

## 5 Axis Air Bearing System



**NIF Target  
Assembly Station**

### Features:

- X, Y and Z axis motorized linear air bearing slides
- Dual motorized air bearing rotary spindles
- Counterbalance pulley with air bearing sleeve
- Turnkey system includes:
  - Delta Tau motion controller
  - Industrial PC with and application software
  - Operator control panel
- System accuracy to 4  $\mu$ " (0.000,004")

**ABTech's** experience in developing ultra-precision motion systems led the engineers at the University of California's Lawrence Livermore National Labs (LLNL) to contract for the design and manufacture of a target assembly station for the National Ignition Facility (NIF).

**ABTech** developed this ultra-precision motion system using a total of six air bearings including two motor driven rotary bearings coupled with X and Y linear driven slides and a vertical ceramic beam linear slide counterbalanced over a frictionless air bearing sleeve.

NIF technicians use applicators the size of a single hair to apply the adhesive when assembling miniature BB sized capsules of fusion fuel for targets. This compact system (about 2 feet in height) achieved position accuracies of 4 millionths of an inch!

The NIF will use the world's largest laser (housed in a building the size of 3 football fields) to compress and heat the targets to thermonuclear ignition. Producing temperatures and densities like those in the sun these experiments will help scientists sustain confidence in the stability of the nuclear weapon stockpile without performing dangerous testing. Additional benefits in science and fusion energy are expected.

**ABTech** is proud to have been asked and to have successfully contributed to this impressive research endeavor.

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