

Mineral Industry Surveys

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NICKEL IN MAY 2004

Reported domestic consumption in May, on a daily average basis, was 6% greater than that of April, according to the U.S. Geological Survey. Average daily nickel consumption of cathode, pellets, briquets, powder, and ferronickel for stainless steel was 68.7 metric tons per day (t/d)—10% greater than the 62.2 t/d (revised) for April 2004 and 25% greater than the 55.1 t/d (revised) for May 2003. Consumption of >99.8% nickel metal to make superalloys (like INCONEL 718 and WASPALOY) increased slightly from April levels, on a daily average basis. Consumption to make corrosion-resistant, less stress-resistant nickel-base alloys (like INCONEL 600 and Nickel 200) increased by 4%. Sales to plating companies averaged 32.4 t/d, about 12% greater than the April sales figure of 28.9 t/d.

On May 31, U.S. consumer stocks of cathode, pellets, briquets, and powder totaled 1,300 metric tons (t)—26% less than the 1,750 t (revised) on April 30 and 7% less than the 1,390 t reported for yearend 2003. Stocks in London Metal Exchange (LME) warehouses worldwide totaled 11,442 t on May 31—27% less than the 15,630 t on April 30. Data collected by the International Nickel Study Group indicated that, at the end of April, world nickel producers (excluding those in Austria, China, The Former Yugoslav Republic of Macedonia, Serbia, and the Ural area of Russia) had 101,900 t of nickel (Ni) in primary products in stock, of which 70,600 t, or 69%, was Class I material (electrolytic cathode, pellets, briquets, rondelles, powder, etc.). The other 31% was Class II materials (ferronickel, oxide sinter, and East Asian utility nickel—products with a Ni content of less than 99%).

The United States imported 45,700 t of primary nickel in the first 4 months of 2004, 4% less than the 47,600 t for the corresponding period of 2003. Trade data for May will appear in a subsequent report.

Exploration accelerates in far-northern Quebec

More than 20 companies are actively exploring for nickel on Canada's Ungava Peninsula. Much of the work has focused on the Proterozoic Cape Smith fold belt, which extends across the northern tip of the peninsula. The 6-year old Raglan Mine,

owned by Falconbridge Ltd., is in the central-eastern part of the belt. The open pit and underground complex produced 25,110 t of Ni in concentrate in 2003.

The bulk of the latest exploration drilling has taken place to the west and southeast of Raglan. Because large areas of the region are covered by overburden, airborne electromagnetic and magnetic surveys have played an important role in the search for nickel. Some of the more promising targets are associated with the Povungnituk group and the Chukotat group. Both formations are composed largely of stacked basalt flows with thin interbedded sedimentary horizons. Exploration crews are drilling for massive sulfides at points where ultramafic flows and sills have intruded the stacked basalts.

In 2002, Anglo American Exploration (Canada) Ltd. and Knight Resources Ltd. teamed up to explore 680 square kilometers (km²) of claims, 80 kilometers (km) west of Raglan. Since then, the West Raglan project area has been expanded to 720 km². In July 2003, Knight Resources discovered surface evidence of massive sulfide mineralization in an area now known as the Frontier Area, 7 km west of Lac Chukotat. A second mineralized area—the Rain Day—was found 5 km to the east. Crews drilled 18 holes on the West Raglan properties during the summer and fall of 2003. Of the 18, 8 intersected nickel mineralization. The most promising hole intersected over 5 meters of mineralization averaging 4.2% Ni. Crews resumed drilling in July 2004 (Knight Resources Ltd., 2004).

Canadian Royalties Inc. has been exploring the Expo-Ungava property—1,429 km² of claims that include the Mesamax and Expo deposits. On July 27, 2004, the company reported that one of its drill holes had intersected an ultramafic body northeast of and stratigraphically below the ultramafic body that hosts the Expo deposit. Massive and disseminated sulfides were found at depths of 96 to 120 m (Canadian Royalties Inc., 2004).

