	13,000	566	1,570	2	160	641	194	16,200	103,000	85
October	5,140	609	1,010	11	230	564	183	7,740	111,000	106
November	6,560	684	991	27	181	627	222	9,300	120,000	51
December	6,970	512	750	16	225	530	312	9,310	130,000	70
January-December	97,200	6,970	12,300	1,230	3,030	6,080	2,860	130,000	XX	878
2003:										
January	5,950	928	605	10	341	322	223	8,380	8,380	55
February	7,060	954	916	8	323	424	269	9,960	18,300	115
March	17,400	1,130	1,310	34	420	476	309	21,100	39,400	93
April	7,770	678	1,700	--	496	533	321	11,500	50,900	64
May	6,160	933	1,530	7	412	461	378	9,880	60,800	37
June:										
Australia	1,010	60	--	--	--	--	--	1,070	7,050	--
Brazil	160	--	--	--	3	--	--	163	748	--
Canada	923	211	--	--	54	245	--	1,430	25,100	2
Colombia	--	--	234	--	--	1	--	235	1,450	--
Dominican Republic	--	--	201	--	--	--	--	201	3,710	--
Finland	208	19	--	--	(5)	--	103	330	2,910	--
France	156	--	--	--	17	--	80	253	1,580	(5)
Germany	1	13	--	--	22	--	18	54	512	24
Japan	--	3	--	--	12	--	41	56	426	3
Mexico	--	--	--	--	--	152	--	152	966	--
New Caledonia	--	--	200	--	--	--	--	200	1,360	--
Norway	1,420	--	--	--	7	--	--	1,420	6,400	--
Russia	6,790	--	57	--	--	--	--	6,840	18,400	--
South Africa	--	--	--	--	--	--	--	--	58	--
Sweden	--	21	--	--	--	--	--	21	51	--
United Kingdom	18	22	--	(5)	111	--	15	166	1,200	(5)
Venezuela	--	--	--	--	--	4	--	4	16	--
Zimbabwe	80	--	--	--	--	--	--	80	276	--
Other	--	19	(5)	--	--	6	70	95	1,430	12
Total	10,800	368	692	(5)	226	408	327	12,800	73,600	41
2003: January-June	55,100	5,000	6,750	60	2,220	2,620	1,830	73,600	XX	403
2002: January-June	46,000	3,370	5,140	834	1,720	2,080	1,560	60,700	XX	427

XX Not applicable. -- Zero.

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

[2]The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemicals category includes chlorides (25%); sulfates (22%); other salts (22%); supported catalysts (22%); and oxide, sesquioxide, and hydroxide (65%).

[3]Excludes wrought nickel.

[4]May include revisions for prior months.

[5]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF NICKEL, BY COUNTRY[1]

(Metric tons, nickel content)[2]

