

3032 Light Weight Deflectometer

Compliance:

ASTM E2583-07 (2015)

CD 225 Design for new pavement foundations

NCHRP 10-84

TPF 5(285)

Italy UNI11531-1: 2014

BS 1924-2:2018

CEN/TS 17006:2016



Dynatest Light Weight Deflectometer 3032 (LWD)

Dynatest Light Weight Deflectometer (LWD) Model 3032 is a portable dynamic plate loading device designed for compaction quality assurance (QA) and determination of the modulus of unbound or partially bound material including thin asphalt layers, unbound granular aggregate base, partially stabilized base layers, subgrade soil and etc. The LWD is suitable for testing in difficult to access areas, e.g. trenches, narrow channels, etc. Dynatest LWD is designed to determine the “surface modulus” (often termed stiffness)—a response of the underlying structure, in terms of a transient deflection, to the dynamic stress applied through a circular bearing plate. Whereas the structure to test is composed by different layers, Dynatest LWD allows analysis for the estimation of each “layer modulus” using the Dual Plate System (DPS) and additional geophones. Transport cases available: single case for shipping fully assembled (excl. additional geophones) or multiple cases for easier handling.

Key benefits of the Dynatest Light Weight Deflectometer:

- One Person operation.
- Rapid test allows close test point spacing ensuring homogeneity of the test section.
- Surface Modulus output at time of test.
- The LWD App, available for both iOS and Android smartphone, gives a clear overview of the collected measurements.
- Assessment of both the stiffness and compaction of material with the same unit.
- Quality control of the subbase layers and subgrade before an overlay is applied.
- Testing of trench restorations to reduce the chance of settlement over time.



The Light Weight Deflectometer (LWD) meets the ASTM 2583, the CD225 (UK) standard, and other international standards for determining the modulus and compaction of the material.

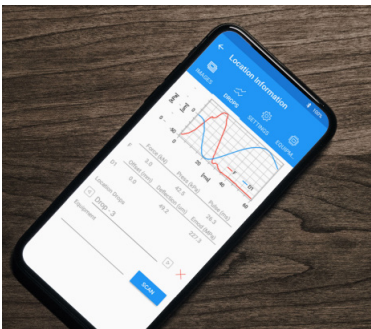
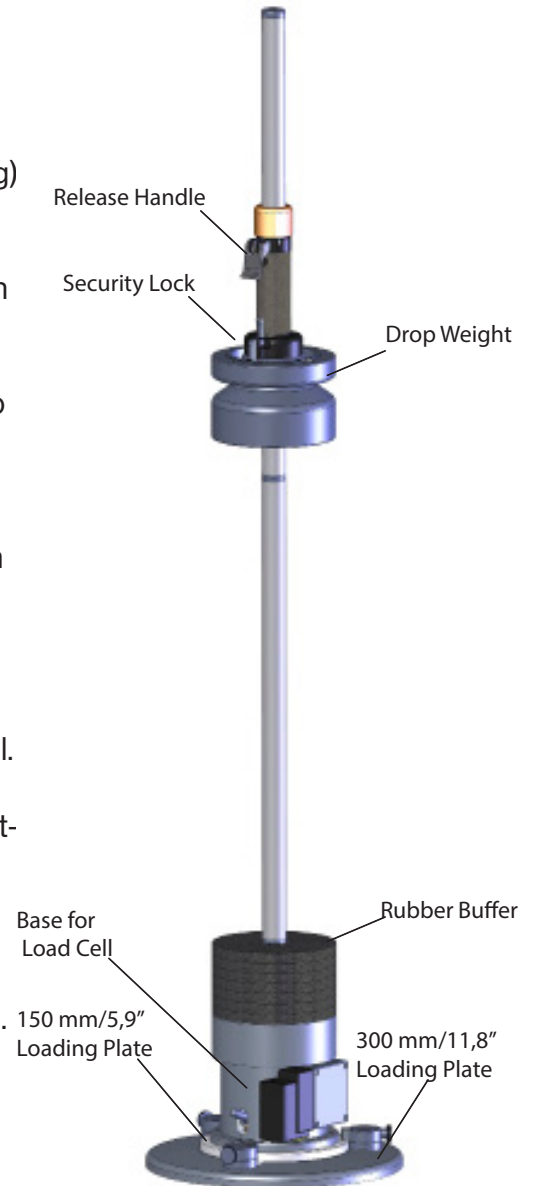


