

Slump of Concrete

CSA A23.2-5C

The slump of concrete is a measure of consistency and it provides an indication of workability. The slump shall be consistent with the placement and consolidation methods, equipment, and site conditions and shall be identified by the Contractor and concrete supplier prior to construction. The higher the slump, the higher the workability and ultimately the easier the placement. A small variation in slump caused by improper procedure or equipment, may cause the rejection of an entire load of concrete and observing good practice is the key to ensure that the concrete properties are properly evaluated.

Apparatus

1. A test specimen mould with a cone shape which includes foot pieces and handles made of metal not thinner than 1.5 mm with the following dimensions: base 200 mm in diameter, the top 100 mm in diameter, and a height 300 mm.
2. A round straight steel tamping rod shall be 16 mm \pm 1 mm in diameter and between 450 mm and 600 mm in length, having at least one end rounded to a hemispherical tip.
3. If a rigid, flat, and non-absorbent surface is not available, base plates made of sealed plywood, plastic or steel may be used.



4. A measuring tape or measure at least 300 mm in length and having 1 mm graduations.

Procedure for testing

1. **Time Constraint** – Complete the test for slump within 10 minutes after obtaining the sample, including transporting and remixing. The entire slump test, from filling to the removal of the mould, must be completed without interruption within 2 minutes.
2. **Sampling** – Obtain a representative grab sample from between the 10% and 90% points of discharge as per CSA A23.2-1C.
3. **Preparation** – After dampening the mould, place it on a moist, flat, level, rigid, non-absorbent surface not subject to vibration.
4. **First Layer** – Standing on the foot pieces throughout the test, fill the mould one third by volume (~70 mm depth) and rod 25 times, uniformly distributing the strokes across the layer.



5. **Second Layer** – Fill the mould to two-thirds of its volume (~160 mm depth) and rod 25 times, penetrating the underlying layer approximately 25 mm.



6. **Third Layer** – Overfill the mould and rod 25 times with the rod penetrating the underlying layer approximately 25 mm. Keep an excess of concrete above the top of the mould at all times.
7. **Strike-Off** – Strike off the excess concrete using the tamping rod with a screeding and rolling motion. Remove all spilled concrete from around the base of the mould.
8. **Mould Removal** – Carefully step off the foot pieces while maintaining downward pressure on the handles. Immediately raise the mould in approximately 5 seconds by a steady upward lift. Lateral or torsional movement must be avoided.

9. **Slump Measurement** – Place the tamping rod on top of the inverted mould and measure the height difference from the bottom of the rod to average height of the top surface of the concrete to the nearest 5 mm.



CSA A23.1:19

Clause 4.3.2.3.2 Tolerances in slump or slump flow

Tolerances for slump shall be within the following applicable ranges:

- a) when the specified slump is less than 80 mm, the allowable variation shall be ± 20 mm;
- b) when the specified slump is 80 mm to 180 mm, the allowable variation shall be ± 30 mm; and
- c) when the specified slump is greater than 180 mm, the allowable variation shall be ± 40 mm.

Tolerance for slump flow shall be ± 70 mm.

Note: *The control of slump before and after the addition of superplasticizer is discussed in Clause 5.2.5.3.3.*

Notes:

1. If two consecutive tests on a sample demonstrate falling away or shearing off of the concrete when the mould is lifted, the concrete may lack the necessary plasticity and cohesiveness for the slump test to be applicable.
2. Duplicate tests on two portions of the same sample should not vary by more than 10 mm.

Source: Clause 4.3.2.3.2, CSA A23.1:19/CSA A23.2:19 Concrete materials and methods of concrete construction/Test methods and standard practices for concrete. © 2019 Canadian Standards Association

With permission of Canadian Standards Association, (operating as "CSA Group"), 178 Rexdale Blvd., Toronto, ON, M9W 1R3, material is reproduced from CSA Group's standard CSA A23.1:19/CSA A23.2:19 Concrete materials and methods of concrete construction/Test methods and standard practices for concrete. This material is not the complete and official position of CSA Group on the referenced subject, which is represented solely by the Standard in its entirety. While use of the material has been authorized, CSA Group is not responsible for the manner in which the data is presented, nor for any representations and interpretations. No further reproduction is permitted. For more information or to purchase standard(s) from CSA Group, please visit store.csagroup.org or call 1-800-463-6727.

This publication is intended for general information purposes only. The Ready Mixed Concrete Association of Ontario disclaims any and all responsibility and liability for the accuracy and the application of the information contained in this publication to the full extent permitted by law.

No part of this publication may be reproduced in any form, including photocopying or other electronic means, without permission in writing from Ready Mixed Concrete Association of Ontario.

Technical information prepared by:
Ready Mixed Concrete Association of Ontario
102B – 1 Prologis Blvd.
Mississauga ON L5W 0G2
T: 905.564.2726
F: 905.564.5680
info@concreteontario.org
ConcreteOntario.org

© 2019 RMCAO
All rights reserved. 12/19