

Industrial scale, large format additive manufacturing solutions

Delivering unique pellet-based extrusion technology and hybrid toolhead configurations for medium-to-large format 3D printing and in-situ machining



The trusted partner of industrial customers adopting production additive manufacturing

From ideation to implementation, 3D Systems is your partner for adopting additive manufacturing in industrial production.

With deep expertise in application development, our proven technology is being utilized by large companies in multiple industries, including aerospace, automotive, foundry, government/defense, and healthcare. Our tooling, functional prototyping, and end-use part production applications are proven across a diverse global customer base. At every step of the journey, industrial customers rely on Titan medium-to-large format industrial 3D printers to reduce part cost, increase system reliability, and achieve higher part performance.

Reduced part cost

As the leader in pellet extrusion, Titan 3D printers deliver up to 10X faster print speeds, up to 10X raw material cost reductions, and lower capital equipment expenses and operating costs as compared to 3D filament printing. By using lower-cost pellet feedstocks, and with hybrid additive and subtractive capabilities, these 3D printers do more for less.

Higher part performance

With a wide range of pellet feedstocks available, including high-temperature and fiber reinforced materials, Titan additive manufacturing systems with heated chambers enable industrial customers to use the right material for their production applications. In addition to offering a range of surface finish, speed, and throughput options, as well as the flexibility to print complex structures, Titan additive manufacturing systems meet the needs of almost every application and budget. Titan industrial 3D printers are compatible with a wide range of materials and an assortment of nozzle sizes, Titan delivers higher part performance, while offering the 24/7 reliability that industrial customers require.

Increased system reliability

Our industrial control system comes with single or dual pellet extruders, with an optional 3-axis spindle, covering a unique combination of additive and subtractive technologies within a single platform. It does the work of multiple machines - expanding extrusion capabilities while offering breakthrough speed and increased system reliability. Titan systems are built for the production floor and repeatability, with industrial CNC motion control systems and a robust machine and extruder design for lights out manufacturing.

More than just machines

In addition to delivering unique pellet-based extrusion technology, hybrid toolhead configurations, and in-situ machining, 3D Systems offers end-to-end support for customer production needs. From custom systems and sensors to application development, R&D, and consumables, 3D System's experts offer 3D printing, laser scanning, and material testing services, as well as custom hardware development, custom tool pathing, and post-processing assistance.

Deliver ultra-high speed, low cost plastic parts with CNC finish

With three different Titan industrial production platforms to choose from, customers can combine configurable modules to tailor a solution that best meets their specific needs.

The robust platforms and configurable modules with Titan overcome industrial manufacturing challenges and deliver low total cost of ownership (TCO) on the factory floor. The Atlas line of 3D printers features hybrid extrusion technologies, heated chambers, and industrial CNC motion control systems, while delivering faster production, reduced costs, and the ability to print large industrial parts.

Three industrial platforms for robust manufacturing

The Atlas is a proven production additive manufacturing system for producing functional parts, including patterns, molds, tooling, jigs, fixtures, end-use parts, and full-scale prototypes. Designed for lights-out manufacturing, the Atlas helps shorten cycle times, reduce costs, and increase uptime in your production processes.

The field-proven standard Atlas printer comes with single pellet extruder - additional toolhead configurations include pellet + filament extruders, dual pellet extruders and hybrid options with pellet + spindle for additive and subtractive technologies on a single platform providing additive and subtractive technologies together in a single platform. Moreover, future-proof Atlas printers are designed to facilitate quick and easy retrofits for existing and new features, which minimizes the customer's capital equipment expense burden and increases equipment lifetime.

Faster production

Shorten cycle times with print speeds up to 30,000 mm/min.

Reduce costs

Save up to 10X on pellet feedstocks and up to 75% with open market filament feedstocks.

Industrial parts

Print full-size parts up to 50" x 50" x 72" using high-performance and high-temperature materials.

