

# Mineral Industry Surveys

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## VANADIUM IN DECEMBER 2023

The amount of vanadium in U.S. imports of select vanadium products on a gross weight basis, excluding vanadium bearing ash and residues, in December 2023, was 24% less than the previous month and 35% less than December 2022. In 2023, the total amount of vanadium in U.S. imports of select vanadium products on a gross weight basis, excluding vanadium bearing ash and residues, was 3% more than in 2022 (table 1).

In December 2023, the leading import sources for vanadium pentoxide ( $V_2O_5$ ), were Brazil and South Africa, in descending order of gross weight quantity. In December 2023, the leading import sources for ferrovanadium (FeV) were Canada, Austria, and Japan in descending order of gross weight quantity. In 2023, the leading import sources for  $V_2O_5$  were Brazil and South Africa, in descending order of gross weight quantity. In 2023, the leading import sources for FeV were Canada, Austria, and Japan, in descending order of gross weight quantity (table 2).

## Prices

According to CRU Group, U.S. FeV prices ranged from \$13.206 to \$13.750 per pound of contained vanadium in December 2023 compared with \$14.211 to \$14.694 per pound in November 2023. In Europe, FeV prices ranged from \$26.625 to \$27.750 per kilogram of contained vanadium in December 2023 compared with \$26.500 to \$27.000 in November 2023. In China,  $V_2O_5$  prices ranged from \$9.000 to \$9.500 per pound of contained vanadium in December 2023, unchanged since September 2021 (fig. 1).

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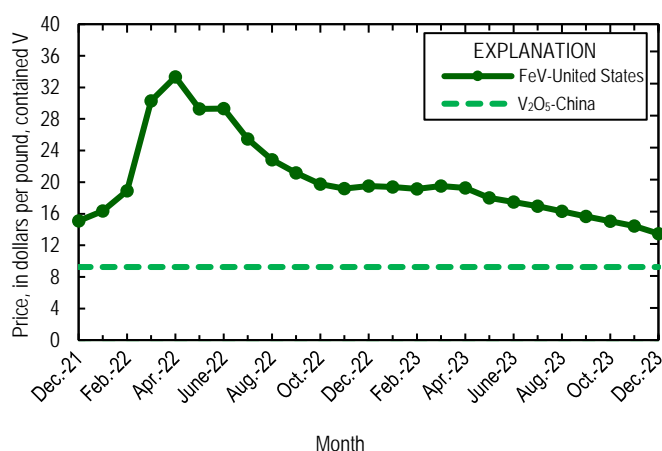


Figure 1. Average monthly prices for ferrovanadium (FeV) and vanadium pentoxide ( $V_2O_5$ ) from December 2021 through December 2023. Source: CRU Group.

TABLE 1  
U.S. IMPORTS FOR CONSUMPTION OF VANADIUM PRODUCTS<sup>1</sup>

(Kilograms, unless otherwise specified)

