



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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**Soleras Advanced Coatings, Ltd.**  
**York County**  
**Biddeford, Maine**  
**A-1073-71-A-N**

**Departmental**  
**Findings of Fact and Order**  
**Air Emission License**

After review of the air emissions license application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., §344 and §590, the Department finds the following facts:

**I. REGISTRATION**

**A. Introduction**

Soleras Advanced Coatings, Ltd. (Soleras) has applied for an Air Emission License permitting the operation of emission sources associated with their manufacturing facility. The equipment addressed in this license is located at 589 Elm Street in Biddeford, Maine.

**B. Emission Equipment**

The following process equipment is addressed in this air emission license:

<u>Equipment</u>	<u>Production Rate</u>	<u>Control Equipment</u>	<u>Stack #</u>
CB #1: Thermal Spray System	62 lb/year raw material use, 33.26 lb/year finished material	Baghouse	1

There are some solvents and cleaning materials used at the facility containing volatile organic compounds (VOC) and hazardous air pollutants (HAP); however, none of the quantities used are at or above licensing threshold amounts as identified in 06-096 CMR 115, Appendix B, Section B(1).

All fuel burning equipment at the facility has a maximum design capacity of less than 1.0 MMBtu/hour and thus are not required to be included in the air emission license, per 06-096 CMR 115 (1)(C)(2)(a).

**C. Application Classification**

Soleras is classified as an existing source that is applying for its first air emission license after the fact. As found in 06-096 CMR 115(1)(C)(2)(d), total facility general process sources whose emissions without consideration of air pollution

control apparatus and under normal operation are less than 100 pounds/day or 10 pounds/hour of any regulated pollutant are exempt from air licensing requirements. Because production levels at Soleras are generating emissions from the coating operation approaching the 10 pound/hour and/or 100 pound/day licensing thresholds for particulate matter emissions, Soleras submitted an air emission license application. The Department has determined the facility is a minor source, and the application has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (as amended).

## II. BEST PRACTICAL TREATMENT (BPT)

### A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT) as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts.

### B. Process Description

Soleras manufactures advanced material targets for sputtering applications and sputter hardware. Sputtering is a technique used to deposit thin films of a material onto a surface (the substrate). By first creating a gaseous plasma\* (using Argon gas, for example), and then accelerating the ions from the plasma into some source material (the target), the source material is eroded by the bombardment of the ions, causing neutral particles of the target material – individual atoms, clusters of atoms, or molecules – to be ejected from the surface of the target. These neutral particles travel in a straight line until they come into contact with something, such as other particles or a nearby surface. The nearby surface (the substrate) placed in the path of these ejected particles will become coated by a thin film of the source (target) material. In summary, a source (target) material is bombarded with ions, causing particles of the source (target) to be ejected. A specific substrate placed in the path of these ejected particles becomes coated with a layer of the source (target) material.

\*Plasma is a state of matter similar to gas in which a portion of the particles are ionized, generally through the addition of energy, the use of a strong electromagnetic field, or some other means. The presence of a non-negligible number of charge carriers (the ions) makes the plasma electrically conductive so that it responds strongly to

electromagnetic fields. Plasma, therefore, has properties quite unlike those of solids, liquids, or gases and is considered a distinct state of matter.

Some sputtering applications that utilize advanced material targets include the manufacturing of energy efficient low-E glass, electrochromic and smart glass, thin film photovoltaic panels, and advanced displays used in touch screen phones and tablet computers. Customers of Soleras are those facilities which use sputtering technology in the manufacturing of their product.

Targets have a base material for backing of the target substance, some of which are made of copper, chromium, indium, stainless steel, or some layered combination of two or more of these or similar metals. This facility makes specific product for each customer specific to each end application; thus, Soleras has to adapt their process, shapes, coatings, base substrates, etc. for each specific order.

Target material is applied in one of three ways, depending on the customer's needs and the intended application of the target: casting (molten recipe of metals, cast in a form resulting in approximately 0.75 in. of target material around the nickel-plated stainless steel core), dipping, or spray coating. The spray coating is the process which triggers the air emission licensing requirement.

