

# Mineral Industry Surveys

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## VANADIUM IN DECEMBER 2005

Reported domestic consumption of vanadium in December 2005 was about 6% more than that of the previous month and was about 14% less than that of December 2004, according to the U.S. Geological Survey. Year-to-date consumption of vanadium from January through December was about 9% less than during the same period in 2004. Consumer stocks of vanadium, in all forms, were 398 metric tons (t) at the beginning of 2005 and 361 t at the end of December.

According to Ryan's Notes (2006), U.S. ferrovanadium (FeV) prices ranged from \$21.083 to \$22.167 per pound of vanadium content in December, as compared with \$24.194 to \$24.794 in November. European FeV prices ranged from \$43.056 to \$45.000 per kilogram in December, as compared with \$49.375 to \$52.000 in November. Vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) prices ranged from \$8.917 to \$9.722 per pound in December as compared with \$11.125 to \$11.750 in November.

Eramet International, Paris, France, announced that its subsidiary, Gulf Chemical & Metallurgical Corp., acquired 100% of Bear Metallurgical Co. (BMC), the leading FeV and the second leading ferromolybdenum (FeMo) producer in the United States. Gulf Chemical & Metallurgical, a catalyst recycler, previously owned 49.5% of BMC, a toll converter based in Butler, PA. Gulf also announced plans to build a new

catalyst recycling facility in Edmonton, Alberta (Canada), to process spent catalysts from Canadian oil sands refining. Residues recovered at the new facility would be converted to FeV and FeMo at BMC allowing Gulf to quickly double its FeV and FeMo production after the new facility comes on-line (Ryan's Notes, 2005).

Northwestern Mineral Ventures Inc., Toronto, Canada, acquired 100% ownership of the Firefly uranium-vanadium project in Utah's La Sal uranium district. The Firefly project included the Firefly and Gray Duran mines and 39 mining claims. The Firefly and Gray Duran mines produced uranium for about 25 years starting in 1953 and coproduced vanadium ore that contained over 2% V<sub>2</sub>O<sub>5</sub>. The company's objective was to return the Firefly Mine to production, pending completion of an engineering study and obtaining permits (Platts Metals Week, 2005).

### References Cited

- Platts Metals Week, 2005, High vanadium price could reopen Firefly: Platts Metals Week, v. 76, no. 52, December 26, p. 13.  
Ryan's Notes, 2005, Gulf takes 100% ownership of BMC: Ryan's Notes, v. 11, no. 48, December 28, p. 3.  
Ryan's Notes, 2006, [untitled]: Ryan's Notes, v. 12, no. 1, January 2, p. 10.

TABLE 1  
U.S. CONSUMPTION AND CONSUMER STOCKS OF VANADIUM, BY FORM<sup>1</sup>

(Kilograms, contained vanadium)

	2004		2005			
	Consumption	Stocks	November		December	
			Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	3,610,000	298,000	265,000 <sup>r</sup>	361,000 <sup>r</sup>	277,000	335,000
Vanadium-aluminum alloy	W	W	W	W	W	W
Other <sup>3</sup>	449,000	101,000	18,600	38,100	24,500	25,700
Total	4,050,000	398,000	284,000 <sup>r</sup>	399,000 <sup>r</sup>	301,000	361,000

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data; included with "Other."

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

<sup>2</sup>Includes other vanadium-iron-carbon alloys as well as vanadium oxides added directly to steel.

<sup>3</sup>Includes other vanadium alloys, vanadium metal, vanadium pentoxide, vanadates, chlorides, other specialty chemicals, and items indicated by symbol W.

TABLE 2  
U.S. CONSUMPTION OF VANADIUM, BY END USE<sup>1</sup>

(Kilograms, contained vanadium)

	2004	2005		
		November	December	Year to date
Steel:				
Carbon	1,300,000	67,900	80,100	882,000
High-strength low-alloy	1,160,000	88,600	90,800	1,080,000
Stainless and heat-resisting	60,000	5,080	5,080	59,900
Full alloy	1,060,000	82,400	77,000	1,010,000
Tool	239,000	20,700 <sup>r</sup>	23,600	401,000
Total steel	3,820,000	265,000 <sup>r</sup>	276,000	3,430,000
Superalloys	16,600	855	836	9,610
Miscellaneous and unspecified <sup>2</sup>	215,000	18,100	24,000	253,000
Total consumption	4,050,000	284,000 <sup>r</sup>	301,000	3,690,000

<sup>r</sup>Revised.

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

<sup>2</sup>Includes cast irons, alloys excluding steel and superalloys, chemical and ceramic uses, and other miscellaneous and unspecified uses.

