

# Mineral Industry Surveys

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## VANADIUM IN SEPTEMBER 2016

Reported domestic consumption of vanadium in September 2016 was about the same as the previous month and was about the 4% less than that of September 2015. Consumer stocks of all forms of vanadium were 160 metric tons (t) at the end of September, a decrease from 166 t at yearend 2015.

According to CRU Group, U.S. ferrovanadium (FeV) prices ranged from \$9.422 to \$9.917 per pound of vanadium content in September, compared with \$9.450 to \$10.000 in August. European FeV prices ranged from \$18.550 to \$18.933 per kilogram of vanadium content in September, compared with \$18.789 to \$19.333 in August. Vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) prices ranged from \$3.300 to \$3.600 per pound of vanadium content in September, compared with \$3.083 to \$3.433 in August (fig. 1).

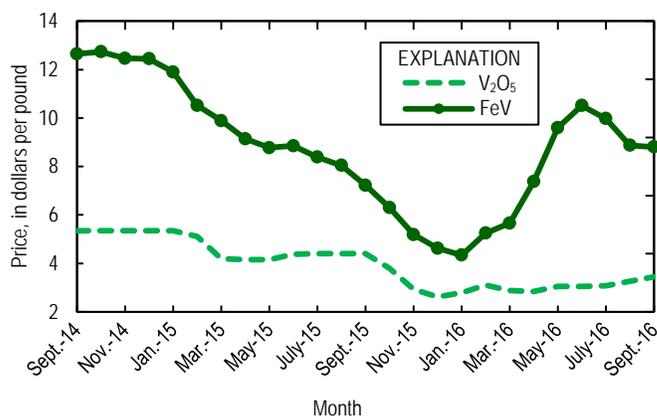


Figure 1. Average monthly prices for U.S. vanadium pentoxide and ferrovanadium from September 2014 through September 2016. Source: CRU Group.

### Reference Cited

CRU Group, 2016, Noble alloys and minor metals prices: CRU Group, October 31. (Accessed November 17, 2016, via <http://www.crugroup.com/>.)

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

(Kilograms, contained vanadium)

	2015		2016					
	Consumption	Stocks	August		September		January–September	
			Consumption	Stocks	Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	2,750,000	96,200	220,000	93,900	217,000	89,600	1,980,000	89,600
Vanadium-aluminum alloy and other forms <sup>3</sup>	803,000	70,100	66,500	70,100	66,400	70,100	598,000	70,100
Total	3,550,000	166,000	286,000	164,000	283,000	160,000	2,580,000	160,000

<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)

	2015	2016		
	January– December	August	September	January– September
Steel:				
Carbon	W	W	W	W
Full alloy	1,420,000	118,000	118,000	1,060,000
High-strength low-alloy	W	W	W	W
Stainless and heat resisting	59,200	4,940	4,930	44,400
Tool	W	W	W	W
Total steel	3,240,000	123,000	123,000	1,110,000
Superalloys	2,800	W	W	W
Miscellaneous and unspecified <sup>2</sup>	306,000	W	W	W
Total	3,550,000	286,000	283,000	2,580,000

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.

<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 ALLOYS AND VANADIUM METAL, INCLUDING WASTE AND SCRAP<sup>1</sup>

(Kilograms, gross weight)

	Aluminum-vanadium master alloy <sup>2</sup>		Vanadium metal, including waste and scrap <sup>3</sup>	
	Quantity	Value	Quantity	Value
Imports for consumption:				
2015	204,000	\$4,520,000	182,000	\$3,450,000
2016:				
August	28,000	522,000	--	--
September:				
Germany	24	11,400	--	--
Russia	17,800	301,000	--	--
Total	17,900	313,000	--	--
January–September	197,000	3,450,000	18,200	410,000
Exports:				
2015	229,000	6,440,000	5,200	354,000
2016:				
August	4,610	239,000	105	9,740
September:				
Australia	--	--	1,000	76,800
France	1,640	63,100	--	--
Germany	--	--	--	--
Japan	--	--	12,000	253,000
Singapore	--	--	73	2,810
Total	1,640	63,100	13,100	333,000
January–September	88,100	2,030,000	16,300	579,000

-- Zero.