A closer look at the smart Features of Dynatest Light Weight Deflectometer 3032 (LWD)

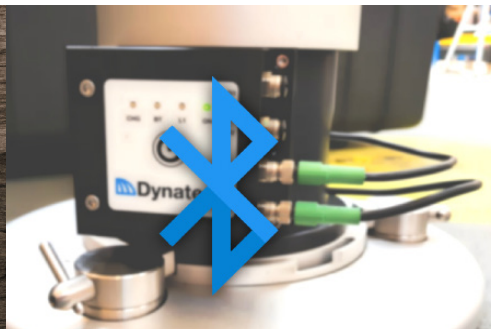
Being the number one choice among our customers remains the number one priority for Dynatest and the vital driver of our Research and Development (R&D) efforts. The Dynatest Light Weight Deflectometer (LWD) Model 3032 has more key customer features than any other LWD on the market - let's have a closer look.

Key Operational Features:

- Precision load cell to measure the impact load-time history and peak magnitude.
- 22 lbs (10 kg) standard weight or optional 11 lbs (5 kg), 33 lbs (15 kg) or 44 lbs (20 kg) drop weight setups applying up to 3,300 lbf (15 kN) impact force.
- Center seismic transducer (geophone) to measure the deflection time history (by single integration of velocity) and peak value on materials.
- Sensor locking plug feature optionally allows center geophone to measure plate deflection.
- Dual Plate System (DPS) for quick and easy switching between the 11.8 in (300 mm) and 5.9 in (150 mm) loading plate diameter.
- A 3.9 in (100 mm) plate diameter is included, and an optional 7.8 in (200 mm) plate is available.
- Lever to ensure that the geophone is centered and seated correctly.
- Movable release handle and laser engraved scale on the weight guide shaft for easy setting of the desired drop height/stress level.
- Enhanced Bluetooth module with high stability and extended range, allows data collection with your phone using the cross-platform LWD Mobile app on: Android and iOS (Apple).
- Up to 50 hours idle time per charge.
- Ability to perform tests while charging.
- Dust and splash proof (IP56) electronics for safe outdoor use.
- Lightweight with total basic configuration weight of 48 lbs (22 kg).
- GPS capability through phone.



Easy data collection with the Dynatest LWD Mobile App.



Micro-USB port for easy charging.



Using the latest energy-efficient technologies increases the idle and working time of your Dynatest LWD.

Comprehensive accessory program to customize your Dynatest LWD for your needs.

The new Dynatest Light Weight Deflectometer is ready to be used in all standard measurement assignments and is delivered with our user friendly manual in order to get your pavement testing started as quickly as possible. If requested, a personalized training regarding the use of the equipment, the mobile app and the software, can be offered by Dynatest: both online training and on-site training are possible options, carried out by a qualified Dynatest engineer. We offer a comprehensive program of accessories and software in order for you to customize the LWD after your needs.

Accessories:

Geophone Kit, Sensor Beam incl. 2 additional geophones.



Transportation box for Geophone Kit.



Additional 200mm Loading Plate.



Transportation Trolley, for ease of transportation on site.



Extra 5kg weights and required buffer plates
(Possibility to add 2 additional 5kg weights).



The Dynatest LWD is high-quality, but becomes truly powerful with the software pack.

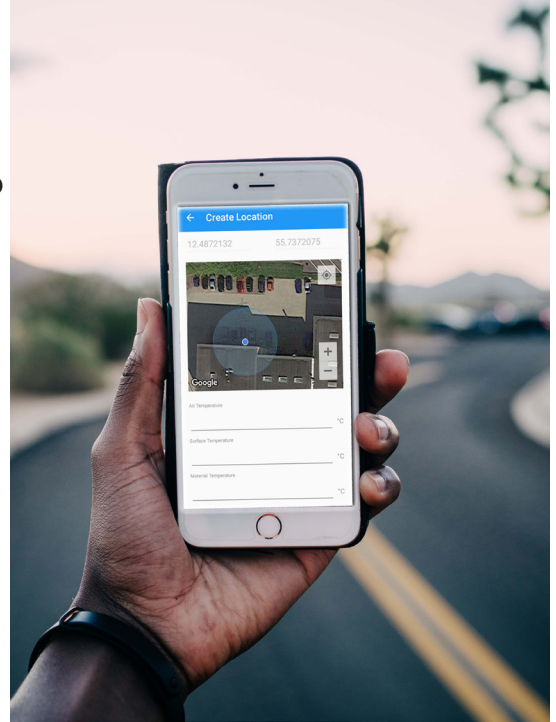
The Dynatest Light Weight Deflectometer is known in the market for its high quality. Even after many years of continuous use, it can be found still fully functional, which offers a low product-life cycle cost for you. But with the market leading software, the LWD truly shows its calibers. The light software pack comes free of charge and gives you great data collection opportunities, with market leading functionalities via an app for both iOS/Android. The Pro version adds calculations, statistics and analysis options beyond your imagination.

