

# RC 422.05

# Manual of Testing

## TEXTURE DEPTH (Non-Contact Laser Method)

### 1. SCOPE

This test method sets out the procedure for measuring texture depth of a road surface using a non-contact laser transducer mounted on an inertial laser profiler vehicle.

This method is usually used to measure texture depth of road surfaces during network surveys.

### 2. APPARATUS

- (a) Inertial Profiler consisting of:
- (i) a vehicular platform capable of transporting and mounting the texture measurement testing equipment, mounting the texture profile measuring equipment and travelling at speeds up to the maximum legal speed limit (100 km/hr or 110 km/hr);
  - (ii) displacement transducers (laser devices) which measure the surface texture depth by measuring the distance between the the mounting of the transducer and the travelled surface in the left wheel path and between wheel paths. The displacement measurement transducers shall ensure a precision of measurement in elevation to at least 0.1 mm.  
  
The transducers shall be set so that they will operate within mid-range during normal operations.
  - (iv) a distance measuring transducer capable of measuring the distance travelled to a precision of 50 mm/km. This transducer shall provide input to the data logger to record the distance travelled from the start of the ride quality survey;
  - (v) data logger capable of capturing the output data from the transducers at intervals of not greater than 10 mm;
  - (vi) computer to analyse the data using an appropriate arithmetic model to provide mean values of surface texture depth which correlates to the results obtained using VicRoads Test Method RC 317.01;

- (b) Operator's manual.

- (c) Flat stainless steel base plate at least 25 mm thick, 75 mm wide and at least 300 mm long. The bottom of the plate shall be machined plane with an out-of-flatness not exceeding 0.1 mm.

- (d) Stainless steel step gauge blocks with the two large faces parallel to within 0.1 mm. At least three blocks, covering the range of the transducer shall be used. The dimensions of the blocks shall be known to within  $\pm 0.1$  mm.

- (e) Bulls eye spirit level.

- (f) Device for measuring the geographic coordinates of the start and end of survey.

### 3. CALIBRATION AND CHECKS

#### 3.1 Component Checks

- (a) Calibrate the vertical displacement transducers in the laboratory at least every two years.
- (b) Check the vertical displacement transducers using the step gauge blocks and the flat plate at least 3000 km day of use of the texture measuring machine. Make adjustments to the output of the device to ensure that readings are within 0.25 mm of the block thickness.
- (c) Check the operation of the accelerometers daily to ensure that they are placed and held vertically on the profiler.

#### 3.2 Verification Checks

Perform verification checks for surface texture prior to each network survey and at least every twelve months in accordance with Test Method RC 422.10.

#### 3.3 Repeatability and Bias Checks

Perform repeatability and bias checks prior to each network survey and after about each 3000 km tested during the survey in accordance with Test Methods RC 422.11 and RC 422.12.

## 4. PROCEDURE

### 4.1 General

Testing shall not be performed when it is raining or when there is water on the pavement surface.

Operate the vehicle at a relatively constant speed maintaining a line of longitudinal travel within the wheel paths of the traffic.

### 4.2 Pre-Operation Checks

- (a) Prior to commencement of the test, check that the accelerometer readings are zero whilst the vehicle is static.
- (b) Repeat a previous run or bounce the vehicle whilst static about 10 times and check that the vertical movement of the vehicle due to bounce does not affect the transducer outputs.
- (c) Repeat a previous run to check that the distance measuring device is operating within the required accuracy.

### 4.3 Texture Depth Survey

- (a) Ensure that the vehicle is operating at a constant speed as it approaches the start of and throughout the survey.
- (b) Measure the texture depth in the left wheel path and between wheel paths in each lane.
- (c) Record unusual physical features that may affect the texture depth readings.
- (d) Record the start and end geographic coordinates of the survey.
- (e) Record significant cross roads, intersections, kilometre marks, reference markers (see VicRoads publication: *A Guide to SRRS Data Collection in the Field*) and other features to enable the location system used to be referenced to the data recorded. There shall be no more than 5 km between reference markers recorded within the survey.

## 5. CALCULATIONS

Calculate the following as required:

- (a) The average texture depth in both the left wheel path and between wheel paths for each 100 m of surface surveyed.
- (b) If required, the average texture depth for the total section surveyed.

## 6. REPORT

Report the following:

- (a) The start and end geographical position of the survey/road;
- (b) The average texture depth in both the left wheel path and between wheel paths for each 100 m section, to the nearest 0.01 mm;
- (c) The average texture depth in both the left wheel path and between wheel paths for the total section surveyed, to the nearest 0.01 mm;
- (e) Relevant details as recorded in Steps 4.3(c) and 4.3(e).

Note: When results are required for statistical calculations, they should not be rounded until the statistical calculation is completed.