Period and country of destination	Cathodes, pellets, and briquets	Powder and flakes	Ferro-nickel	Metal-lurgical-grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total[3]	Total year to date	Wrought nickel
2002:										
June	105	134	(4)	19	1,550	2,500	155	4,470	26,500	283
July	131	139	1	9	1,560	2,040	204	4,080	30,600	200
August	76	222	1	42	826	1,510	168	2,840	33,400 r	230
September	164	122	2	55	718	1,660	153	2,880	36,300	249
October	113	99	8	34	1,010	1,840	167	3,280	39,600	221
November	64	95	8	6	830	1,470	184	2,650	42,300	181
December	75	65	7	3	983	2,080	423	3,630	45,900	175
January-December	1,740	1,480	46	685	13,700	25,700	2,570	45,900	XX	2,570
2003:										
January	92	58	10	11	853	3,060	267	4,350	4,350	586
February	24	84	13	7	948	5,050	261	6,380	10,700	462
March	46	113	5	13	770	5,150	243	6,340	17,100	629
April	78	86	8	19	894	2,880	466	4,430	21,500	149
May	30	59	11	11	836	2,380	379	3,710 r	25,200	143
June:										
Australia	--	--	--	--	1	--	--	1	31	--
Belgium	--	--	--	--	--	1	--	1	170	16
Canada	4	9	--	19	401	222	133	788	6,170	9
China	--	1	8	--	--	475	13	497	2,970	(4)
Germany	--	8	--	2	--	1	1	12	193	1
India	--	1	--	--	--	97	--	98	499	--
Italy	--	(4)	--	--	--	2	(4)	2	494	51
Japan	2	1	--	2	38	48	12	103	848	3
Korea, Republic of	--	5	--	--	--	190	27	222	2,240	1
Mexico	66	7	--	--	--	1	1	75	364	44
Netherlands	--	3	(4)	--	18	118	1	140	785	(4)
South Africa	--	--	--	--	--	--	3	3	57	(4)
Spain	--	--	--	--	--	--	3	3	1,980	--
Sweden	--	--	--	--	32	4	--	36	237	--
Taiwan	--	(4)	--	--	--	419	13	432	6,500	(4)
United Kingdom	--	(4)	21	4	18	54	5	102	754	1
Other	18	12	--	6	8	673	64	781	4,210	17
Total	90	47	29	33	516	2,310	276	3,300	28,500	143
2003: January-June	360	446	76	93	4,820	20,800	1,890	28,500	XX	2,120
2002: January-June	1,120	734	20	536	7,760	15,100	1,280	26,500	XX	1,320

rRevised. XX Not applicable. -- Zero.

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

[2]The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemicals category includes chlorides (25%); sulfates (22%); other salts (22%); upported catalysts (22%); and oxide, sesquioxide, and hydroxide (65%).

[3]Excludes wrought nickel.

[4]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY[1]

(Metric tons, gross weight)

Period and country of origin	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date
2002:									
June	232	293	401	286	15	511	122	1,860	10,000
July	133	259	624	361	31	124	196	1,730	11,800
August	170	217	360	356	34	180	161	1,480	13,200
September	64	153	412	207	35	243	131	1,250	14,500
October	180	150	400	212	28	106	117	1,190	15,700
November	231	279	324	348	28	194	149	1,550	17,200
December	170	192	510	353	21	147	153	1,550	18,800
January-December	2,540	2,640	5,230	3,520	196 r	2,850	1,810	18,800	XX
2003:									
January	54	252	427	332	(2)	133	91	1,290	1,290
February	167	158	356	264	11	93	140	1,190	2,480
March	129	209	600	308	(2)	148	163	1,560	4,040
April	184	245	697	316	6	204	266	1,920	5,950
May	181	204	504	328	7	206	195	1,630	7,580
June:									
Australia	58	--	--	--	--	--	(2)	58	334
Belgium	--	--	(2)	--	--	--	(2)	(2)	112
Canada	--	--	7	--	--	(2)	4	11	98
China	--	--	--	--	--	--	6	6	150
France	5	(2)	91	5	--	1	1	103	787
Germany	1	75	240	172	35	103	(2)	626	3,180
Italy	--	45	1	--	--	13	1	60	553
Japan	--	--	3	1	(2)	102	1	107	280
Mexico	--	--	--	--	--	--	56	56	481
Netherlands	--	--	--	--	--	--	18	18	99
South Africa	59	--	--	--	--	--	--	59	195
Sweden	--	20	222	8	--	55	--	305	1,340
United Kingdom	20	13	1	57	--	15	4	110	1,250
Other	7	3	14	1	--	3	11	39	277
Total	150	156	579	244	35	292	102	1,560	9,140
2003: January-June	865	1,220	3,160	1,790	60	1,080	957	9,140	XX
2002: January-June	1,590	1,390	2,600	1,680	18	1,860	902	10,000	XX

[r]Revised. XX Not applicable. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 7
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY[1]

(Metric tons, gross weight)

