

## OVERVIEW

Full Name	<b>Tungsten (Wolfram)</b>
Symbol	<b>W</b>
Atomic Number	<b>74</b>
Series	<b>Transition Metal</b>
Block / Group / Period	<b>d-block   Group 6   Period 6</b>
Electron Config.	<b>[Xe]6s24f145d4</b>
Phase at STP	<b>Solid</b>
Colour	<b>Gray</b>
Discovery	<b>1783 in Spain</b>

## THERMAL PROPERTIES

Melting Point	<b>3422 °C</b>	°C
Melting Point (abs.)	<b>3695 K</b>	K
Boiling Point	<b>5555 °C</b>	°C
Boiling Point (abs.)	<b>5828 K</b>	K
Heat of Fusion	<b>35 kJ/mol</b>	kJ/mol
Heat of Vaporization	<b>800 kJ/mol</b>	kJ/mol
Specific Heat (solid)	<b>132 J/(kg K)</b>	J/(kg·K)
Thermal Conductivity	<b>170 W/(m K)</b>	W/(m·K)
Thermal Expansion	<b>4.5×10<sup>-6</sup> K<sup>-1</sup></b>	K <sup>-1</sup>

## MECHANICAL PROPERTIES

Density (solid, STP)	<b>19.25 g/cm<sup>3</sup></b>	g/cm <sup>3</sup>
Density (liquid, MP)	<b>17.6 g/cm<sup>3</sup></b>	g/cm <sup>3</sup>
Young's Modulus	<b>411 GPa</b>	GPa
Shear Modulus	<b>161 GPa</b>	GPa
Bulk Modulus	<b>310 GPa</b>	GPa
Poisson's Ratio	<b>0.28</b>	
Speed of Sound	<b>5174 m/s</b>	m/s
Mohs Hardness	<b>7.5</b>	
Vickers Hardness	<b>3430 MPa</b>	MPa
Brinell Hardness	<b>2570 MPa</b>	MPa

## ELECTRICAL PROPERTIES

Type	<b>Conductor</b>
Conductivity	<b>2×10<sup>7</sup> S/m</b> S/m
Resistivity	<b>4.999999999997×10<sup>-8</sup> mΩ/m</b> m·m
Superconducting Pt.	<b>0.015</b> K

## MAGNETIC PROPERTIES

Type	<b>Paramagnetic</b>
Vol. Susceptibility	<b>0.0000884</b>
Mass Susceptibility	<b>4.59×10<sup>-9</sup> m<sup>3</sup>/Kg</b> m <sup>3</sup> /kg

## REACTIVITY

Valence	<b>6</b>
Electronegativity	<b>2.36</b> (Pauling)
Electron Affinity	<b>78.6 kJ/mol</b> kJ/mol
Ionization Energies	<b>770, 1700</b> kJ/mol

## ATOMIC DIMENSIONS

Atomic Radius	<b>193 pm</b> pm
Covalent Radius	<b>162 pm</b> pm

## CRYSTAL STRUCTURE

Structure	<b>Body-centered Cubic</b>
Lattice Constant	<b>316.52, 316.52, 316.52 pm</b>
Space Group	<b>Im_3m</b> #229

## ISOTOPES &amp; NUCLEAR

Stability	<b>Stable</b>
Stable Isotopes	<b>180W, 182W, 183W, 184W, 186W</b>
Isotopic Abundance	<b>180W0.12%182W26.5%183W14.31%184W...</b>
Known Isotopes	<b>158W ■ 192W (35 total)</b>
Neutron Cross Sect.	<b>18.4</b> barns

## ELEMENTAL ABUNDANCES

Universe	<b>5×10<sup>-8</sup>%</b> %
Earth's Crust	<b>0.00011%</b> %
Oceans	<b>1.2×10<sup>-8</sup>%</b> %

## HEALTH &amp; SAFETY

DOT Hazard Class	<b>4.1</b>
RTECS Number	<b>YO7175000</b>
NFPA Health/Fire/Rx	<b>0 / 0 / 0</b>