References Cited

- Canadian Royalties Inc., 2004, Early hole confirms Expo northeast mineralization: Montreal, Canada, Canadian Royalties Inc. press release, July 27, 3 p.
- Knight Resources Ltd., 2004, Drilling commences at West Raglan: Vancouver, Canada, Knight Resources Ltd. press release 04-04, July 16, 2 p.

TABLE 1
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE¹

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total	Total year to date
2003:					
May	4,400	524	25	4,950	25,700
June	4,130	498	43	4,670	30,400
July	4,240	900	25	5,170	35,600
August	4,320	873	28	5,220	40,800
September	4,320	844	28	5,190	46,000
October	4,840	911	32	5,780	51,800
November	4,420	1,190	30	5,640	57,400
December	4,130	902	30	5,060	62,500
January-December	53,400	8,620	412	62,500	XX
2004:					
January	4,290	595	34	4,920	4,920
February	4,940	455	26	5,420	10,300
March	5,010	529	34	5,580	15,900
April ^f	4,660	458	134	5,250	21,200
May:					
Steel:					
Stainless and heat resisting	1,590	545	W	2,130	9,850
Alloy (excludes stainless)	W	--	--	W	W
Superalloys	1,060	--	W	1,060	4,700
Copper-nickel alloys	W	--	--	W	W
Electric, magnetic, and expansive alloys	11	--	--	11	55
Other nickel & nickel alloys	W	--	W	W	W
Cast iron	W	--	--	W	W
Electroplating (sales to platers)	1,010	--	--	1,010	4,560
Chemical and chemical uses	W	--	--	W	W
Other uses	1,550	--	20	1,570	7,780
Total reported	5,210 ²	545	20	5,770	26,900
Total all companies (calc) ³	XX	XX	XX	10,100	47,300
2004: January-May	24,100	2,580	249	26,900	XX
2003: January-May	23,000	2,500	197	25,700	XX

^fRevised. W Withheld to avoid disclosing company proprietary data; included in "Other uses" category. XX Not applicable. -- Zero.

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

²Of consumption, 5,060 metric tons were consumed as cathodes and pellets, the remainder as briquets and powder.

³Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (56.93%) to apparent primary consumption for 2002.

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
2003:					
May		1,340	58	42	1,440
June		1,800	102	73	1,970
July		1,480	91	57	1,630
August		1,670	140	51	1,860
September		1,280	99	52	1,430
October		1,360	109	60	1,530
November		1,410	227	59	1,690
December		1,390	260	46	1,700
2004:					
January		1,390	186	55	1,630
February ^r		1,660	111	44	1,810
March		1,630	108	40 ^r	1,780
April		1,750 ^r	227 ^r	34	2,010 ^r
May:					
Steel (stainless, heat resisting and alloy)		445	(3)	(3)	445
Nonferrous alloys ⁴		838	(3)	(3)	838
Foundry (cast irons)		(3)	--	--	(3)
Chemical (catalysts, ceramics, plating salt, etc.) and unspecified uses		18	158	42	218
Total		1,300	158	42	1,500

^rRevised. -- Zero.

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

²Stocks 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.

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

⁴Includes 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 USE¹

(Metric tons, nickel content)

Period	Consumption			Stocks		
	Ferrous scrap ²	Nonferrous scrap ³	Total scrap	Ferrous scrap ²	Nonferrous scrap ³	Total scrap
2003:						
May	4,920	773	5,690	3,150	102	3,250
June	4,030	645	4,680	3,100	109	3,210
July	4,340	682	5,020	3,370	105	3,480
August	4,770	755	5,530	3,310	115	3,430
September	3,810	739	4,540	3,290	108	3,400
October	5,350	763	6,110	3,110	101	3,210
November	4,960	674	5,630	2,950	97	3,050
December	4,930	653	5,590	2,810	85	2,900
January-December	57,600	8,410	66,000	XX	XX	XX
2004:						
January	5,050	698 ^r	5,750	2,700	73 ^r	2,770 ^r
February	4,780	708 ^r	5,490	2,710	79 ^r	2,790
March	5,520 ^r	937 ^r	6,460 ^r	3,270 ^r	80 ^r	3,350
April	5,280 ^r	865 ^r	6,140 ^r	2,950 ^r	82 ^r	3,030
May	5,210	801	6,010	2,730	63	2,790
January-May	25,800	4,010	29,900	XX	XX	XX

^rRevised. XX Not applicable.

