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CROWN CORK & SEAL COMPANY USA, INC.

NOTICE OF CONSTRUCTION APPLICATION – CAN MANUFACTURING OPERATION LINE 3

Crown Cork & Seal Company, Inc.
1202 Fones Road
Olympia, Washington

RAMBOLL

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1. INTRODUCTION

Crown Cork and Seal Company (USA), Inc. (Crown) owns and operates a metal beverage can manufacturing facility located at 1202 Fones Road in Olympia, Washington (Facility). Operation of the Facility is authorized by the Olympic Region Clean Air Agency (ORCAA) Air Operating Permit (AOP) No. 15AOP1129 issued on September 1, 2016 and amended on March 9, 2017.

The Facility currently operates two production lines (Lines 1 and 2), each capable of processing 1,900 cans per minute (cpm). Each production line includes can washing and drying, rim coating, exterior printing/coating lines (decorators, pin ovens), interior coating lines (lacquer spray machines (LSMs), interior bake ovens (IBOs)), and solvent cleaning. Facility operations are supported by a diesel-fueled emergency fire-pump engine.

Crown's proposed project under this Notice of Construction (NOC) application is to install and operate a third production line (Line 3) capable of processing 3,000 cpm. The new can production line will include, but is not limited to, the following key components: a can washer and natural gas-fired dryer with a rated capacity of 2.59 million British thermal units per hour (MMBtu/hr), two exterior coating decorators, two natural gas-fired pin ovens each with a rated capacity of 2.59 MMBtu/hr, nine interior LSMs, and one natural gas-fired IBO oven with a rated capacity of 3.93 MMBtu/hr. Crown's NOC application also proposes to install and operate a regenerative thermal oxidizer (RTO) to reduce can decorating and coating process emissions of volatile organic compounds (VOCs) and toxic air pollutants (TAPs) from all three production lines. The RTO will be equipped with a natural gas-fired burner (up to 11.2 MMBtu/hr) and the system will include a particulate filter (baghouse) to prevent solids build-up in the RTO heat exchange media as a fire safety precaution.

Crown also proposes to remove and/or replace some existing equipment on existing can production Lines 1 and 2, including the following: replace the natural gas-fired Line 2 pin oven (2.59 MMBtu/hr), replace Line 1 and Line 2 natural gas-fired IBOs (3.93 MMBtu/hr each), replace the two existing natural gas-fired boilers with two natural gas-fired hot water heaters (3.25 MMBtu/hr each), and remove the back-up washer and dryer. Crown is not proposing any increase or change to the can production rate for Lines 1 and 2 or any changes to other existing equipment. There are no emission increases from the proposed modifications to Line 1 and Line 2.

In accordance with Rule 6 of ORCAA's Regulations, an Order of Approval (OA) is required for the construction and operation of a new air contaminant source and its air pollution control equipment. Rule 6.1(c) of ORCAA's Regulation presents a list of equipment that is categorically exempt from the requirement to submit an NOC and obtain an OA, including natural gas-fired fuel burning equipment less than 5 MMBtu/hr (Rule 6.1(c)(26)(ii)), and routing, turning, carving, cutting and drilling equipment used for metal (Rule 6.1(c)(81). Consequently, the proposed natural gas-fired Line 3 can dryer and hot water heaters, as well as, activities associated with can forming and necking, are all exempt activities and are, therefore, not subject to new source review.[1] Activities associated with can washing and can decorating and coating are subject to new source review and comprise the Project.

[1] Crown's air quality consultant Ramboll US Corporation (Ramboll) contacted ORCAA's Jennifer DeMay on April 21, 2020 and on June 1, 2020, to discuss ORCAA's exemption policy. During the calls, Ms. DeMay confirmed that each activity or operation may qualify independently for an

The Project will increase annual facility emissions of criteria pollutants and TAPs, including: oxides of nitrogen (NO_X), carbon monoxide (CO), particulate matter (PM), particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and sulfur dioxide (SO_2). Facility-wide VOC emissions will decrease with the proposed installation of the RTO. This submittal includes a NOC application in accordance with ORCAA's Rule 6.

Chapter 2 provides a detailed process description and project description. Chapter 3 presents a discussion of the methodology used to estimate Project emissions and presents Project emissions. Chapter 4 provides a detailed review of the federal, state, and local regulatory applicability. Chapter 5 provides a complete Best Available Control Technology (BACT) analysis for the Project. And, Chapter 6 summarizes an assessment of local air quality impacts and confirms that predicted ambient concentrations meet ambient air quality standards and TAP criteria.

