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NORTHROP GRUMMAN

World Renown Turbine Manufacturer

# Electrical Discharge Machining (EDM), Wire EDM, Small Hole EDM, Ram EDM, CNC Machining, CNC Turning, Full Tool Room and Waterjet Machining

AMT specializes in creating unique or difficult to fabricate components by coupling the efficiency of CNC Machining, Turning and Waterjet Machining with the inherent high precision of CNC Wire & Ram EDM (Electrical Discharge Machining). With over 20 years in business, we have manufactured production quantities of fabricated assemblies and complex precision parts for all industries. Tolerances of +/- .0001" (.0025 mm) are achieved by many of our skilled associates operating in our climate-controlled 31,500 sq. ft. facility. We have fabricated many precision, complex machined parts that other facilities have claimed "can't be made!". AMT is ISO 9001:2008 and AS 9100:C certified and a small business. AMT is ITAR (International Traffic in Arms Regulations) registered with the United States Department of Commerce and is approved to review ITAR classified drawings and documents. AMT is listed in the CCR (Central Contractor Registration) database which provides AMT specific company information and allows other organizations to efficiently do business. Our talented staff regularly take on challenges to apply our innovation and automation concepts to fabricate highly accurate, precision components from round bar, flat, square & sheet stock, castings and forgings.















View Photo Gallery >

#### Materials we process include:

2024 aluminum	copper tungsten	maraging 350	302 stainless steel	tantalum
5052 aluminum	delrin	molybdenum	303 stainless steel	tellurium copper
6061 aluminum	GP02 Glastic	nickel 200	304 stainless steel	tin
7050 aluminum	Inconel 600 ESR	nickel 201	316 stainless steel	titanium 6Al-4V
7075 aluminum	Inconel 625	niobium	347 stainless steel	titanium CP2
aluminum bronze	Inconel 718	Nitinol	410 stainless steel	tool steels: H13, S7, P20,
beryllium copper	Invar 32 (Super Invar)	nylon 6/6	440C H.T stainless steel	D2, O1, A2, M2
beryllium nickel	Invar 36	phenolic	1018 steel	tungsten
brass	Invar 49	rhenium	4140 steel	Ultem 1000
bronze	Hastelloy	silicon	4340 steel	Ultem 2400
carbide	Kovar	13-8 PH stainless steel	9310 steel	Waspalloy
copper	Lexan	15-5 PH stainless steel	A36 steel	zircon
copper moly	magnesium	17-4 PH stainless steel		

We will work together with you, our valued customer, to create successful results utilizing our specialized equipment, persistence and innovation to achieve the desired precision components. Let AMT's staff apply their collective consciousness approach and years of knowledge to analyze the manufacturing process to efficiently produce production quantities of critical, precision parts that meet or exceed your expectations.

Email terry@amtmfg.com or fax us your .igs, .stp, parasolid and Solidworks files for quotation and fabrication.

To download our website for offline viewing & printing, click here.





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Advanced Machining & Tooling, Inc. (AMT), a California corporation, commenced doing business in 1989. We started our business in a small 168 sq. ft room and over the decades we've expanded into a 31,500 sq. ft. facility of fully climatecontrolled space. We are located in the city of Poway, neighbor to San Diego in the inland valley, five miles east of the I-15 freeway. Our employment has increased to over 45 full and part time Toolmakers, Machinists, EDM Specialists and administrative personnel.

It is our experience that, AMT produced precision parts allow a competitive advantage to our customers due to the increased machined precision, many parts are interchangeable and improved inherent quality and accuracy of CNC & EDM produced components. Being ISO 9001 & AS 9100 approved assures you the highest quality and consistent work. We are committed to our customers to help define and resolve technical & manufacturing issues with cost-effective solutions.



#### Mission

It is the mission of Advanced Machining & Tooling, Inc. (AMT) to provide exceptional service and quality Precision EDM, Waterjet & CNC manufactured parts, products and assemblies that consistently meet or exceed our customers 'expectations through continuous improvements.

#### Product/Services Capabilities

AMT's focus is the manufacture of high precision, complex parts. Our competitive advantage is the utilization of Electrical Discharge Machining (EDM) and Waterjet equipment coupled with state of the art CNC machining and turning equipment to produce the majority of our precision components. Our Waterjet provides precision components at lower cost than standard techniques. The EDM process results in repeatable components at extreme high precision. Our combination of technologies allows a unique, innovative or automated approach to be utilized for the machining of complex shapes or difficult materials. Superior results are consistently obtained and the interchangeability of components is achieved.

#### Quality/Business Systems

AMT has achieved approved supplied status by maintaining an efficient quality control and business system that is certified to ISO 9001:2008 and AS 9100:C. Our calibration system far exceeds the obsolete Mil-STD 45208A. All of our final inspection instruments are traceable to NIST. Our processes and manufacturing are accomplished in strict accord to our ISO/AS documented systems. The business systems are continuously improved, being upgraded and consistently improved. We are training our talented associates on a regular basis to maintain the state of the art in manufacturing techniques and systems.





