

# Mineral Industry Surveys

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## VANADIUM IN JANUARY 2013

Reported domestic consumption of vanadium in January 2013 was 4% more than that of the previous month and was 7% less than that of January 2012. Consumer stocks of vanadium, in all forms, were 228 metric tons (t) at the beginning of 2013 and 236 t at the end of January.

According to Ryan's Notes, U.S. ferrovanadium (FeV) prices ranged from \$13.750 to \$14.281 per pound of vanadium content in January 2013, compared with \$12.964 to \$14.000 in December 2012. European FeV prices ranged from \$30.813 to \$31.813 per kilogram in January, compared with \$27.000 to \$28.000 in December. Vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) prices ranged from \$6.250 to \$6.500 per pound in January, compared with \$5.964 to \$6.500 in December.

Evraz Highveld Steel and Vanadium Ltd. (Moscow, Russia) reported that vanadium slag production from South Africa decreased 21% in 2012 to 6,205 t compared with 7,881 t in 2011. Evraz's total FeV production in 2012 decreased 14% to 14,381 t FeV compared with 16,683 t FeV in 2011. Evraz's 2012 FeV production at its own plants increased 15% to 7,259 t FeV compared with 6,321 t FeV in 2011. Production at third-

party facilities, however, decreased 31% to 7,122 t FeV compared with 10,362 t FeV in 2011. Evraz's 2012 production of oxides, vanadium aluminum and chemicals increased 4.1% to 1,330 t compared with 1,277 t in 2011. Output of oxides, vanadium aluminum and chemicals was only 186 t in the fourth quarter compared with 443 t in the third quarter. Evraz attributed the decrease to problems with primary feedstock availability in the United States. Evraz also announced that production of oxides, vanadium aluminum and chemicals in the first quarter of 2013 may be affected by scheduled maintenance work at its Hot Springs, AR, plant. The plant's electrical equipment was expected to be upgraded in order to process vanadium-bearing slag (Ryan's Notes, 2013).

Included in this Mineral Industry Surveys are U.S. imports and exports of vanadium for December 2012 and January 2013.

### Reference Cited

Ryan's Notes, 2013, Nitrided vanadium tightness persists; Evraz's Q1 Nitrovan output may be lower: Ryan's Notes, v. 19, no. 4, January 28, p. 1.

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

(Kilograms, contained vanadium)

	2011		2012				2013	
	Consumption	Stocks	December		January–December		January	
			Consumption	Stocks	Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	4,240,000	122,000	227,000 <sup>r</sup>	172,000 <sup>r</sup>	2,950,000 <sup>r</sup>	172,000 <sup>r</sup>	231,000	165,000
Vanadium-aluminum alloy and other forms <sup>3</sup>	882,000	63,300	63,400	56,400	818,000	56,400	70,100	71,400
Total	5,120,000	185,000	291,000 <sup>r</sup>	228,000 <sup>r</sup>	3,770,000 <sup>r</sup>	228,000 <sup>r</sup>	301,000	236,000

<sup>1</sup>Revised. -- Zero.

<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	2012		2013 January
		December	January– December	
Steel:				
Carbon	677,000	44,500	602,000	43,300
Full alloy	2,120,000	107,000 <sup>r</sup>	1,440,000 <sup>r</sup>	113,000
High-strength low-alloy	W	W	W	W
Stainless and heat resisting	61,500	5,120	61,500	5,120
Tool	W	W	W	W
Total steel	2,860,000	157,000 <sup>r</sup>	2,110,000 <sup>r</sup>	161,000
Superalloys	15,300	455	5,390	457
Miscellaneous and unspecified <sup>2</sup>	W	W	W	W
Total	5,120,000	291,000 <sup>r</sup>	3,770,000 <sup>r</sup>	301,000

<sup>1</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
Imports for consumption:				
2012	103,000	\$681,000	154,000	\$4,840,000
2013, January	--	--	--	--
Exports:				
2012	23,900,000	65,300,000	26,000	698,000
2013:				
January:				
Canada	364,000	921,000	--	--
Dominican Republic	--	--	164	2,510
Japan	3,860	110,000	5,000	128,000
Korea, Republic of	33,100	250,000	--	--
Mexico	1,840,000	4,980,000	--	--
Singapore	3,060	12,500	--	--
Total	2,240,000	6,270,000	5,160	131,000

-- 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>						
2012	4,190,000	\$108,000,000	1,640,000	\$26,500,000	905,000	\$12,800,000
<b>2013:</b>						
January:						
Austria	9,820	234,000	91	5,510	8,340	180,000
Brazil	16,400	443,000	--	--	--	--
Canada	90,300	2,560,000	--	--	--	--
China	--	--	37,400	517,000	--	--
Czech Republic	80,700	1,890,000	--	--	--	--
Germany	--	16,800	--	--	--	--
Japan	8,800	199,000	--	--	--	--
Korea, Republic of	16,200	412,000	--	--	--	--
Russia	--	--	94,400	746,000	--	--
South Africa	--	--	106,000	1,810,000	--	--
Total	222,000	5,750,000	238,000	3,080,000	8,340	180,000
<b>Exports:</b>						
2012	454,000	11,000,000	61,800	1,160,000	287,000	3,540,000
<b>2013:</b>						
January:						
Belgium	20,000	464,000	--	--	--	--
Canada	15,600	351,000	--	--	530	8,880
Germany	--	--	--	--	11,200	155,000
Mexico	64	2,810	--	--	--	--
Netherlands	16,300	326,000	--	--	3,130	43,600
Peru	4,580	72,400	--	--	--	--
Total	56,600	1,220,000	--	--	14,900	207,000

-- 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
	2012	2,040,000	\$9,880,000	175,000	\$141,000	108,000,000
2013:						
January:						
Austria	--	--	--	--	7,440	100,000
Canada	44,300	246,000	--	--	179,000	85,000
Germany	--	--	5,560	11,500	--	--
Mexico	--	--	--	--	39,000	19,700
Total	44,300	246,000	5,560	11,500	225,000	205,000

-- 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
2012	29,100	\$370,000	280,000	\$6,190,000
2013:				
January:				
Austria	--	--	2,040	50,200
China	--	--	18,500	395,000
India	--	--	28	5,000
Japan	--	--	65	7,560
South Africa, Republic of	--	--	20,900	417,000
Total	--	--	41,500	874,000

-- 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.