

U.S. Space Industry Deep Dive

Product and Service List

(Section 3 on the survey template)

A1 - Astronomical satellites
A2 - Atmospheric balloon packages
A3 - Atmospheric probes
A4 - Communications satellites
A5 - Earth observation satellites (excluding meteorological, remote sensing, and imaging)
A6 - Landers
A7 - Manned spacecraft
A8 - Meteorological satellites
A9 - Microsatellites
A10 - Navigation satellites
A11 - Remote sensing and imaging satellites
A12 - Satellite or spacecraft buses
A13 - Search and rescue satellites
A14 - Space habitats
A15 - Surface penetrators
A16 - Surface rovers
A17 - Unmanned space exploration spacecraft
A18 - Small launch vehicles (<2,000 kg payload)
A19 - Medium launch vehicles (2,000 - 20,000 kg payload)
A20 - Heavy launch vehicles (20,000 - 50,000 kg payload)
A21 - Super-heavy launch vehicles (50,000 kg+ payload)
A22 - Other spacecraft/launch vehicles
B1 - Casings
B2 - Chambers
B3 - Cold gas propulsion systems and their components
B4 - Cryo fuel transfer, storage, and equipment
B5 - Hybrid rocket motors, engines, and their components (including HTPB-based systems)
B6 - Igniters
B7 - Ion propulsion systems and their components
B8 - Liquid rocket motors, engines, and their components
B9 - Non-Toxic Monopropellant propulsion systems and their components
B10 - Nozzles
B11 - Nuclear thermal electric propulsion systems and components
B12 - Propellant tanks
B13 - Solar electric propulsion systems and their components
B14 - Solid rocket motors, engines, and their components
B15 - Thermal electric propulsion systems and their components
B16 - Thrusters not specified above
B17 - Other space-related propulsion systems
B18 - Cutting, lubricating, and hydraulic oils and greases
B19 - Fuel oils
B20 - HTPB (Hydroxyl-Terminated Polybutadiene) fuel
B21 - LO2/LCH4 (Liquid Oxygen/Liquid Methane) fuel
B22 - LOX/LH2 (Liquid Oxygen/Liquid Hydrogen) fuel
B23 - Other liquid propellants and fuels - petroleum-based (and constituent ingredients)
B24 - Solid fuels (and constituent ingredients)
B25 - Other space-related fuels
C1 - Accelerometers
C2 - Actuators
C3 - Altitude determination and control equipment and components
C4 - Altitude determination and control sensors (including altimeters)
C5 - Earth sensors
C6 - Entry, descent, and landing systems
C7 - Gimbal systems and equipment
C8 - GPS equipment
C9 - Guidance, navigation, and control equipment and components
C10 - Gyroscopes
C11 - Hazard detection and avoidance systems

C12 - Inertial navigations systems
C13 - Light Detection and Ranging (LIDAR) systems
C14 - Radar systems
C15 - Reaction/momentum wheels
C16 - Rendezvous and docking systems
C17 - Space object capturing systems
C18 - Star trackers
C19 - Sun sensors
C20 - Telemetry equipment and components
C21 - Thrust control systems
C22 - Other space-related navigation and control equipment and components
D1 - Antennas/antenna systems
D2 - Communications security/cryptologic equipment
D3 - Delay tolerant networking
D4 - Lunar wireless network
D5 - Microwave systems
D6 - Multiplexers and demultiplexers
D7 - Optical communications systems and components (excluding fiber optic cables)
D8 - Relay equipment
D9 - Routers
D10 - Signal amplifiers
D11 - Signal converters
D12 - Signal receivers and transmitters
D13 - Transponders
D14 - Other space-related communications equipment and components
E1 - Ablative armor/plating
E2 - Atmospheric monitoring
E3 - Biocides
E4 - Bonding systems
E5 - CO2 removal and recovery systems
E6 - Cooling systems
E7 - Cryogenics/cryo-coolers
E8 - Damage protection systems
E9 - H2O removal and recovery systems
E10 - Heat shields
E11 - Heaters and radiators
E12 - High pressure oxygen supplies
E13 - Hygiene and waste removal and recovery systems
E14 - Insulation
E15 - Oxygen supply systems (including recovery and filtration equipment)
E16 - Pressure control equipment
E17 - Radiation shielding systems
E18 - Space safety/abort systems (deconstruct receivers, escape systems, etc.)
E19 - Space suits and related equipment
E20 - Spacecraft airlocks
E21 - Thermal monitoring
E22 - Other space survivability systems or components
F1 - Atomic clocks
F2 - Bulk plasma
F3 - Chemical analysis instruments
F4 - Cosmic ray sensors (1 MeV)
F5 - Electric field sensors
F6 - Electrical and electrical properties testing and measurement instruments
F7 - Energetic neutral imaging systems
F8 - Environmental chambers and related measuring equipment
F9 - Filtered photometers
F10 - Gas chromatograph
F11 - Geophysical instruments
F12 - Heavy atom detectors
F13 - High energy particle sensors (30 KeV - 2 MeV)
F14 - Hyper-spectral detectors
F15 - Infrared detectors
F16 - Low energy particle sensors (100 eV)

