

# Mineral Industry Surveys

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## VANADIUM IN SEPTEMBER 2003

Reported domestic consumption of vanadium in September 2003 was about 3% less than that of the previous month and was about 5% less than that of September 2002, according to the U.S. Geological Survey. Year-to-date consumption of vanadium from January through September was about 5% less than during the same period in 2002. Consumer stocks of vanadium, in all forms, were 209 metric tons (t) at the beginning of 2003 and 206 t at the end of September.

According to Ryan's Notes (2003b), the range for U.S. ferrovanadium (FeV) prices during September was \$5.372 to \$5.489 per pound of vanadium content, as compared with \$5.344 to \$5.500 in August. European FeV prices ranged from \$11.356 to \$11.556 per kilogram of vanadium content in September as compared with \$10.556 to \$10.767 in August. In September, vanadium pentoxide ( $V_2O_5$ ) prices ranged from \$2.028 to \$2.128 per pound, as compared with \$1.922 to \$2.100 in August.

Prices of FeV and  $V_2O_5$  in the United States were marginally higher in September, with the price range being narrower. European FeV price increased by about \$0.80 per kilogram and the spread between FeV and  $V_2O_5$  prices increased. In the United States, FeV spot sales at the end of September were reported in a narrow range of \$5.35 to \$5.50 per pound, and in Europe, most FeV business was done at about \$11.50 per kilogram.

FeV prices could dip by the end of the year unless producers take steps to limit output, producer Xstrata, Plc (Xstrata) said

last week in its half-year report. Xstrata reported FeV output of 3,838 kg in the first half of 2003, up 28% compared to the same period in 2002, as the company continued to switch from  $V_2O_5$  to producing value-added FeV. Its  $V_2O_5$  output fell to 7,235 kg in the first half of 2003, down 22% from the year-earlier period. Global steel demand, the major indicator of FeV demand, reportedly increased 8.6% in the first half of 2003, but "the major increase came from China where the unit consumption of vanadium per ton of produced steel, while growing, remains the lowest," the Xstrata report noted (Metals Week, 2003).

With the shutdown of Xstrata's Windimurra Mine in Australia, vanadium production probably is less than consumption, said one analyst. Prices have not reacted, however, because massive inventories have to be worked off. No one is certain about the size of the inventory held by Glencore International AG, Xstrata's largest shareholder, but sellers agree the companies have exercised restraint in releasing the material (Ryan's Notes, 2003a).

### References Cited

- Metals Week, 2003, Xstrata sees FeV prices lower, sees need for more cuts: Metals Week, v. 74, no. 38, September 22, p. 11.
- Ryan's Notes, 2003a, With the shutdown of the Windimurra vanadium mine: Ryan's Notes, v. 9, no. 37, September 15, p. 3.
- Ryan's Notes, 2003b, [untitled]: Ryan's Notes, v. 9, no. 40, October 6, p. 4.

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

(Kilograms, contained vanadium)

	2002		2003			
	Consumption	Stocks	August		September	
			Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	2,730,000 <sup>r</sup>	189,000	235,000 <sup>r</sup>	197,000 <sup>r</sup>	233,000	199,000
Vanadium-aluminum alloy	W	W	W	W	W	W
Other <sup>3</sup>	349,000 <sup>r</sup>	20,200	25,400	12,200	17,700	7,350
Total	3,080,000 <sup>r</sup>	209,000	260,000 <sup>r</sup>	209,000 <sup>r</sup>	251,000	206,000

<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)

	2002	2003		
		August	September	Year to date <sup>2</sup>
Steel:				
Carbon	731,000	58,100 <sup>r</sup>	62,500	575,000
High-strength low-alloy	900,000	78,900 <sup>r</sup>	78,000	692,000
Stainless and heat-resisting	37,500	2,290	2,290	20,000
Full alloy	748,000	68,500 <sup>r</sup>	65,000	604,000
Tool	270,000	20,600	20,700	192,000
Total steel	2,690,000	228,000 <sup>r</sup>	229,000	2,080,000
Superalloys	12,400	1,670	991	10,000
Miscellaneous and unspecified <sup>3</sup>	382,000	29,900	21,600	175,000
Total consumption	3,080,000	260,000 <sup>r</sup>	251,000	2,270,000

<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 revisions to prior month's data.

