REASONABLY AVAILABLE CONTROL MEASURE (RACM)
DETERMINATION FOR THE BUNTING BEARINGS LLC FACILITY–
DELTAPLANT

1.0 Facility Operations and Lead Emission Points.

Bunting Bearings, LLC – Delta Plant (Bunting) is a copper foundry located in Delta, Ohio (Fulton County). The facility manufactures continuous cast and centrifugal cast products in copper based alloys (typically bronze) which contain various percentages of lead. The lead component is integral in most of Bunting’s products in that it adds machinability to the characteristics of bronze. A typical process flow would include the melting of the raw metal, the addition of alloys in the appropriate percentages, the pouring and casting of the material into various shapes, and after cooling, the machining of the material into the desired product. A description of each of the facilities lead emitting sources is as follows:

**Continuous Cast Induction Melting Furnace**

Raw material is charged into each induction melting furnace. Chemistry is then taken from the molten metal to determine the actual chemical analysis of the material and additions are made if necessary to assure the chemistry meets the customer’s requirements.

**Continuous Cast Tundishes**

Molten metal is poured into a tundish from an induction melting furnaces and held at a constant temperature. An opening in the bottom of each tundish allows molten metal to flow into the graphite dies where it is cooled to below the solidification temperature.

**Centrifugal Melting Furnace**

Raw material is charged into each induction melting furnace. The raw material is heated until the material is molten. Chemistry is then taken from the molten metal to determine the actual chemical analysis of the material and additions are made if necessary to assure the chemistry meets the customer’s requirements. Once this is complete, the material is ready to transfer to one of the centrifugal casting machines.

**Transfer Ladles**

Molten metal that was melted in the centrifugal melting furnaces is poured into the transfer ladle and moved to each of the centrifugal casting machines.
Centrifugal Casting Machines

Each of the casting machines utilizes a hydraulic motor to rotate a centrifugal die. Once the molten metal is in the die, water is sprayed on the outside surface of the die and the machine continues to spin until the molten metal is allowed to solidify.

Ball Mill

Dross and slag is collected from all of the melting furnaces as well as the tundishes from the continuous cast department and the transfer ladle in centrifugal. This material is then processed in the ball mill to separate the solid metal from the non-metallic and oxides. The mill rotates which allows it to break-up the dross and slag. Large metallic pieces remain in the ball mill and are later removed and then reprocessed as raw material. The small material is sold to outside sources.

Miscellaneous Fugitive Sources

This includes all other possible points that may generate fugitive lead emissions such as building rooftops, roadways, baghouse dust collection points and baghouse dust storage.

2.0 Basis for the RACM Determination

The US EPA has concluded that in determining whether a control measure is a RACM, three factors should be considered: the economic feasibility of the control measure; the capital costs, annualized cost, and cost effectiveness of the control measure; and the extent of adoption of the control measure by state regulations.

The recently developed RACM guidance for lead emitting sites in non-attainment areas\(^1\) does not have a specific category established for a copper foundry. Therefore, there is no information available with regards to the first two factors (economic feasibility and cost) that have been evaluated specifically with regards to this type of facility. However, the Ohio Environmental Protection Agency (OEPA) has large amounts of information available on the economic feasibility and costs of control techniques and practices at similar sources. It is the OEPA’s position that there is sufficient technical information available on similar sources that no further cost analysis is necessary.

The resources that the RACM determination is based upon are primarily found under existing state and federal regulations, as well as specific guidance documents. The OEPA believes that

\(^{1}\) Implementation of the 2008 Lead National Ambient Air Quality Standards Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions, March 2012
existing, established regulations present clear examples of the type of control measures available for this RACM determination, as well as which ones are economically feasible and typically cost effective.

Regulations affecting similar sources (similar either by process type or in the emission of lead) were evaluated in determining what reasonable control measures would be for the operations at Bunting. As such, many of these regulations evaluated were established for the purpose of establishing particulate control requirements and not for any control associated with Hazardous Air Pollutants (HAPs). USEPA has used particulate control measures and particulate emission limits as surrogates for controlling particulate HAPs, and the OEPA will use USEPA’s accepted particulate surrogate approach in the RACM determination for Bunting. A description of each of the regulations and guidance documents reviewed is as follows:

**40 CFR Part 63, Subpart X, Secondary Lead Smelting**

Establishes fabric filtration with bag leak detection as the commonest form of control on smelter emissions, and establishes an outlet concentration for lead. This rule establishes total and partial enclosure requirements on all lead sources, and extensive monitoring requirements on potential fugitive sources (such as roadways). All sources are to be inspected and maintained in accordance with the facility’s standard operating procedures manual.

**40 CFR Par 63, Subpart ZZZZZZ, Area source standards for Aluminum, Copper, and other Non-Ferrous Foundries**

Establishes fabric filtration as commonest form of control on foundry emissions, and establishes an outlet concentration for particulates on larger foundries. This rule establishes monitoring requirements of daily visible emissions checks or use of a baghouse leak detection system and requires the development of a management practices plan.

