

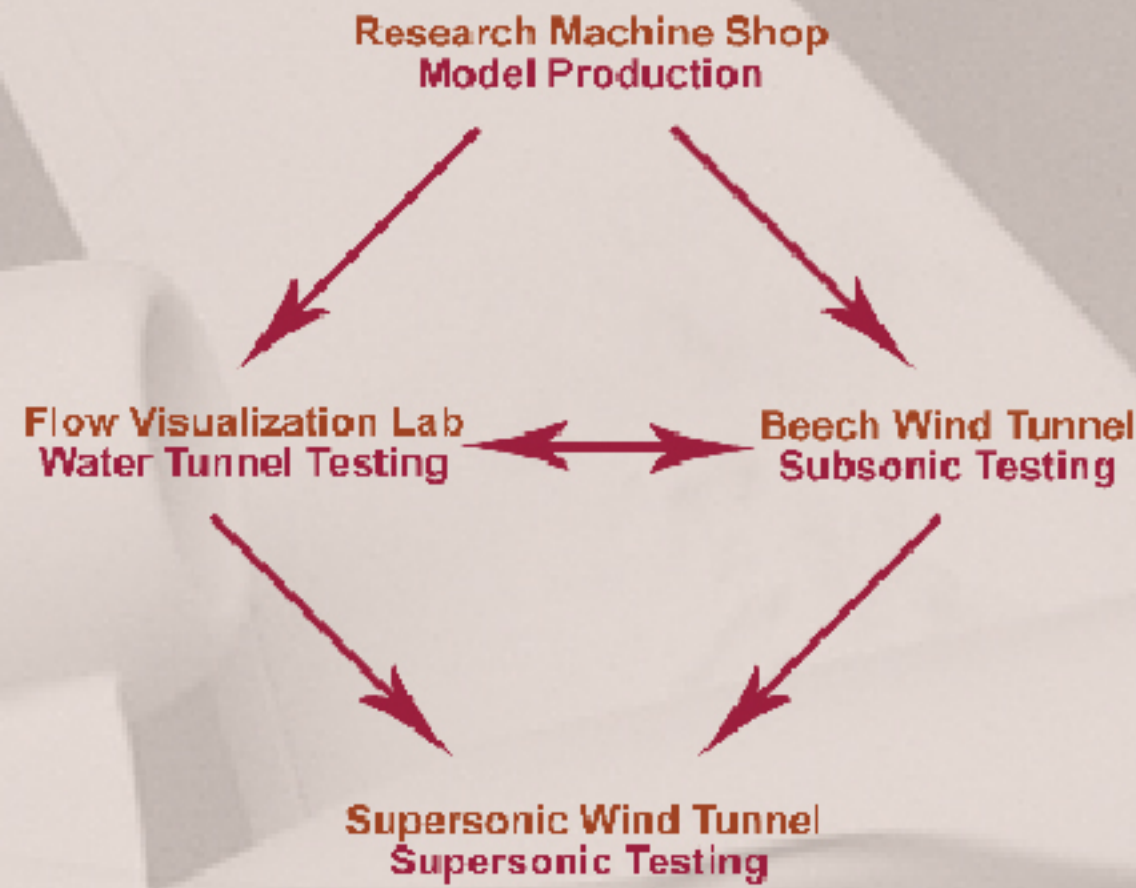
AERODYNAMIC
DESIGN, TESTING &
CERTIFICATION SERVICES



NATIONAL INSTITUTE FOR AVIATION RESEARCH
Wichita State University

The National Institute for Aviation Research at Wichita State University is equipped to handle a wide variety of aerodynamic testing needs.

The Institute offers services to cover several stages of development, from model design and production to flow visualization, subsonic wind tunnel testing and supersonic testing.



WALTER H. BEECH WIND TUNNEL

After more than \$7 million in recent renovations and upgrades, including the addition of a sting mount system, the Walter H. Beech Wind Tunnel is now the most capable low-speed university wind tunnel for aviation research, certification and testing.