The appropriate ORCAA application forms are included in Appendix A. Appendix B provides the detailed emission calculations for the Project. Appendix C includes manufacturer technical specification documents for the RTO. Safety Data Sheets for various materials used throughout the process are included as Appendix D. Appendix E provides the Washington's State Environmental Policy Act (SEPA) checklist. And, air dispersion model files supporting the Project permit application are provided on a DVD included as Appendix F.

NOC exemption if it is a listed activity in Regulation 6.1(c) and may then be exempt from a larger project. Also, Ms. DeMay confirmed that the fuel burning exemption thresholds are for each emission unit rather than an aggregate limit. Finally, Ms. DeMay confirmed that the oven combustion emissions cannot be separated form curing emissions for the purpose of new source review.

2. PROJECT DESCRIPTION

Crown proposes to modify its existing facility to install and operate a new beverage can manufacturing line (Line 3), replace specific equipment in the two existing production lines (Lines 1 and 2), and install new air pollution control equipment to control VOC and TAP emissions from all three lines. Figures 1 and 2 display the facility location and site layout map, respectively. The new production line will have the capability of producing various styles of beverage cans, ranging from approximately 7-ounce to 16-ounce sizes. Two-piece aluminum beverage cans will be manufactured by forming single piece aluminum can bodies which are then attached to a can end (lid) in the beverage packaging operation. Can ends manufacturing will not be conducted at this facility.

Construction activities for the Project are proposed to commence upon issuance of all required permits.

