



Turbojet and Turbofan Aero Engine Test Facilities

For Turnkey Multi-Purpose Repair and Overhaul Capabilities



Aerotest Limited have designed, developed and supplied Turnkey Multi-purpose Engine Test Facilities for repair and overhaul testing of uninstalled Turbojet and Turbofan engines combined with aircraft run-up facilities.

Aerotest's main aim is to provide our customers with high quality "state of the art" and maintainable test solutions.

Aerotest also provide adaptations and upgrades for existing test cells to enable the end user the flexibility and capability to manage new and/ or different engine types.

All Aerotest facilities have been fully correlated and approved by the OEM's enabling the end user to fully performance test engines with the confidence of reliable confirmed data.

The Aerotest Turnkey Multi-purpose Engine Test Facility project takes only 18 months on average to complete in any environmental location, thus providing major logistical and fleet operating cost benefits.

A Turnkey Multi-purpose Engine Test Facility provides the following advantages:

- Multi-engine capability for flexible testing solutions in a safe and efficient test environment.
- The Aerotest "state of the art" Engine Test Facility has a proven capacity to test over 500 engines per annum.
- Proves the performance of the overhauled Turbojet and Turbofan engines.
- Turbojet and Turbofan engines installed and fully tested during a ONE TIME installation.
- A faster, more accurate way of repeatable and recording test data.
- Proven application software approved by the CAA, FAA, UK MoD and many foreign military quality control authorities.
- Increases aircraft availability.

Test Facility "Turnkey" project design and construction, comprising of the following:

- Complete project management for major turnkey civil and military aerospace projects.
- All civil ground works, structural steelwork and building design.
- World-class acoustic design and noise reduction performance.
- Mechanical systems and services design.
- Electrical and electronics design.
- Instrumentation systems design.
- Fluid systems design.
- "State of the art" high speed data acquisition systems.
- Engine / component real time test application software.
- Test facilities maintenance and NAMAS traceable instrumentation calibration equipment.
- Installation and commissioning services.
- Compilation of test facility operation and maintenance manuals.
- Post contract design/ software and maintenance support services.



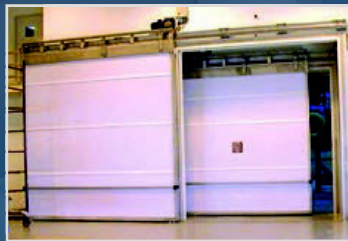
AERO ENGINE & COMPONENT TEST FACILITIES



A Turnkey Multi-purpose Engine Test Facility comprises of:

Turbojet and Turbofan engine test cell which includes the following features:

- Structural steel modular building forming the support structure of the test cell.
- Acoustically attenuated vertical Intake system.
- Acoustically attenuated exhaust system.
- Exhaust system fast acting roller shutter door.
- Turning vanes mounted below the vertical air-intake air splitter silencer to change the airflow direction from a vertical into a horizontal direction.
- Triple glazed acoustic viewing window to reduce the control room noise level.
- Acoustic semi-automatic sliding access single leaf double doors for engine entry and exit to the test cell.
- Aerotest 'Aero-sound' modular acoustic panels with stainless steel support structure.
- Two complete single leaf personnel access door and noise lock lobbies from the test cell into the control room and from the test cell to outside.
- Engine pre-rigging test adapters with multi-way female coupling plate.



- Engine test thrust stand, with fail safe interlocks and automatic integral electric dual hoist test adapter and Engine handling system X-Y crane.
- Unique thrust stand floating frame with fail safe locating blocks and multi-way male coupling plate.
- Thrust measurement system.
- Hydraulic scissor engine access platform for personnel.
- Test cell lighting.
- Engine CO2 fire extinguishing system.
- Full colour tilt, pan and zoom CCTV cameras.
- Externally mounted "Red" flashing beacons above all doors.
- Anti-slip flooring and effluent disposal system.



A Turnkey Multi-purpose Engine Test Facility comprises of:

Turbojet and Turbofan engine control room which includes the following features:

- Structural steel modular building forming the support structure of the engine test acoustic control room.
- Acoustically attenuated using Aerotest 'Aero-Sound' modular high performance acoustic panels.
- Fully air conditioned.
- Category 3 VDU fluorescent lighting.
- Fire system backup (pneumatic) release mechanism.
- Hand-held foam fire extinguisher.
- Optional acoustic viewing window.
- Fully suspended anti-static computer flooring.
- Ergonomically designed control console, maximising the 'Operator' working space allowing control of all the required functions from a seated position.
- Tower PCs with high resolution colour monitors.
- Wireless personnel communications control panel.
- Accelerometer based vibration monitoring system fully interfaced with the data acquisition system.
- Colour closed circuit TV (CCTV) monitor and remote control centre, with tilt, pan and zoom cameras.
- Independent vibration suite with variable software filtering all with a common set of velocity pick-ups.

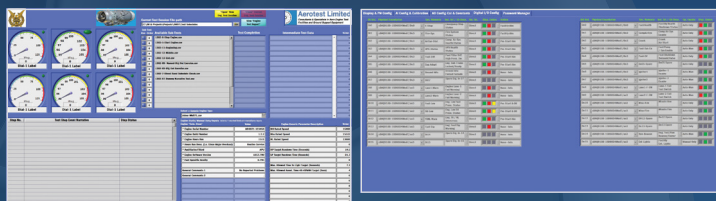


Control room electronics cabinet is equipped with:

- Stabilised power supply.
- Multi-channel data acquisition system.
- Terminations cabinet.
- 28-volt un-interruptible power supplies- engine control.
- 115 volt 400 Hz un-interruptible power supplies- engine control.
- Multi channel vibration suite, with analogue outputs to the data acquisition system processor.
- Throttle interface controller.
- Test cell safety interlocks panel.

