

# Mineral Industry Surveys

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## VANADIUM IN NOVEMBER 2020

Reported domestic vanadium consumption in November 2020 was essentially unchanged compared with consumption in October 2020, and 57% more than consumption in November 2019 (tables 1 and 2). However, it is important to note that monthly reported domestic vanadium consumption in 2020 was revised in order to include consumption data from an annually reported domestic vanadium consumer that was not included on a monthly basis in 2019.

Consumer stocks of all forms of vanadium were 179 metric tons (t) of contained vanadium at the end of November 2020, essentially unchanged compared with consumer stocks in October 2020 and a 7% decrease from 192 t at yearend 2019 (table 1).

**Prices**

According to CRU Group (2021), U.S. ferrovanadium (FeV) prices ranged from \$9.763 to \$10.700 per pound of contained vanadium in November 2020, compared with \$9.750 to \$10.700 per pound in October 2020. In Europe, FeV prices ranged from \$23.694 to \$24.238 per kilogram of contained vanadium in November 2020, compared with \$24.067 to \$24.600 per kilogram in October 2020. In China, vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) prices have ranged from \$6.300 to \$6.500 per pound of contained vanadium since June 2020 (fig. 1).

**Reference Cited**

CRU Group, 2021, Noble alloys and minor metals prices: CRU Group, January 4. (Accessed January 16, 2021, via <http://www.crugroup.com/>)

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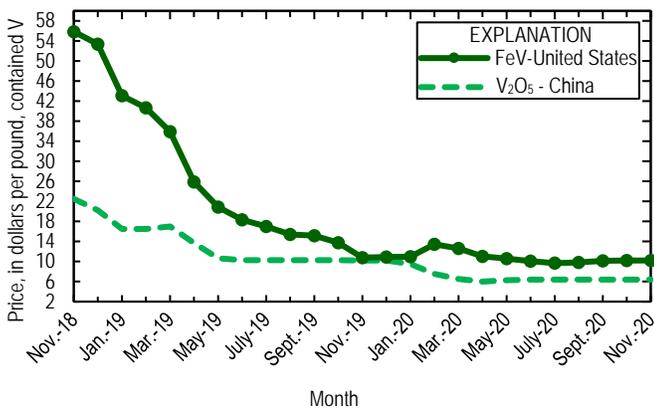


Figure 1. Average monthly prices for FeV and V<sub>2</sub>O<sub>5</sub> from November 2018 through November 2020. Source: CRU Group.

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

(Kilograms, contained vanadium)

	2020					
	October		November		January–November	
	Consumption	Stocks	Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	350,000	139,000	351,000	137,000	3,810,000	137,000
Vanadium-aluminum alloy and other forms <sup>3</sup>	19,900	40,100	19,800	42,100	235,000	42,100
<b>Total</b>	<b>370,000</b>	<b>179,000</b>	<b>371,000</b>	<b>179,000</b>	<b>4,050,000</b>	<b>179,000</b>

<sup>e</sup>Estimated.

<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>e, 1</sup>

(Kilograms, contained vanadium)

	2020		
	October	November	January– November
Steel:			
Carbon	W	W	W
Full alloy	97,800	97,800	1,100,000
High-strength low-alloy	W	W	W
Stainless and heat resisting	4,530	4,490	53,000
Tool	W	W	W
Total steel	102,000	102,000	1,150,000
Superalloys	W	W	W
Miscellaneous and unspecified <sup>2</sup>	W	W	W
Total	370,000	371,000	4,050,000

<sup>e</sup>Estimated. 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	2020								
		October			November			January–November		
		Gross weight	Contained weight	Value (thousands)	Gross weight	Contained weight	Value (thousands)	Gross weight	Contained weight	Value (thousands)
Vanadium ores and concentrates	2615.90.6090	--	--	--	91	46	\$7,220	6,370	3,600	\$529,000
Vanadium bearing ash and residues	2620.40.0030, 2620.99.1000	26,300	7,950	\$239,000	(3)	(3)	58,900	387,000	60,000	6,980,000
Chemical compounds:										
Vanadium pentoxide (anhydride)	2825.30.0010	50,600	50,400	720,000	30,000	25,700	479,000	2,260,000	1,560,000	35,300,000
Vanadium oxides and hydroxides, other	2825.30.0050	--	--	--	--	--	--	101,000	66,500	2,830,000
Vanadium sulfates	2833.29.3000	24,500	19,600	179,000	--	--	--	28,800	22,300	208,000
Vanadates	2841.90.1000	75	50	3,620	2,000	1,600	33,100	187,000	104,000	2,030,000
Ferrovandium	7202.92.0000	144,000	115,000	3,080,000	168,000	126,000	3,510,000	1,740,000	1,190,000	50,900,000
Vanadium metal, including waste and scrap	8112.92.7000	--	--	--	38	38	5,250	311	161	70,300
Vanadium and articles thereof <sup>4</sup>	8112.99.2000	1,770	1,150	169,000	2,300	1,970	264,000	132,000	87,900	5,490,000
Total		247,000	194,000	4,390,000	203,000	155,000	4,360,000	4,840,000	3,090,000	104,000,000

-- 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.