Figure 1: Facility Location

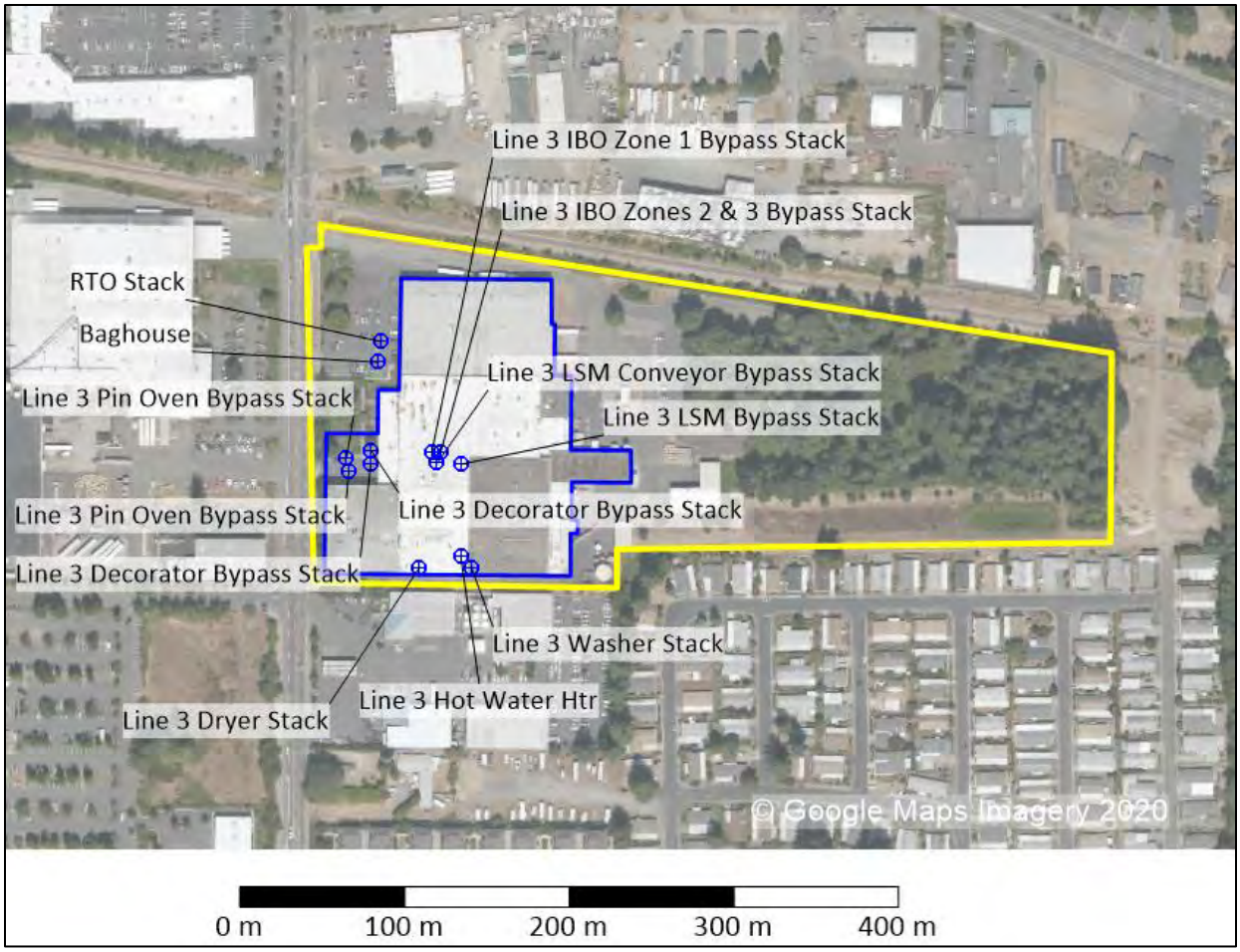

Figure 2: Site Layout with New Equipment

2.1 Process Description

Beverage can body fabrication involves a draw and iron (D&I) process, where cups are punched from aluminum sheet stock and then drawn through dies in the bodymakers to form the desired can body shape. The can bodies are washed and then surface treated to remove drawing lubricant and promote improved adhesion of coatings. A protective bottom rim varnish (UV coating) is applied to the bottom of the can. A decorative label is then printed on the can body exterior, followed by a protective over-varnish coat. An interior coating is also applied to prevent contact of the beverage with the aluminum can body. The over-varnish and inside spray coatings are both waterborne coatings that comply with applicable Federal New Source Performance Standards (NSPS) applicable to beverage can manufacturing. The UV rim varnish also complies with the NSPS limits for exterior can coatings. A general process flow diagram is provided in Figure 3.

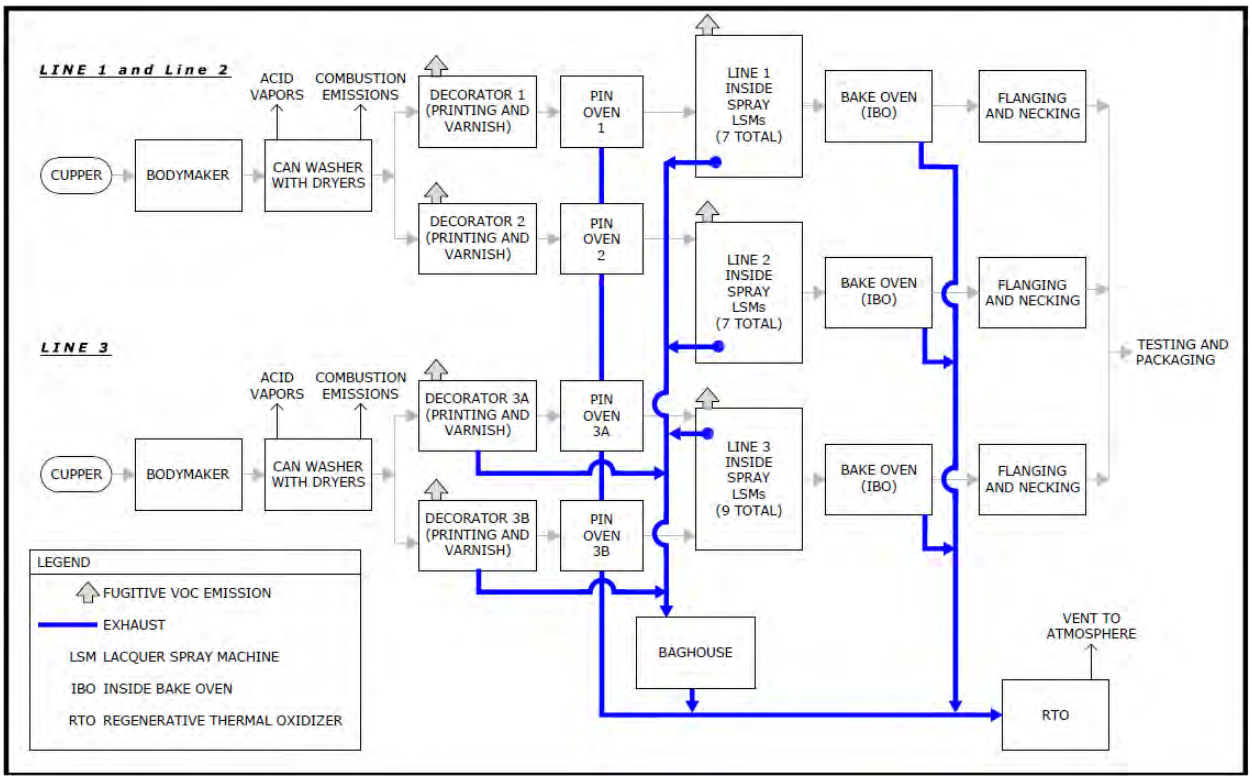

Figure 3: Process Flow Diagram (Normal RTO Scenario)

