

# Mineral Industry Surveys

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## VANADIUM IN SEPTEMBER 2018

Reported domestic consumption of vanadium in September 2018 was essentially unchanged from that of the previous month and 14% less than that of September 2017. Consumer stocks of all forms of vanadium were 183 metric tons (t) at the end of September, an increase from 155 t at yearend 2017 (table 1).

According to CRU Group (2018), U.S. ferrovanadium (FeV) prices ranged from \$41.213 to \$42.375 per pound of contained vanadium in September 2018, compared with \$39.200 to \$39.944 per pound in August 2018. European FeV prices ranged from \$91.250 to \$93.250 per kilogram of contained vanadium in September 2018, compared with \$81.056 to \$81.833 per kilogram in August 2018. CRU Group discontinued publishing U.S. vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) prices from July 2017 onward. The Chinese V<sub>2</sub>O<sub>5</sub> prices ranged from \$19.013 to \$19.650 per pound of contained vanadium in September 2018, compared with \$15.300 to \$15.800 per pound of contained vanadium in August 2018 (fig. 1).

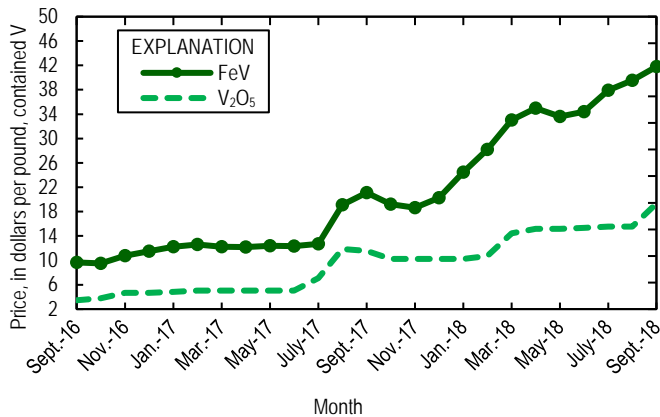


Figure 1. Average monthly prices for FeV and V<sub>2</sub>O<sub>5</sub> from September 2016 through September 2018. Prices for FeV are United States prices, and prices for V<sub>2</sub>O<sub>5</sub> are United States prices from September 2016 through June 2017 and Chinese prices from July 2017 through September 2018. Source: CRU Group.

**Reference Cited**

CRU Group, 2018, Noble alloys and minor metals prices: CRU Group, September 28. (Accessed November 19, 2018, via <http://www.crugroup.com/>.)

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

(Kilograms, contained vanadium)

	2018					
	August		September		January–September	
	Consumption	Stocks	Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	224,000	153,000	225,000	145,000	2,010,000	145,000
Vanadium-aluminum alloy and other forms <sup>3</sup>	21,100	37,800	21,100	37,800	326,000	37,800
Total	245,000	191,000	246,000	183,000	2,330,000	183,000

<sup>p</sup>Preliminary.

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

<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)

	2018		
	August	September	January– September
Steel:			
Carbon	W	W	W
Full alloy	101,000	101,000	958,000
High-strength low-alloy	W	W	W
Stainless and heat resisting	4,930	4,930	44,400
Tool	W	W	W
Total steel	106,000	106,000	1,000,000
Superalloys	W	W	W
Miscellaneous and unspecified <sup>2</sup>	W	W	W
Total	245,000	246,000	2,330,000

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.

Includes estimates.

<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 FOR CONSUMPTION OF VANADIUM PRODUCTS<sup>1</sup>

(Kilograms, unless otherwise specified)