LWD App Light

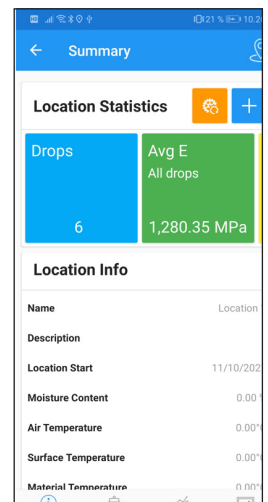
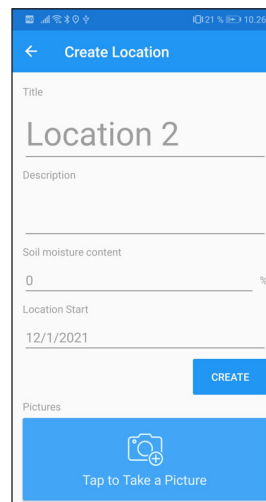
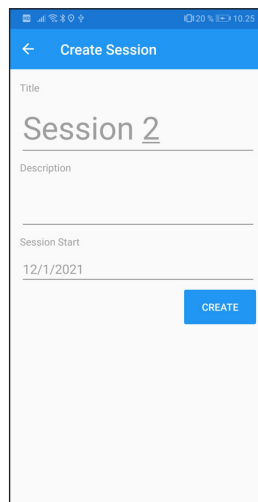
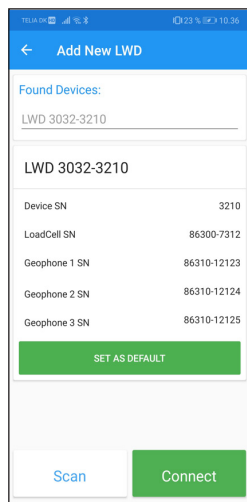
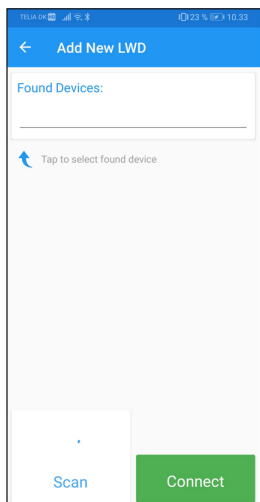
To get reliable and repeatable data from high-quality equipment is very important, but so is the ease of the data collection software. To be able to do this via an App, that you can use on your own mobile, saves you time and money. The set-up of the LWD App is done via a standard bluetooth connection with clear indication when paired and ready to use. Without further work, you can make the first drop

Structured approach - free of charge

The LWD App helps you to organize all your data in projects and several data collection sessions, which are used to organize the location where the drop measurements take place. The App uses the GPS on your device to show and record the location. In the light (free of charge) version you get:



- Create hierarchal databases for data collection (Project, Session, and Location).
- Input data collection attributes, assumptions & comments.
- Ability to collect real time GPS location.
- Ability to capture and tag photo images on each test location.
- Offline data acquisition.
- Instant surface modulus results, figures, and summary tables, on Location, Session, and Project level.
- Data export and sharing for post-processing with LWDMod or similar program.
- The database file from your LWD App can be shared via email or exported directly to the phone's memory.

