Designation: D 2773 – 94

An American National Standard

Standard Test Method for Loss on Ignition of Electrical Grade Magnesium Oxide[1]

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1. Scope

1.1 This test method covers the determination of the loss on ignition of electrical grade magnesium oxide for use in sheathed heating units.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 2755 Test Method of Sampling and Reduction to Test Weight of Electrical Grade Magnesium Oxide[2]

3. Summary of Test Method

3.1 The loss on ignition is the free and combined moisture together with any carbonaceous impurities that are volatilized at 1000°C, their loss calculated as a percentage of the original weight.

4. Significance and Use

4.1 Magnesium oxide, being a hygroscopic material, can contain sufficient moisture that is detrimental to the manufacturing process and performance of sheathed heating elements.

5. Apparatus

5.1 *Balance*, capable of weighing to ±0.1 mg.

5.2 *Platinum Crucible*, of 15-cm^3 capacity, with lid.

5.3 *Muffle Furnace*, capable of 1000°C temperature.

5.4 *Vacuum Desiccator*.

5.5 *Vacuum Pump*, capable of producing vacuum of 2 mm (266 Pa) Hg pressure.

5.6 *Tongs*.

6. Sampling

6.1 Obtain a sample of magnesium oxide in accordance with Test Method D 2755.

6.2 From the sample, take at least two specimens of 20± 1 g each.

7. Procedure

7.1 Heat the platinum crucible with lid at 1000 ± 25°C in the muffle furnace for at least 10 min. Remove the crucible from the furnace and cool to room temperature in a desiccator. Weigh the crucible and lid to the nearest 0.1 mg.

7.2 Transfer sample to the crucible, cover immediately with a lid, and weigh to the nearest 0.1 mg.

7.3 Place the crucible with specimen in the muffle furnace at 1000 ± 25°C, and ignite the sample for 1 h at this temperature.

7.4 Remove the crucible from the furnace and place immediately in desiccator. Loosen the crucible lid and leave slightly ajar to allow for outgasing of the material during the evacuation process. Close the desiccator and apply vacuum. Evacuate the desiccator to below 2 mm (266 Pa) Hg pressure (Note 1) and maintain vacuum until the sample is cooled to room temperature (Note 2).

NOTE 1—Avoid sudden evacuation of the desiccator which could lead to dust loss.

NOTE 2—Under normal conditions, a cooling period of at least 12 h is required.

7.5 Remove the crucible with specimen and lid, and immediately weigh to the nearest 0.1 mg.

7.6 Perform at least two determinations to obtain the average loss on ignition.

8. Calculation

8.1 Calculate the percentage loss on ignition as follows:

$$\text{Loss on ignition, \%} = [(B - C)/(B - A)] \times 100 \quad (1)$$

where:

A = weight of crucible, and lid,
B = weight of crucible, lid and original sample, and
C = weight of crucible, lid and ignited sample.

9. Report

9.1 Report the following information:

9.1.1 Proper identification of the sample, and

9.1.2 The average percent loss on ignition.

[1] This test method is under the jurisdiction of ASTM Committee D-9 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.14 on Electric Heating Unit Insulation.

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[2] *Annual Book of ASTM Standards*, Vol 10.02.