<sup>3</sup>Data suppressed according to U.S. Census Bureau; not included in "Total."

<sup>4</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, OTHER OXIDES AND HYDROXIDES OF VANADIUM  
AND VANADIUM PENTOXIDE (ANHYDRIDE)<sup>1,2</sup>

(Kilograms, gross and contained weight)

Country or locality	HTS <sup>3</sup> code	2020					
		October		November		January–November	
		Gross weight	Contained weight	Gross weight	Contained weight	Gross weight	Contained weight
<b>Imports for consumption:</b>							
Vanadium ores and concentrates	2615.90.6090						
Mexico		--	--	91	46	6,100	3,440
Other, Canada		--	--	--	--	278	167
Total		--	--	91	46	6,370	3,600
Vanadium pentoxide (anhydride) <sup>4</sup>	2825.30.0010						
Brazil		20,000	20,000	20,000	20,000	1,340,000	863,000
Germany		--	--	10,000	5,710	155,000	118,000
Other [4 countries and (or) localities]		30,600 <sup>r</sup>	30,400 <sup>r</sup>	--	--	761,000	581,000
Total		50,600	50,400	30,000	25,700	2,260,000	1,560,000
Ferrovanadium	7202.92.0000						
Austria		16,200	13,000	36,400	21,300	531,000	364,000
Canada		128,000	102,000	132,000	105,000	961,000	715,000
Other [5 countries and (or) localities]		--	--	--	--	247,000	108,000
Total		144,000	115,000	168,000	126,000	1,740,000	1,190,000
<b>Exports:</b>							
Vanadium ores and concentrates	2615.90.6090						
China		--	--	2,980	NA	2,980	NA
Other [7 countries and (or) localities]		7,100 <sup>r</sup>	NA	--	--	60,900	NA
Total		7,100	XX	2,980	XX	63,900	XX
Vanadium pentoxide (anhydride) <sup>4</sup>	2825.30.0010						
Germany		--	--	NA	150	NA	150
Italy		--	--	NA	2,040	NA	2,040
Other [4 countries and (or) localities]		NA	100 <sup>r</sup>	--	--	NA	47,400
Total		XX	100	XX	2,190	XX	49,600
Other oxides and hydroxides of vanadium	2825.30.0050						
Jamaica		--	--	NA	318	NA	318
Kuwait		--	--	NA	300	NA	300
Other [6 countries and (or) localities]		--	--	--	--	NA	45,100
Total		--	--	XX	618	XX	45,700
Ferrovanadium	7202.92.0000						
Canada		--	--	11,400	8,510	19,000	14,200
Other [11 countries and (or) localities]		10,000 <sup>r</sup>	8,020 <sup>r</sup>	--	--	176,000	133,000
Total		10,000	8,020	11,400	8,510	195,000	147,000

<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 or localities in November.

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

<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	2020					
		October		November		January–November	
		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						
Canada		1,110,000	NA	1,330,000	NA	7,890,000	NA
Finland		--	--	2,580	NA	23,800	NA
Mexico		33,600	NA	51,900	NA	302,000	NA
Other, Japan		318 <sup>r</sup>	NA	--	--	318	NA
Total		1,140,000	XX	1,380,000	XX	8,220,000	XX
Vanadium bearing ash and residues, Belgium	2620.40.0030, 2620.99.1000	26,300	7,950	--	--	387,000	60,000
Vanadium sulfates	2833.29.3000						
Finland		24,500	19,600	--	--	24,500	19,600
Other [2 countries and (or) localities]		--	--	--	--	4,290	2,680
Total		24,500	19,600	--	--	28,800	22,300
Vanadates	2841.90.1000						
China		--	--	2,000	1,600	2,660	2,130
Other [9 countries and (or) localities]		75 <sup>r</sup>	50 <sup>r</sup>	--	--	184,000	102,000
Total		75	50	2,000	1,600	187,000	104,000
Vanadium metal, including waste and scrap and aluminum-vanadium master alloy	8112.92.7000, 8112.99.2000						
Germany		66	66	1,510	1,190	3,550	2,770
Russia		--	--	784	782	113,000	74,500
United Kingdom		--	--	40	40	42	42
Other [5 countries and (or) localities]		1,700	1,080	--	--	15,800	10,700
Total		1,770	1,150	2,340	2,010	132,000	88,000
<b>Exports:</b>							
Vanadium bearing ash and residues	2620.50.0000, 2620.99.1000						
Belgium		46,600	NA	58,200	NA	105,000	NA
Other [6 countries and (or) localities]		73,700 <sup>r</sup>	NA	--	--	659,000	NA
Total		120,000	XX	58,200	XX	764,000	XX
Vanadium metal, including waste and scrap and aluminum-vanadium master alloy	8112.92.7000, 8112.99.2000						
United Kingdom		--	--	372	NA	5,890	NA
Other [11 countries and (or) localities]		9 <sup>r</sup>	NA	--	--	18,600	NA
Total		9	XX	372	XX	24,500	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 in November.

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

Source: U.S. Census Bureau.