Material	HTS <sup>2</sup> Code	2018								
		August			September			January–September		
		Gross weight	Contained weight	Value (thousands)	Gross weight	Contained weight	Value (thousands)	Gross weight	Contained weight	Value (thousands)
Vanadium bearing ash and residues	2620.40.0030, 2620.99.1000	2,340,000	225,000	\$6,980,000	2,730,000	286,000	\$7,830,000	19,200,000	1,920,000	\$39,700,000
<b>Chemical compounds:</b>										
Vanadium pentoxide (anhydride)	2825.30.0010	358,000	355,000	13,400,000	202,000	177,000	6,910,000	3,380,000	3,300,000	108,000,000
Vanadium oxides and hydroxides, other	2825.30.0050	--	--	--	150	97	11,400	140,000	91,400	5,010,000
Vanadium sulfates	2833.29.3000	5,070	3,160	30,400	--	--	--	8,060	5,170	75,300
Vanadates	2841.90.1000	19,800	12,400	512,000	37,800	24,600	1,130,000	391,000	233,000	9,410,000
Ferrovandium	7202.92.0000	376,000	281,000	27,800,000	368,000	289,000	13,900,000	3,100,000	2,330,000	155,000,000
Vanadium metal, including waste and scrap	8112.92.7000	594	382	125,000	16,500	12,800	546,000	35,500	26,700	1,810,000
Vanadium and articles thereof <sup>3</sup>	8112.99.2000	77,100	50,100	2,640,000	10,300	8,300	327,000	358,000	234,000	13,200,000
Total		3,180,000	928,000	51,500,000	3,360,000	798,000	30,700,000	26,600,000	8,140,000	332,000,000

-- Zero.

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

<sup>2</sup>Harmonized Tariff Schedule of the United States (HTS).

<sup>3</sup>Aluminum-vanadium master alloy consisting of 35% aluminum and 64.5% vanadium.

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>1,2</sup>

(Kilograms, gross and contained weight)

Country or locality	HTS <sup>3</sup> code	2018					
		August		September		January–September	
		Gross weight	Contained weight	Gross weight	Contained weight	Gross weight	Contained weight
<b>Imports for consumption:</b>							
Vanadium pentoxide (anhydride) <sup>4</sup>	2825.30.0010						
China		113,000	112,000	94,300	71,600	603,000	551,000
Germany		1,430	818	8,000	6,400	93,400	76,200
Korea, Republic of		--	--	20,000	19,600	60,000	58,900
South Africa		90,800	90,400	80,000	79,700	1,070,000	1,070,000
Other [3 countries and (or) localities]		153,000 <sup>r</sup>	152,000 <sup>r</sup>	--	--	1,560,000	1,550,000
Total		358,000	355,000	202,000	177,000	3,380,000	3,300,000
Other oxides and hydroxides of vanadium:	2825.30.0050						
India		--	--	150	97	150	97
Other [2 countries and (or) localities]		--	--	--	--	140,000	91,300
Total		--	--	150	97	140,000	91,400
Ferrovanadium	7202.92.0000						
Austria		215,000	164,000	195,000	151,000	1,740,000	1,340,000
Canada		42,000	33,600	173,000	138,000	645,000	509,000
Other [6 countries and (or) localities]		119,000 <sup>r</sup>	83,700 <sup>r</sup>	--	--	712,000	482,000
Total		376,000	281,000	368,000	289,000	3,100,000	2,330,000
<b>Exports:</b>							
Vanadium pentoxide (anhydride) <sup>4</sup>	2825.30.0010						
Argentina		--	--	14,700	NA	14,700	NA
Other [5 countries and (or) localities]		114,000 <sup>r</sup>	NA	--	--	397,000	NA
Total		114,000	XX	14,700	XX	411,000	XX
Other oxides and hydroxides of vanadium	2825.30.0050						
Other [5 countries and (or) localities]		741 <sup>r</sup>	NA	--	--	45,700	NA
Total		741	XX	--	--	45,700	XX
Ferrovanadium	7202.92.0000						
Canada		21,900	16,400	9,270	6,950	89,500	67,200
Mexico		53,600	40,200	110,000	82,200	346,000	222,000
Other [6 countries and (or) localities]		5,240 <sup>r</sup>	3,930 <sup>r</sup>	--	--	35,400	24,600
Total		80,800	60,600	119,000	89,200	471,000	314,000

<sup>r</sup>Revised. NA Not available. XX Not applicable. -- Zero.