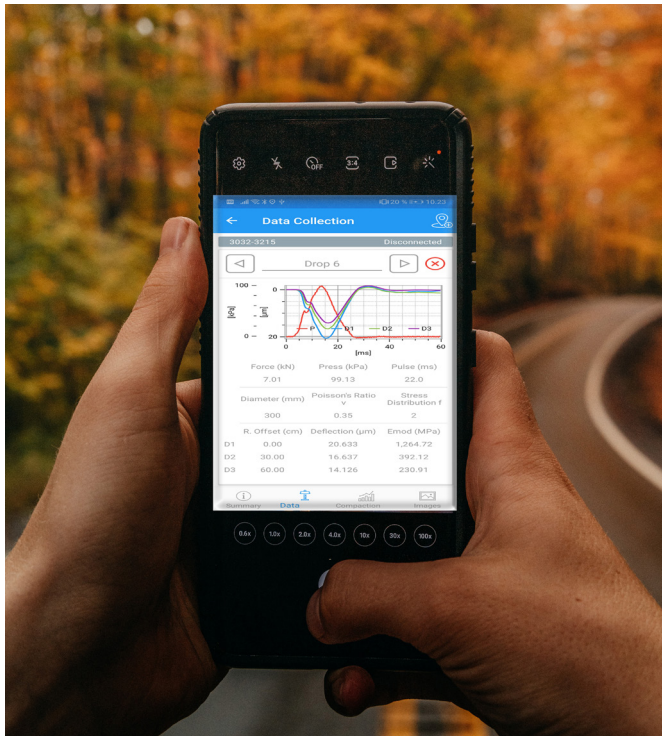


Calculations and analysis with the LWD Pro App.

The LWD Pro App package is issued per LWD and can be used on multiple phones/tablets. This Pro license gives you access to statistics on location, session, and project level, and compaction calculations for each station and updated for every drop.

Enhanced functionalities in the LWD Pro App:

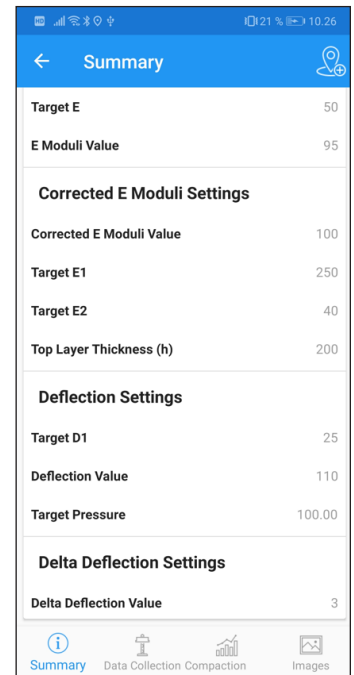
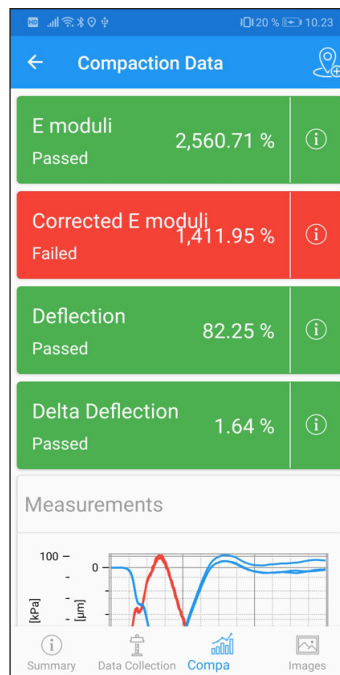
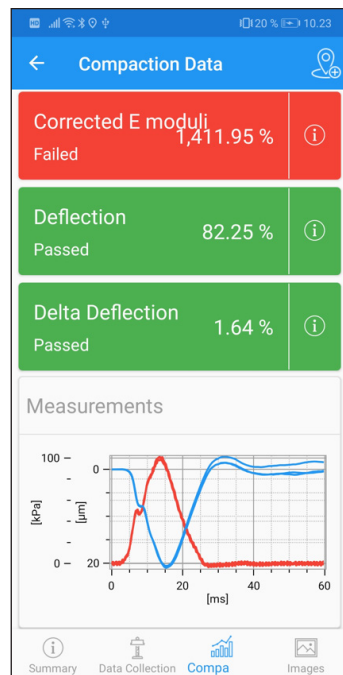
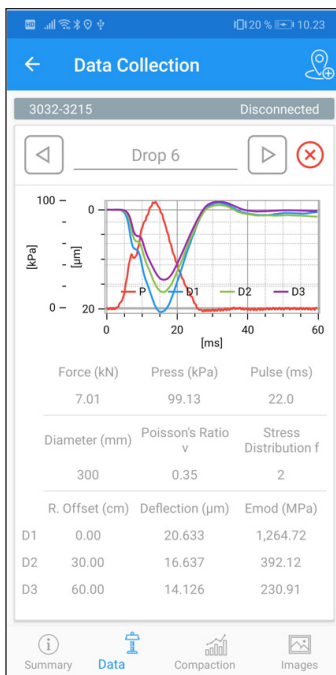
- Compaction Quality Control and Statistics module providing different compaction criteria to determine percentage compaction according to MNDOT, INDOT, TPF 5-285, Italian ANAS and UK specifications.
- Statistics on location, sessions and project level, including the possibility to customize to show the statistical value required.