F17 - Low noise high frame rate detectors
F18 - LWIR detectors
F19 - Magnetic field sensors and magnetometers
F20 - Meteorological instruments and apparatus
F21 - Microwave detectors
F22 - Miscellaneous laboratory equipment and supplies
F23 - Multi-spectral detectors
F24 - MWIR detectors
F25 - Near-IR visible detectors
F26 - Nuclear detectors
F27 - Physical properties testing and inspection equipment
F28 - Radiometers
F29 - Single photon detectors
F30 - Spectrometers
F31 - SWIR detectors
F32 - Synthetic aperture radar systems
F33 - Telescopes
F34 - Visible detectors
F35 - X-ray optics
F36 - Other space-related instruments or sensors
G1 - Ground antennas
G2 - Ground-based communications equipment (terminals, relays, etc.)
G3 - Ground tracking, telemetry, and control equipment
G4 - Simulation and/or training machines
G5 - Other space-related ground systems
H1 - Dust management systems (mitigation and removal)
H2 - Dust tolerant connectors
H3 - Lunar excavation
H4 - Mineral mapping systems
H5 - Oxygen and water extraction from regolith
H6 - Regolith excavation and handling
H7 - Surface habitation systems and equipment
H8 - Volatile (H, C, N, He) extraction from regolith
H9 - Other non-Earth based surface systems and equipment
I1 - Batteries (lithium ion, nickel hydrogen, nickel cadmium, silver zinc, etc.)
I2 - Electrical converters
I3 - Fuel cell power units and components
I4 - Generators
I5 - Other energy storage devices
I6 - Nuclear fission power systems
I7 - Radioisotope thermoelectric generators
I8 - Radioactive materials for use in power generation
I9 - Solar electrical power systems, equipment, and components
I10 - Transformers
I11 - Wires and cables (electrical)
I12 - Other space-related power sources/energy storage systems
J1 - Application-specific integrated circuits (ASICs)
J2 - Attenuators
J3 - Capacitors
J4 - Charge couple devices
J5 - Circuit boards
J6 - Circuit breakers
J7 - Coils and transformers
J8 - Connectors
J9 - Diodes
J10 - Electrical insulators
J11 - Electron tubes
J12 - Fiber optics (conductors, cables, switches, assemblies, etc.)
J13 - Field programmable gate arrays
J14 - Filters and networks
J15 - Fuses, arrestors, absorbers, and protectors
J16 - Inductors
J17 - Integrated circuits/semiconductors (excluding ASICs)

J18 - Large format focal plane arrays
J19 - Lasers and laser systems
J20 - Lugs, terminals, and terminal strips
J21 - Memory
J22 - Modulators/demodulators
J23 - Non-volatile memory
J24 - Optoelectronic devices and associated equipment
J25 - Oscillators and piezoelectric crystals
J26 - Radiation hardened/tolerant electronics
J27 - Relays and solenoids
J28 - Resistors
J29 - Signal/function generators (radio frequency, microwave, etc.)
J30 - Switches (coaxial, radio frequency, video, etc.)
J31 - Synchros and resolvers
J32 - Transistors
J33 - Traveling wave tubes, amplifiers
J34 - Other space-related electronic equipment
K1 - Computers and data processing equipment
K2 - Data handling and input/output storage devices
K3 - Data terminal equipment
K4 - Displays/monitors
K5 - Fault tolerant computing
K6 - High dexterity manipulation systems
K7 - High performance super computers
K8 - Robotics and autonomous systems
K9 - Other space-related computer hardware and robotic systems
L1 - Communications software
L2 - Data mining and knowledge management software
L3 - Environmental control and monitoring software
L4 - Ground system software
L5 - Mission automation and execution software
L6 - Mission planning software
L7 - Modeling, analysis, and visualization software
L8 - Navigation and control software
L9 - Payload instrument software
L10 - Propulsion system operating software
L11 - Simulation software
L12 - Other space-related software
M1 - Bars and rods (specify materials to the right)
M2 - Plates, sheets, etc. (specify materials to the right)
M3 - Pipes and tubes (specify materials to the right)
M4 - Precious metals (specify materials to the right)
M5 - Rare Earth Elements (specify materials to the right)
M6 - Carbon fiber materials
M7 - Other fiber based materials (including rayon, nylon, etc.)
M8 - Composite materials
M9 - Dust resistant coatings
M10 - Optical coatings
M11 - Protective coatings
M12 - Thermal coatings
M13 - Other types of coatings
M14 - Adhesives
M15 - Chemicals
M16 - Gases and pressurants (N, He, etc.)
M17 - Inks
M18 - Resins
M19 - Sealants
M20 - Solvents
M21 - Substrates
M22 - Struts
M23 - Fairings and skirts
M24 - Spacecraft panels
M25 - Cover glass