In spray coating, Soleras uses thermal spraying to coat sputtering targets. Thermal spraying is a coating process where heated metals are sprayed onto a surface. The coating thickness can be from as thin as 20 micrometers to as thick as several millimeters over a large area at high deposition rates. Soleras uses metals and alloys as coating materials, which are introduced to the process in either powder or wire form, heated to a molten or semi-molten state, and then accelerated toward substrates in the form of micrometer-size particles. The metals are heated by plasma for metals powders or electrical arc discharge for metal wire. Resulting coatings are formed by the accumulation of numerous sprayed particles.

Air pollutant emissions from this process are particulate matter emissions. All of the various metal coatings used in the thermal spraying process begin as solids.

Soleras also conducts small welding and abrasive blasting operations inside the facility with HEPA filtration technology for particulate control which exhausts inside the facility; therefore, they are not required to be included in the air emission license.

#### C. CB #1: Thermal Spray System

The facility's Thermal Spray System is a source of particulate matter (PM) emissions. Emissions from the thermal spray coating operation are discharged into a TAFA\* Dust Control System, a baghouse with 99.99% control efficiency for particulates 0.5 microns in diameter and larger.

\* TAFAs® is a registered trademark used for Metallic Based Wires for use in the Twin or Single Wire Arc Thermal Spray Process and owned by Praxair S. T. Technology, Inc., Tafa Incorporated.

1. New Source Performance Standards (NSPS)

There are no standards from Environmental Protection Agency's (EPA's) New Source Performance Standards (NSPS) 40 Code of Federal Regulation (CFR) Part 60 applicable to thermal spray coating systems using solid metals as the applied substance.

2. National Emission Standards for Hazardous Air Pollutants (NESHAP)

Because there are no hazardous air pollutants of licensable quantities used in this manufacturing process, the facility is not subject to NESHAP requirements.

3. BACT/BPT Findings

a) Particulate Emissions

The BACT analysis for the Thermal Spray System included a search of the EPA's database of control technology determinations, known as the RACT/BACT/LAER Clearinghouse (RBLC), using various Process Unit descriptions, such as thermal spray coating, thermal spraying, plasma spraying, wire arc spraying, etc. No sources were identified using these process operations.

An internet search for air emission licenses for sources with thermal spray operations identified a facility in New York, Advanced Coating Technologies Inc. (ACT), which is licensed to operate using a dust collection system specifically for thermal spraying operations having 99.99% removal efficiency for particulates. Conditions of ACT's license also require the control device to be operated and kept in a satisfactory state of maintenance and repair, in accordance with ordinary and necessary practices, standards, and procedures, including manufacturer's specifications.

The TAFAs Dust Control System used by Soleras was purchased in 2010 and operates at a 99.999+ % removal efficiency for particles 0.5 micron in diameter or larger. The dust control system was specifically designed to control particulate emissions generated from this specific source category. Therefore, Soleras is proposing that the TAFAs Dust Control System represents BACT for the control of particulates generated from the thermal spraying operation. Soleras proposes that the control system will be operated and kept in a satisfactory state of maintenance and repair in accordance with the manufacturer's recommendations.

To meet the requirements of BACT for control of particulate matter (PM) emissions from the Thermal Spray System, emissions shall be vented through a baghouse maintained for 99.99% removal efficiency.

b) Visible Emissions

The facility has proposed and the Department has concurred with operation of the TAFA Dust Control System at 99.99% removal efficiency in accordance with the manufacturer's recommendations for maintenance and servicing as BACT for visible emissions from the Thermal Spray System.

Visible emissions from the baghouse shall not exceed 10% opacity on a six-minute block average basis, except for no more than one six-minute block average in any one-hour period. The facility shall take corrective action if visible emissions from the baghouse exceed 5% opacity. [06-096 CMR 101(2)(B)(3)(c)]

4. Control Equipment

Air emissions from the Thermal Spray System shall be controlled by a baghouse.

5. Periodic Monitoring

The control system shall be operated and kept in a satisfactory state of maintenance and repair in accordance with the manufacturer's recommendations.

Soleras shall keep records of baghouse failures and malfunctions and baghouse maintenance. All components of the Thermal Spray System shall be maintained so as to prevent PM leaks.

D. General Process Emissions

Visible emissions from any general process source not specifically addressed in this license shall not exceed 20% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period.