Compaction quality of base and subbase layers has a major effect on the overall performance of pavement structures. Therefore, it is important to test and ensure that base and subbase layers are compacted properly.

This can be tested by the Dynatest Light Weight Deflectometer 3032, but the calculations of compaction can be time consuming.

With the Pro license version of the LWD App, all the calculations are done automatically, while measuring in the field. The results are shown by adjustable graphs. The Pro App shows a summary of the acquired data, and clearly points out when the test is passed or failed.



LWDMod software provides an ideal analysis package for your Dynatest Light Weight Deflectometer.

The non licensed LWDMod is delivered as standard with the LWD 3032 equipment. It is a desktop application designed to run on any PC with Windows 7 or higher and offers advanced features for data organization, analysis, and reporting.

The non licensed version of LWDMod is a free version that include the following features.

LWDMod Lite version:

- Import and edit LWD data for removal of outliers
- Export test results to Excel or Word for further analysis
- Export to UK requirements
- Possibility to export: point number, location, drop number, time, plate size, load, stress, geophone(s) distance(s), geophone(s) deflection(s), surface deflection moduli, deflection offset, loss of energy, air temperature, surface temperature, material temperature, GPS/notes, time histories, CBR soil, compaction results (shown & calculated in Dynatest LWD 3032 Pro App)

LWDMod, licensed version, will give you enhanced calculations and analysis:

- One license required per PC
- Data Visualization—including figures and summary tables
- Calculation and Analysis including: back-calculation of layer moduli, overlay design thickness calculations, depth to bedrock, subgrade non-linearity, and estimation of the layer thickness

The screenshot displays the LWDMod software interface with several key components:

- Elastic Moduli Plot:** A line graph showing Modulus (MPa) on a logarithmic scale (10 to 1000) versus Location (1122-1 to 1122-7). Three data series are plotted: E1 (blue), E2 (green), and E3 (red).
- Report Window:** A configuration panel for Test Results and Analysis Results. Test Results include checkboxes for Point No., Location, Drop No., Time, Plate size, Load, Stress, Distance 1-3, Deflection 1-3, Surface Deflection Moduli, Deflection offset, Loss of Energy, and Notes. Analysis Results include checkboxes for Point No., Location, Thicknesses, Elastic Moduli, Bedrock, and Design thickness.
- Table:** A data table with columns for No. Use, Radius (mm), Stress (kPa), Distances (mm), Deflections (Micron), Deflections (calc.), Em (MPa), Eo (MPa), and RMS. The table contains 5 rows of data.
- Design Plot:** A bar chart showing Overlay (mm) on the y-axis (0 to 400) versus Location (1122-1 to 1122-7). Red bars represent the overlay thickness at each location.
- Structure and seed values:** A panel for configuring the number of layers (set to 2), deflections, and material properties like h (100 mm), E (150 MPa), and C (50 MPa).
- Results:** A panel showing calculated values for n (-0.13), C (43 MPa), and Em (45 MPa).
- Surface Modulus Design:** A panel for setting existing surface modulus (70 MPa), required surface modulus, and required thickness.

During your road formation and foundation, it is key to conduct a proper quality control and assurance testing including stiffness and density measurement. The modulus of the layers will affect the bearing capacity, and if the construction is not properly done, the spread of the load to the layers beneath could be critical. It is essential that stresses and strains in every structural layer are within the defined range. The same quality assessment is of course as important when strengthening and maintaining of an old road.

The Falling Weight Deflectometer is the perfect measuring equipment to identify local spots or poor performance and the Light Weight Deflectometer from Dynatest is a perfect equipment to identify local issues or poor compaction and it will offer you a portable and cost-effective solution for your quality control.



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