# PROPOSED

**Application No. 0074-03 Reviewed by: CBS**
February 24, 2005

**COVERED SOURCE PERMIT (CSP) NO. 0074-01-C REVIEW**
**APPLICATION FOR RENEWAL NO. 0074-03**

**Applicant:** Ball Metal Beverage Container Corporation

**Equipment Description:**

One (1) can washer
Reynolds Metals Co. (model no. RMC 96", max. fuel consumption of 1,850 cf/hr, with three Maxon burners model nos. 415, 161P, and 67)

Three (3) can printers
Three (3) Rutherford Machine Co. (model no. ACP-400)

Three (3) can overvarnish units
Three (3) Reynolds Metals Co. (Reynolds designed Gravure Unit R-400)

Three (3) can printer ovens
Two (2) Ross (max. fuel consumption of 2,000 cf/hr, with two (2) Eclipse Fuel Engineering Co. burners model nos. RAH80 and RAH120); and
One (1) Feco (max. fuel consumption of 2,000 cf/hr, with two Eclipse Fuel Engineering Co. burners model nos. RAH80 and RAH120)

Eight (8) can inside spray machines
Eight (8) Reynolds Metals Co. (model no. DG-250)

Two (2) can inside bake ovens
One (1) Feco (model no. Magna Air, serial no. 15357, max. fuel consumption of 2,400 cf/hr with two Eclipse Fuel Engineering Co. burners model no. RAH120); and
One (1) Ross (model no. Inside Bake, serial no. 75530, max. fuel consumption of 2,000 cf/hr with two Eclipse Fuel Engineering Co. burners model nos. RAH80 and RAH120).

**Equipment Location:**

Ball Metal Beverage Container Corporation
91-320 Komohana Street
Kapolei, Hawaii (Oahu)
UTM Coordinates: 2,356,676m N; 593,654m E (NAD-83)

**Point of Contacts:**

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**Proposed Project:**

This is a renewal for a major CSP application for an existing source. This source is major because potential emissions for VOC exceed 100 tpy from the can coatings and solvents. This source is also subject to NSPS Subpart WW because this is a beverage can surface coating plant that was modified after November 26, 1980. The Standard Industrial Classification Code (SICC) is 3411 - Metal Cans. Specifically, this is a two-piece aluminum beverage can plant and the following is the process description:

1) Cup forming from aluminum sheets; 2) Draw and iron to produce the full height of the can; 3) Trimming to the exact height of the can; 4) Cleaning prior to printing; 5) Printing exterior of can; 6) Varnish over the print; 7) Varnish to the bottom of the can; 8) Print oven drying; 9) Inside spraying; 10) Bake oven to cure the inside; 11) Waxing and flanging to receive the top; and 12) Light testing to check if there are any pin holes on the can. The can top is attached by others after the beverage is filled.

There are basically two emission types:

1. Can coating operations which emit evaporated VOCs and HAPs (fugitive); and
2. Natural gas combustion which primarily emit $NO_x$ and CO (point).

Doug Barndt of Ball mentioned that most of the emitted VOC is ethylene glycol monobutyl ether (EGBE). However, pursuant to a CFR final rule dated 11/18/04, EGBE was delisted as a HAP. Through a seven year petition process a risk assessment demonstrated that emissions of EGBE may not reasonably be anticipated to result in adverse human health or environmental effects. Thus, Ball will continue to be a major source of VOCs only.

The chronological description of processes that involve air permitting are as follows:

1. Can Washing & Drying ($NO_x$, CO)
2. Printing & Varnishing (VOC, HAP)
3. Printer Curing Oven (VOC, HAP, $NO_x$, CO)
4. Inside Spraying (VOC, HAP)
5. Inside Spraying Curing Oven (VOC, HAP, $NO_x$, CO)

This review is based on the application dated 6/27/03, additional information dated 1/20, 25, 27 of 2005, and 2/7, 17, 18 of 2005. CSP No. 0074-01-C issued 7/14/99 and amended 12/5/02 will be superseded upon issuance of this CSP. The application fee of $3,000 for a renewal to a major CSP was processed and the receipt will be issued with the permit.

**Applicable Requirements:**

Code of Federal Regulations (CFR)

40 CFR Part 60 - New Source Performance Standard (NSPS) Subpart WW - Standards of Performance for the Beverage Can Surface Coating Industry since the plant was modified after November 26, 1980. The modifications include increases in VOC with the addition of an inside bake oven, can inside spray machines, and a necking lubricator (closed File Nos. 436 and 560). There was also an operational modification to increase the VOC limits (closed File No. 853).

Consolidated Emissions Reporting Rule (CERR) since the facility has potential emissions ≥100 tpy for VOCs, pursuant to Table 1 of 40 CFR Part 51, Subpart A.