FEATURES:

- Test section 7'H x 10'W x 12'L
- 2,500 HP fan
- Active heat exchanger
- Speeds of more than 240 mph
- Accurate and precise internal and external balances
- Real-time data reduction and display

CAPABILITIES:

- Aerotech ATE external balance with several model mounting arrangements
- Triumph and Aerotech ATE internal balances and c-strut sting system
- PSI 8400 pressure measurement system with more than 280 channels available
- Flow visualization with multi-camera video recording system
- Engineering technical services available from WSU aerospace engineering faculty including computational fluid dynamics modeling, analysis and wind tunnel model structural analysis.

RESEARCH MACHINE SHOP

NIAR's Research Machine Shop is equipped with the latest machining technology in order to provide first-rate support for all of NIAR's laboratories. With more than 50 years combined experience in machining, the employees of the Research Machine Shop specialize in producing precise models for wind tunnel and flow visualization testing.

CAPABILITIES:

- CATIA V5 software
- Mastercam versions 9.1 and X software
- HAAS VF-2 vertical machining center 30" x 16" x 20" travel
- HAAS VF-4, four axis vertical machining center 50" x 20" x 25" travel
- FADAL 8030 vertical machining center 80" x 30" x 30" travel

FLOW VISUALIZATION LAB

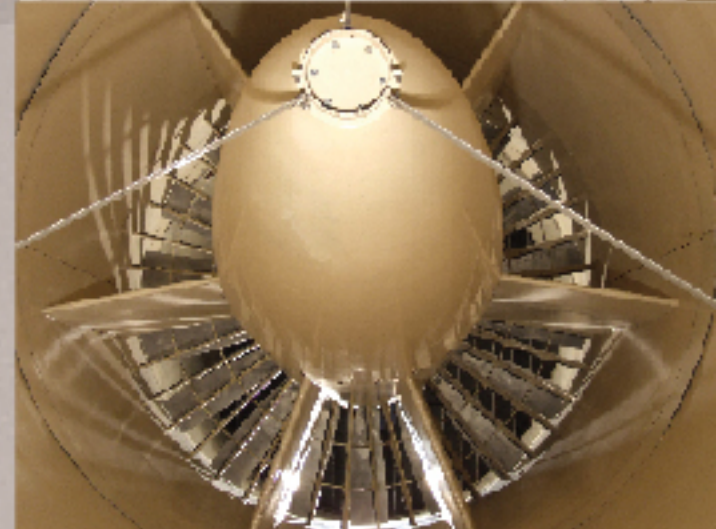
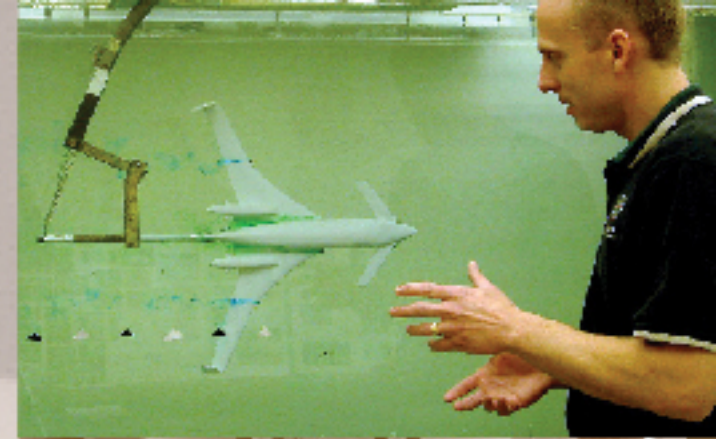
The Flow Visualization Laboratory is a water tunnel with a test section that is two feet wide, six feet long and three feet high. This tunnel can reach flow velocities between zero and one foot per second. Models can be moved either in yaw or pitch, allowing engineers to visualize possible flow interference on new or modified bodies.

CAPABILITIES:

- Flow visualization using dye streams or hydrogen bubbles
- Laser and high-intensity lighting systems
- High-resolution digital camera
- Digital video cameras
- Submersible video camera
- DVD and digital video capture

SUPERSONIC WIND TUNNELS

The Aerodynamics Laboratory also has access to the WSU aerospace engineering department's supersonic wind tunnel. The nine by nine inch supersonic tunnel can simulate wind speeds from Mach .9 to Mach 4 for 30-second intervals with a 40-minute preparation time.





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