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

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

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

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY¹

(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
2003:										
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	10,800	368	692	(5)	226	408	327	12,800	73,600	41
July	6,240	294	1,840	11	352	420	312	9,470	83,000	49
August	7,420	762	913	(5)	477	475	544	10,600	93,600	62
September	9,990	1,030	1,180	(5)	570	744	248	13,800	107,000	48
October	7,270	565	1,010	20	326	715	255	10,200	118,000	34
November	7,030	625	932	--	318	889	324	10,100	128,000	28
December	6,230	860	471	(5)	530	821	284	9,190	137,000	34
January-December	99,300	9,130	13,100	90	4,790	6,690	3,790	137,000	XX	660
2004:										
January	7,360	829	1,040	40	489	933	435	11,100	11,100	77
February	7,200	834	1,070	161	667	1,020	485	11,400	22,600	49
March	10,700	812	806	134	1,430	1,660	376	15,900	38,400	72
April:										
Australia	1,660	60	--	--	43	--	--	1,760	4,170	--
Brazil	260	--	--	--	--	--	--	260	1,160	--
Canada	4,670	383	--	23	161	637	--	5,880	23,900	--
Colombia	--	--	383	--	--	13	--	396	1,090	--
Dominican Republic	--	--	667	--	--	16	--	683	2,690	--
Finland	321	60	--	--	--	1	90	472	2,540	--
France	39	12	--	--	95	--	35	181	834	8
Germany	1	18	--	--	71	--	39	129	1,020	13
Japan	--	4	--	--	1	--	55	60	318	5
Mexico	--	--	--	--	10	202	2	214	1,020	--
New Caledonia	--	--	100	--	--	--	--	100	350	--
Norway	568	--	--	--	7	--	--	575	3,940	--
Russia	3,180	58	81	--	--	--	--	3,310	6,640	--
South Africa	--	39	--	--	--	--	--	39	379	--
Sweden	--	2	--	--	11	--	--	13	27	--
United Kingdom	17	77	--	--	147	--	10	251	1,280	1
Venezuela	--	--	--	--	--	24	--	24	305	--
Zimbabwe	--	--	--	--	--	--	--	--	361	--
Other	2	7	446 ⁶	--	28	15	65	563	1,370	26
Total	10,700	720	1,680	23	574	908	296	14,900	53,400	53
2004: January-April	36,000	3,190	4,590	357	3,160	4,520	1,590	53,400	XX	251
2003: January-April	38,200	3,700	4,530	52	1,580	1,750	1,120	50,900	XX	324

XX Not applicable. -- Zero.

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

²The 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%).

³Excludes wrought nickel.

⁴May include revisions for prior months.

⁵Less than 1/2 unit.

⁶Nickel in ferronickel that transited through warehouses in Estonia.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF NICKEL, BY COUNTRY¹

(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
2003:										
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	25,200	147
June	90	47	29	33	516	2,310	276	3,300	28,500	143
July	87	95	27	2	510	3,570	393	4,690	33,200	148
August	56	77	37	1	792	3,040	301	4,300	37,500	162
September	107	106	18	51	707	2,350	223	3,560	41,100	148
October	133	153	12	4	1,010	3,270	276	4,850	45,900	141
November	210	127	1	5	819	1,600	371	3,130	49,000	102
December	44	92	10	4	809	3,190	441	4,590	53,600	72
January-December	996	1,100	181	161	9,460	37,800	3,900	53,600	XX	2,890
2004:										
January	52	129	15	5	657	2,370	399	3,630	3,630	153
February	85	166	--	17	540	2,550	396	3,750	7,380	54
March	116	150	(4)	8	1,000	3,800	497	5,570	12,900	59
April:										
Australia	--	1	--	--	--	(4)	(4)	1	5	1
Belgium	--	5	--	--	21	3	(4)	29	134	(4)
Canada	5	22	--	--	889	162	186	1,260	4,490	5
China	--	1	--	--	9	667	10	687	2,550	131
Finland	--	--	--	--	73	--	--	73	1,510	--
Germany	--	6	--	--	9	18	2	35	105	2
India	--	(4)	--	--	--	167	--	167	354	--
Italy	--	15	--	--	--	--	(4)	15	26	--
Japan	--	10	--	2	21	35	2	70	374	3
Korea, Republic of	--	4	--	1	--	1,040	59	1,100	4,220	1
Mexico	118	3	--	--	--	7	9	137	435	50
Netherlands	--	14	--	--	--	9	29	52	235	3
South Africa	--	--	--	--	--	--	--	--	17	--
Spain	--	--	--	--	--	--	--	--	(4)	--
Sweden	--	(4)	--	--	32	(4)	--	32	102	--
Taiwan	--	1	--	--	--	311	8	320	1,280	--
United Kingdom	--	21	3	5	10	54	(4)	93	284	4
Other	21	29	--	--	2	189	258	499	1,410	27
Total	144	132	3	8	1,070	2,660	563	4,570	17,500	227
2004:January-April	398	577	18	37	3,260	11,400	1,860	17,500	XX	493
2003:January-April	240	340	36	50	3,470	16,100	1,240	21,500	XX	1,830

