LM2500+
Marine Gas Turbine

GE's LM2500+ gas turbine is based on the industry standard-setting GE LM2500 marine gas turbine. The LM2500+ main features are increased power (20%) compared to the LM2500, the same high availability and reliability, and an even higher efficiency (lower SFC) than the LM2500. As in the case of the LM2500, the LM2500+ simple modular design provides for easy maintenance, featuring a split compressor casing, in-place blade and vane replacement, in-place hot section maintenance and external fuel nozzles.

Comparing the Design of the LM2500+ to the LM2500

The primary difference between the two engines is the addition of one stage of compressor blades forward of the LM2500's first stage blading which results in approximately a 20% airflow increase at full power. This "zero" stage is a wide-chord, single-piece bladed disk or blisk. The LM2500+'s stage one blades have been redesigned without mid-span dampers. The LM2500+ 17-stage compressor has an increased pressure ratio to 23.1:1 from 18:1 of the LM2500.

Aft of the LM2500+ compressor is the fully annular combustor with externally mounted fuel nozzles; a two-stage air-cooled high-pressure turbine which drives the compressor and the accessory-drive gearbox; and a six-stage aerodynamically coupled, low-pressure power turbine which is driven by the gas generator's high energy exhaust gas flow. The increase in power warranted several design changes in the existing LM2500 power turbine. The overall flow function was increased 11% to account for the higher airflow. Stage 1 and Stage 6 blades are optimized for aerodynamic efficiency to keep the power turbine at its previously high level of efficiency. The power turbine rotor has been strengthened for the higher torque and potential energy of the LM2500+.

Pre-wired, pre-piped and factory-tested for easy installation, the LM2500+ module weighs just 50,600 pounds (23,000 kilograms) with shock mounts and 48,090 pounds (21,859 kilograms) without. It requires only 338 x 108 x 120 cubic inches of ship space (28.2 x 9 x 10 feet) (7.16 x 2.74 x 3.05 meters). The inlet duct flow area is 57 square feet (5.35 square meters) and the exhaust flow area is 36 square feet (3.3 square meters).

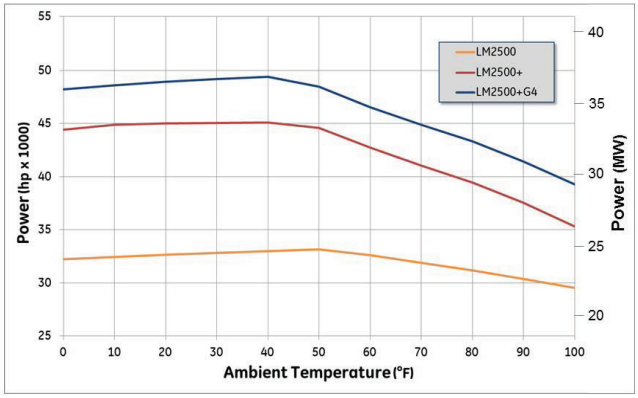
Performance

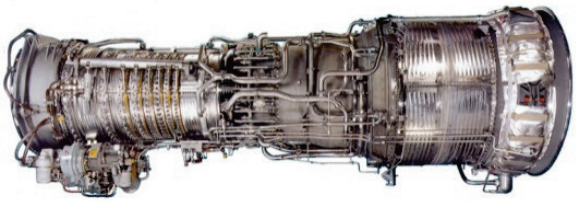
Output	40,500 shp (30,200 kW)
SFC	.354 lb/shp-hr (215 g/kW-hr)
Heat rate	6,522 Btu/shp-hr
	8,746 Btu/kWs-hr
	9,227 kJ/kWs-hr
Exhaust gas flow	189 lb/sec (85.9 kg/sec)
Exhaust gas temperature	965°F (518°C)
Power turbine speed	3600 rpm

Average performance, 60 Hz, 59°F, sea level, 60% relative humidity, no inlet/exhaust losses

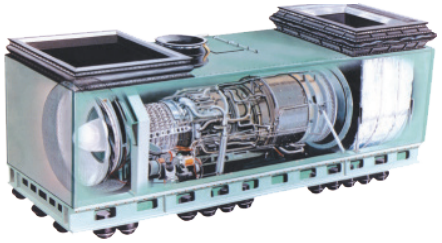
Max Power vs. Ambient Temperature

losses: inlet/exhaust 4/6 inches (10/15 centimeters) water





LM2500+
Marine Module



GE Aviation (Cincinnati, OH)
www.ge.com/marine

Imagination at work.

