# METHOD OF
# CAPPING MOULDED CONCRETE CYLINDERS WITH SULPHUR MORTAR

## 1. SCOPE

1.1 This method covers apparatus, materials, and procedures for capping concrete cylinders with sulphur mortar for compressive strength tests.

## 2. REFERENCES

2.1 CSA Standard A23.2-9C Compressive Strength of Cylindrical Concrete Specimens

## 3. PROCEDURE

3.1 Procedures of CSA Standard A23.2-9C shall be followed, except as noted below.

## 4. EXCEPTIONS

4.1 APPARATUS

4.1.1 CYLINDER CAPPER: The capper shall consist of a machined metal plate and alignment device. The plate shall be at least 12 mm thick and 25 mm greater in diameter than the specimen to be capped. The capping surface shall not depart from a plane by more than 0.05 mm. It shall be free of gouges, grooves, or indentations greater than 0.25 mm deep or greater than 30 $mm^2$ in surface area. The alignment device shall consist of a base plate and vertical guide plates or bars. The surface planes of the vertical guide plates shall be adjusted so that they do not depart from perpendicularity to the surface of the capping plate by more than 0.5° (approximately equivalent to 1 mm in 100 mm). The location of each guide plate with respect to the capping plate shall be such that no cap will be off-centred on the concrete cylinder by more than 2 mm. The base plate shall be equipped with adjustable legs for levelling the capping surface.

4.1.2 MELTING POT: The pot used for melting sulphur mortar shall be equipped with automatic temperature controls and shall be made of metal. The heating elements shall be separated from the sulphur by a steel wall.

4.1.3 SMALL TOOLS: Metal ladle (250 ml), rawhide or nylon hammer, scoop, scraper, brush (50 mm), metal stirring paddle, spoon (30 ml), all-metal thermometer (0-200°C), screw-driver, 0.05 mm feeler gauge, 150 mm metal ruler, 100 mm level, and cloth wipers.

4.2 MATERIALS

4.2.1 Sulphur Mortar: The capping compound shall be a proprietary mixture of sulphur and granular materials. When tested in accordance with CSA Standard A23.2-9C, the mortar shall have a minimum compressive strength of 35 MPa at 2 h.

4.3 CAPPING PROCEDURE

4.3.1 Capping: Dry off any excess moisture from the ends of the cylinder with an absorbent cloth or jet of dry air. Place the cylinder near the capper. Oil the capping plate lightly, fill the capper with the molten sulphur mortar, and then immediately take the cylinder and, pressing its side surface lightly against the vertical guide plates, lower it gently onto the capping plate and hold it against the guide plates until the sulphur mortar hardens. Then pull the cylinder gently with one hand away from the guide plates and hit the plate with the rawhide hammer with the other hand to release it from the capper. Repeat this procedure to cap the other end of the cylinder. Place the cylinder under a double layer of wet burlap for temporary storage before breaking.

4.3.2 Checking: Check each cylinder cap for bond and large air voids between the cap and the cylinder by sounding with your knuckles, a coin, or other light metal implement to see if a hollow sound can be detected. A hollow sound indicates poor bond or air voids. Check the planeness of the caps with the metal ruler and feeler gauge on at least three cylinders, representing the start, middle and end of each day's capping operation.

4.4 GENERAL NOTES

4.4.1 The cylinders must be kept under a double layer of wet burlap when removed from the moisture room and waiting to be capped and then, after capping, either under wet burlap ( broken the same day) or in moisture room ( broken the next day) when waiting to be tested.

4.4.2 The sulphur mortar must be dry at the time it is placed in the pot to avoid foaming.

4.4.3 Do not reuse the sulphur mortar. Recovered mortar has lower strength and is less pourable due to contamination with oil.

4.4.4 If recess is machined into the metal plate, the thickness of the plate beneath the recess shall not be less than 12 mm. In no case shall the recess be deeper than 12 mm.

4.4.5 The cap shall be 1 to 3 mm thick.

4.4.6 Cylinder ends that are obviously uneven, convex or concave shall be squared before capping by sawing. If a saw is unavailable, the cylinder shall not be tested.