Period and country of destination	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date
2002:									
June	1,070	393	142	567	8	127	363	2,670	15,500
July	437	518	94	392	8	144	307	1,900	17,400
August	951	527	142	545	15	128	426	2,730	20,200
September	788	568	174	733	4	133	333	2,730	22,900
October	290	507	146	717	3	187	320	2,170	25,100
November	739	418	174	546	10	147	295	2,330	27,400
December	415	316	78	302	14	115	426	1,660	29,100
January-December	8,720	6,020	1,520	6,590	169	1,770	4,290	29,100	XX
2003:									
January	729	375	138	236	12	231	192	1,910	1,910
February	1,160	419	93	215	38	168	374	2,460	4,380
March	226	615	113	399	214	150	307	2,020	6,400
April	600	743	158	315	14	182	292	2,300	8,700
May:	857	950	82	295	44	184	256	2,670	11,400
June:									
Australia	--	(2)	(2)	4	--	--	1	5	24
Belgium	3	108	1	2	--	(2)	1	115	575
Canada	15	34	18	29	3	61	55	215	1,440
France	113	118	7	11	1	1	1	252	1,390
Germany	27	41	2	12	--	1	5	87	2,810
India	(2)	4	(2)	2	--	--	11	17	80
Ireland	--	--	(2)	--	--	--	1	1	10
Italy	1	19	(2)	22	1	1	2	46	237
Japan	6	75	10	3	2	2	5	103	716
Korea, Republic of	1	20	(2)	1	--	(2)	6	28	210
Mexico	1	16	26	238	--	59	106	446	1,770
Netherlands	--	1	(2)	4	(2)	3	1	9	71
Singapore	(2)	5	(2)	(2)	--	1	2	8	56
Spain	(2)	18	--	(2)	--	(2)	(2)	18	93
Sweden	1	--	--	1	(2)	(2)	1	3	42
Switzerland	--	1	3	19	1	14	(2)	38	275
Taiwan	2	(2)	(2)	63	(2)	1	17	83	239
United Kingdom	9	467	7	45	(2)	12	(2)	540	2,160
Other	1	53	20	65	13	7	65	224	1,420
Total	180	980	94	521	21	163	280	2,240	13,600
2003: January-June	3,750	4,080	678	1,980	343	1,080	1,700	13,600	XX
2002: January-June	5,100	3,160	714	3,350	115	914	2,180	15,500	XX

XX Not applicable. -- Zero.

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

[2]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

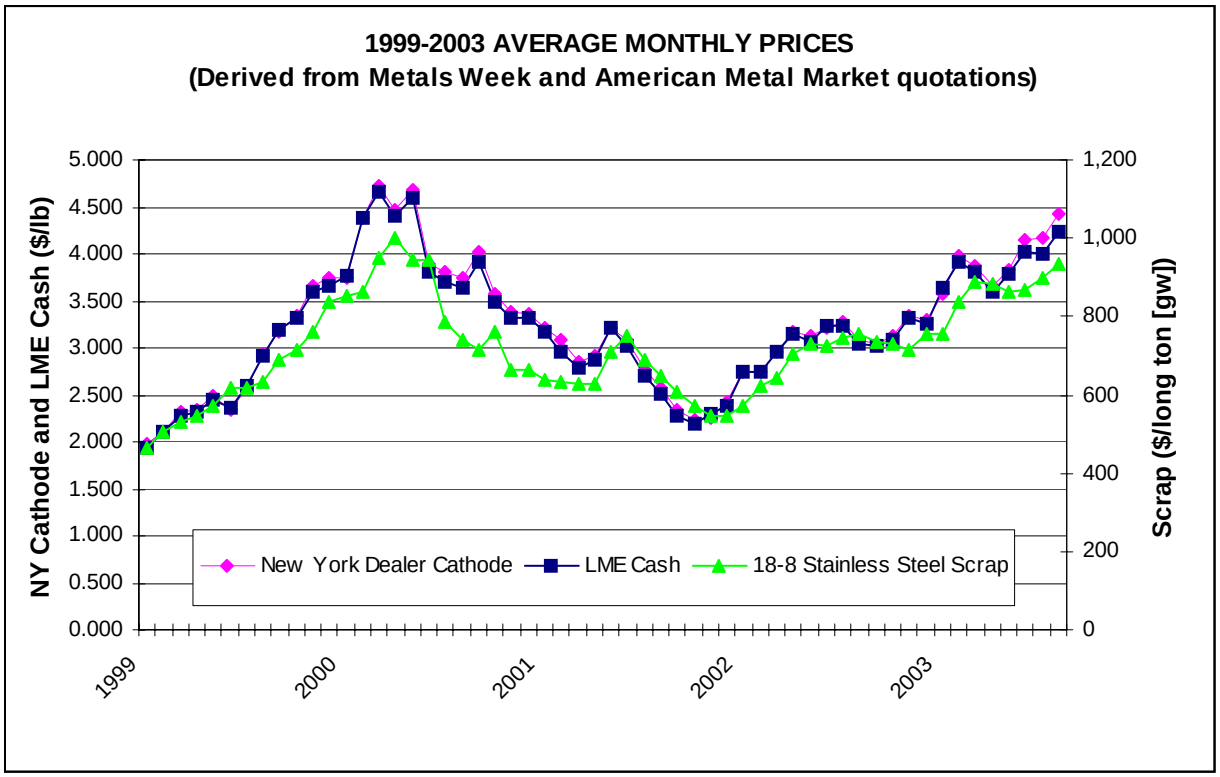
	Percent	
	Wrought	Cast
July 2003:		
Stainless and heat resisting steels	70	30
Alloy steels	99	1
Superalloys	88	12
Copper-nickel alloys	73	27
Other nickel-base alloys	100	(1)