XX Not applicable. -- Zero.

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

²The 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%).

³Excludes wrought nickel.

⁴Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY¹

(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
2003:									
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	150	156	579	244	35	292	102	1,560	9,140
July	130	266	554	277	30	305	168	1,730	10,900
August	151	78	469	319	32	322	154	1,530	12,400
September	48	239	406	211	10	115	95	1,120	13,500
October	204	307	443	305	15	162	95	1,530	15,000
November	195	239	331	210	23	89	156	1,240	16,300
December	314	169	388	215	45	704	147	1,980	18,300
January-December	1,910	2,520	5,750	3,330	214	2,770	1,770	18,300	XX
2004:									
January	102	278	286	193	14	134	133	1,140	1,140
February	165	214	362	251	8	374	238	1,610	2,750
March	102	167	446	213	18	364	459	1,770	4,520
April:									
Australia	158	--	--	--	--	--	(2)	158	249
Belgium	23	18	(2)	--	--	--	(2)	41	51
Canada	--	--	8	--	(2)	1	8	17	82
China	--	--	--	--	--	--	47	47	116
France	16	--	137	6	--	14	4	177	467
Germany	4	114	117	149	43	668	(2)	1,100	2,440
Italy	--	77	--	--	--	28	(2)	105	676
Japan	13	--	10	1	--	4	1	29	508
Mexico	--	--	--	--	--	--	60	60	233
Netherlands	--	--	--	--	--	--	30	30	72
South Africa	56	--	--	--	--	--	--	56	124
Sweden	--	27	215	6	--	53	--	301	1,080
United Kingdom	27	20	11	2	--	3	12	75	478
Other	48	--	6	--	(2)	(2)	10	64	202
Total	345	256	504	164	43	771	172	2,260	6,770
2004: January-April	713	913	1,600	821	84	1,640	1,000	6,770	XX
2003: January-April	534	864	2,080	1,220	18	578	659	5,950	XX

XX Not applicable. -- Zero.

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

²Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 7
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY¹

