

Solutions For Advanced Materials

INTEGRATED TECHNOLOGIES, INC.
(I N T E C)

S

ince its inception, Intec has distinguished itself as a worldwide leader in providing solutions for advanced materials. With a diverse professional staff and state-of-the-art laboratories, Intec is the multidisciplinary solution provider for the manufacture, design, and test of composites, metal matrix, and other advanced materials.

An ongoing commitment to excellence, innovation, and service

Qualified Intec professionals provide experience, information, and an interdisciplinary approach to understanding the formulation, evaluation, and application of new materials. Intec's expert R&D and production teams work together offering the technology to use, assess, and create valuable advanced materials assisting customers in bringing better products to market faster.

Delivering results

Intec serves both manufacturers and raw material suppliers by providing innovative solutions that reduce manufacturing costs, shorten product development cycles, enhance structural durability, and improve product performance. Whether providing original designs or helping to achieve the peak performance of a new material, Intec has a track record for delivering the kind of results that can mean the difference in a competitive marketplace.

Winning confidence

Intec has won the confidence of leading manufacturers from around the world including:

- Bell Helicopter • Boeing • K2 • Hughes • TRW
- Lockheed • Teledesic • Optiva • Pratt & Whitney
- Hexcel • 3M • BF Goodrich • Cytec • Toray
- US Air Force • United Airlines • Northrop



Intec is the multidisciplinary solution provider for advanced materials such as:

- Thermoplastic
- Thermoset
- Metal matrix
- Ceramic
- Fiberglass
- Graphite
- Kevlar
- Elastomers
- Advanced metallic alloys





T E S T I N G

Understanding how advanced materials respond during manufacturing and in the field is critical to the production of superior products. Intec laboratory professionals work closely with clients to identify and quantify key material characteristics to support product development, certification, and quality. Intec testing professionals provide unique insight and the knowledge to recognize anomalies or unexpected trends and to assure accurate technical data.

From designing and conducting large allowables programs to performing quality control testing; from characterizing a new composite materials system to dynamically testing a full scale fighter wing; Intec has the knowledge, experience and state-of-the-art equipment to do the job.

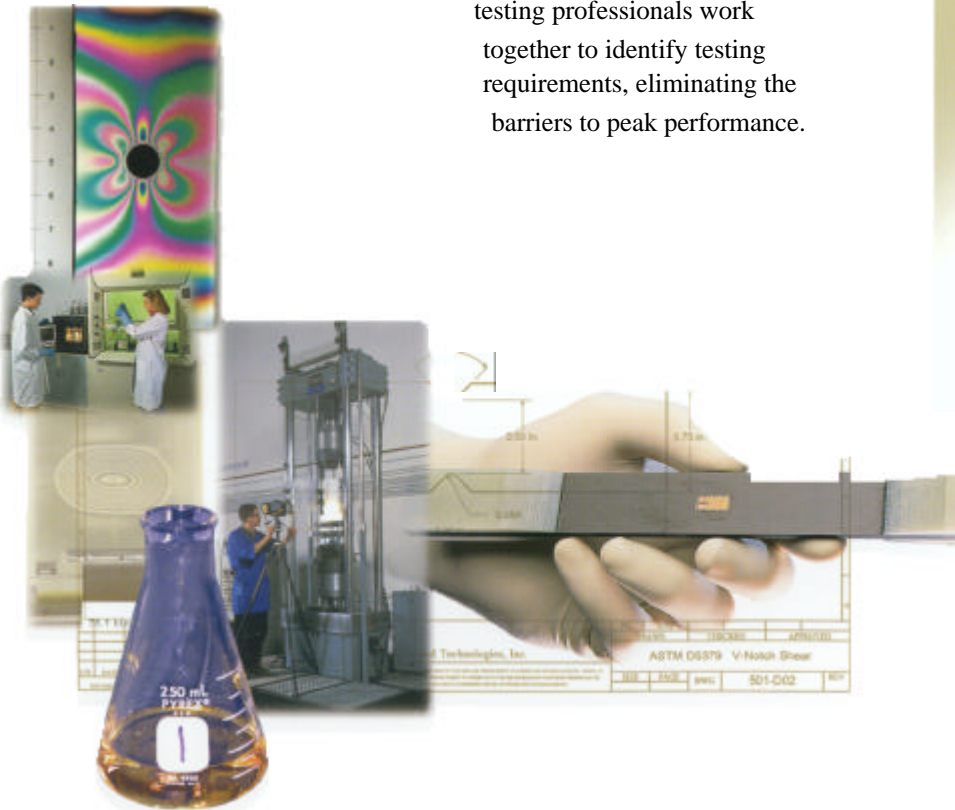
In conjunction with NASA, NRTC, DOD, and FAA, Intec testing engineers participate in national materials technology research programs, and regularly conduct publishable research to develop new test standards and characterize advanced materials and processes.

This guarantees Intec customers the highest quality and most accurate material and component properties to support development and certification of production parts.