Major Source because the potential facility air pollutant emissions is greater than ≥100 tpy for VOCs.

Hawaii Administrative Rules (HAR) Title 11 Chapter 59
Hawaii Administrative Rules (HAR) Title 11 Chapter 60.1:

- Subchapter 1 - General Requirements
- Subchapter 2 - General Prohibitions
  - 11-60.1-32 Visible Emissions
- Subchapter 5 - Covered Sources
  - 11-60.1-83 Initial Covered Source Permit Application
- Subchapter 6 - Fees for Covered Sources, Sections 111-115
- Subchapter 8 - New Source Performance Standards
- Subchapter 9 - Hazardous Air Pollutant Sources

**Non-Applicable Requirements:**

CFR

40 CFR 52.21 - Prevention of Significant Deterioration of Air Quality (PSD) since there is no change in emissions (specifically significant increase).

40 CFR Part 61 because the facility is not a major source of HAP emissions.

40 CFR Part 63 - National Emission Standard for Hazardous Air Pollutants (NESHAPS) KKKK - Surface Coating of Metal Cans since EGBE was delisted as a HAP and thus the facility is not a major source of HAP emissions.

Compliance Assurance Monitoring (CAM) is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 CFR, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential precontrol emissions that are greater than the major source level [>100 tpy]; and (5) not otherwise be exempt from CAM. CAM is not applicable to the boilers since items 2, 3, and 5 do not apply.

A Best Available Control Technology (BACT) analysis was not required since there is no proposed modification to the facility and thus there will be no significant increase in air emissions.

Synthetic Minor Source because it is a Major Source.

**Insignificant Activities/Exemptions:**

1. The following equipment is exempt by HAR 11-60.1-82(f)(3)(A) - Water boilers which have a heat input of less than 5 MMBtu/hr and are fired exclusively with natural or synthetic gas:

   2.7 MMBtu/hr boiler fired only on synthetic natural gas.

2. The following equipment are exempt by HAR 11-60.1-82(f)(7) - Other activities as determined on a case-by-case basis to be insignificant by the director:
   a. Waxer and can washing because hydrogen fluoride emissions were calculated to be 0.028 tpy and sulfuric acid emissions to be 0.14 tpy (based on similar can plants);
   b. Wastewater treatment because the diluted sulfuric acid solution which are held in tanks at a steady state will have negligible vapor emissions;
   c. Individual solvent cleaning sinks because the solvent is pumped as needed and collected back into the 55 gallon drum. These operations are small and intermittent and therefore VOC emissions are insignificant; and
   d. Three (3) cyclones because based on an emissions test for a similar can plant,

the average PM emission rate was 0.10 lb/hr per cyclone. Therefore, each cyclone operating 8760 hr/yr will have a maximum potential emission of 0.43 tpy.

Note that the ovens and washers which burn synthetic natural gas are not exempt because the individual heat input of the ovens and washers exceed 1 MMBtu/hr pursuant to HAR 11-60.1-82(f)(2).

Sample calc: 1020 Btu/cf x 1,850 cf/hr = 1,887,000 Btu/hr for the can washer

**Alternative Operating Scenarios:**

The facility is not proposing any alternate operating scenarios.

**Project Emissions:**

Maximum air emissions from the can coating operations were calculated using the standards provided by 40 CFR Part 60 Subpart WW for VOC emissions. Maximum air emissions from the ovens and can washers which burn synthetic natural gas were calculated using AP-42 factors from section 1.4 - Natural Gas Combustion, 10/96.

For maximum annual VOC emissions, the following calculations are based on the existing permit limits for each solvent usage and the new maximum VOC content (in kg VOC / liter) allowed by Subpart WW:

ink/exterior base coat
(62,720 lb/yr)(**0.29 kg VOC / liter**)(1 gal / 7.36 lb)(3.7854 liters / gal)(1 ton / 907.18 kg) = 10.31 tpy VOC

clear base coat / overvarnish
(21,600 lb/yr + 311,520 lb/yr)(**0.46 kg VOC / liter**)(1 gal / 7.36 lb)(3.7854 liters / gal) (1 ton / 907.18 kg) = 86.87 tpy VOC

inside spray coat
(1,136,160 lb/yr)**(0.89 kg VOC / liter**)(1 gal / 7.36 lb)(3.7854 liters / gal)(1 ton / 907.18 kg) = 573.28 tpy VOC

For natural gas combustion calculations and short-term emissions, please refer to the application no. 0074-01 review. The maximum expected HAPs emissions were calculated on Ball's letter dated 1/27/05 using the solvent data sheets. The amount of clean up solvent used and the HAP content of the coatings will vary year to year, but should not change significantly. **TABLE 1** shows the potential facility emissions.