Configurations available:

Pellet Extruder

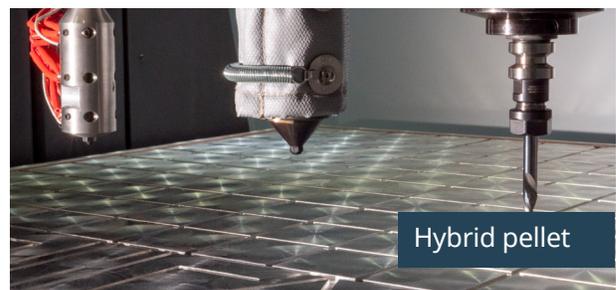
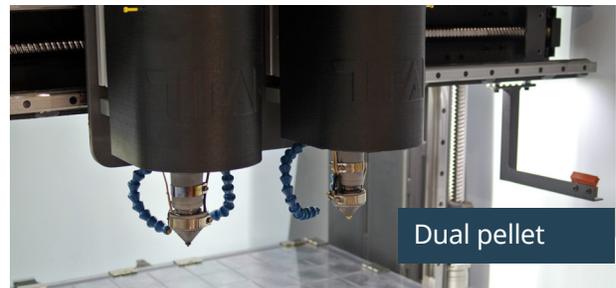
Pellet + Filament (single or dual) Extruders

Dual Pellet Extruders

Dual Pellet + Filament Extruders

Hybrid Pellet Extruder + Spindle

Hybrid Pellet + Filament Extruders + Spindle



Atlas: pellet extrusion and hybrid pellet + filament extrusion system

The flagship medium-to-large format 3D printer, the Atlas, is an industrial additive manufacturing system available with pellet extrusion or a hybrid pellet + filament extrusion system.

Atlas-H: dual pellet

The Atlas-H is an industrial additive manufacturing system with dual retracting pellet extruders for 3D printing with multiple pellet materials. Also available with a hybrid configuration that includes dual pellet extrusion and filament extrusion, the Atlas-H provides industrial customers ultimate flexibility in choosing the right material and printing method for their applications.

The Atlas-H 3D printer expands extrusion capabilities, enabling the use of multiple materials in a single print, including water soluble pellets for complex parts. It features a heavy-duty, robust frame and industrial components for printing with dual retracting pellet extruders while still

achieving fast print speeds and high accuracy. The Atlas-H enables manufacturers to print with the most affordable 3D printing feedstocks and is proven in production applications in the aerospace, automotive, foundry, government/defense, consumer appliance, visual merchandising, and other industries.

Atlas-HS: hybrid additive and subtractive system

The Atlas-HS with hybrid additive and subtractive capabilities provides new solutions for surface finish and production parts, all in one industrial system. Print fast with pellet extrusion and then smooth parts quickly with milling either during or after the printing process while keeping the part on the print bed.

Providing new solutions for production additive manufacturing with reduced cycle times and smooth, accurate parts, the Atlas-HS is designed and built to address the needs of customers in the aerospace, automotive, foundry, consumer product, appliance, government, and other industries. The hybrid additive and subtractive system on the Atlas-HS enables users to manufacture end-use parts, patterns, molds, tools, jigs, and fixtures quickly and cost-effectively on a single machine.



Atlas standard features and options

3D Systems is the only manufacturer offering hybrid configurations including pellet extrusion, filament extrusion, and spindle toolheads.

The Titan line of Atlas 3D printers enables the adoption of additive manufacturing in industrial production. All Atlas models come ready to produce functional, high-performance parts on the production floor. All feature a robust platform built on a welded steel frame.

Servo-controlled open architecture CNC

The Atlas printers feature an industrial CNC motion control system with servo drives on all axes for increased speed and reliability. Because it uses proven motion control technology, the Atlas control platform flattens the learning curve for users both familiar and new to conventional CNC and 3D printing equipment.

Medium-to large-format 3D printing build volumes

In addition to an industrial CNC system with servo drives on all axes, the Titan platform offers a variety of print volume options.