Intec is the best choice when you want to bring better products to market faster. Building on years of collective experience, Intec's testing professionals work together to identify testing requirements, eliminating the barriers to peak performance.

Intec's vast testing experience and capabilities include:

- *Static*
- *Fatigue*
- *Fracture toughness*
- *Analytical chemistry*
- *Component*
- *Thermal*
- *Physical*
- *Impact*
- *Full scale*



*Intec has the knowledge and technology
to meet the unique challenges
of machining advanced materials.*

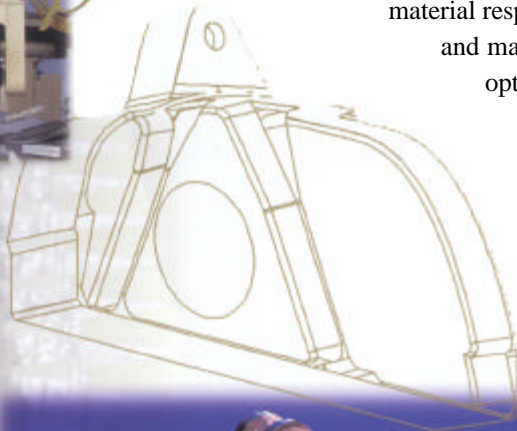
MACHINING

Intec's highly efficient and flexible advanced materials machining group handles internal, offload production, and prototype work. While advances in software and machining equipment have improved cycle time and quality, technology is only half the battle. Experience in fixturing, setup, feeds, speeds, and cutters is critical to producing quality parts from advanced materials. Intec's machining group possesses experience with a wide variety of materials (organic, metallic, and ceramic) and forms (cast, plate, forged, laminate, and sandwich).

Intec's highly skilled machinists specialize in producing large molds and mandrels for composite fabrication, using the most advanced CAM software and years of experience to anticipate material response. This approach saves time and material by allowing virtual prototyping and the optimization and verification of tool paths.

Whether machining an aluminum aircraft fighter frame, creating a composite tail rotor mold, or preparing metal matrix specimens for evaluation, Intec's machining group can do the job.

$$a_n = \frac{v^2}{D}$$



$$r = D \left(1 + \cot \frac{\alpha}{2} \right) + a$$



Intec's machining group provides critical skill and experience in producing quality parts from advanced materials:

- *Specimens and fixtures*
- *Master models*
- *Molds and mandrels*
- *Frames, spars and ribs*
- *Tooling*
- *Components and assemblies*

Intec's Fabrication Team can ensure your next process is trouble-free.



FABRICATION

Rapidly changing materials and processing technologies make it essential for companies to meet their program demands at the lowest possible cost in the shortest time. Intec fabrication professionals work in partnership with customers to develop the manufacturing solutions that best fit their needs.

Using customer or Intec produced 'build to print' files in virtually any format, Intec professionals manufacture a wide range of composite parts and supporting metallic structures in Intec's composite manufacturing facility.

Intec fabrication engineers participate in national manufacturing technology research programs in association with NASA, NRTC, and the FAA, and regularly conduct publishable research in emerging advanced materials and

Intec's fabrication team is proficient in the following processes:

- Extrusion
- Autoclave
- Resin transfer molding
- Resin infusion (VARTM)
- Injection molding
- Vacuum processing
- Compression molding
- Thermal forming
- Casting



$$\eta = \eta_0 \exp\left(\frac{E}{RT}\right)$$

processes. This guarantees Intec customers the highest quality in repeatable production parts.

Today's time-critical and demanding manufacturing environments require the ability to anticipate material and tooling response to process conditions.

Whether building satellite reflectors and landing gear doors or developing new process parameters for experimental polymer hybrids, Intec's versatile fabrication team has the knowledge, advanced processing equipment and tooling to make it happen.



DESIGN & ENGINEERING

In a competitive global marketplace, bringing superior products to market faster is essential for success. Intec design and analysis engineers use their materials knowledge along with state-of-the-art design and analysis tools to provide the leading edge in new product development.

Intec's highly experienced staff develops innovative composite structural designs, while controlling project costs. With composite and analytical knowledge, Intec engineers take full advantage of the material's performance characteristics in each design and provide the unique advantage of building in cost-effective fabrication methods.

Intec's design and engineering group offers experience in the following fields:

- *Materials* • *Controls* • *Dynamics* • *Weights*
- *Structures* • *Integration* • *Aerodynamics*

Intec's engineering services include:

- *Program management and project engineering*
- *Manufacturing engineering, producibility, and production planning*
- *Advanced composite structural analysis*
- *FEM stress analysis*
- *CAD production drawings*
- *Process control and material control specification*
- *FAA, DER, TC, and STC coordination*
- *Material and structural R & D programs*
- *Failure analysis*

Stainless
Fasteners
LK100V4-7

$$y_{n+1} = y_n + h \int_0^1 y'(\alpha) d\alpha$$

Titanium
Fasteners
NAS6204-6

