

METHOD OF SAMPLING AND TESTING
MT 318-04
PROCEDURE FOR USING DRY ICE TO OBTAIN CORES FROM
HOT PLANT MIX SURFACING

1 Scope:

- 1.1 This procedure is for obtaining a core from the plant mix surfacing as soon as the finish roller has completed rolling while the plant mix is still hot. This is a procedure for obtaining a quick comparison of density with the nuclear device. This method is not as accurate a method as MT 313 and therefore, does not replace it.

2 Apparatus:

- 2.1 *Coring Machine* – a motor driver core machine that is capable of obtaining a 4-inch diameter core the full depth of the bituminous paving mixtures.
- 2.2 *Dry Ice Making Machine* – The machine must produce approximately a 16 oz. Block of dry ice. Dry ice may also be purchased from a commercial source.
- 2.3 *Insulated Ice Chest* – The ice chest should be large enough to carry a block of dry ice. Once should be able to remove the dry ice easily.
- 2.4 *Asbestos Gloves or Tongs for Handling Dry Ice* – warning: dry ice may cause severe burns if not handled properly.
- 2.5 *Nuclear Device* – The device must be capable of giving results in pounds per cubic foot.
- 2.6 *Balance and Water Container for Obtaining Specific Gravity of Core* – The sensitivity should be 0.5 g. or less.
- 2.7 *Miscellaneous Equipment* – Seating sand for Nuclear Device, broom for sweeping sand off plant mix, marking chalk and sampling sacks or heavy paper for covering dry ice.

3 Procedure:

- 3.1 Dry ice will be made the day before by using the dry ice machine and storing the ice in an insulated ice chest. (At least enough ice to make a volume of 10" x 10" x 2", is recommended.)
- 3.2 Two test sites will be selected for obtaining cores. As soon as finish rolling is completed, density tests on the plant mix surfacing will be taken with a nuclear device. The exact location where the nuclear test was taken will be outlined with marking chalk. Four tests at 90° intervals will be taken and the results averaged.
- 3.3 The seating sand will be removed and the dry ice will be placed on the outlined spot. The recommended time for cooling the plant mix surfacing is: 1"-2" thick, 20 minutes minimum; greater than 2" and up to 5" thick, 30 minutes minimum.
- 3.4 Coring will proceed as soon as the dry ice is removed from the plant mix surfacing. If the coring machine moves or shifts during coring operation, it is possible to break or distort the core, resulting in improper densities. Special care is needed for following the coring procedure so a good core is obtained. If the core is segregated or separated in any way, additional cores should be taken and more cooling time will be required.

3 Procedure: (continued)

- 3.5** Failure to keep constant downward pressure on the drill bit could distort the core and polish the diamond bit. This shortens the life of the core bit. If the core bit binds, the core is usually ruined for density testing and the bit could be burned, thus ruining the bit. Also, if the operator applies too much pressure to the coring bit, this could result in breaking the material, ruining the core for density testing.
- 3.6** After the complete core is obtained, the core will be thawed by being placed on the hot plant mix surfacing for about 20 minutes. (The core should be turned about every 4 or 5 minutes so all sides are the same temperature.)
- 3.7** After the core has been thawed and dry, the specific gravity of the core will be obtained according to MT-314, Method of Test for Bulk Specific Gravity of Compacted Bituminous Mixture.

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