HEATING AND DRYING MATERIALS IN MICROWAVE OVEN

(An Arizona Method)

SCOPE

1. (a) This method describes the procedure for the heating, drying, and/or determining moisture content of soils and aggregates, and bituminous mixtures utilizing a microwave oven.

(b) This test method may involve hazardous material, operations, or equipment. This test method does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of any regulatory limitations prior to use.

(c) See Appendix A1 of the Materials Testing Manual for information regarding the procedure to be used for rounding number to the required degree of accuracy.

APPARATUS

2. Requirements for the frequency of equipment calibration and verification are found in Appendix A3 of the Materials Testing Manual. Apparatus for this test procedure shall consist of the following:

(a) Microwave oven capable of variable heat intensity settings. When heating and drying aggregates that have been extracted from bituminous mixtures, proper ventilation of fumes from oven exhaust fan shall be provided. The microwave oven shall be operated in accordance with the manufacturer's instructions.

(b) Sample containers suitable for microwave use.

(c) A balance or scale capable of measuring the maximum weight to be determined and conforming to the requirements of AASHTO M 231, except the readability and sensitivity of any balance or scale utilized shall be at least 0.1 gram.

HEATING AND DRYING SOILS AND AGGREGATE SAMPLES

3. The heating and drying of soils and aggregates is controlled by the intensity of heat generated that prevents aggregate breakage and sample splattering. When the percent moisture is determined, the method used with a microwave oven shall give results similiar to those achieved with a conventional oven. In case of dispute, a conventional oven shall be utilized in accordance with the applicable AASHTO test method, T 255 "Total Moisture Content of Aggregate by Drying", or T 265 "Laboratory Determination of Moisture Content of Soils".

(a) The following describes the method for drying samples of soils and aggregates to constant weight.

1) Record the tare weight of a suitable size container to the nearest 0.1 gram. Place sample in container and determine and record the wet weight of sample to the nearest 0.1 gram.

2) Dry sample until a constant weight is obtained. The sample is considered to be at constant weight when further drying causes, or would cause, a difference in weight of not more than 0.1 gram.

(b) After the sample has been dried to constant weight, the percent moisture, if desired, is determined as follows:

1) Cool container and sample to room temperature. Determine and record the dry weight of sample to the nearest 0.1 gram.

2) Calculate and record the percent moisture to the nearest 0.1% by the following:

$$\% \text{ moisture} = \frac{(\text{wet weight}) - (\text{dry weight})}{(\text{dry weight})} \times 100$$

HEATING AND DRYING BITUMINOUS MIXTURES

4. Bituminous mixtures shall be heated in such a manner that controls the intensity of heat generated to prevent splattering, aggregate breakage, and asphalt being "burned off".

(a) The determination of constant weight and percent moisture, if desired, shall be determined in accordance with Arizona Test Method 406.