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### CNC Capabilities - Milling

With our new Okuma 5 Axis milling machine and our three Mori Seiki Machining Centers, precision machined parts can be machined to tolerances of +/-.0001" on our calibrated, extremely precise machines. Our newest Okuma is equipped with a 48 station tool changer and performs fully integrated five axis machining simultaneously. All of our machines are capable of machining very tough materials very efficiently. Complicated four and five axis machining is accomplished by our skilled cadre of personnel. All of our equipment is operated in a temperature controlled environment to assure higher precision. Our new Okuma are in addition to three Mori Seiki's and three Kiras that we continue to operate bringing our total capacity to seven VMC's.

At AMT, we marry the cost effective traditional CNC machining & waterjet operations with the EDM process approach to save time or material. This allows critical final part shapes to be fabricated by EDM or waterjet after heat treatment and results in a superior product with less internal stress.



### Current capabilities:

- Maximum Cutting Area: 40" x 20" x 20" tall
- Maximum Weight: 3600 lbs.
- 5-Axis Simultaneous Machining
- 4-Axis Simultaneous Machining
- · 4-Axis Indexed machining

Complex shapes and configurations are created on our Mastercam system and CNC machined efficiently. We can accept .igs, .stp, parasolid and Solidwork files for direct input into our system.

At AMT, our focus is high quality parts that exceed your expectations. We are service oriented and will work with you to find the most cost effective approach to manufacturing your parts.





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# **CNC** Capabilities - Turning

Our newest CNC Lathes are both Okumas. The Captain L470 1250C adds a new dimension in cutting size for us at ATM. Utilizing our 15" chuck or on a face plate, we can turn a 26" diameter titanium part. The 30 HP motor and extended travel, can support a 50" long part. Our Okuma LT10 features state- of-the-art dual spindles, dual turret design and incorporates a magazine bar feed. This machine allows a complete part piece to be manufactured in one cycle. This eliminates handling and saves the handling and reloading time - saving you money!

Additional capacity is provided by our other three Okuma CNC Lathes and our Miyano twin spindle lathe, utilizing live tooling. Very tight tolerance parts are manufactured in production quantities. We regularly turn Inconel, titanium, stainless steel and exotic materials on these precision machines.

• Maximum work piece size 26" diameter; 50" long







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### **EDM Capabilities**

We have an operational base of 14 various state of the art EDM machines. Our latest Mitsubishi technology machine produces the finest finish at the least amount of time and at the least expensive cost. We evaluate each of our manufacturing requirements to determine the appropriate method of manufacturing. In many instances, traditional CNC Machining or turning will not result in the required precision mandated on the blueprint. When this occurs, we have the option to use the more precise EDM approach to comply to print requirements. When a heat treated part requires a precise hole on location, we usually opt for EDM. When the deburring process will take as long as the original operations, we use the burr free EDM approach or the Waterjet approach and save time and money!

Keep in mind that in addition to being able to EDM cut conductive materials as hard as 70 Rc, tapered shapes are also possible. Complex precision components can easily be cut to unique shapes with high precision at a reasonable price. We work with a collective consciousness to find techniques to



manufacture parts that customers felt were impossible. The EDM technology opens new doors of opportunity for engineers, scientists and designers. Precision EDM components have been conceptualized, fabricated, and delivered into Space many times as well as to Mars.





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# **CNC Waterjet Machining Capabilities**

Our CNC Waterjet machine is the Omax 2626XP. Omax is the leading producer of waterjet machines delivered worldwide. The Omax 2626XP is the highest technology and most accurate waterjet machine ever produced. Greater accuracy is achieved through an enhanced thermal system and a premium linear positioning system. Precise, straight edge cutting is achieved through the patented Tilt-a-Jet option that eliminates the nasty taper angle created by all other waterjet machines. The straight cut edges allow many new fabrication options for cost effectively producing machined components. We regularly waterjet Inconel, Kovar, titanium, stainless steel and exotic materials on this precision machine. Components as large as 40" x 29" x 8" thick can be machined with precision.







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#### Toolroom

Our toolroom features high quality machines manned by very knowledgeable toolroom machinists and toolmakers. We have full toolroom capabilities including milling, turning and grinding.

At AMT, we study the various methods to manufacture a precision component and then create the tools, procedures and fixtures from the collective wisdom of our forty- five employees. Unique and specialized fixtures are built with critical final part shapes fabricated by EDM after heat treatment. Our tools are first class and allow us to maintain very close tolerances while machining.