Turbojet and Turbofan engine test facility software control:

- Aerotest provides a 'state of the art' solution for the control and instrumentation requirements for a Turbojet and Turbofan engine test facility.
- The software is configured to allow the operator to select between the different power plants to be tested.
- This method of controlling both the power plants and the test facility provides the customer with an easy method of upgrading the facility for future engine modifications and applications.
- The Aerotest Supervisory Control and Data Acquisition (SCADA) system has been developed using National Instruments globally supported 'LabView' software to run within the well proven and reliable latest MS Windows operating environment.



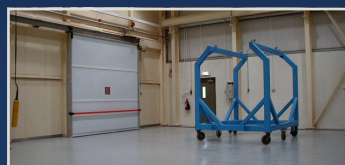
- The software code at the heart of the system is designed to for any customer specified engine test procedures.
- It enables the operators to repeat functions accurately and produce consistent and comparable test results.



- The DAQ hardware platform communicates back to the control room via a single Ethernet connection/cable.
- The DAQ hardware is incorporated into a temperature controlled 'Field Instrumentation Enclosure' which typically houses other ancillary sensors & equipment e.g. pressure sensors, pump contactors, starters etc.

A Turnkey Multi-purpose Engine Test Facility comprises of: Turbojet and Turbofan engine preparation shop which includes the following features:

- Structural steel modular building forming the support structure of the engine preparation shop.
- Air-conditioning via a water-chilled system, thus creating a working environment suitable for full time occupancy.
- Facilitates the rigging and de-rigging of the engine to the test adapter and transport trolley.
- Facilitates the fitting and removal of engine instrumentation probes, intake flare and jet pipe and drain engine test oil.
- Facilitates the storage of trolleys and testing adapters.



- Facilitates the storage of tools and spare parts.
- Dual hooked XYZ five Tonne crane.
- Internal acoustic treatment and glazed windows to allow natural light, giving a superior working environment.
- Acoustic semi-automatic sliding access door for entry and exit.
- Anti-slip flooring.
- Fire alarm central panel with heat and smoke detectors.

A Turnkey Multi-purpose Engine Test Facility comprises of:

Turbojet and Turbofan engine service rooms which includes the following features:

- An acoustic and air-conditioned electrical and pneumatics service room, housing the mains distribution panel, uninterruptible power supply, hydraulics pack and pneumatics cabinet.
- An acoustic fuel service room, which is force ventilated, via ductmounted silencers, housing the fuel measurement/ control module, and inhibiting system.
- Separate air compressor and test cell Co2 system rooms, each protected from external environmental elements.



- Independent zoning, automatic and manual fire extinguishing systems for the acoustic fuel room and electrical services rooms.





A Turnkey Multi-purpose Engine Test Facility comprises of:

Turbojet and Turbofan engine fuel system which includes the following features:

- A modern, well-proven, fuel system, which comprises of a suitably sized horizontal double cylindrical construction fuel tank with integral pump and filtration unit housed within a secure cabinet at the front of the tank including a roller shutter door mounted on integral saddles.
- High accuracy fuel measurement and pressure control system, to suit a wide variety of turbo jet engines. The system is of a modular design, enabling ease of maintenance and expansion at a later date to suit more powerful aero engines.
- The system employs very high accuracy flowmeters.
- The Aerotest system ensures a fuel supply to the engine under test via a failsafe design, irrespective of the fuel boost pump operating or not, thus eliminating the need for by-pass lines and check valves.



A Turnkey Multi-purpose Engine Test Facility comprises of:

Turbojet and Turbofan engine air start system which includes the following features:

- A modern technology rotary screw, oil free compressor, desiccant/ refrigerant dryer and filtration all located in a separate well ventilated compressor services room.
- The pre-commissioned package will supply compressed air to a vertical air receiver located outside the rear of the test facility, servicing the following systems:
- Engine air starter.
- Facility pneumatic control valve cabinet.
- General shop air.
- The system is sized to allow five successive start cycles, each of thirty seconds duration.



A Turnkey Multi-purpose Engine Test Facility comprises of: Turbojet and Turbofan engine fire system which includes the following features

- All equipment is manufactured, installed, commissioned and certified in accordance with the latest standards whether it is the USA-NFPA Codes of Practise, British Standards or the latest Civil Defence Authority regulations.
- The test cell is equipped with a Co2 discharge nozzle system supported from the thrust stand framework and directed towards engine.
- Control room, electrical room and fuel room shall be equipped with FM200 fire extinguishing systems.
- Smoke and heat detectors are installed in each room.
- The FM200 Waterless fire suppression system does not discharge immediately upon sensor detection, the system includes audible alarm bells and time delays to allow personnel evacuation prior to discharge and therefore not endanger human life.
- Fire alarm central control panel, with heat and smoke detectors normally located within the engine preparation shop.
- Automatic and periodic self test function of detector serviceability with annunciation of indicated detector un-serviceability.
- Output for air force base fire warning system (auto dial from Main alarm and monitoring panel).
- Output for alarm bells/ light signs (inside and/ or outside building).
- Warning, flashing LED when in Auto Mode.



Ordering Information:

NCAGE Number: KE 160



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Aerotest Limited is an ISO BS EN 9001: 2015 registered company with a quality approval certificate, number FM6664



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