M26 - Spacecraft windows or window materials
M27 - Beryllium-based structures
M28 - Carbon fiber-based structures
M29 - Composite-based structures
M30 - Other lightweight material-based structures
M31 - Glass fabricated structures not specified elsewhere (glass laminates, nanostructures, etc.)
M32 - Plastic fabricated structures not specified elsewhere (plastic moldings, cellular materials, etc.)
M33 - Rubber fabricated structures not specified elsewhere (moldings, foam, etc.)
M34 - Structures created through additive manufacturing processes
M35 - Bearings
M36 - Castings
M37 - Compressors and vacuum pumps
M38 - Couplings, connectors, and fittings
M39 - Dampers
M40 - Fasteners (screws, nuts, bolts, clips, brackets, rivets, etc.)
M41 - Forgings
M42 - Gaskets (o-rings, washers, etc.)
M43 - Gears and gear boxes
M44 - Hydraulics, valves, actuators, pumps
M45 - Landing gear or systems
M46 - Magnets
M47 - Mirrors
M48 - Precision machined parts
M49 - Pyrotechnics, cartridge and propellant actuated devices
M50 - Semi-finished machined parts
M51 - Specialty storage devices or containers
M52 - Springs and wire forms
M53 - Wire and cables (non-electrical)
M54 - Other space-related materials, structures, or mechanical systems
N1 - Bending and forming machines
N2 - Boring, broaching, drilling, and tapping machines
N3 - Chemical production machinery
N4 - Clean work stations, controlled environments and related equipment
N5 - Computer Numerical Control (CNC) systems
N6 - Electrical and ultrasonic erosion machines
N7 - Filament winding machines
N8 - Five-axis machine tools
N9 - Forging machinery
N10 - Foundry machinery
N11 - Gear cutting and finishing machines
N12 - Grinding machines
N13 - Hydraulic, pneumatic, and mechanical presses
N14 - Lathes
N15 - Lubrication and fuel dispensing equipment
N16 - Metal heat treating and non-thermal treating equipment
N17 - Milling machines
N18 - Rocket maintenance, repair, and checkout specialized equipment
N19 - Rolling and drawing machines
N20 - Semiconductor, microcircuit, and printed circuitboard manufacturing machinery
N21 - Space vehicle maintenance, repair, and checkout specialized equipment
N22 - Test stands
N23 - Thermal vacuum chambers
N24 - Tooling kits and equipment
N25 - Welding, soldering, riveting and brazing equipment
N26 - Wind tunnels
N27 - Wire and ribbon forming machines
N28 - Other machinery utilized for space-related manufacturing/servicing
O1 - Analysis, fusion, or visualization of data derived from space (including electro-optical imagery, data from satellite sensors, etc.)
O2 - Calibration of space-related equipment
O3 - Coating services
O4 - Commercial satellite operation
O5 - Communications and broadcast services
O6 - Data storage and handling services

O7 - Encryption and secure communication services
O8 - Friction stir welding and spun form domes
O9 - Ground support and operations services
O10 - Heat treatment services
O11 - Information and software assurance (including verification and validation)
O12 - Launch support services
O13 - Logistics services
O14 - Machining services (includes cutting, boring, grinding, etc.)
O15 - Maintenance, repair, and rebuilding services
O16 - Materials testing
O17 - Plating services
O18 - Priming and painting services
O19 - Product assurance, quality control services
O20 - Professional services
O21 - Program management and support services
O22 - Program review/development services
O23 - Provision of data derived from space (including electro-optical imagery, remote sensing, etc.)
O24 - Safety and mission assurance services
O25 - Software and algorithm development services
O26 - Space crew operations and training
O27 - Space launch services
O28 - Space medicine
O29 - Space vehicle handling and servicing
O30 - Space-related design and engineering services
O31 - Specification development services
O32 - Systems engineering
O33 - Testing or inspection of space-related equipment (includes inspection, simulation, vibration testing, acoustics testing, etc.)
O34 - Other space-related services
P1 - Atmospheric/suborbital research
P2 - Biomedical research
P3 - Communications and navigation
P4 - Entry, descent, and landing systems
P5 - Ground and launch systems processing
P6 - Human exploration destination systems
P7 - In-space propulsion technologies
P8 - Launch propulsion systems
P9 - Materials
P10 - Mechanical Systems
P11 - Modeling, simulation, information technology, and processing
P12 - Nanotechnology
P13 - Payloads, science instruments, and sensor systems
P14 - Propellants and fuels
P15 - Robotics and autonomous systems
P16 - Space power and energy storage
P17 - Space survivability, life support, and habitation systems
P18 - Structures
P19 - Theoretical and scientific R&D
P20 - Thermal management systems
P21 - Other space-related research & development focus