



Transport
Roads & Maritime
Services

Test method T108

Liquid limit of road materials

OCTOBER 2012



Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Generally Revised Amendments to Clauses 3, 5 and 7 to clarify requirements for equipment and techniques- Ian Stewart	G.Donald	Apr 2007
Ed 2/ Rev 0	All	Reformatted RMS template	J Friedrich	October 2012

Note that Roads and Maritime Services is hereafter referred to as 'RMS'.

The most recent revision to Test method T108 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T108

Liquid limit of road materials

1. Scope

This test method sets out the procedure for the routine determination of the liquid limit for soils, gravels and crushed rock, materials that are encountered or used in road and bridge construction.

2. Test Requirements, Procedure and Reporting

This Test Method is identical to AS 1289.3.1.1, except that:

Clause 3 (c) is amended as follows:

(c) Palette knives of convenient size (e.g. having a blade 200 mm long and 30 mm wide), having sufficient flexibility to avoid crushing of intact rock or mineral grains, while still allowing adequate pressure to be exerted on the soil during mixing and placement into the liquid limit apparatus.

Clause 5 (a) is replaced by the following:

- (a) Obtain at least 250 g of the material passing the 425 μm sieve and prepared in accordance with AS1289.1.1 (see AS1289.3.1.1 Note 5). Alternatively, when practically all soil passes a 425 μm sieve the material may be used in the natural state without further preparation. Then proceed as follows:
- (i) Record the method of preparation (see AS1289.3.1.1 Note 1)
 - (ii) Place the sample in the mixing bowl or on the glass plate and add water in increments, mixing thoroughly with the palette knives for not less than 3 min after each increment of water (see Notes A, B C and D, below).
 - (iii) Continue adding water and mixing the soil until the soil becomes a thick homogeneous paste (see AS1289.3.1.1 Note 6). Cover the soil in a bowl and allow to cure for at least 12 h at room temperature (see AS1289.3.1.1 Note 7). Record the start and finish times of the curing period.

Notes:

- (a) Soils of medium to high plasticity will require mixing times of more than 3 min. Mixing times of over 5 min may be required for high plasticity clays to obtain uniform distribution of moisture.
- (b) Inadequate mixing may result in an erroneous value being obtained for the liquid limit (usually below the true value). This is due to the time necessary for water to penetrate into absorptive particles and into the internal structure of some clays, and for mechanical disturbance to break up aggregations of finer particles, particularly clays. The sample should be mixed as a paste, using firm pressure with the palette knives, against the surface of the bowl or glass plate. In the case of highly plastic clays other techniques may be needed, in the initial stages of water addition, to bring the material to a suitable consistency.
- (c) If there is evidence that the liquid limit of the sample increases with additional and/or firmer mixing, the mixing times and/or pressure from the palette knives shall be increased until no further changes occur. Any such tendency should be noted in the report.
- (d) In soils containing a high proportion of mica (particularly muscovite, commonly known as white mica), such as some granitic sands, an increase in liquid limit may also be recorded after prolonged mixing. This may be due to mechanical attrition of the mica particles, which are soft, flexible and highly fissile. The presence of mica and any such behaviour arising from it should be noted in the report

Clause 5 (c) (i) is amended as follows:

- (i) Level off the mixture parallel to the base, using sufficient downward pressure from the palette knife to prevent the formation of air voids within the soil cake, to give a depth of soil in the cup of about, but not greater than, 10mm (Note E). Hold the grooving tool normal to the surface of the cup, with the chamfered edge facing in the direction of movement and divide the soil by drawing the grooving tool along the diameter through the centre-line of the hinge in one continuous motion (Note F). If at any time during these operations the soil cake slides in the cup start the procedure again, first following the requirements of Clause 5 (d).

Notes:

- (e) Placement of soil in the cup in a loose condition substantially changes the behaviour of the material in the test and leads to determination of a falsely low liquid limit.
- (f) Repeatedly drawing the tool backwards and forwards to form the groove may, in lower plasticity soils, redistribute moisture in the soil cake and lead to an incorrect determination of the liquid limit.

Clause 5 (g) 1st paragraph is amended as follows:

Replace “mixing for at least 1 min after each addition of water” with “mixing for at least 3 mins after each addition of water”

Clause 7 is amended by the insertion of an additional paragraph, as follows:

- (g) Note any tendency for the liquid limit to increase with increased or firmer mixing of the sample, beyond the minimum requirements of the method, together with any evidence for the cause(s) of the behaviour.

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