Material	HTS <sup>2</sup> codes	2023								
		November			December			January–December		
		Gross weight	Vanadium content	Value (thousands)	Gross weight	Vanadium content	Value (thousands)	Gross weight	Vanadium content	Value (thousands)
Vanadium ores and concentrates	2615.90.6090	517,000	285,000 <sup>3</sup>	\$2,300,000	418,000	194,000 <sup>3</sup>	1,750,000	2,200,000	1,200,000 <sup>3</sup>	9,770,000
Vanadium bearing ash and residues	2620.40.0030, 2620.99.1000	(4)	(4)	1,610,000	666	457 <sup>3</sup>	754,000	666	457 <sup>3</sup>	26,200,000
Chemical compounds:										
Vanadium pentoxide (anhydride)	2825.30.0010	340,000	226,000	6,150,000	249,000	240,000	4,650,000	3,010,000	2,320,000 <sup>5</sup>	67,900,000
Vanadium oxides and hydroxides, other	2825.30.0050	--	--	--	20,000	13,300	393,000	230,000	151,000	5,280,000
Vanadium chlorides	2827.39.1000	21,800	21,700	1,430,000	18,600	17,700	282,000	161,000	154,000	5,730,000
Vanadium chloride oxide and chloride hydroxide	2827.49.1000	--	--	--	--	--	--	582,000	363,000	504,000
Vanadium sulfates	2833.29.3000	200	124	10,400	--	--	--	2,650	1,690	27,500
Vanadates	2841.90.1000	--	--	--	--	--	--	39,800	28,900	783,000
Hydrides and nitrides of vanadium	2850.00.2000	31,200	25,000	190,000	22,300	17,800	99,300	306,000	245,000	2,010,000
Ferrovandium	7202.92.0000	280,000	217,000	10,200,000	179,000	135,000	7,210,000	2,980,000	2,280,000	98,500,000
Vanadium metal, including waste and scrap	8112.92.7000	344	157	105,000	--	--	--	20,800	20,000	1,220,000
Vanadium and articles thereof <sup>6</sup>	8112.99.2000	2	2	6,740	--	--	--	336,000	221,000	15,700,000
Total		1,190,000	XX	22,000,000	908,000	XX	15,100,000	9,870,000	XX	234,000,000

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>Harmonized Tariff Schedule of the United States.

<sup>3</sup>Data are in kilograms of vanadium pentoxide.

<sup>4</sup>U.S. Census Bureau has suppressed quantity data for some months; not included in "Total."

<sup>5</sup>Includes U.S. Geological Survey estimates.

<sup>6</sup>Aluminum-vanadium master alloy consisting of 35% aluminum and 64.5% vanadium.

Source: U.S. Census Bureau.

TABLE 2  
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		2023					
		November		December		January–December	
		Gross weight	Vanadium content	Gross weight	Vanadium content	Gross weight	Vanadium content
Imports for consumption:	HTS <sup>3</sup> codes						
Vanadium ores and concentrates	2615.90.6090						
Canada		517,000	285,000 <sup>4</sup>	416,000	193,000 <sup>4</sup>	1,430,000	743,000 <sup>4</sup>
Mexico		639	383 <sup>4</sup>	1,590	953 <sup>4</sup>	767,000	460,000 <sup>4</sup>
Other [1 country and (or) locality]		--	--	--	--	9	3 <sup>4</sup>
Total		517,000	285,000 <sup>4</sup>	418,000	194,000 <sup>4</sup>	2,200,000	1,200,000 <sup>4</sup>
Vanadium pentoxide (anhydride)	2825.30.0010						
Brazil		160,000	125,000	220,000	211,000	1,540,000	1,350,000
South Africa		180,000	101,000	29,400	29,200	1,300,000	820,000
Other [5 countries and (or) localities]		--	--	--	--	169,000	147,000 <sup>5</sup>
Total		340,000	226,000	249,000	240,000	3,010,000	2,320,000 <sup>5</sup>
Other oxides and hydroxides of vanadium:	2825.30.0050						
South Africa		--	--	20,000	13,300	120,000	79,400
Other [1 country and (or) locality]		--	--	--	--	110,000	71,400
Total		--	--	20,000	13,300	230,000	151,000
Ferrovanadium	7202.92.0000						
Austria		140,000	109,000	34,000	27,000	1,140,000	911,000
Canada		125,000	101,000	125,000	97,700	1,470,000	1,170,000
Japan		--	--	20,000	10,200	251,000	128,000
Other [2 country and (or) locality]		15,400 <sup>r</sup>	6,470 <sup>r</sup>	--	--	123,000	66,900
Total		280,000	217,000	179,000	135,000	2,980,000	2,280,000
Exports:	Schedule B <sup>3</sup> codes						
Vanadium ores and concentrates	2615.90.6090						
Latvia		3,500	NA	--	--	3,500	NA
Other [3 countries and (or) localities]		--	--	--	--	143,000	NA
Total		3,500	XX	--	--	147,000	XX
Vanadium pentoxide (anhydride) <sup>6</sup>	2825.30.0010						
Belgium		NA	--	NA	10,100	NA	10,100
Thailand		NA	--	NA	24	NA	24
Other [6 countries and (or) localities]		NA	6,400 <sup>r</sup>	--	--	NA	18,100
Total		XX	6,400	XX	10,100	XX	28,200
Other oxides and hydroxides of vanadium:	2825.30.0050						
Canada		NA	1,360	NA	1,360	NA	22,600
Other [6 countries and (or) localities]		NA	434 <sup>r</sup>	--	--	NA	114,000
Total		XX	1,800	XX	1,360	XX	136,000
Ferrovanadium	7202.92.0000						
Argentina		--	--	--	--	198	149
Colombia		--	--	--	--	301	226
Other [5 countries and (or) localities]		--	--	--	--	224,000	151,000
Total		--	--	--	--	224,000	151,000