(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
2003:									
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	180	980	94	521	21	163	280	2,240	13,600
July	750	553	72	223	25	263	216	2,100	15,700
August	708	707	112	344	30	228	201	2,330	18,000
September	597	623	80	281	52	140	271	2,040	20,100
October	206	802	55	396	55	255	253	2,020	22,100
November	274	621	121	382	49	254	208	1,910	24,000
December	379	571	69	350	107	203	199	1,880	25,900
January-December	6,660	7,960	1,190	3,960	661	2,420	3,050	25,900	XX
2004:									
January	522	731	155	366	9	118	231	2,130	2,130
February	543	777	155	343	15	172	299	2,300	4,430
March	980	640	92	491	30	184	333	2,750	7,180
April:									
Australia	(2)	1	2	(2)	--	2	2	8	100
Belgium	50	80	1	24	--	1	(2)	156	413
Canada	13	36	16	45	9	41	86	246	943
China	--	23	2	8	(2)	8	54	95	415
France	116	79	(2)	27	(2)	1	2	225	1,210
Germany	1	27	3	4	6	6	3	50	313
India	--	5	--	--	--	1	--	6	34
Ireland	--	--	(2)	(2)	--	--	(2)	1	8
Italy	15	37	1	9	(2)	(2)	1	63	470
Japan	57	9	7	50	(2)	1	1	125	1,290
Korea, Republic of	4	9	4	112	--	1	2	132	436
Mexico	9	12	24	48	4	42	82	221	954
Netherlands	1	7	18	4	--	5	40	75	155
Singapore	(2)	1	1	4	--	1	1	8	44
Spain	4	--	--	1	--	1	(2)	6	29
Sweden	(2)	--	1	7	--	--	(2)	9	66
Switzerland	2	2	3	12	(2)	3	(2)	21	81
Taiwan	(2)	12	(2)	24	--	2	4	42	156
United Kingdom	8	253	3	39	(2)	6	1	310	1,270
Other	3	56	13	54	3	22	24	172	766
Total	283	649	99	472	22	144	303	1,970	9,160
2004: January-April	2,330	2,800	500	1,670	76	618	1,160	9,160	XX
2003: January-April	2,710	2,150	502	1,170	278	731	1,160	8,700	XX

XX Not applicable. -- Zero.

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

²Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

	Percent	
	Wrought	Cast
May 2004:		
Stainless and heat resisting steels	68	32
Alloy steels	98	2
Superalloys	90	10
Copper-nickel alloys	92	8
Other nickel-base alloys	100	(1)

¹Less than 1/2 unit.

TABLE 9
NICKEL PRICES

Date	Platts Metals Week			18/8 Stainless steel scrap Free market	American Metal Market, 18/8 Stainless steel scrap Pittsburgh
	Cathode NY Dealer \$/lb.	LME Cash mean ¹ \$/t	LME Cash mean ¹ \$/lb.	Free market \$/long ton (gw)	Free market \$/long ton (gw)
2003:					
Average for month of:					
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
September	4.668	9,965.341	4.520	978	985
October	5.066	11,047.174	5.011	1,041	1,013
November	5.568	12,086.500	5.482	1,153	1,160
December	6.390	14,162.500	6.424	1,262	1,222
Yearly average	4.446	9,629.469	4.368	961	942
2004:					
Average for week ending:					
May 7	5.22-5.38	11,120.625	5.044	1,375-1,400	1,360-1,375
May 14	5.05-5.25	10,680.000	4.844	1,250-1,275	1,360-1,375
May 21	5.04-5.19	10,869.500	4.930	1,225-1,250	1,360-1,375
May 28	5.43-5.65	11,803.500	5.354	1,225-1,250	1,360-1,375
June 4	5.58-5.99	12,384.375	5.617	1,215-1,240	1,200-1,215
June 11	5.74-5.85	12,339.000	5.597	1,200-1,210	1,200-1,215
June 18	5.99-6.39	13,438.500	6.096	1,200-1,210	1,200-1,215
June 25	6.94-7.22	14,944.500	6.779	1,290-1,360	1,200-1,215
July 2	7.01-7.10	14,945.500	6.779	1,350-1,400	1,200-1,215
July 9	7.18-7.52	15,768.000	7.152	1,375-1,425	1,440-1,460
July 16	7.17-7.45	15,209.000	6.899	1,450-1,465	1,440-1,460
July 23	7.02-7.18	14,867.000	6.744	1,450-1,465	1,440-1,460
July 30	6.57-6.87	14,231.000	6.455	1,450-1,465	1,440-1,460
Average for month of:					
January	6.900	15,326.548	6.952	1,517	1,463
February	6.968	15,145.125	6.870	1,537	1,585
March	6.203	13,715.000	6.221	1,458	1,563
April	6.056	12,848.125	5.828	1,397	1,503
May	5.185	11,118.289	5.043	1,281	1,367
June	6.063	13,533.523	6.139	1,241	1,208
July	6.990	15,023.295	6.814	1,430	1,402

¹Mean of the cash buyer price and the cash seller and settlement price.