**TABLE 1**
**POTENTIAL FACILITY EMISSIONS (TPY)**

| Pollutant | Natural Gas Combustion [1] | Ink/Exterior Base Coat [2,3] | Clear Base Coat / Overvarnish [2,3] | Inside Spray Coat [2,3] | Misc. [4] | Total (tpy) |
|---|---|---|---|---|---|---|
| $SO_2$ | 0.03 | | | | | 0.03 |
| $NO_x$ | 5.36 | | | | | 5.36 |
| CO | 1.12 | | | | | 1.12 |
| PM | 0.63 | | | | | 0.63 |
| $PM_{10}/PM_{2.5}$ [5] | 0.63 | | | | | 0.63 |
| VOC | 0.31 | 10.31 | 86.87 | 573.28 | 5 | 675.77 |
| HAPs | | 0.1 | 1.56 | 4.87 | 2.81 | 9.34 |

1. All natural gas combustion sources are assumed to operate 8760 hr/yr.
2. All can coating operations are assumed to operate at the maximum allowable permit limits as shown above.
3. HAPs calculations shown in Ball's letter dated 1/27/05. HAP content in % weight were taken from the solvent data sheets.
4. The miscellaneous VOC emissions are from maximum expected clean-up solvent usage and the HAP emission is the generated formaldehyde during the oven curing. An emission factor of 0.0066 lb of formaldehyde per 1,000 cans was used based on stack testing of seven other Ball can plants. Maximum expected can production is 2,332,800 cans/day.
5. It is conservative to assume that $PM_{10} = PM_{2.5}$.

**Ambient Air Quality Assessment (AAQA):**

As confirmed by Department of Health letter dated July 19, 1994, an air dispersion modeling analysis is not required for the can coating operations. The reasons are:

1. Air dispersion modeling techniques do not exist for modeling a single VOC area source in a given region for purposes of determining the source's impact on regional ambient ozone concentrations.
2. 40 CFR Part 51 Appendix W - Guideline on Air Quality Models (Revised) offers a complex model for entire urban areas. However, the process involved is considered extensive and normally conducted only for attainment demonstrations in ozone nonattainment areas.

An AAQA was performed previously for the natural gas combustion sources using a SCREEN3 modeling program. The terrain was assumed to be flat and all default options were used. Downwash was considered and the total emissions were assumed to emit from one point. **TABLE 2** shows the maximum total emissions and stack parameters used (average stack parameters were used). **TABLE 3** shows maximum concentrations expected at the receptor distance of 50 meters.

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## TABLE 2
## SOURCE EMISSION RATES AND STACK PARAMETERS FOR AIR MODELING

| SOURCE | | EMISSION RATES [2] | | | | | STACK PARAMETERS [3] | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Stack No. | $SO_2$ (g/s) | $NO_x$ (g/s) | CO (g/s) | $PM_{10}$ (g/s) | Pb (g/s) | Height (m) | Temp. (K) | Velocity (m/s) | Diameter (m) |
| Combined sources [1] | 1 | 0.001 | 0.154 | 0.032 | 0.018 | 0.000 | 15.24 | 427.44 | 13.72 | 0.38 |
| | | | | | | | | | | |

1. The combined sources include all natural gas combustion sources which include all ovens and washers.
2. The emission rates are based on the maximum fuel input for the combined sources.
3. All air emissions from the natural gas combustion are assumed to be emitted from one stack (the average parameters of all the stacks).

## TABLE 3
## PREDICTED AMBIENT AIR QUALITY IMPACTS

| AIR POLLUTANT | AVERAGING TIME | IMPACT ($\mu g/m^3$) | AIR STANDARD ($\mu g/m^3$) | PERCENT STANDARD | IMPACT LOCATION (R)[1] |
|---|---|---|---|---|---|
| $SO_2$ | 3-Hour | 0 | 1300 | 0% | 50 |
| | 24-Hour | 0 | 365 | 0% | 50 |
| | Annual | 0 | 80 | 0% | 50 |
| $NO_2$ [2] | Annual | 12 | 70 | 17% | 50 |
| CO | 1-Hour | 122 | 10000 | 1% | 50 |
| | 8-Hour | 85 | 5000 | 2% | 50 |
| $PM_{10}$ | 24-Hour | 3 | 150 | 2% | 50 |
| | Annual | 1 | 50 | 2% | 50 |
| Pb | Calendar Quarter | 0 | 1.5 | 0% | 50 |
| $H_2S$[3] | 1-Hour | n/a | 35 | 0% | n/a |

Note:
1. (R) = distance from source to maximum impact in meters.
2. $NO_2$ assumed to equal $NO_x$.
3. $H_2S$ emissions not expected from this facility.