Print volume sizes

- Atlas 2.5 has a 42" x 42" x 48" build volume (length x width x height)
- Atlas 3.6 has a 50" x 50" x 72" build volume (length x width x height)
- Custom build volume sizes available

Standard industrial heated enclosure

All Atlas models include a full-sheet metal, insulated enclosure that enables printing with high-temperature materials. The actively heated recirculating forced air system maintains ambient temperatures of up to 80°C, complementing the machined aluminum heated bed, which reaches maximum temperatures of up to 140°C. The Atlas with a heated enclosure improves dimensional stability when 3D printing large parts with high-temperature materials such as ABS, PC, and nylons.

Additional features available

- Customized I/O sensors
- Material dryers
- Air filtration integration

Specifications

Specifications	Atlas, Atlas-H, Atlas-HS
Slicing Software	Simplify3D
Motion Controller	CNC
Drives	Servos on all axes
Print Speeds	Up to 30,000 mm/min
Rapid Travel Speeds	Up to 60,000 mm/min
Interface	Industrial PC with touch screen
Connectivity	USB & Ethernet connectivity available; remote access and monitoring
Frame	Welded, American-made steel precision machined with a tolerance of .005"
Components	Recirculating ball screws, preloaded linear rails, preloaded runner blocks
Data Monitoring	Monitor and stream data, create alerts based on data
Feed Detection	Detect clogs or lack of material, create alerts based on detection
Max Temperatures	Extruders: 400°C Print Bed: 140°C Enclosure: 80°C
Vacuum Plenum	Integrated vacuum system holds build sheet against aluminium bed
Control Panel	NFPA 79-compliant electronics enclosure (Atlas, Atlas-H and Atlas-HS)
Build Size Range	Standard: 42" x 42" x 48" up to 50" x 50" x 72"; custom sizes available
Extrusion Methods	Pellet extrusion, filament extrusion (2.85 mm or 1.75 mm)

Toolhead Configurations	Atlas	Atlas-H	Atlas-HS
Single Pellet Extruder	x		
Single Pellet + Single or Dual Filament Extruders	x		
Dual Pellet Extruders		x	
Dual Pellet + Filament Extruder		x	
Single Pellet Extruder + Spindle			x
Single Pellet + Filament Extruder + Spindle			x
Dual Pellet Extruders + Spindle			x

System Requirements	Atlas, Atlas-H, Atlas-HS
Power Input	208 V three phase, 100 amp
Atlas 2.5 Machine Weight	4500 lbs.
Atlas 3.6 Machine Weight	6000 lbs.
Atlas 2.5 Machine Footprint	8' x 7' x 8.6'
Atlas 3.6 Machine Footprint	11' x 10' x 10'

Extrusion Capabilities	Atlas, Atlas-H, Atlas-HS
• Pellet Nozzle Diameters	0.6–9.0 mm
• Pellet Layer Heights	0.4–6.0 mm
• Pellet Extruder Throughput	1–30* lbs. per hour
• Filament Nozzle Diameters	0.4–1.2 mm
• Filament Layer heights	0.15–1.0 mm
• Filament Extruder Throughput	< 1–2 lbs. per hour

*max flow rate with 9 mm nozzle

Toolhead Configurations	Atlas, Atlas-H, Atlas-HS
Heated Enclosure	80°C
Titan Pellet Extruder	400°C
Titan Mastiff Filament Extruder	400°C
Heated Bed	140°C

Build Volumes	Atlas, Atlas-H, Atlas-HS
• 42" x 42" x 48"	x
• 50" x 50" x 72"	x
• Custom Sizes Available	x