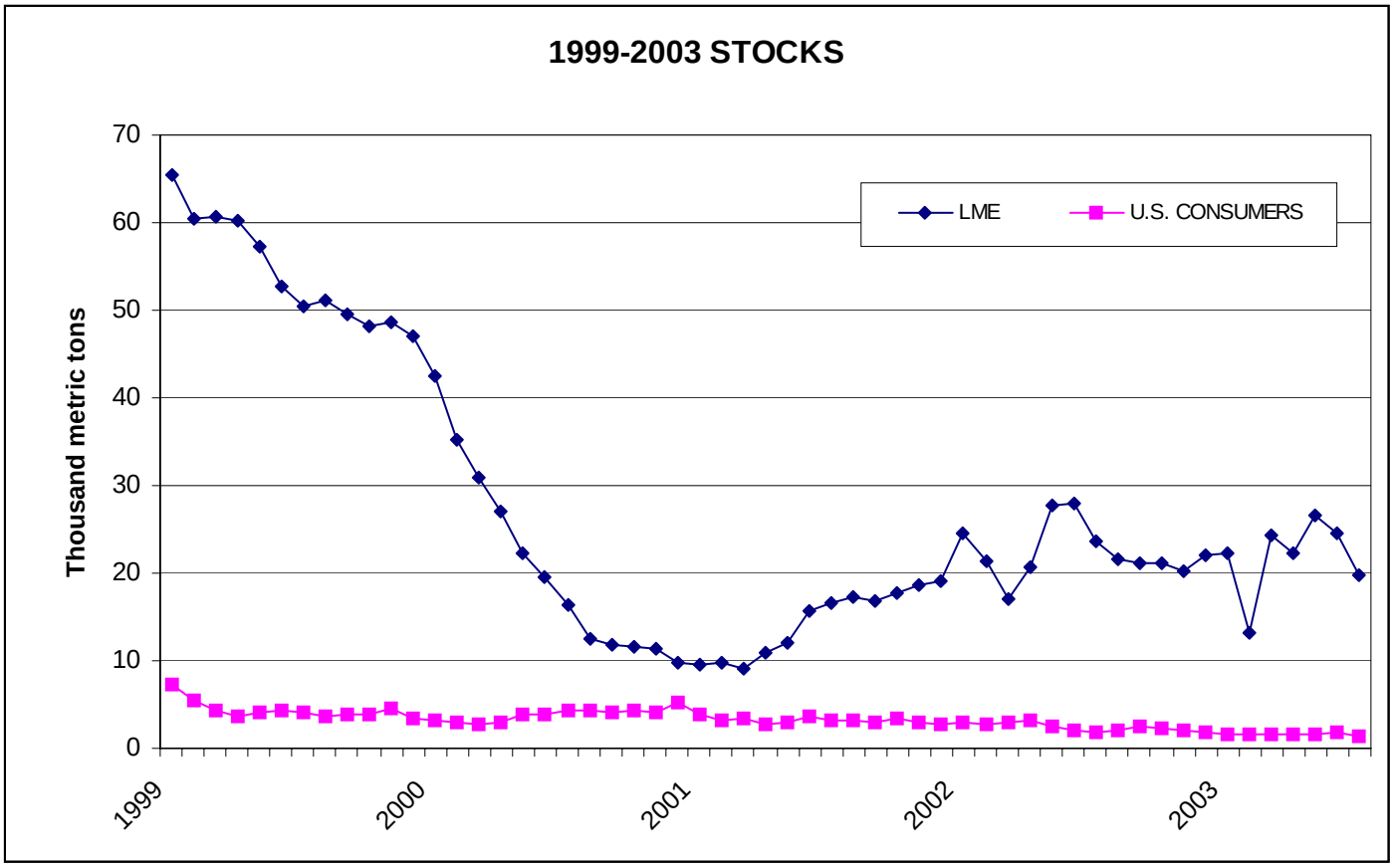
[1]Less than 1/2 unit.