E. Annual Emissions

1. Total Annual Emissions

Annual emissions from this facility were calculated as follows based on 8760 hours/year of operation, worst case historical emission data, and a factor to allow for future production increases.

**Total Licensed Annual Emissions for the Facility**  
(used to calculate the annual license fee)

	<b>PM</b>	<b>PM<sub>10</sub></b>
Thermal Spray System, tons per year	0.02	0.02

2. Greenhouse Gases

Greenhouse gases are considered regulated pollutants as of January 2, 2011, through 'Tailoring' revisions made to EPA's *Approval and Promulgation of Implementation Plans*, 40 CFR Part 52, Subpart A, §52.21 Prevention of Significant Deterioration of Air Quality rule. Greenhouse gases, as defined in 06-096 CMR 100 (as amended), are the aggregate group of the following gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. For licensing purposes, greenhouse gases (GHG) are calculated and reported as carbon dioxide equivalents (CO<sub>2</sub>e).

Because there are no fuel burning units at this facility large enough to be included in the air emission license, greenhouse gases emitted from the facility are calculated only from process sources. Soleras GHG emissions are below the major source threshold of 100,000 tons of CO<sub>2</sub>e per year; therefore, no additional licensing requirements are needed to address GHG emissions.

### III. AMBIENT AIR QUALITY ANALYSIS

According to 06-096 CMR 115, the level of air quality analyses required for a minor new source shall be determined on a case-by case basis. Based on the information available in the file and the similarity to existing sources, the Department finds that Maine Ambient Air Quality Standards (MAAQS) will not be violated by this source.

### ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-1073-71-A-N subject to the following conditions.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

### STANDARD CONDITIONS

- (1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which

any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S.A. §347-C).

- (2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [06-096 CMR 115]
- (3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 CMR 115]
- (4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 CMR 115]
- (5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S.A. §353-A. [06-096 CMR 115]
- (6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 CMR 115]
- (7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 CMR 115]
- (8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 CMR 115]
- (9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license. [06-096 CMR 115]
- (10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license. [06-096 CMR 115]

- (11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:
- A. perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
    - 1. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring, or other causes indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
    - 2. pursuant to any other requirement of this license to perform stack testing.
  - B. install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and
  - C. submit a written report to the Department within thirty (30) days from date of test completion.  
[06-096 CMR 115]
- (12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:
- A. within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and
  - B. the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and
  - C. the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.  
[06-096 CMR 115]

- (13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement. [06-096 CMR 115]
- (14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emission and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 CMR 115]
- (15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status. [06-096 CMR 115]

#### **SPECIFIC CONDITIONS**

- (16) **CB #1: Thermal Spray System**
  - A. Emissions from the Thermal Spray System shall vent to a baghouse at all times that the system is in operation, and all components of the Thermal Spray System shall be maintained so as to prevent PM leaks. [06-096 CMR 115, BACT/BPT]
  - B. To document maintenance of the baghouse, the licensee shall keep a maintenance log recording the date and location of all bag failures, malfunctions, and all routine maintenance. The maintenance log shall be kept on-site at the facility. [06-096 CMR 115, BACT/BPT]
  - C. Visible emissions from the Thermal Spray System baghouse shall not exceed 10% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period. The facility shall take corrective action if visible emissions from the baghouses exceed 5% opacity. [06-096 CMR 101(2)(B)(3)(c)]
- (17) **General Process Sources**

Visible emissions from any general process source not specifically addressed in this license shall not exceed 20% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period. [06-096 CMR 101]

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- (18) Soleras shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (38 M.R.S.A. §605).

DONE AND DATED IN AUGUSTA, MAINE THIS 12<sup>th</sup> DAY OF October, 2012.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Melanie L. Gifford  
PATRICIA W. AHO, COMMISSIONER

**The term of this license shall be ten (10) years from the signature date above.**

[Note: If a complete renewal application, as determined by the Department, is submitted prior to expiration, then pursuant to Title 5 MRSA §10002, all terms and conditions of this license shall remain in effect until the Department takes final action on the renewal of the license.]

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: June 21, 2012

Date of application acceptance: August 7, 2012

Date filed with the Board of Environmental Protection:

This Order prepared by Jane Gilbert, Bureau of Air Quality.