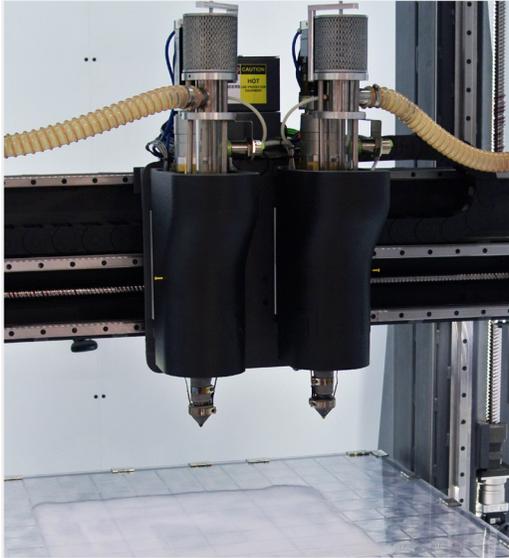
Industrial Features	Atlas, Atlas-H, Atlas-HS
Heated Chamber (up to 80°C)	x
Heated Bed (up to 140°C)	x
CNC Motion Control System	x
Door Interlocks	x

Integration Options	Atlas, Atlas-H, Atlas-HS
Material Dryer	x
HEPA Air Filtration	x
Thermal Imaging Camera(s)	x
Customized Sensor I/O	x
Auto Z Leveling System	x
Advanced Safety Interlocks	x
Interchangeable Build Sheet	x



Toolhead options

3D Systems is the only manufacturer offering hybrid configurations that include pellet extrusion, filament extrusion and spindle toolheads.