**Other Issues:**

1. Ethylene glycol is listed in the 'Documentation of the Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs)', Sixth Edition, Vol. 1, 1991 as an irritant (not known to cause cancer or deaths). It also states 'The low vapor pressure of ethylene glycol virtually precludes (prevents) excessive exposure to the vapors at room temperature'. The substance is still under review by the TLV Committee, and is given a TLV Ceiling of 50 ppm (125 $mg/m^3$). In any case, the ethylene glycol concentrations cannot be accurately quantified because the open ovens create fugitive emissions as well as stack emissions.
2. Visible emissions monitoring is not applicable to the SNG-fired ovens because it is considered a 'clean' burning fuel unlike fuel oil which contains sulfur.
3. See **ENCLOSURE 1** for pictures of the 1/25/05 site visit. At the site visit, Doug Barndt mentioned that the coatings change periodically. Therefore, the VOC and HAP content will also vary, but not significantly. The three (3) main glycol ethers are EGBE, hexyl cellosolve, and butyl carbitol (EGBE was removed from the HAPs list).
4. Paul Almodovar (919-541-0283) and Kelly Rimer (919-541-2962) of EPA specialize in beverage can coating. They mentioned that there is no EPA emission factor for the formed formaldehyde during the oven curing process. Therefore, the facility's emission factor should be sufficient.
5. Pursuant to Doug Barndt's email dated 2/18/05, methyl ethyl ketone (MEK) is no longer used at the plant and there is a petition to remove it from the HAPs list. Therefore, it appears to be reasonable to monitor MEK use as any other HAP in lieu of adding back the MEK usage limit of 10,400 lb/yr that was a part of the plant's air permit prior to the initial CSP 0074-01 dated 7/14/99.

**Previous Permit Conditions:**

1. Comply with all applicable requirements of NSPS Part 60, Subpart WW - Standards of Performance for the Beverage Can Surface Coating Industry.

2. Clear base coat and overvarnish shall not exceed 333,120 lb/yr.

3. Ink and exterior base coat shall not exceed 62,720 lb/yr.

4. Inside spray coat shall not exceed 1,136,160 lb/yr.

5. VOC emissions shall not exceed the following volume-weighted calendar-month average emissions [pursuant to 40 CFR §60.492(a), (b), and (c)]:

   0.29 kg of VOC per liter of coating solids from each two-piece can exterior base coating operation, except clear base coat;

   0.46 kg of VOC per liter of coating solids from each two-piece can clear base coating operation and from each overvarnish coating operation; and

0.89 kg of VOC per liter of coating solids from each two-piece can inside spray coating operation.

6. Submit semi-annual reports to monitor the volume-weighted average of the total mass of VOC per volume of coating solids to ensure not exceeding the limit specified above (pursuant to 40 CFR §60.495(b))

7. The monthly average emissions of VOC shall be calculated based on the VOC content stated by the supplier or Method 24 (as allowed pursuant to 40 CFR §60.496(a)(1))

8. Monthly records [for a minimum of five (5) years] shall be kept of the materials used, VOC contents, and calendar month average emissions of VOC for the operations specified above [minimum of two (2) years pursuant to 40 CFR §60.495(d)]

**New Permit Conditions:**

1. IPA/butanol solvents used for clean-up shall not exceed 66,880 lb/yr (it was removed in the initial CSP No. 0074-01-C dated 7/14/99 because it was thought to be discontinued; these solvents were separated from the solvent used with the coatings because the VOC emissions calculations would be overlapped)

2. Annual limit and monitoring for HAP emissions (the applicant requested this condition in order to remain below a major source of HAPs and thus have the facility be exempt from 40 CFR Part 63 - National Emission Standard for Hazardous Air Pollutants (NESHAPS) KKKK - Surface Coating of Metal Cans)

3. Monitoring, recordkeeping, and reporting for all operational and emission limits.

4. Scenario for the installation of exterior base coating machines and cure ovens as long it does not increase the estimated beverage can production rate of 2,332,800 cans/day nor exceed any of the operational/emissions limitations (exterior base coating machines and curing ovens were removed)

**Conclusion and Recommendation:**

In conclusion, it is the Department of Health's preliminary determination that the facility will comply with all State and Federal laws, rules, regulations, and standards with regards to air pollution. Therefore, a renewal of CSP No. 0074-01-C for Ball Metal Beverage Container Corporation is recommended based on the information provided in the air permit application and subject to the following:

1. Above special permit conditions;
2. 30-day public review period; and
3. 45-day EPA review period.