<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 leading countries and (or) localities in November.

<sup>3</sup>Harmonized Tariff Schedule of the United States are imports and Schedule B of the United States are exports.

<sup>4</sup>Data are kilograms of vanadium pentoxide.

<sup>5</sup>Includes U.S. Geological Survey estimates.

<sup>6</sup>May include catalysts containing vanadium pentoxide.

Source: U.S. Census Bureau.

TABLE 3  
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		2023					
		November		December		January–December	
		Gross weight	Vanadium content	Gross weight	Vanadium content	Gross weight	Vanadium content
Imports for consumption:	HTS <sup>3</sup> codes						
Slag, from the manufacture of iron and steel	2619.00.9000						
Canada		1,880,000	NA	1,600,000	NA	19,200,000	NA
Mexico		90,900	NA	16,600	NA	730,000	NA
Other [4 countries and (or) localities]		513,000 <sup>r</sup>	NA	--	--	2,240,000	NA
Total		2,480,000	XX	1,620,000	XX	22,200,000	XX
Sulfates; China	2833.29.3000	200	124	--	--	2,650	1,690
Vanadates	2841.90.1000						
China		--	--	--	--	30,000	22,000
South Africa		--	--	--	--	5,000	3,850
Other [4 countries and (or) localities]		--	--	--	--	4,800	3,060
Total		--	--	--	--	39,800	28,900
Vanadium metal, including waste and scrap and aluminum-vanadium master alloy	8112.92.7000, 8112.99.2000						
Germany		340	153	--	--	19,200	18,700
Japan		4	4	--	--	1,760	1,410
United Kingdom		2	2	--	--	10	10
Other [7 countries and (or) localities]		--	--	--	--	336,000	221,000
Total		346	159	--	--	357,000	241,000
Exports:	Schedule B <sup>3</sup> codes						
Vanadium bearing ash and residues	2620.50.0000, 2620.99.1000						
France		94,700	NA	135,000	NA	860,000	NA
Germany		33,800	NA	63,700	NA	140,000	NA
Netherlands		--	--	20,000	NA	186,000	NA
Other [5 countries and (or) localities]		13,300 <sup>r</sup>	NA	--	--	344,000	NA
Total		142,000	XX	219,000	XX	1,530,000	XX
Hydrides and nitrides of vanadium	2850.00.2000						
Germany		18,400	14,900	940	930	165,000	133,000
South Africa		12,800	10,100	21,400	16,900	117,000	92,100
Other [7 countries and (or) localities]		--	--	--	--	24,700	19,900
Total		31,200	25,000	22,300	17,800	306,000	245,000
Vanadium metal, including waste and scrap and aluminum-vanadium master alloy	8112.92.7000, 8112.99.2000						
France		268	NA	530	NA	6,540	NA
Japan		11,600	NA	19,500	NA	102,000	NA
Other [7 countries and (or) localities]		458 <sup>r</sup>	NA	--	--	26,800	NA
Total		12,300	XX	20,000	XX	135,000	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 leading countries and (or) localities in November.

<sup>3</sup>Harmonized Tariff Schedule of the United States are imports and Schedule B of the United States are exports.

Source: U.S. Census Bureau.