

Dynatest 6450 Lightweight Profilometer® Specifications (December 2002)

System:

The Dynatest 6450 Lightweight Profilometer® (LWP) is a true spatially based system capable of reporting and recording data points at selected intervals ranging between 25 mm (1 in.) and 305 mm (12 in.) along the traveled lane at speeds between 20 and 30 kilometers per hour (12 and 18 miles per hour). The system can easily meet the precision and bias standards required by Texas DOT (TEX-1001-S) in real time data collection.

The LWP includes operator selectable cutoff wavelengths ranging from 7.6 m to 91.4 m (25 ft to 300 ft). The cutoff wavelength for profile calculation is nominally 61 m (200 ft).

Under ASTM E950 precision and bias test conditions the LWP has met the following results:

Over 322 m (1056 ft) with a 61 m (200 ft) filter, a bias of 0.031 in. (0.79 mm) and a precision of 0.014 in. (0.36 mm).

Data Collection Sensor(s):

The LWP utilizes a Dynatest patented Model T3000IR non-contact infrared sensor combined with an accelerometer.

Displacement Sensors:

The Dynatest patented Model T3000IR non-contact infrared sensor, designed specifically for use in pavement profile measurements, has a large spot or "footprint" of 6mm X 31 mm (0.25 in. X 1.25 in.). The infrared sensor has a vertical displacement measuring resolution of 0.025mm (0.001 in.) on all paved surfaces. The T3000IR has a mean time between failure (MTBF) of 10,000 hours. The LWP comes with a precision calibration kit including either metric or US "1-2-3" calibration blocks, and base-plate.

The LWP comes standard with a single front mounted infrared displacement sensor. An optional second sensor is available. With dual sensors, one sensor is mounted on each side of the vehicle and aligned with a 1753 mm (69 in.) track spacing for dual wheel-path testing.

Accelerometer:

The displacement sensor is combined with a precision servo-balanced aircraft grade accelerometer with mean time between failure (MTBF) of 100,000 hours.

Distance Measuring:

The digital distance-measuring encoder is integrated into the front axle of the vehicle, and encoder is accurate to 0.1 %.

Photo Cell:

The LWP is equipped with a photocell pickup sensor for automatic starting/stopping of the profile testing. Two reflective orange signal cones with photocell reflectors for start/stop of profile are included.

Hand Held Pendants:

The LWP has dual hand held pendants; one for photocell arming and starting/stopping of profile recording and a second pendant for pausing and starting of profile index recording.

Computer Specifications:

The LWP uses a Windows® based operating system conveniently run on a removable laptop to provide operation of the profiler operating program and data storage. (Client may supply computer)

Laptop Computer requires the following minimum requirements:

- Processor Speed: 800 MHz
- Minimum RAM: 512 MB
- Hard Drive: 10 GB
- Operating System: Windows® 2000, or Windows® XP
- USB Port
- Ethernet Port

Computer Software:

- Operating program for profile data collection is Windows® based menu driven.
- Diagnostic screen
- Calibration screen
- Menu driven system set-up and header setup
- On-line International Ride Index (IRI)
- On-line Profilograph Index program (PI)
- Operator selectable blanking band
- English or Metric units selectable.
- Real-time profile display on screen.

Printer (Optional):

The optional printer is an inkjet printer that allows profile traces and pavement smoothness indices (IRI, PI etc.) to be printed in the field.

Vehicle:

The 6450 Light Weight Profilometer® (LWP) is housed in a Kawasaki Mule Model 500 Series vehicle with the following features:

- Steel roll bar and cage assembly.

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- Removable top.
- Removable lexan windshield.
- Four rim mounted tubeless tires for use on soft pavement surface.
- Bench seat with two seat belts.
- Side view mirrors for driver and passenger sides.
- Safety flasher beacon with dash mounted on/off switch.
- Dual front headlamps with dash mounted on/off switch.
- Tail and brake lights.
- 16 liter (4.2 US gal) fuel tank with gauge.
- Seating capacity of 2, maximum load 400 kg (880 lbs).

Engine and Performance:

- OHV, single-cylinder, 4-stroke, positive air-cooled engine.
- 286 ml (17.5 cu.in.) displacement.
- Two wheel, gear driven.
- Forward and reverse automatic transmission.
- 12-volt battery and alternator system sufficient to keep battery charged with computers and all lights running. Battery should provide a minimum of 30 minutes computer operation when Mule motor is off.
- Electric key-start ignition.
- Top continuous profiling speed is 30 km/h (18 mph).

Trailer (Optional):

The 6450 LWP system is optionally supplied with a trailer that meets the following specifications:

- An enclosed aluminum shell with steel, aluminum and wood frame.
- Single axle.
- The trailer shall be properly sized to allow the 6450 LWP to be driven into the trailer.
- The trailer shall have sufficient size and capacity to carry the weight of the 6450 LWP within the trailer manufacturers design load. The trailer shall have a payload capacity of 850 kgs (1,880 lbs), a curb weight of 500 kgs (1,100 lbs) and a GVWR of 1350 kgs (2,980 lbs). This will provide approximately 450 kgs (1,000 lbs) surplus capacity for storage.
- The bottom hinged rear door shall swing down and act as a drive-on loading ramp for the 6450 LWP. The door shall be tensioned for easy opening/closing by one person.
- Interior hold-downs shall be securely mounted inside the trailer to secure the 6450 LWP during transit.
- The trailer shall include a lockable side door mounted on the right side. The door shall be 152 cm (60 in.) tall by 76 cm (30 in.) wide.
- The trailer shall include US DOT lighting, brakes and wiring required for legal highway/street use.
- The trailer shall include a spare tire and wrench securely mounted inside the trailer.

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