

## Engineering Example List of Export Restricted Items

- Accelerometer
- ADCs (analog-to-digital converters)
- Alloys: aluminum, magnesium, metal powders, nickel, niobium, titanium
- Altimeters
- Amplifiers
- Antennae, for microwave power source, phased array & space
- Array processors/assemblies
- Blanks, beryllium/beryllium (Be/Be) deposited material
- Bulk acoustic wave devices
- Cables, Optical fiber
- Cameras
- Capacitors, high energy storage
- Cathodes
- Ceramic based materials & fibers
- CVD equipment
- Composite materials and structures
- Compound semiconductor integrated circuits
- Computers (rad hard, high temp, high performance, digital, systolic, neural & optical)
- Conductive polymers
- Converter integrated circuits
- Coprocessors or accelerators, graphics
- Cryocoolers for optical sensors
- Cryptographic enabling systems, equipment, integrated circuits, software or technology
- DACs (Digital-to-analog converters)
- Detection systems for explosives and detonators
- Detectors, optical
- Diamond film substrate technology
- Digital array processors
- Digital signal processors
- Digitizers, waveform
- Diodes, laser
- Dry etching equipment, anisotropic plasma
- E.coli, infectious
- Electro-optical materials & integrated circuits
- Electromagnets, superconductive
- Electron beam equipment
- Epitaxial growth equipment
- Fast Fourier Transform (FFT) processors
- Fiber optic magnetometers
- Field programmable gate arrays (FPGA)
- Field programmable logic arrays (FPLA)
- Filters, tunable band-pass
- Frequency analyzers (signal analyzers)
- Gallium organo-metallic compounds; Gallium nitride (GaN) "substrates"
- Gas turbine engine & blades
- Germanium
- Gimbals, optical control
- Graphite
- Gravimeters
- Gyros
- Infectious bacteria or virus
- Information security equipment, software & technology
- Infrared sensors & cameras
- Ion beam equipment for mask making/semiconductor devices
- Integrated circuit computer-aided-design (CAD) software
- Laminates & composite structures, organic metal or carbon
- Laser acoustic detection equipment
- Laser diodes
- Lasers
- Lightweight turbofan/turbojet engines
- Lithograph templates
- Lithography equipment,
- Lithography software
- Logic processors and assemblies
- Machine tools,
- Magnetic metals
- Metals or carbon coated fibers
- Micromachined Angular Rate Sensors
- Microwave circuits & frequency extenders,
- Microwave wave components
- Military items, specially designed
- Mirrors, optical
- Mixers, frequency extenders
- Monolithic integrated circuits
- Multi-layer masks (with phase shift layer),
- Multichip integrated circuits
- Multimode optical fiber & cables, high tensile strength
- Multispectral imaging sensors
- Nanocrystalline alloy strips
- Navigation systems, equipment & components
- Neodymium lasers
- Neural network integrated circuits & computers
- Niobium alloys
- Non-linear optical materials
- Optical components & equipment
- Oscilloscopes
- Plasma separation process equipment & components
- Polymeric substances
- Propeller blades or propfans composite technology
- Propulsion systems/components,
- Quantum cryptography
- Radar systems, components, & SW
- Radar altimeters
- Radiation hardened items
- Radiographic equipment
- Recording equipment, analog & digital tape recorders
- Recovery of source code – software
- Reinforced composite materials
- Remotely operated vehicles
- Resin impregnated fibers
- Reticles
- Robots
- S-parameter test/measurement equipment
- Satellite parts & components
- Scanning electronic beam guns
- Sensors
- Signal processing devices
- Silicon carbide (SiC) substrate blanks
- Silicon, hetero-epitaxial grown multi-layer substrates
- Silicon carbide wafers
- Slapper detonators (Electric)
- Software for restricted items
- Solenoids, superconductive
- Solid-state imaging devices
- Solid-state power semiconductor switches, diodes, or 'modules
- Sonar
- Source code for restricted items or encryption
- SONENT (Synchronous Optical Network) technology
- Space launch vehicles
- SQUIDS (Superconducting quantum interference devices)
- Submersible vehicles/vehicle systems, equipment, or components
- Superconductive materials, devices or circuits
- Technology for restricted items
- Test equipment for semiconductor devices
- UAVs Unmanned aerial vehicles
- Wafer probe, production align and expose equipment
- Waveform digitizers
- Wide-swath bathymetric survey systems
- Zinc selenide(ZnSe), substrate blanks
- Zinc sulphide (ZnS), substrate blanks
- Zirconium fluoride (ZrF4) glass
- Zirconium metal, alloy, compounds

**This list is not exhaustive.**

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<http://www.bis.doc.gov/index.php/regulations/export-administration-regulations-ear>

[http://www.pmdtc.state.gov/regulations\\_laws/itar.html](http://www.pmdtc.state.gov/regulations_laws/itar.html)

# Engineering Example List of Export Restricted Items

## Export Restricted Materials

**Periodic Table of the Elements**

The periodic table below shows various elements. Elements circled in red in the original image are: H, Li, Be, He, Mg, Ca, Sr, Ba, Ra, Ti, Zr, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, Tl, Pb, Bi, Po, At, Rn, Fr, Ra, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, and Lr. A legend at the bottom identifies element categories: Alkali Metal, Alkaline Earth, Transition Metal, Basic Metal, Semimetal, Nonmetal, Halogen, Noble Gas, Lanthanide, and Actinide.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
IA	IIA	IIIB	IVB	VB	VIB	VIB	VIII	VIII	VIII	IB	IIB	IIIA	IVA	VA	VIA	VIA	VIIA	VIIIA
1 H Hydrogen 1.008																	2 He Helium 4.003	
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	
11 Na Sodium 22.990	12 Mg Magnesium 24.305	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.45	18 Ar Argon 39.948											
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.88	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.69	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.63	33 As Arsenic 74.922	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.798	
37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98.906	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.905	46 Pd Palladium 106.367	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.6	53 I Iodine 126.905	54 Xe Xenon 131.29	
55 Cs Cesium 132.905	56 Ba Barium 137.327	57-71 Lanthanide Series	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.222	78 Pt Platinum 195.084	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.38	82 Pb Lead 207.2	83 Bi Bismuth 208.98	84 Po Polonium 209	85 At Astatine 210	86 Rn Radon 222	
87 Fr Francium 223	88-103 Actinide Series	104 Rf Rutherfordium 261	105 Db Dubnium 262	106 Sg Seaborgium 263	107 Bh Bohrium 264	108 Hs Hassium 265	109 Mt Meitnerium 266	110 Ds Darmstadtium 267	111 Rg Roentgenium 268	112 Cn Copernicium 269	113 Nh Nihonium 270	114 Fl Flerovium 271	115 Uup Ununpentium 272	116 Lv Livermorium 273	117 Uus Ununseptium 274	118 Uuo Ununoctium 276		
		57 La Lanthanum 138.905	58 Ce Cerium 140.12	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.24	61 Pm Promethium 145	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.50	67 Ho Holmium 164.930	68 Er Erbium 167.259	69 Tm Thulium 168.930	70 Yb Ytterbium 173.054	71 Lu Lutetium 174.967		
		89 Ac Actinium 227	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.076	97 Bk Berkelium 247.070	98 Cf Californium 251.083	99 Es Einsteinium 252.083	100 Fm Fermium 257.103	101 Md Mendelevium 258.103	102 No Nobelium 259.103	103 Lr Lawrencium 260.103		
		Alkali Metal	Alkaline Earth	Transition Metal	Basic Metal	Semimetal	Nonmetal	Halogen	Noble Gas	Lanthanide	Actinide							

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