**Implementation of the 2008 Lead National Ambient Air Quality Standards Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions**

Provides detailed economic feasibility and cost analysis information on four major source categories: Lead Acid Battery manufacturing; Secondary Lead Smelting; and Iron and Steel Foundries, and integrated Iron and Steel Mills. This guidance establishes fabric filtration with partial or total enclosure as the commonest form of control and with the best overall control efficiency. Establishes procedures and practices available and considered cost effective for controlling misc. fugitive emissions where lead may be emitted.

**Ohio EPA Regulations 3745-31-05, 3745-17-07, 3745-17-08, and 3745-17-11**

Where applicable, OAC 3745-31-05 establishes Best Available Technology requirements for all sources, OAC 3745-17-07 & 08 establish opacity requirements for stack particulate sources and
fugitive particulate sources respectively, and OAC 3745-17-11 establishes particulate mass emission limitations for stack sources.

**Ohio EPA’s “Reasonably Available Control Measures (RACM) for Controlling Fugitive Dust Sources”**

Provides emission factors and establishes what control practices have historically been evaluated and considered cost effective at a large variety of fugitive dust sources.

### 3.0 Application of RACM to the Bunting Facility

After a complete review of available resources, the OEPA has determined the requirements outlined below as the RACM determination for the Bunting Facility. These requirements will be incorporated into the facilities’ Permits to Operate (PTIOs) and work in conjunction with the facility’s development and implementation of a Preventative Maintenance Plan (PMP). The PMP developed by Bunting also addresses non-permitted control practices, (such as inspecting and cleaning of storage areas) as well. A breakdown of the RACM determination for the Bunting facility is as follows:

**Use of Fabric Filters to Control Process Equipment**

The use of fabric filtration has been in place for virtually all particulate point sources in the foundry industry and strongly indicates that this requirement is considered RACM. For Bunting, all process equipment which is a source of Lead emissions will be required to have fabric filtration for control. Permit requirements will establish emission limits for particulates and lead, with monitoring and periodic testing used to demonstrate compliance. The permits will also establish opacity requirements for stack emissions, with the use of a bag leak detection system to ensure compliance. The facility’s PMP incorporates steps and procedures specifically to ensure that the control equipment is maintained and operating properly.

**Partial and Total Enclosures in Conjunction with Collection Hoods to Control Lead Emissions**

As discussed in the US EPAs RACM guidance document identified previously, several industry categories that process lead containing materials have completely adopted the use of partial and total enclosures to control fugitive emissions. Not only does this support the determination of RACM for those facilities, but this guidance document also indicates that this can be used to support RACM determinations for similar processes. Specifically, secondary lead smelting facilities were compared to Bunting as both handle high lead percentage materials, and they both have furnaces and associated material handling operations.

In addition, the use of collection hoods in combination with total or partial enclosures is common and suggests these additional control measures are economically feasible and should be considered RACM. Therefore, it is OEPA’s determination that the use of total enclosure for
all melting operations and the use of partial enclosure for the fugitive material handling operations (in conjunction with the use of side stream collection points or overhead hoods where appropriate) meet the requirements for RACM at the Bunting facility. The permits will establish opacity requirements for fugitive emissions, with the use of periodic visible emissions checks to ensure compliance. The facility’s PMP incorporates steps and procedures specifically to ensure that the enclosures and collection points are properly maintained.

Additional Control Measures for Controlling Fugitive Dust Emissions

Cost-effectiveness data for fugitive dust control measures are not well-developed\(^2\), as costs for specific fugitive dust control measures are highly variable from plant-to-plant. This guidance further indicates that the amount of lead emissions for a facility and its location with respect to areas with more serious air quality are the key considerations when determining whether fugitive dust control measures are reasonable. OEPA has determined that inspection techniques in conjunction with control practices (as necessary) on a plant-wide basis are a reasonable approach to address fugitive dust emissions. Periodic inspections are consistent with current OEPA permitting practices on fugitive dust sources, and with this approach, no significant capital costs for equipment are typically necessary. Therefore OEPA has determined the development and implementation of the facilities PMP to be RACM for fugitive dust emissions. Examples of some of the items addressed in the facility’s PMP to address fugitive dust are as follows:

1. Periodic inspections of roadways, building roofs and exteriors, and storage areas and cleaning areas as necessary.
2. Timely cleaning of accidental releases.
3. Storing materials capable of generating fugitive lead-dust in sealed containers.

4.0 Conclusion for the RACM determination at the Bunting Facility

OEPA considers the establishment and implementation of RACM at the Bunting Facility to be the most appropriate and effective way to obtain compliance with National Ambient Air Quality Standard (NAAQS) for Lead. Historically, control equipment has always been required at Bunting, and recently, the majority of the additional RACM requirements have already been implemented at the facility. The OEPA believes that the use of existing control equipment, where a plan is implemented to properly operate and maintain this equipment, in conjunction with an aggressive plan to address fugitive emissions, will allow the recently lowered Lead NAAQs to be achieved and maintained.

\(^2\) Implementation of the 2008 Lead National Ambient Air Quality Standards Guide to Developing Reasonably Available Control Measures (RACM) for Controlling Lead Emissions, March 2012