Turbine
Test Products

Froude – the Industry Standard

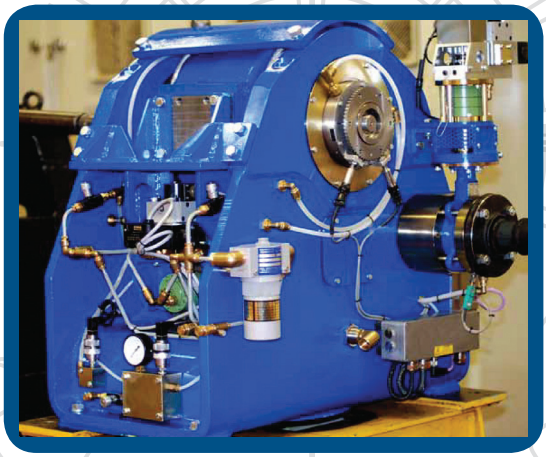
- Low- and high-speed dynamometers
- New digital dynamometer control systems
- High- and low-speed flywheels for inertia simulation
- Test stands and test trolleys
- Engine cradle / adaptor frames

Principal Applications

- Turboprop
- Turboshaft
- Power generation
- Industrial
- Auxiliary Power Units
- Marine

Froude

The most recognized engine-testing brand for over 135 years.



Description

Froude has always been the innovator of the test equipment industry producing world class products for world class customers. We design and manufacture a range of dynamometers, control systems and test equipment specifically designed for the discerning world of Turbine testing.

Applications include research and development, production and post overhaul testing. Our products are the product of choice of most of the world's leading manufacturers, M.R.O.s and test facility suppliers.

Froude has a unique range of dynamometers covering applications from high-powered industrial gas turbines, direct and indirect drive turbo shaft engines, turboprop engines and A.P.U.s. We supply hydraulic (water brake), eddy current and AC dynamometers.

F Type Dynamometers

'F' type hydraulic dynamometers are designed for high accuracy of control, torque measurement and rapid load changes (response). Our range includes low speed, high torque variants for turboprop testing and higher speed, lower torque variants for turboshaft testing in uni- and bi-directional configurations.

F Type at a Glance

- Power range 750 kW (1,000 shp) to 30 MW (40,000 shp)
- Operating speed up to 16,000 rpm
- High accuracy torque measurement
- High response servo-hydraulic control valves
- Health monitoring of critical parameters
- Fail safe systems on control valves

HS Dynamometers

HS dynamometers are designed for direct turboshaft engines with high accuracy of control, torque measurement and rapid load changes (response).

HS at a Glance

- Power range 1,670 kW (2,500 shp) to 30 MW (40,000 shp)
- Speed range 7,000 to 30,000 rpm
- High accuracy torque measurement
- High response servo-hydraulic control valves
- Health monitoring of critical parameters
- Fail safe systems on control valves

LS Dynamometers

Low-speed, very high power dynamometers can be supplied for use with steam turbine and gearbox applications as well as for capital ship and cathedral engines. In fact, we are world leaders in the design and production of large dynamometers for testing piston, turbine and electric prime movers for the marine industry. We have a unique design which allows for simplified maintenance and vastly reduced installation time.

LS at a Glance

- Power range 9,000 kW to 100,000 kW
- Torque measurement accuracy ±0.2% of full rated torque of dynamometer
- Speed measurement accuracy ±1 RPM
- High torque/power/size ratio
- Horizontally split casing
- Innovative shaft design

Texcel Dynamometer Control System

As known throughout the industry, the VX100 PRO continues the tradition of extremely accurate load control. The system is user friendly with drag and drop functionality and enhanced screen views.

The Texcel VX100 PRO has been specifically designed for turbine test applications using distributed I/O concepts eliminating the need for high density wiring between the dynamometer and the control console. The system incorporates four control modes, special control profiles, health monitoring and failsafe control in critical conditions.

Flywheels

- Inertias matched to engine requirements
- Speed ranges from 800 rpm to 30,000 rpm
- LS flywheel for turboprops
- HS flywheel for turbo shaft
- UHS flywheel for speeds over 24,000 rpm

Test Stands

Designed for use with Froude dynamometers, test stands and test skids are available in two basic sizes. They can be supplied with engine mounts directly onto the stand or with interchangeable engine cradles when more than one engine type is to be tested, or for re-rigging outside of the test cell for greater test utilization.

- Model 6000 test stand for heavy turboprop; high-powered turboshaft
- Model 2000 for medium and light turboprop and medium and lower-powered turboshaft engines

We are also able to provide test skids for use with model 6000 test stands which incorporate a dynamometer and engine adaptor frames.

The test skid is installed on the 6000 test stand in place of an engine cradle. By using the same services and control system as the dynamometer on the 6000 test stand, this provides a cost effective solution for testing a wide variety of engines in a single test cell.

Test trolleys are available in two model sizes:

- 3000 for medium turboprop and turboshaft engines
- 2000 for light turboprop and medium to light turbo shaft engines

These can be supplied with direct engine mounts or interchangeable cradles/engine adaptor frames. This provides a fully flexible test system as trolleys can easily be moved in and out of a test cell giving a quick change over.

Engine Applications

TURBOPROP

Rolls-Royce:	T56, AE2100, Dart & Tyne
GE:	CT64/CT7-2
PWC:	PT6A, PW100 series
Honeywell:	PW150, TPE331
EPI:	TP-400
Avio:	AR318

TURBOSHAFT

Rolls-Royce:	A250, 300 & 500 series, GEM, Gnome, RTM322
GE:	T700 / CT7
Turbomeca:	Turmo Arriel Artouste, Makila
PWC:	PT6T and PW200 series
Klimov:	TV2, TV3

Froude maintains a policy of continuous research and development and specifications are subject to alteration without notice.

Further information:

Froude Inc.
41123 Jo Drive, Novi MI 48375
+1 248.579.4295

sales@froudedyno.com
froudedyno.com

Manufacturing and Support:

Froude Ltd.
Blackpole Road
Worcester WR3 8YB UK

Froude

The most recognized engine-testing brand for over 135 years.

F_DYNO_02_15_17