
Standard Method of Test for

**Determination of Heavy Metal
Content of Glass Beads Using
X-Ray Fluorescence (XRF)**

AASHTO Designation: T 392-21¹

Adopted with Revisions: 2021

Technical Subcommittee: 4c, Markings and Coatings



**American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, D.C. 20004**

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1. SCOPE

- 1.1. This test method covers the determination of the total heavy metal content of glass beads using X-ray fluorescence (XRF). Heavy metals include but are not limited to lead, antimony, and arsenic. This test method is intended as a quality assurance tool for agencies to verify the manufacturer's certified test results for heavy metals provided in accordance with Environmental Protection Agency testing methods 3052, 6010B, and 6010C as they relate to compliance with Section 1504 of MAP-21.
- 1.2. The values stated in SI units are to be regarded as the standard.
- 1.3. *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.*
- 1.4. *The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
 - M 247, Glass Beads Used in Pavement Markings
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
- 2.2. *Environmental Protection Agency Test Methods:*
 - Method 3052, Microwave Assisted Acid Digestion of Siliceous and Organically Based Matrices
 - Method 6010B, Inductively Coupled Plasma-Atomic Spectrometry
 - Method 6010C (SW-846), Inductively Coupled Plasma-Atomic Emission Spectrometry
- 2.3. *Legislation:*