

1.0 INTRODUCTION

The Brembo North America, Inc. "Disc Plant" in Homer, Michigan receives rough cast automobile brake rotors from outside suppliers, and dry mills these parts to specifications; then applies paint on 14 coating lines using automated (non-manual) high volume low pressure (HVLP) sprayers to apply high-solids paint. Dry filters are used to collect overspray from the coating process.

From On December 1, 2020, a series of paint solids transfer efficiency tests were conducted at the Disc Plant. The tests were conducted in accordance with the "Paint Solids Transfer Efficiency Test Plan" dated September 16, 2020 (the "Test Plan") to address the paint solids transfer efficiency testing requirement applicable to FG-Zinc in the site's Renewable Operating Permit (MI-ROP-N6226-2015a); to demonstrate that EU-Zinc-03 (Brentro 1) and EU-Zinc-05 (Blechtopf) achieve a minimum transfer efficiency of 70.0% when applying Norway Zinc Dust Coating ("Zinc Paint").

The Test Plan was reviewed by MDEQ TPU staff and approved on November 16, 2020. A copy of the approval letter is included in Appendix A.

The following key personnel were responsible for conducting and overseeing the testing campaign:

<p>Brembo: Ryan Birch - HSE Manager Emalee Metzner – HSE Coordinator Robert Jenkins - Manufacturing Engineer Brembo North America, Inc. 29991 M-60 East Homer, MI 49245 Office (517) 568-4398</p>	<p>Consultant: Christopher Blume, P.E. RPS 135 S. LaSalle Street Suite 3500 Chicago, IL 60603 Office (312) 541-4200</p>
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This report includes the relevant information referenced in the MDEQ's approval letter, including: sampling and analytical procedures in Section 2; results and discussion in Section 3; and conclusions in Section 4.

2.0 SAMPLING AND ANALYTICAL PROCEDURES

2.1 Sampling Procedures

In accordance with MI-ROP-N6226-2015a and Michigan R 336.2040(9), paint solids transfer efficiency testing using Zinc Paint was conducted on the following Emission Units ("lines")¹:

- EU-Zinc-03 (Brento 1)
- EU-Zinc-05 (Blechtopf)

For each transfer efficiency test the following steps were followed:

2.2.1 Pre-Testing Setup

- 1) For each line, two different, representative part types (disc brake rotors) were selected to be used for transfer efficiency testing².
- 2) For each part type, ten rotors were selected to be used for each test.

2.2.2 Pre-Painting Data Collection

- 1) The paint line name on which the test was conducted was recorded.
- 2) The part number of the rotor being painted was recorded.
- 3) Each of the 10 rotors being painted was assigned a "part designation" number, which was written on the rotor using an indelible marker.
- 4) In the facility's quality lab, each rotor was weighed to the nearest 0.01 pound³ using the quality lab scale⁴; and the weights were recorded.

The foregoing information was recorded on "Data Sheets for Weighing", which are included in Appendix B.

2.2.3 Data Collection During Painting

- 1) The paint batch number being used by the Zinc Paint line was recorded.
- 2) The paint test tank and associated supply and return lines were filled with Zinc Paint.
- 3) The paint test tank was weighed to the nearest 0.01 pound using the paint test scale⁵; and the weight recorded.
- 4) The 10 rotors were painted.
- 5) The paint test tank was reweighed to the nearest 0.01 pound using the paint test scale; and the weight recorded.
- 6) One Zinc Paint sample from the paint test tank was collected in laboratory provided containers; and shipped to RTI Laboratories in Livonia, Michigan for laboratory

¹ EU-Zinc-03 and EU-Zinc-05 are the only two lines on which Brembo intends to maintain authority to use Zinc paint.

² Other lines included in FG-Zinc do not require ongoing authority to utilize Zinc paint.

³ With the approval of Matt Karl, the EGL E representative who oversaw the testing, for EU-Zinc-05 only one part type was tested because that line is used to apply Zinc paint to only one specific part.

⁴ Michigan R 336.2040(9) allows for weight accuracy of 0.05 lbs for the unpainted part only, however for consistency among all measurements, weighing the unpainted part to the nearest 0.01 lbs.

⁵ OHAUS Ranger, S/N 2715606-ZLF (last calibrated on 07/15/2020).

⁶ Mettler Toledo ICS4x5-1, S/N B732517876 (last calibrated on 07/15/2020).

analysis as described in Section 2.3.

The foregoing information, as well as relevant paint line operating parameters, was recorded on "Data Sheets for Painting", which are included in Appendix B.

2.2.4 Post-Painting Data Collection

- 1) Painted test parts were allowed to fully dry for at least 30 minutes.
- 2) Each part was reweighed to the nearest 0.01 pound using the paint test scale; and the weights were recorded.

2.3 Analysis Procedures

Zinc Paint samples were shipped following standard chain-of-custody procedures, via overnight express courier, to RTI Laboratory in Livonia, Michigan for Method 24 analysis to determine solids content (non-volatile residual). Laboratory reports are included in Appendix C.

2.3 QA/QC Procedures

Parts weighing was conducted in the facility's laboratory, in a temperature controlled environment. Air flow from the ventilation system in the lab did not appear to cause any interference with the precision or accuracy of the quality lab scale.

The paint test tank was weighed while minimum environmental disturbances (i.e., foot traffic, fork lift traffic) were occurring.

RTI Laboratories abided by applicable QA/QC of Method 24, and general, good analytical practices.

Paint lines were operated consistent with routine, normal operation, and within relevant permit limits. There were no deliberate or coincidental/accidental deviations from the sampling procedures described in Section 2.0. In summary, paint line operation and sampling procedures were consistent with the approved test plan.

3.2

Discussion

A summary of all TE test results along with the TE test data and operating parameters for each test are included in Appendix D.

where:
C = parts weight gain (lb)
Z = paint usage (lb)
NVR = solids content (non-volatile residue, wt%)

$$TE = \frac{Z \times NVR}{C}$$

For each test, paint solids transfer efficiency ("TE") was determined as follows:

3.1 Results

3.0 RESULTS AND DISCUSSION





4.0 CONCLUSIONS

The paint solids transfer efficiency testing described here in was conducted in accordance with the approved "Paint Solids Transfer Efficiency Test Plan" dated September 16, 2020. The results demonstrate that EU-Zinc-03 (Brentro 1) and EU-Zinc-05 (Blechtopf) achieved a minimum transfer efficiency of 70.0% when applying Worlag Zinc Dust Coating ("Zinc Paint"); as required under MI-RQP-N6226-2015a.