#### Current capabilities:

- Full Toolroom Equipment & Skilled Personnel
- Milling, Grinding, Turning, Boring
- Jigs, Fixtures, Tools & Dies Made to Exacting Tolerances and Assembled Complete.



We will work with you to create the solution to your manufacturing or machined part challenge. Our in-house skilled personnel include: Toolmakers, Engineers, CNC Machinists, EDM Specialists, Master Machinists, and CAD Programmers. Our AMT Designed tools will provide turn-key requirements solutions without relying on outside organizations.

At AMT, our focus is high quality parts that exceed our customers' expectations. We are service oriented and will work with you to find the most cost effective approach to manufacturing your parts.





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# **Equipment Listing**

### **CNC** Equipment

- CNC Wire EDM Machines Mitsubishi
- RAM/Cavity EDM Machines Mitsubishi
- CNC Small Hole EDM Equipment Current EDM
- CNC Machining Equipment Okuma, Mori Seiki & Kira
- CNC Turning Equipment Okuma, Miyano
- Waterjet Equipment Omax

# Conventional Equipment

- Conventional Grinding Equipment
- Conventional Turning Equipment
- Conventional Milling Equipment
- Conventional Jig Bore Equipment
- Computer Equipment
- Inspection/ Quality Assurance Equipment ISO 9001 Certified Mitutoyo, Brown & Sharp







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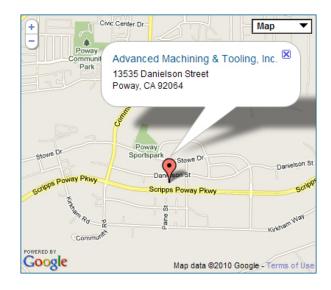
World Renown Turbine Manufacturer

### Contact

We work together with our customers to help define and resolve technical & manufacturing issues. Contact us for futher information on how we can help you meet your needs. Or fax or email us your drawing for quotations. We are here to help you.

### Advanced Machining & Tooling, Inc.

13535 Danielson Street Poway, CA 92064 PHONE: (858) 486-9050, FAX: (858) 486-9055 terry@amtmfg.com







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# Alliant Techsystems (ATK)

AMT, Inc has supported major, space based science endeavors with ATK for over 15 years.

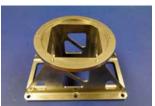
ATK is a multi-billion dollar provider of advanced composite products for the space and aerospace markets. ATK is recognized as a world leader in the design, manufacture and test of composite structure programs for customers around the globe. We have supported ATK in the design & fabrication of complex fittings made from aluminum, titanium & Invar.

In the early 2000's the Jet Propulsion Labs (JPL) funded by NASA, teamed with ATK to construct the two Mars Exploration Vehicle platforms. The two rovers, Spirit & Opportunity have operated way beyond the design expectation. The complex structures were fabricated by ATK / AMT and utilized dozens of precision titanium fittings to assure the success of the program and structure. Their complicated parts regularly challenge our staff.

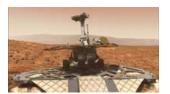
#### Techniques Used:

- CNC Wire EDM
- CNC Milling
- CNC Turning
- Small Hole EDM
- Sinker EDM
- Jig Boring
- Polishing

- Mitsubishi EDM
- CNC Mori Seiki Vertical Machining Centers
- · CNC Okuma Lathes
- Current Small Hole EDM
- Mitsubishi CNC Plunge EDM
- SIP Jig Bore

















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### **General Atomics Aeronautical Systems**

The General Atomics Aeronautical Systems (GA-ASI) is a division of San Diego headquartered General Atomics .GA-ASI produces the Predator series of Unmanned Arial Vehicles (UAV) and supports NASA, the US Air Force, US Army, and the US Navy. This unmanned vehicle is considered the most effective weapon developed for the Middle East. The far-seeing capability allows reconnaissance of our borders and in the hills of Afghanistan. Every critical component that we fabricate is mission critical to the Predator's success.

### Techniques Used:

- CNC Wire EDM
- CNC Milling
- CNC Turning
- Small Hole EDM
- Sinker EDM
- Jig Boring
- Polishing

- Mitsubishi EDM
- CNC Mori Seiki Vertical Machining Centers
- · CNC Okuma Lathes
- Current Small Hole EDM
- Mitsubishi CNC Plunge EDM
- SIP Jig Bore













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# General Atomics Electromagnetic Systems

The General Atomics Electromagnetic Systems (GAES) is a division of San Diego headquartered General Atomics. GAES has been awarded the contract to provide the Navy the newest technology to launch aircraft off the newest generation of Gerald Ford class (CVN78) aircraft carrier. The Electromagnetic Launch System (EMALS) is being designed in San Diego and assembled in Tupelo Mississippi. AMT is proud to support this major technological innovation by supplying tens of thousands of components which will replace the 50 year old steam catapult system.