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

<sup>2</sup>Aluminum-vanadium master alloy consisting of 35% aluminum and 64.5% vanadium. Includes Harmonized Tariff Schedule code 8112.99.2000.

<sup>3</sup>Vanadium metal, including waste and scrap (HTS 8112.92.7000).

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 <sup>2</sup>		Vanadium pentoxide (anhydride) <sup>3,4</sup>		Other oxides and hydroxides of vanadium <sup>5</sup>	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>Imports for consumption:</b>						
2015	2,030,000	\$64,700,000	2,870,000	\$32,800,000	93,700	\$1,840,000
2016:						
August	212,000	4,760,000	265,000	2,240,000	52,200	856,000
September:						
Austria	91,500	1,170,000	--	--	--	--
Brazil	1,890	64,200	39,800	291,000	--	--
Canada	279	3,930	--	--	--	--
China	--	--	59,700	555,000	--	--
Czech Republic	(6)	1,980,000	--	--	--	--
Germany	--	--	10,700	216,000	--	--
Japan	36,000	311,000	--	--	--	--
Korea, Republic of	6,400	119,000	--	--	--	--
South Africa	--	--	120,000	1,180,000	78,000	1,270,000
Taiwan	--	--	10,500	151,000	--	--
Total	136,000	3,650,000	240,000	2,400,000	78,000	1,270,000
January–September	1,710,000	35,300,000	1,880,000	18,600,000	556,000	8,410,000
<b>Exports:</b>						
2015	163,000	3,190,000	356,000	3,430,000	99,800	841,000
2016:						
August	15,300	324,000	--	--	21,300	190,000
September:						
Canada	16,500	294,000	--	--	2,460	22,800
India	--	--	668	6,350	--	--
Mexico	5,130	85,900	--	--	--	--
Peru	606	15,200	--	--	--	--
Total	22,200	395,000	668	6,350	2,460	22,800
January–September	426,000	5,440,000	3,890	92,500	116,000	992,000

-- Zero.

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

<sup>2</sup>Includes HTS code 7202.92.0000.

<sup>3</sup>Includes HTS code 2825.30.0010.

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

<sup>5</sup>Includes HTS code 2825.30.0050.

<sup>6</sup>Withheld to avoid disclosing company proprietary data; not included in "Total".

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 <sup>2</sup>		Slag, from the manufacture of iron and steel	
	Quantity	Value	Quantity (gross weight)	Value
	2015	9,440,000	\$36,700,000	87,600,000
2016:				
August	654,000	1,520,000	24,500,000	443,000
September:				
Canada	412,000	775,000	28,700,000 <sup>3</sup>	786,000 <sup>3</sup>
Mexico	--	--	18,000	6,720
Netherlands	18,700	12,300	--	--
Singapore	--	--	654	2,290
Total	431,000	787,000	28,700,000	795,000
January–September	3,820,000	8,040,000	97,600,000	2,390,000

-- Zero.

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

<sup>2</sup>Includes HTS code 2620.99.1000 and 2619.00.9000.

<sup>3</sup>Referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF MISCELLANEOUS VANADIUM CHEMICALS<sup>1</sup>

(Kilograms, contained vanadium)

	Sulfates <sup>2</sup>		Vanadates <sup>3</sup>	
	Quantity	Value	Quantity	Value
2015	12,600	\$142,000	173,000	\$2,330,000
2016:				
August	62	3,010	25,500	312,000
September:				
Austria	--	--	200	4,280
China	--	--	15,600	242,000
Finland	600	4,100	--	--
Germany	1,200	7,900	4,600	92,000
Japan	100	2,540	--	--
Taiwan	--	--	12,300	137,000
Total	1,900	14,500	32,700	475,000
January–September	11,200	110,000	255,000	3,430,000

-- Zero.

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

<sup>2</sup>Sulfates (HTS code 2833.29.3000).

<sup>3</sup>Vanadates (HTS code 2841.90.1000).

Source: U.S. Census Bureau.