



EMISSION STACK TEST REPORT

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AIR QUALITY DIVISION

Toda America
4750 W. Dickman Road
Battle Creek, Michigan
24 November 2015

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OBJECTIVE

The Michigan Department of Environmental Quality, Air Quality Division, has approved Permit to Install 70-10A in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Under FGLINE2, Section V of the Permit to Install states the following:

“Within 60 days of achieving the maximum production rate of FGLINE2, but not later than 180 days after commencement of initial startup of FGLINE2, the permittee shall verify and quantify cobalt emission rates from stacks SVA2BF630 and SVA2BF680 of FGLINE2 by testing at owner's expense, in accordance with Department requirements. No less than 60 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. (R 336.1225, R 336.2001, R 336.2003, R 336.2004)”.

The objective of this Stack Test was to meet the permit requirements to verify the cobalt emission rates from stacks SVA2BF630 and SVA2BF680 of FGLINE2 at the Toda America facility in Battle Creek, Michigan.

Toda America produces cathode material for Lithium-Ion Batteries. The following steps outline the production process of this material:

1. The raw materials are inspected, tested in our lab, and documented before they are used in production. Materials used at Toda America include precursor material, Lithium Hydroxide, Aluminum Oxide, and Boric Acid among others.
2. The materials are charged into storage tanks at the beginning of our production line. As they move through the production line, they are prepared, mixed, and poured into individual trays called "saggars."
3. The saggars are conveyed through a Rotary House Kiln (RHK) for approximately 24 hours. Here, the materials react at temperatures upwards of 1800°F and then cool to crystallize and form our product.
4. The product is grinded into nanoparticles, homogenized, passed through several powerful magnets to remove contaminants, and finally packed into sealed containers in an environmentally controlled packing room. These containers are stored in our shipping warehouse.

3.0

PROCESS DATA

MATERIAL DESCRIPTION

The emission streams are composed of a metallic powder composed of various metals. The projected and actual (observed during testing) production rates are shown below.

Projected Capacity: 150 – 195 pounds/hour sustained for testing

Actual Rate: 149 pounds/hour based on 7 hour production run (7:00am to 2:00pm)

AIR POLLUTION CONTROL EQUIPMENT

The fabric filters pressure drop (in inches of W.C.) were monitored and recorded during the testing (see below).

Time	BH630	BH680
9:00am	2.0 "	1.8"
9:30am	2.0 "	1.8"
10:00am	2.0 "	1.8"
10:30am	2.0 "	1.9"
11:00am	1.9"	1.9"
11:30am	1.9"	2.0 "
12:00pm	1.9"	2.0 "
12:30pm	2.0 "	2.0 "

4.0

STACK TEST RESULTS

Presented below are the average results of the three tests conducted on each source showing compliance with each applicable emission limit.

Source		Permit Limit (lbs/hr)	Test Result (lbs/hr)
FGLINE2	(SVA2BF630)	0.0014	0.000000335
FGLINE2	(SVA2BF680)	0.0014	0.000000476

The stack testing details are attached.