#### Techniques Used:

- CNC Wire EDM
- CNC Milling
- CNC Turning
- Small Hole EDM
- Sinker EDM
- Jig Boring
- Polishing

- Mitsubishi EDM
- CNC Mori Seiki Vertical Machining Centers
- CNC Okuma Lathes
- Current Small Hole EDM
- Mitsubishi CNC Plunge EDM
- SIP Jig Bore









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#### Hamilton Sundstrand

AMT, Inc has been an approved AS9100 certified supplier to Hamilton Sundstrand for over ten

HS is a huge NYSE listed corporation that supports the defense, space and aerospace industries.

AMT is proud to have supplied tens of thousands of production parts to support the Auxiliary Power Unit (APU) for the Airbus A320.

Critical EDM operations allow precision parts to consistently produced.

Our 4 Axis CNC Machining Centers have created unique precision parts from Inconel 718 and stainless steel. Our CNC Turned and machined parts will be utilized on the new Boeing 787 jets.

#### Techniques Used:

- CNC Wire EDM
- CNC 4 Axis Wire EDM
- CNC Milling
- CNC 4 Axis Machining
- CNC Turning
- Small Hole EDM
- Sinker EDM
- Jig Boring
- Polishing

- Mitsubishi EDM
- CNC Mori Seiki Vertical Machining Centers
- · CNC Okuma Lathes
- Current EDM Small Hole EDM
- Mitsubishi CNC Plunge EDM
- SIP Jig Bore















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### Lawrence Livermore National Laboratory

The National Ignition Facility (NIF) project team at the Lawrence Livermore National Laboratory (LLNL) has developed the world's largest and most powerful laser system. The building that houses the laser system is over two football fields in size and houses 192 high power lasers. When all 192 lasers are fired in unison, they will focus on a single point and implode a fusion fuel capsule!

LLNL Scientists & Procurement Specialists called on AMT, Inc to produce numerous precision focusing optics components. Hundreds of tapered spindle tubes were fabricated and polished to a 2 finish. Precision alignment is produced by attaching the tubes to the precision platform wheel. Precision location of platform wheel is less than twelve tenths (.0012").

This was a multi-year project and thousands of precision components were required. AMT is proud to support the scientific community in the manufacture of precision machined components to help support this historic, scientific achievement.

### Techniques Used:

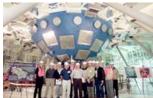
- CNC Wire EDM
- CNC Milling
- CNC Turning
- Small Hole EDM
- Sinker EDM
- Jig Boring
- Polishing

- Mitsubishi EDM
- CNC Mori Seiki Vertical Machining Centers
- CNC Okuma Lathes
- Current Small Hole EDM
- Mitsubishi CNC Ram EDM
- SIP Jig Bore















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### Northrop Grumman Aerospace Systems

Northrop Grumman is the largest defense contractor in the United States. AMT is proud to be a preferred supplier to numerous Northrop Grumman facilities. In 2008, we were recognized as a "Northrop Grumman Gold Supplier".

Precision components must be fabricated from exotic material to satisfy the numerous demands of aerospace and space requirements. AMT has fabricated many parts from Nickel 200, 6Al-4V

Many of the exacting components we have fabricated are considered "mission critical".

Every associate at AMT applies exacting and demanding standards to create the specialized components that Northrop Grumman contracts AMT to produce.

#### Techniques Used:

- CNC Wire EDM
- CNC Milling
- CNC Turning
- Small Hole EDM
- Sinker EDM
- Jig Boring
- Polishing

# Machines Used:

- Mitsubishi EDM
- CNC Mori Seiki Vertical Machining Centers
- · CNC Okuma Lathes
- Current Small Hole EDM
- Mitsubishi CNC Plunge EDM
- SIP Jig Bore













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### Solar Turbines, a Caterpillar Corporation

As one of the leading turbine manufacturers in the world, Solar Turbines (a Caterpillar Company), designs and builds the highest quality power generating turbines. AMT, Inc has been a proud vendor to Solar since 1989. Projects we've participated in have received corporate notoriety by being nominated for the Presidents Award.

Our precision components assemble with thousands of fabricated components to create turbines that generate up to 14 megawatts of power with 34% conversion efficiency. We are partners in industry with Solar and have multi-year contracts to provide numerous precision machined components for multiple Solar facilities.

We support their weekly manufacturing build plans with 100% on time delivery. AMT continues to assist Solar in developing cost effective solutions to fabrication issues.

#### Techniques Used:

- CNC Machining
- CNC Wire EDM
- CNC Turning
- · Conventional Machining
- Small Hole EDM
- CNC Sinker EDM

- Mitsubishi Wire EDM
- Mori Seiki Vertical Machining Center
- · Okuma CNC Lathe
- Bridgeport Milling
- Current Small Hole EDM
- Mitsubishi Sinker EDM















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