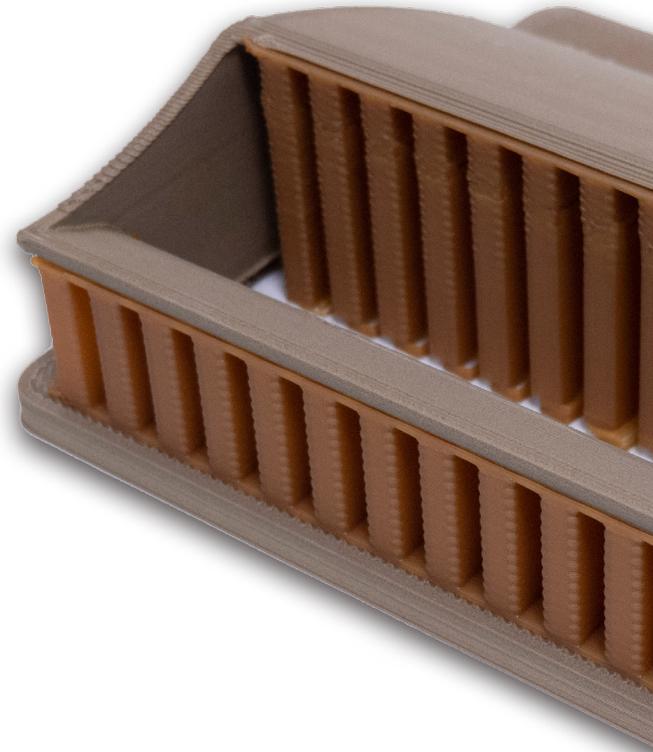


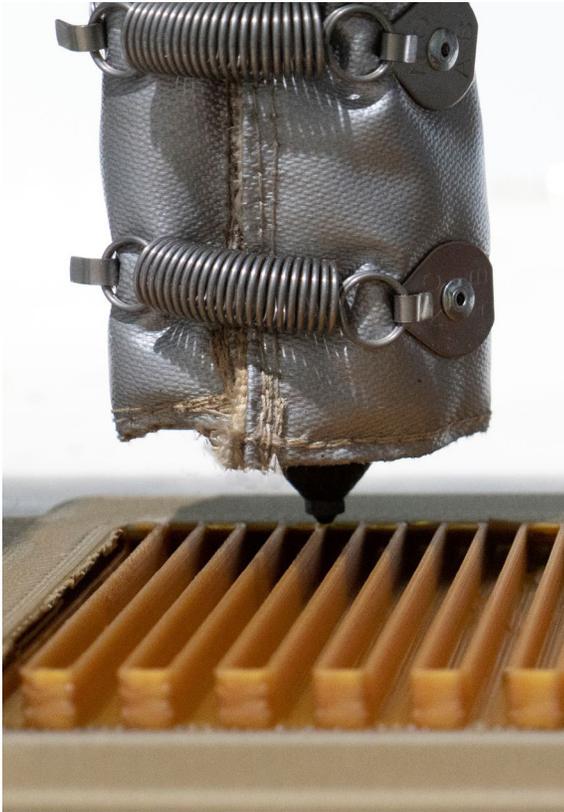
Pellet extrusion on the Atlas

3D print with a variety of different materials including ABS, PLA, CF-PEI, GF-PEKK, and GF-PC, on the Atlas with Titan's pellet extrusion system and industrial heated enclosure. Direct pellet-fed 3D printing enables the use of a wide range of materials while reducing material cost by 10X, and with up to 10X higher deposition rates compared to filament 3D printing.

Hybrid pellet + filament extrusion on the Atlas

The Atlas with hybrid pellet + filament extrusion system provides the ultimate flexibility in choosing the right extrusion technique for your application. For large parts that need to be printed quickly, select pellet extrusion for high deposition rates. For parts that require high surface resolution and fine details, filament extrusion is the preferred method. Hybrid printing also enables printing with dual materials, such as a soluble support material and a high-performance model material.





Dual pellet extrusion on the Atlas-H

Maximize the advantages of low-cost pellet extrusion and multi-material printing with dual pellet extrusion on the Atlas-H. With two retracting pellet extruders, customers can print with two pellet materials, such as soluble support material and high-performance model material. Other capabilities of dual pellet printing include printing with two different materials that are chemically compatible, such as transitioning from a rigid to a flexible material or color blending.

Hybrid dual pellet + filament extrusion on the Atlas-H

The Atlas-H with hybrid dual pellet + filament extrusion system provides the ultimate flexibility in choosing the right extrusion technique for your application. For large parts that need to be printed quickly, select pellet extrusion for high-deposition rates. For parts that require high surface resolution and fine details, filament extrusion is the preferred method. Hybrid printing also enables printing with dual materials, such as a soluble support material and a high-performance model material.

Hybrid pellet extrusion + spindle on the Atlas-HS

The Atlas-HS is a cutting-edge hybrid additive and subtractive system. It incorporates pellet extrusion with a 3-axis milling system on the same gantry. The Atlas-HS enables 3D printed parts to be milled both during and after the printing process. Taking production additive manufacturing to the next level, the Atlas-HS shortens cycle times and produces smooth and accurate end-use 3D-printed parts.