LM2500+ Marine Gas Turbine

LM2500+ Marine Gas Turbine Genset

The LM2500+ marine gas turbine can be coupled with an electric generator making an LM2500+ marine gas turbine-generator set. The LM2500+ genset is ideal for military applications for which electric drive is the propulsion system of choice. The Japanese *Asuka* research ship uses the similar LM2500 in an electric drive propulsion system. Seventeen cruise ships in service use GE's LM2500 and LM2500+ gas turbine gensets as the total propulsion and on-board energy system. GE furnishes the complete LM2500+ gas turbine-generator set using a generator from a generator manufacturer acceptable to the customer.

Specific Qualifications

The LM2500+ gas turbine propulsion system includes the turbine, base and enclosure, and lube oil storage and conditioning assembly. This gas turbine meets United States Navy requirements for surface combatant vessels for shock, vibration, EMI and electrical bonding plus airborne and structure-borne noise. The first military application of the LM2500+ is on the U.S. Navy's *Makin Island* LHD 8 assault ship. Each LM2500+ production unit is tested by GE and is available for customer witness. The LM2500+ marine gas turbine has been granted type approval by ABS, BV, DNV GL and Lloyd's Register.

Dimensions*

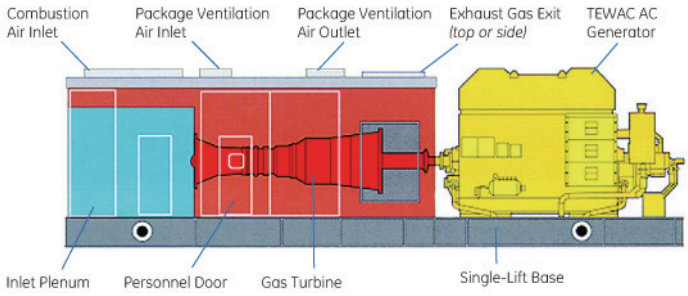
Base plate width		123 in (3.12 m)
Base plate length		566 in (14.38 m)
Enclosure height		157 in (3.98 m)
Base plate weight		208,000 lb (94,545 kg)
Duct flow areas	Inlet	57 sq ft (5.3 sq m)
	Exhaust	36 sq ft (3.3 sq m)

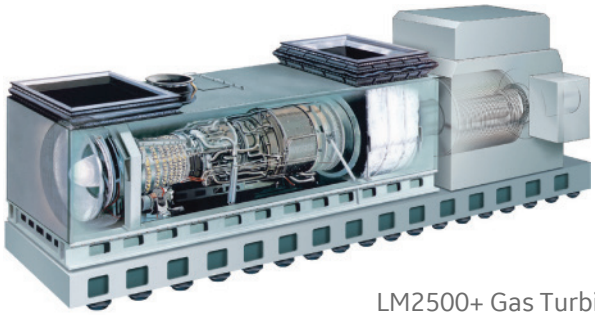
* Exact dimensions, weight and performance vary with the specific generator selected.

Performance

Output	29,000 kW
Heat rate	8,856 Btu/kW-hr
Thermal efficiency	38%

Average performance, 60 hertz, 59°F, sea level, 60% relative humidity, 4 inches water inlet loss, 6 inches water exhaust loss





LM2500+ Gas Turbine-Generator Set

GE Aviation (Cincinnati, OH)
www.ge.com/marine
Other product sheets are available on the LM500, LM2500, LM2500+G4 and LM6000 gas turbines.

(2-17)