

## Company History

Founded in 1988, Composite Technology Development, Inc. (CTD) is a technology and product-development company located in Lafayette, Colorado. The company specializes in the development of engineered materials, foams, composites, and products made from these materials. CTD markets its products to customers primarily in the energy, aerospace, and defense industries. In addition to its technology offerings, CTD also provides engineering services including low-temperature mechanical testing and thermomechanical design.



The company's business is well diversified, with approximately 70 percent of sales derived from government-funded and commercial R&D activities and 30 percent from sales of commercial products and testing services. Based on CTD's business approach, potential, and success, CTD's president, Dr. Naseem Munshi, was named 2007 Ernst & Young Entrepreneur of the Year for the Technology Sector in the Rocky Mountain Region.



## Selected Customers & Partners

### Resins & Hardware:

Lockheed Martin  
LORD Corporation  
Everson Tesla  
Advanced Magnet Laboratories  
Cryomagnetics  
Hypertech Research  
Quantum Design  
Vanguard  
Honeybee Robotics  
Exoterra

### Testing Customers :

Alliant Techsystems  
Lockheed Martin  
Ball Aerospace  
NASA  
GE Healthcare  
Vestas Wind Systems

### Government Clients:

DOE  
NASA  
Navy/USMC

## Manufacturing Capabilities

Resin Transfer Molding (RTM, VARTM, VPI)

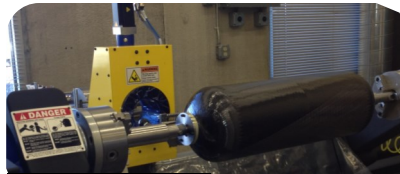
Filament Winding

— 4-axis filament winder

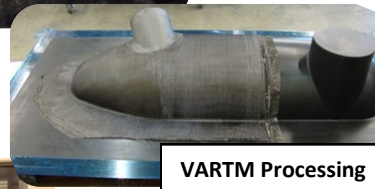
— Up to 30 in. diameter x 10 ft structures

Compression Molding

Small-scale pre-preg production



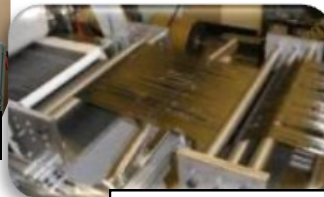
Filament Winding



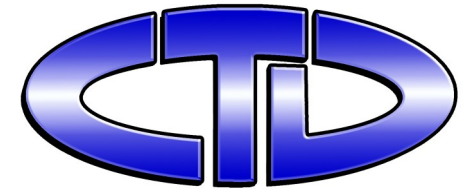
VARTM Processing



Compression Molding

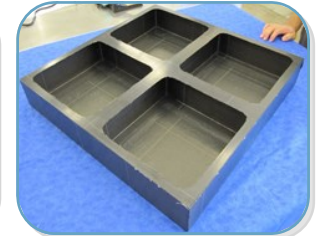
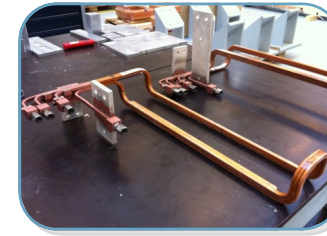


Custom Pre-preg

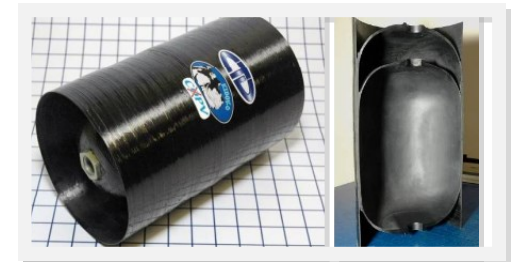


COMPOSITE TECHNOLOGY DEVELOPMENT, INC.

ENGINEERED MATERIAL SOLUTIONS



## Unique Materials and Manufacturing for Challenging Applications



2600 Campus Drive, Suite D  
Lafayette, CO 80026  
Phone: 303-664-0394  
[www.ctd-materials.com](http://www.ctd-materials.com)

## Composite Bearing Materials

CTD has developed composite bearing materials (slippers) for use in aircraft carrier arrestment systems. Leading contributors to system downtime have been addressed, and will greatly reduce operational and maintenance costs to the Navy.

### Product Features

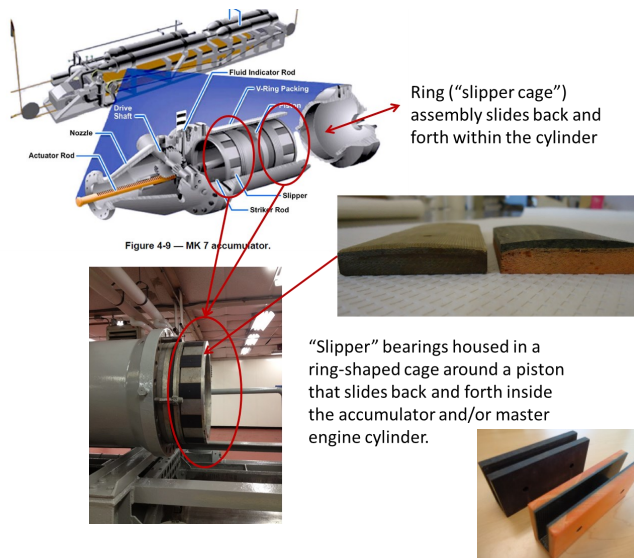
- Excellent Wear Resistance
  - Coefficients of Friction 0.1 – 0.6,
  - Wear factors  $10^{-7}$  mm<sup>3</sup>/N-m to  $10^{-6}$  mm<sup>3</sup>/N-m
  - Comparable to PEEK/composite at lower cost
- Low swelling in moisture & hydraulic fluids (100 days)
  - < 3% after immersion in water at 100°F
  - < 3% after immersion in ethylene glycol at 200°F

### Application Areas

- Aircraft arrestors and catapults
- Heavy duty wear plates and bearings
- Earth moving equipment and agricultural machinery

### Aircraft Arrestor Application

- Loads ranging from 10 psii to 460 psi
- Arrestments speeds (550 in/sec) up to 20,000 cycles
- Low swelling in humidity, greases and hydraulic fluid
- Reduced swelling and wear factors decrease system



## High Performance Resin Systems

CTD currently offers over 20 resin products for challenging applications in the energy and aerospace and defense markets. CTD's products are offered to customers worldwide.

### Product Features

- Processing
  - VPI/VARTM compatible, long pot-life
  - Prepreg tapes
- Radiation tolerant
- Cryogenic-compatible systems
- Elevated temperature capabilities
- Custom formulations
  - High dielectric strength
  - Toughened, microcrack resistant
  - Nanoparticles

### Application Areas

- Electrical and thermal insulation



- Aerospace / Oil & Gas / Geothermal

## Comprehensive Testing Services

CTD has over 25 years experience in materials testing, including testing at cryogenic temperatures. Our familiarity with materials, their behavior, and test methods ensure high quality testing and accurate results.

### Testing Capabilities

- ASTM and SACMA Tests
- Mechanical and Thermal Testing from 4K to 500K
- Electrical Testing from 77K to > 500K

### Specialized Services

- Custom test development
- Specimen fabrication
- Mock-up and/or prototype testing
- Post test analysis

