Lesson Learned Statement:

Significant beryllium surface contamination levels were found on parts made from A357 aluminum alloy (beryllium-containing alloy) and work surfaces involved with processing this alloy. These levels exceeded the DOE housekeeping limit, as given in 10 CFR Part 850, of 3.0 micrograms per 100 square centimeters.

Discussion:

The Kansas City Plant (KCP) is engaged in making replacement mounting brackets for a transport cradle. These mounting brackets are made from A357 aluminum alloy castings. It was discovered that A357 aluminum is comprised of 0.04 percent – 0.07 percent beryllium, which is below the percentage used to define beryllium in 10 CFR Part 850 (0.1 percent beryllium content).

The KCP Industrial Hygiene staff determined a need to further evaluate the potential for beryllium surface contamination even though the alloy is exempt from 10 CFR Part 850. Surface sampling and airborne monitoring were conducted at several particulate-generating processing areas, as well as areas where parts were deburred, staged, and handled for inspection. Also, beryllium content within machine coolant is being monitored as this process is scheduled to continue for some time.

Analysis:

A total of 98 surface wipe samples were collected to assess the beryllium surface contamination on machines, fixtures, tools, work benches, etc. Sample results ranged from non-detect to 12.4 micrograms per 100 square centimeters (the highest reading was found on incoming castings from a vendor). Fourteen air monitoring events were performed and thus far, all air monitoring results were non-detect for beryllium. Coolant samples collected from a machining process have resulted in levels less than 6 parts per billion beryllium.

Recommended Actions:

Staff from the KCP’s Industrial Hygiene department, Process Engineering, and Manufacturing Team Managers have worked together to implement controls, such as wet machining and exhausted enclosures, to protect associates from inhaling and/or coming in contact with contaminated parts, tools, fixtures, machine surfaces, etc. In addition, associates are required to wear lab coats and gloves (at a minimum) when handling items made of, or potentially contaminated with A357 aluminum alloy in order to prevent fine beryllium particles from penetrating the skin. Monitoring of the process and especially
machine coolant for potential buildup of beryllium will continue. Other metal alloys such as copper, nickel, and aluminum contain beryllium in concentrations less than 0.1 percent and may warrant evaluation.

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**Name Of Authorized Derivative Classifier:**

Clyde Hicks

**Name Of Reviewing Official:**

Judy Mills

**Priority Descriptor:**

Yellow / Caution

**Keywords:**

BERYLLIUM, A357 ALUMINUM ALLOY, 10 CFR PART 850, <0.1% BERYLLIUM, MOUNTING BRACKETS, MACHINING

**References:**

10 CFR Part 850, Chronic Beryllium Disease Prevention Program, Final Rule

Information in this report is accurate to the best of our knowledge. As means of measuring the effectiveness of this report please use the "Comment" link at the bottom of this page notify the Lessons Learned Web Site Administrator of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is important and appreciated.

**DOE Function / Work Categories:**

Inspection & Testing
Maintenance - Other
Machining & Fabrication
Occupational Safety & Health - General
ISM Category:
Analyze Hazards
Develop / Implement Controls
Perform Work

Hazard:
Personal Injury / Exposure - Beryllium

End of Lesson!