

10/22/2020

Hazard Evaluation Process (HEP) for Drop-On Glass and Ceramic Beads for Pavement Markings

Introduction

The MnDOT Office of Environmental Stewardship developed the Hazard Evaluation Process (HEP) as a tool to determine potential environmental impacts that could result from use of a product and consequently, if the product is acceptable for use on MnDOT infrastructure. This document covers drop-on glass and ceramic beads for pavement markings.

Product Evaluation for Environmental Hazard

The information in the sections below must be submitted by the manufacturer for MnDOT to complete the HEP. MnDOT may request additional information from the applicant. The applicant must provide the requested information to MnDOT within 3 months of MnDOT's request. Applicants are responsible for meeting this deadline. If MnDOT does not receive the requested information within 3 months, the application will expire, and MnDOT will take no further action on the application. MnDOT will not notify an applicant of an expired application. If an application expires, the applicant may submit a new application packet to MnDOT.

Manufacturer information

- a. Name of company
- b. Address
- c. Technical contact name and telephone number
- d. Product trade name
- e. Product Technical Data Sheet
- f. Product Safety Data Sheet (SDS)

Total metals testing results

Total metal concentrations in the glass or ceramic beads should be evaluated using EPA method 3052 (digestion of siliceous compounds) followed by inductively coupled plasma (ICP) mass spectrometry (EPA method 6010B or 6010C). Additionally, analysis of the same metals using x-ray fluorescence (XRF) should be completed. Reports on laboratory letterhead should be supplied that include the test results, as well as the QA/QC results of the analyses (such as detection limits, laboratory blanks, spikes and duplicates). The total metals concentrations shall not exceed the following concentrations, to demonstrate that the glass or ceramic beads are not considered hazardous waste:

Metal	Concentration (mg/kg)
Arsenic	100
Barium	2,000
Cadmium	20
Chromium	100
Lead	100
Mercury	4
Selenium	20
Silver	100

If the total metals results indicate that any of the metals exceeded the limits above, the company would have the opportunity to run additional testing to demonstrate that the glass or ceramic beads would not be considered a hazardous waste. However, this would not apply to lead and arsenic if they exceeded 200 mg/kg, total metal concentration, which is a MnDOT specification requirement.

MnDOT requires the ICP and XRF test results, as described above, on 3 different lots of beads from each plant supplying glass beads to Minnesota. These lots should be randomly selected from different cullets over the last year. After approval and addition to the approved products list, if there are changes in production methods, facilities or material sources, the manufacturer must notify MnDOT. Testing of glass or ceramic beads from the new methods, facilities and/or material sources may be needed to ensure compliance.

Quality Control Plan

The manufacturer is required to illustrate within its Quality Control (QC) plan measures and safeguards within its production methods that ensure metals thresholds are not violated.

MnDOT Contact Information

MnDOT Office of Environmental Stewardship

Information pertaining to the requirements above should be sent to:

Laura Lyle (laura.lyle@state.mn.us)

Chief Toxicologist

Phone: 651-366-3608