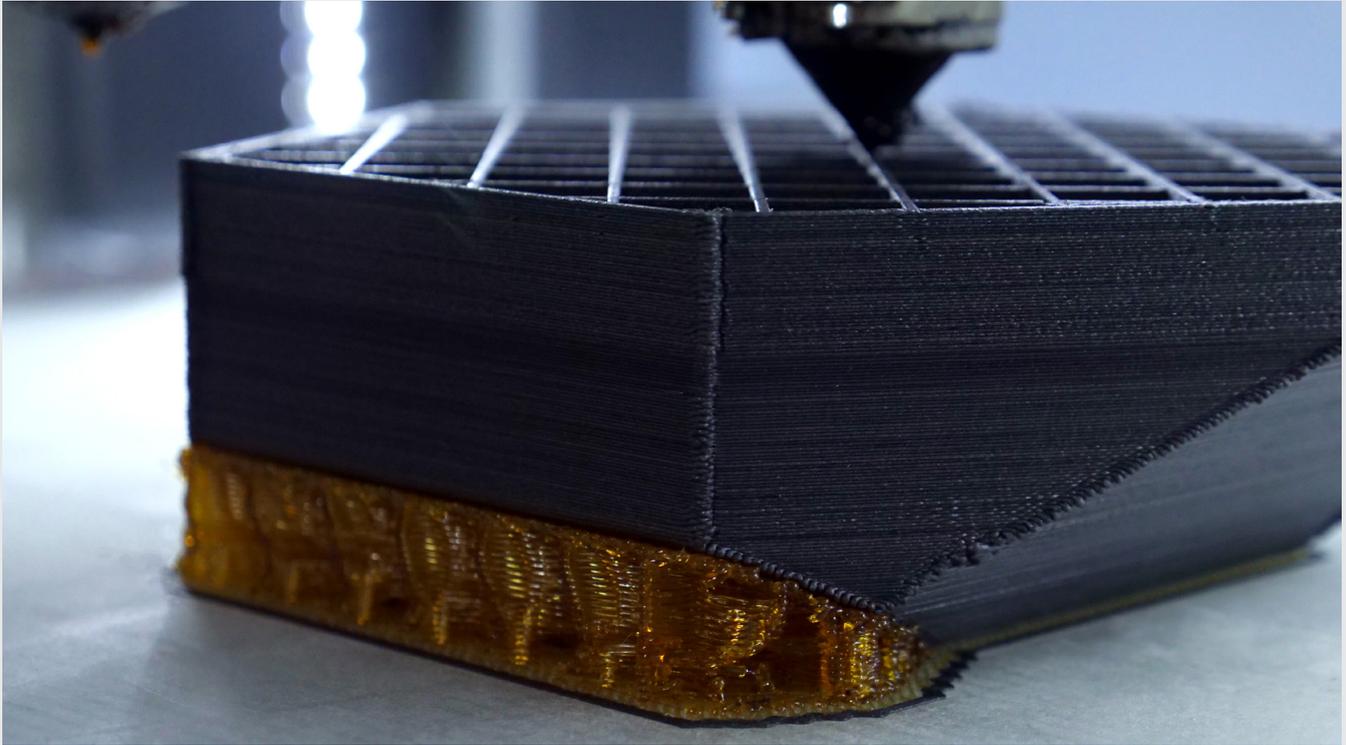
Hybrid pellet extrusion + filament + spindle on the Atlas-HS

The Atlas-HS with three unique toolheads — pellet extruder, filament extruder, and spindle — provides ultimate flexibility to customers. The pellet extruder allows for making large parts fast with cheaper feedstock, while the spindle creates a smoother surface finish. The filament extruder enables the printing of support material for complex geometries.



Materials for pellet extrusion

3D printing directly with plastic pellets on Atlas models enables the adoption of additive manufacturing in industrial production.



Affordable feedstocks

Pellet extrusion 3D printing enables the use of affordable feedstocks, often at a 10X reduction in cost compared to filament. Commodity resins can cost as little as \$2 per pound.

Faster print times

High deposition rates ranging from 1 to 30 pounds per hour with pellet extrusion 3D printing on the Atlas platforms mean faster print times, enabling large parts to be printed in days instead of weeks.

More material options

Direct pellet-fed 3D printing opens up a world of material options, with hundreds of formulations available, ranging from low durometer (soft) to high-performance and highly filled resins such as carbon fiber, glass fiber, and minerals.

Open market pellet feedstocks

Atlas 3D printers use open market pellet feedstocks. Pellet materials can be purchased through 3D Systems or on the open market. Having successfully printed hundreds of grades of polymers with pellet extrusion on the Atlas systems, our experts can help customers identify and implement the right materials for their applications. Here is a sample of materials compatible with the Titan 3D printer extrusion system on the Atlas models:

Flexible materials (Compatible with very flexible materials, such as Shore A 26)

- TPU
- TPE
- PEBA
- TPC

Standard materials

- PLA
- ABS
- PETG
- PP
- ASA

Lightweight materials

- Glass bead or carbon fiber

High performance/filled materials

- PC 20% CF & GF
- Nylons up to 50% CF
- PEI 20% CF & GF
- PPS
- PPSU
- PEKK 30% CF & GF
- PEEK 30% CF & GF

In-situ compounding

- Color blending
- Material blending
- Transitioning — instantaneous or graded





Compatible materials

Have a specific material in mind or need a custom compound? 3D System's experts share their experience gained from printing hundreds of materials, allowing customers to focus on product development. We can help you with material integration, testing, and procurement. We leverage our strong partnerships with top global chemical companies to implement unique and custom-compounded materials for your additive manufacturing application.

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