TABLE 9
NICKEL PRICES

	Platts Metals Week				American Metal Market,
Date	Cathode NY Dealer $/lb.	LME Cash $/t	LME Cash $/lb.	18/8 Stainless steel scrap Free market $/long ton (gw)	18/8 Stainless steel scrap Pittsburgh $/long ton (gw)
2002:					
Average for month of:					
August	3.094	6,717.143	3.047	XX	755
September	3.053	6,640.238	3.012	XX	733
October	3.118	6,804.457	3.086	XX	729
November	3.349	7,313.929	3.318	XX	716
December	3.308	7,193.158	3.263	XX	755
Yearly average	3.095	6,771.751	3.072	XX	703
2003:					
Average for week ending:					
July 4	4.00-4.07	8,387.000	3.804	865-880	860-875
July 11	4.06-4.23	8,675.500	3.935	880-910	900-910
July 18	4.22-4.31	8,817.000	3.999	880-910	900-910
July 25	4.19-4.26	8,856.000	4.017	880-910	900-910
August 1	4.42-4.52	9,279.000	4.209	890-920	900-910
August 8	4.40-4.49	9,203.500	4.175	900-930	930-940
August 15	4.40-4.49	9,156.500	4.153	900-930	930-940
August 22	4.47-4.70	9,606.500	4.357	910-930	930-940
August 29	4.40-4.71	9,463.750	4.293	910-930	930-940
Average for month of:					
January	3.580	8,026.020	3.641	XX	757
February	3.978	8,623.000	3.911	840	840
March	3.865	8,378.810	3.801	886	885
April	3.655	7,910.125	3.588	885	885
May	3.826	8,330.625	3.779	839	861
June	4.155	8,874.762	4.026	874	867
July	4.178	8,797.391	3.990	893	897
August	4.418	9,351.375	4.242	918	935

XX Not applicable.


1999-2003 AVERAGE MONTHLY PRICES
(Derived from Metals Week and American Metal Market quotations)
NY Cathode and LME Cash ($/lb)
Scrap ($/long ton [gw])
5.000
4.500
4.000
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
1,200
1,000
800
600
400
200
0
New York Dealer Cathode
LME Cash
18-8 Stainless Steel Scrap
1999
2000
2001
2002
2003


1999-2003 STOCKS
Thousand metric tons
70
60
50
40
30
20
10
0
LME
U.S. CONSUMERS
1999
2000
2001
2002
2003