

# Mineral Industry Surveys

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## VANADIUM IN MAY 2012

Reported domestic consumption of vanadium in May 2012 was slightly less than that of the previous month and was slightly more than that of May 2011, according to the U.S. Geological Survey. Consumer stocks of vanadium, in all forms, were 163 metric tons (t) at the beginning of 2012 and 236 t at the end of May.

According to Ryan's Notes, U.S. ferrovanadium (FeV) prices ranged from \$15.500 to \$17.000 per pound of vanadium content in May, as compared with \$15.256 to \$16.838 in April. European FeV prices ranged from \$25.306 to \$25.806 per kilogram in May, as compared with \$25.250 to \$25.750 in April. Vanadium pentoxide ( $V_2O_5$ ) prices ranged from \$6.500 to \$7.000 per pound in both April and May.

Denison Mines Corp. (Toronto, Ontario, Canada) announced an agreement to sell its U.S. mining assets and operations to Energy Fuels Inc. (EFR), a uranium and vanadium mineral development company. Denison's White Mesa Mill in Utah is the only conventional uranium mill currently operating in the United States. It also has a vanadium coproduct recovery circuit that produced approximately 590 t of  $V_2O_5$  in 2011. The company expected to produce only 270 t of  $V_2O_5$  in 2012. EFR was expected to follow the production guidance set by Denison (Ryan's Notes, 2012).

### Reference Cited

Ryan's Notes, 2012, Denison Mines agrees to sell US assets: Ryan's Notes, v. 18, no. 17, April 23, p.2.

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

(Kilograms, contained vanadium)

	2011 <sup>P,†</sup>		2012					
			April		May		January–May	
	Consumption	Stocks	Consumption <sup>†</sup>	Stocks	Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	4,240,000	127,000	343,000	167,000	337,000	183,000	1,700,000	183,000
Vanadium-aluminum alloy and other forms <sup>3</sup>	879,000	63,300	73,700	59,600 <sup>†</sup>	73,100	52,300	353,000	52,300
Total	5,120,000	190,000	417,000	227,000 <sup>†</sup>	410,000	236,000	2,050,000	236,000

<sup>P</sup>Preliminary. <sup>†</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 other vanadium-iron-carbon alloys as well as vanadium oxides added directly to steel.

<sup>3</sup>Includes vanadium-aluminum alloy, other vanadium alloys, vanadium metal, vanadium pentoxide, vanadates, chlorides, and other specialty chemicals.

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

(Kilograms, contained vanadium)

	2011 <sup>P</sup>	2012		
		April	May	January–May
Steel:				
Carbon	677,000	62,100	53,300	291,000
High-strength low-alloy	W	W	W	W
Stainless and heat-resisting	61,500	5,120	5,120	25,600
Full alloy	2,120,000 <sup>†</sup>	173,000 <sup>†</sup>	175,000	865,000
Tool	W	W	W	W
Total steel	2,860,000 <sup>†</sup>	240,000 <sup>†</sup>	233,000	1,180,000
Superalloys	15,300 <sup>†</sup>	570	576	2,580
Miscellaneous and unspecified <sup>2</sup>	W	W	27,100	W
Total	5,120,000 <sup>†</sup>	417,000 <sup>†</sup>	410,000	2,050,000

<sup>P</sup>Preliminary. <sup>†</sup>Revised. W Withheld to avoid disclosing company proprietary data; included in "Total."

<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>				
2011	1,350,000	\$3,800,000	43,900	\$1,930,000
2012:				
April	2,890	18,200	9,340	303,000
May:				
China	4,050	28,400	--	--
Germany	--	--	11,100	387,000
Total	4,050	28,400	11,100	387,000
January–May	65,600	471,000	44,500	1,490,000
<b>Exports:</b>				
2011	10,600,000	36,700,000	102,000	3,340,000
2012:				
April	2,010,000	5,920,000	183	7,060
May:				
Canada	475,000	1,210,000	--	--
China	19,100	156,000	--	--
Hong Kong	4,360	56,700	--	--
Mexico	1,980,000	5,270,000	--	--
New Zealand	3,790	22,400	--	--
Singapore	--	--	2	3,120
Total	2,480,000	6,720,000	2	3,120
January–May	9,240,000	26,800,000	566	24,900

-- 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>						
2011	2,220,000	\$64,600,000	2,800,000	\$45,800,000	886,000	\$17,400,000
2012:						
April	523,000	13,900,000	79,500	1,280,000	139,000	1,680,000
May:						
Austria	24,500	790,000	14,800	207,000	16,700	404,000
Canada	61,700	1,900,000	--	--	--	--
China	--	--	90,400	1,260,000	--	--
Czech Republic	218,000	5,520,000	--	--	--	--
Germany	389	24,800	325	16,000	--	--
Korea, Republic of	93,100	2,550,000	--	--	--	--
South Africa	--	--	30,700	723,000	66,500	1,070,000
Thailand	--	--	10,000	251,000	--	--
Total	398,000	10,800,000	146,000	2,450,000	83,200	1,470,000
January–May	1,930,000	50,200,000	555,000	10,200,000	517,000	7,090,000
<b>Exports:</b>						
2011	444,000	9,970,000	88,700	1,410,000	254,000	2,390,000
2012:						
April	22,100	591,000	415	12,700	809	7,200
May:						
Brazil	--	--	--	--	3,810	54,200
Canada	45,000	1,150,000	--	--	--	--
Germany	--	--	--	--	11,900	162,000
Mexico	30,400	413,000	399	12,700	--	--
Total	75,400	1,570,000	399	12,700	15,800	216,000
January–May	249,000	5,880,000	5,520	86,900	65,400	796,000

-- 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, unless otherwise specified)

	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 (gross weight)	Value
2011	1,420,000	\$1,570,000	89,600	\$479,000	189,000,000	\$5,170,000
2012:						
April	86,000	230,000	--	--	8,120,000	1,800,000
May:						
Canada	121,000	305,000	--	--	72,300	35,000
Germany	--	--	--	--	32,000	6,940
Italy	--	--	--	--	44,000	53,600
Mexico	--	--	--	--	624,000	681,000
Netherlands	8,020	49,700	--	--	--	--
Total	129,000	355,000	--	--	772,000	777,000
January–May	570,000	1,480,000	49,600	126,000	9,380,000	2,720,000

-- 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
2011	42,200	\$738,000	303,000	\$7,400,000
2012:				
April	18	3,840	18,700	417,000
May:				
Austria	--	--	7,920	97,000
China	4,780	4,600	6,620	214,000
Germany	--	--	156	13,600
Japan	--	--	25	4,700
South Africa	--	--	33,800	630,000
Taiwan	--	--	238	14,500
Total	4,780	4,600	48,800	974,000
January–May	12,000	137,000	126,000	2,800,000

-- 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.