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

<sup>2</sup>Presentation of monthly data is based on the quantities (gross weight or contained weight) of the five leading countries and (or) localities in September.

<sup>3</sup>Harmonized Tariff Schedule of the United States (HTS).

<sup>4</sup>May include catalysts containing vanadium pentoxide.

Source: U.S. Census Bureau.

TABLE 5  
U.S. IMPORTS AND EXPORTS OF ALUMINUM VANADIUM MASTER ALLOY, VANADIUM BEARING ASH AND RESIDUES,  
VANADIUM SULFATES, VANADATES, VANADIUM METAL AND U.S. IMPORTS OF SLAG<sup>1,2</sup>

(Kilograms, gross and contained weight)

Country or locality	HTS <sup>3</sup> code	2018					
		August		September		January–September	
		Gross weight	Contained weight	Gross weight	Contained weight	Gross weight	Contained weight
<b>Imports for consumption:</b>							
Slag, from the manufacture of iron and steel	2619.00.9000						
Australia		--	--	3,040	NA	3,040	NA
Canada		20,300,000	NA	2,830,000	NA	70,300,000	NA
Finland		--	--	8,340	NA	8,340	NA
Germany		--	--	48,400,000	NA	48,400,000	NA
Mexico		18,700	NA	75,800	NA	350,000	NA
Other [2 countries and (or) localities]		--	--	--	--	22,300,000	NA
Total		20,400,000	XX	51,300,000	XX	141,000,000	XX
Vanadium bearing ash and residues	2620.40.0030, 2620.99.1000						
Canada		2,250,000	220,000	1,820,000	182,000	17,900,000	1,750,000
Mexico		--	--	906,000	104,000	1,000,000	128,000
Other [4 countries and (or) localities]		96,100 <sup>r</sup>	5,380 <sup>r</sup>	--	--	303,000	34,600
Total		2,340,000	225,000	2,730,000	286,000	19,200,000	1,920,000
Vanadium sulfates	2833.29.3000						
China		5,070	3,160	--	--	7,900	5,070
Other [1 country and (or) locality]		--	--	--	--	160	100
Total		5,070	3,160	--	--	8,060	5,170
Vanadates	2841.90.1000						
Taiwan		18,900	12,300	37,800	24,600	189,000	123,000
Other [8 countries and (or) localities]		925 <sup>r</sup>	117 <sup>r</sup>	--	--	202,000	110,000
Total		19,800	12,400	37,800	24,600	391,000	233,000
Vanadium metal, including waste and scrap and aluminum-vanadium master alloy	8112.92.7000, 8112.99.2000						
Belgium		--	--	1,000	650	1,000	650
China		37,600	24,500	16,100	12,500	114,000	76,300
Germany		3,380	2,600	8,770	7,030	34,000	25,800
Russia		36,300	23,200	959	956	240,000	154,000
Other [6 countries and (or) localities]		297 <sup>r</sup>	249 <sup>r</sup>	--	--	5,160	4,450
Total		77,700	50,500	26,800	21,100	394,000	261,000
<b>Exports:</b>							
Vanadium bearing ash and residues	2620.50.0000, 2620.99.1000						
France		145,000	NA	--	--	145,000	NA
Other [8 countries and (or) localities]		--	--	--	--	1,520,000	NA
Total		145,000	XX	--	--	1,670,000	XX
Vanadium metal, including waste and scrap and aluminum-vanadium master alloy	8112.92.7000, 8112.99.2000						
Finland		--	--	5	NA	5	NA
United Kingdom		553	NA	4,570	NA	12,700	NA
Other [13 countries and (or) localities]		7,530 <sup>r</sup>	NA	--	--	175,000	NA
Total		8,090	XX	4,570	XX	188,000	XX

<sup>r</sup>Revised. NA Not available. XX Not applicable. -- Zero.

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

<sup>2</sup>Presentation of monthly data is based on the quantities (gross weight or contained weight) of the five leading countries and (or) localities in September.

<sup>3</sup>Harmonized Tariff Schedule of the United States.

Source: U.S. Census Bureau.