TABLE 3  
U.S. IMPORTS AND EXPORTS OF ALUMINUM-VANADIUM MASTER ALLOY AND  
VANADIUM METAL, INCLUDING WASTE AND SCRAP<sup>1</sup>

(Kilograms, gross weight)

	Aluminum-vanadium master alloy		Vanadium metal, including waste and scrap	
	Quantity	Value	Quantity	Value
<b>Imports for consumption:</b>				
2004	19,100	\$66,700	31,200	\$1,710,000
2005:				
September	--	--	10,700	631,000
October	1	6,620	96	56,800
November, China	1,000	2,370	--	--
Year to date <sup>2</sup>	1,000	12,800	39,000	2,440,000
<b>Exports:</b>				
2004	10,900,000	24,000,000	522,000	7,760,000
2005:				
September	880,000	2,990,000	24,200	1,760,000
October	1,080,000	2,680,000	31,200	1,190,000
November:				
Australia	20,800	79,800	--	--
Belgium	20,700	269,000	--	--
Canada	279,000	799,000	--	--
China	268	3,190	--	--
France	--	--	2	12,200
Germany	403	5,240	935	44,100
Japan	13,500	56,000	4,200	216,000
Mexico	1,640,000	3,880,000	--	--
Spain	2,090	25,200	--	--
Thailand	23,300	115,000	--	--
Taiwan	9,550	44,400	--	--
United Kingdom	--	--	7	3,550
Total	2,010,000	5,270,000	5,150	275,000
Year to date	12,300,000	36,100,000	264,000	14,900,000

-- Zero.

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

<sup>2</sup>May include revisions to previous months' data.

Source: U.S. Census Bureau.

TABLE 4  
U.S. IMPORTS AND EXPORTS OF FERROVANADIUM, VANADIUM PENTOXIDE (ANHYDRIDE) AND  
OTHER OXIDES AND HYDROXIDES OF VANADIUM<sup>1</sup>

(Kilograms, contained vanadium)

	Ferrovanadium		Vanadium pentoxide (anhydride) <sup>2</sup>		Other oxides and hydroxides of vanadium	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>Imports for consumption:</b>						
2004	3,020,000	\$62,100,000	1,040,000	\$8,600,000	120,000	\$1,650,000
<b>2005:</b>						
September	147,000	8,610,000	122,000	4,030,000	30,400	251,000
October	248,000	10,300,000	204,000	5,710,000	53,200	1,080,000
<b>November:</b>						
Austria	--	--	25	2,930	6,910	386,000
Canada	8,240	525,000	--	--	--	--
China	--	--	17,000	714,000	--	--
Czech Republic	81,500	4,610,000	--	--	--	--
South Africa	--	--	49,900	1,760,000	--	--
Total	89,700	5,130,000	66,900	2,480,000	6,910	386,000
Year to date <sup>3</sup>	11,800,000	121,000,000	1,220,000	46,700,000	183,000	5,620,000
<b>Exports:</b>						
2004	267,000	8,770,000	240,000	2,090,000	584,000	4,140,000
<b>2005:</b>						
September	38,900	1,260,000	3,910	166,000	154,000	1,430,000
October	70,500	2,700,000	50,600	1,080,000	21,500	219,000
<b>November:</b>						
Argentina	--	--	100	4,790	--	--
Brazil	8,090	321,000	--	--	2,740	38,700
Canada	6,770	141,000	--	--	90,700	838,000
China	--	--	--	--	9,590	114,000
Latvia	--	--	18,000	580,000	--	--
Mexico	4,060	240,000	--	--	--	--
Netherlands	--	--	--	--	9,250	141,000
United Kingdom	--	--	--	--	316	2,810
Total	18,900	701,000	18,100	584,000	113,000	1,130,000
Year to date	455,000	17,900,000	243,000	5,240,000	749,000	13,600,000

-- Zero.

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

<sup>2</sup>May include catalysts containing vanadium pentoxide.

<sup>3</sup>May include revisions to previous months' data.

Source: U.S. Census Bureau.

TABLE 5  
U.S. IMPORTS FOR CONSUMPTION OF VANADIUM-BEARING ASH, SLAG<sup>1</sup>

(Kilograms, contained vanadium pentoxide)

	Ash and residues		Ash and residues (not from the manufacture of iron and steel)		Slag, from the manufacture of iron and steel	
	Quantity	Value	Quantity	Value	Quantity	Value
2004	4,260,000	\$8,520,000	11,100,000	\$2,000,000	244,000,000	\$10,400,000
2005:						
September	400,000	999,000	433,000	58,900	48,000,000	918,000
October	618,000	1,440,000	702,000	108,000	51,300,000	1,240,000
November:						
Canada	--	--	497,000	66,800	44,200,000	480,000
Mexico	244,000	590,000	--	--	--	--
Total	244,000	590,000	497,000	66,800	44,200,000	480,000
Year to date <sup>2</sup>	4,120,000	9,220,000	6,440,000	1,020,000	481,000,000	9,990,000

-- Zero.

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

<sup>2</sup>May include revisions to previous months' data.

Source: U.S. Census Bureau.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF MISCELLANEOUS VANADIUM CHEMICALS<sup>1</sup>

(Kilograms, contained vanadium)

	Sulfates		Vanadates	
	Quantity	Value	Quantity	Value
2004	500	\$19,100	74,700	\$1,150,000
2005:				
September	--	--	--	--
October	--	--	9,050	29,200
November:				
Germany	--	--	358	28,900
Japan	--	--	25	4,510
South Africa	--	--	6,240	261,000
Switzerland	--	--	1	2,010
Total	--	--	6,630	296,000
Year to date <sup>2</sup>	--	--	83,200	2,470,000

-- Zero.

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

<sup>2</sup>May include revisions to previous months' data.

Source: U.S. Census Bureau.