<sup>3</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>				
2002	97,500	\$206,000	32,300	\$1,270,000
2003:				
June	57,700	87,000	14,200	231,000
July	31,800	62,100	18,000	219,000
August:				
China	--	--	500	2,410
Germany	--	--	35,800	493,000
Russia	--	--	1,000	79,300
United Kingdom	--	--	1	2,900
Total	--	--	37,300	578,000
Year to date	173,000	288,000	93,300	1,510,000
<b>Exports:</b>				
2002	529,000	11,700,000	49,200	898,000
2003:				
June	699,000	1,530,000	57,400	337,000
July	1,060,000	1,950,000	2,080	29,300
August:				
Austria	--	--	46	9,300
Canada	381,000	732,000	--	--
France	--	--	5	7,070
Hong Kong	1,530	18,700	--	--
Italy	--	--	4	2,950
Japan	11,600	126,000	1,050	18,400
Malaysia	473	13,900	--	--
Mexico	405,000	805,000	--	--
United Kingdom	2,970	16,800	--	--
Total	803,000	1,710,000	1,110	37,700
Year to date	3,390,000	10,400,000	187,000	3,580,000

-- Zero.

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

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>						
2002	2,520,000	\$19,400,000	406,000	\$1,990,000	42,300	\$560,000
<b>2003:</b>						
June	126,000	1,460,000	70,500	580,000	4,030	68,200
July	88,300	871,000	66,200	709,000	--	--
<b>August:</b>						
Austria	15,400	161,000	--	--	--	--
Canada	75,800	602,000	--	--	--	--
China	--	--	250	2,410	--	--
Czech Republic	32,500	326,000	--	--	--	--
Germany	--	--	--	--	3,560	70,500
Israel	--	--	--	--	4,030	68,200
Switzerland	16,300	177,000	--	--	--	--
Taiwan	--	--	7,240	64,800	--	--
Total	140,000	1,270,000	7,490	67,200	7,580	139,000
Year to date	668,000	6,510,000	394,000	2,960,000	24,800	452,000
<b>Exports:</b>						
2002	142,000	1,550,000	91,200	568,000	203,000	1,700,000
<b>2003:</b>						
June	18,300	262,000	12,700	124,000	39,400	373,000
July	21,500	294,000	25,900	217,000	79,100	436,000
<b>August:</b>						
Canada	6,120	94,900	--	--	11,800	156,000
Italy	--	--	9,160	40,000	--	--
Mexico	6,000	91,100	--	--	--	--
Total	12,100	186,000	9,160	40,000	11,800	156,000
Year to date	292,000	3,970,000	179,000	1,490,000	205,000	1,770,000

-- 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.

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
2002	3,830,000	\$520,000	10,300,000	\$1,560,000	243,000,000	\$19,900,000
2003:						
June	--	--	1,630,000	399,000	83,200,000	1,110,000
July	14,800	2,010	1,320,000	294,000	44,900,000	512,000
August:						
Australia	--	--	--	--	5,570	19,500
Canada	--	--	1,260,000	230,000	40,900,000	327,000
Mexico	784,000	1,130,000	--	--	--	--
United Kingdom	--	--	106,000	79,000	--	--
Total	784,000	1,130,000	1,370,000	309,000	40,900,000	346,000
Year to date	1,860,000	1,330,000	7,980,000	1,750,000	176,000,000	2,810,000

-- Zero.

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

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
2002	14,100	\$390,000	48,100	\$567,000
2003:				
June	--	--	6,480	68,200
July	--	--	2,700	70,400
August:				
Germany	--	--	167	8,310
Japan	--	--	31	4,930
South Africa	--	--	15,800	168,000
Total	--	--	16,000	181,000
Year to date	--	--	38,300	476,000

-- Zero.

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

Source: U.S. Census Bureau.