

2- Plastic Limit Test

Definition

The plastic limit test is used to determine the lowest moisture content at which the soil behaves plastically. It is defined as the water content at which the soil begins to crumble when it can be rolled into a thread of approximately **3 mm** in diameter.

Methods of Determining Plastic Limit

The following methods can be applied to determine the plastic limit:-

1. Cone Penetrometer Method.
2. Convention Plastic Limit Test

Apparatus

1. Smooth glass surface for rolling the thread.
2. Container for determination of water content.
3. Balance sensitive to 0.01g.
4. Oven.

Procedure

1. Take about 20g of plastic soil (set aside earlier during the preparation for liquid limit).
2. The soil is broken and kneaded into several smaller samples, shaped into **(1-2) cm** diameter ball. The material should be plastic enough not to stick to the fingers when squeeze.
3. Roll the soil between fingers on a glass plate to form a uniform **thread of 3 mm diameter** (The rate of rolling should be a bout 80-90 strokes per minute, counting one stroke when the hand moves forward and backward to the starting point).
4. If the diameter of the thread becomes less than 3 mm without cracks, it shows that the water content is more than the plastic limit. Knead the soil to reduce the water content, and roll it again to thread.
5. Repeat the process of alternate rolling and kneading until the thread crumbles and the soil can no longer be rolled into thread.
6. Collect the pieces of the crumbled soil thread in a moisture content container, and determine its water content.
7. Repeat the procedure at least twice more with fresh samples of plastic soil each time.

Calculation

1. Determine the plastic limit, which is taken as the **average of four water contents** in your data sheet.
2. Compute the plasticity index (PI):

$$PI = LL - PL$$

*Take the L.L from your (liquid limit) previous test.

Discussion

- How you can describe the soil, when either LL or PL can't be determined?

Plastic Limit Test Data Sheet

Student Name:

Signature:

Group Name:

Test date: / /

Plastic Limit Test							
No.	Can No.	Weight of can (g)	Weight of can + wet soil (g)	Weight of can + dry soil (g)	Weight of dry soil (g)	Weight of water (g)	Water Content %
1							
2							
3							
4							

P.L =