Can Forming

The can forming steps begin when aluminum sheet metal is uncoiled and a cupper lubricant (a synthetic lubricant) is spread on the sheet with a roll applicator. The lubricated sheet is fed into a cupper press, which stamps out shallow aluminum cups sized for the desired can style being produced. The scrap aluminum left over from the punch press patterns is collected, bailed, and sent for recycling at a secondary aluminum smelter. The cupper lubricant has almost no volatility at the temperature ranges at which the process operates, resulting in negligible evaporative losses. As such, this step is an insignificant emissions source. The safety data sheet (SDS) for the cupper lube is included in Appendix D. Additional information supporting this classification is included in Section 3.4 of this application.

Cups from the initial can forming step are continuously fed through an extrusion process (bodymakers) that draws the can to a smaller diameter and irons the walls to the appropriate length for the can style being manufactured. This D&I process is facilitated by application of a drawing lubricant aqueous solution, which aids in the reshaping process (lubricating and cooling the aluminum can and bodymaker dies). This drawing lubricant is a synthetic lubricant that is used in a dilute (approximately 3%) aqueous solution. Like the cupper lubricant, the bodymaker synthetic lubricant has negligible volatility at the temperatures seen in the operation and the aqueous solution concentration at which it is used. The bodymaker lubricant SDS is included in Appendix D. As further outlined in Section 3.4, the bodymakers are also considered to be an insignificant emission source.

At the exit of the bodymaker, excess aluminum is trimmed from the top of the can body to level the uneven edge and obtain the desired height of the cans. This trimming operation is completed with a knife-like cutting tool that slices off approximately 1/4-inch of excess aluminum. The can is still enveloped in drawing lubricant, and therefore, the de minimis amount of aluminum fines created in this operation are carried away and then filtered from the drawing lubricant. Accordingly, no PM emissions are created by this process step.

Can Washing

Once formed, the can bodies are processed in a can washer to remove any drawing lubricant solution and to treat the metal surface for improved adhesion of inks and coatings. The aluminum surface of the can body is slightly etched, and then a proprietary surfactant surface treatment (containing no VOC) is applied that improves adhesion of the coatings. The can washer is a multi-stage process where dilute acid wash and surface treatment aqueous solutions are sprayed on the cans via a series of nozzles within enclosed sections of the washer. Water rinse stages, including a final rinse with deionized water, follow the acidic washes and surfactant surface treatment stages. In the last stage, the cans pass through a natural gas-fired dryer. The cans exiting the dryer section ("bright cans") are then conveyed to the rim coater for application of a UV varnish to the bottom rim of the can prior to the decoration process step.

The can washer stages that spray acidic or surface treatment aqueous solutions are vented to the atmosphere. The can dryer and one of the water rinse stages are ventilated, but this exhaust only contains products of combustion from the dryer burners, water vapor, and possibly minute amounts of acid fume / mist. The acidic wash solutions contain less than 10% sulfuric acid and less than 0.1% hydrofluoric acid; therefore, the partial pressures of acid fumes from these solutions are minimal. Past studies at the facility have developed acid mist/fume emission factors from the can washing process that are used in the emission calculations for the Project (see Section 3.1). The raw material for surface treatment contains 5% to 10% proprietary surfactant and is used in a 3.5% solution strength, so the total surfactant concentration is less than 0.4% by weight. Accordingly, the washing, rinsing and surface treatment stages of the can washer result in minimal emissions. SDSs for the various can washer chemical additives are included in Appendix D.

Exterior Decorating and Coating Process

Bright cans from the can washer are conveyed to a bottom rim coater where a UV rim varnish is applied with a roll coater. The rim varnish is cured with ultra-violet lamps before the cans proceed to the printing mandrel on the decorator. Most of the organic materials in the rim varnish cross link in the UV curing step and are transformed into the cured coating film on the bottom rim. The rim varnish SDS is included in Appendix D. The maximum VOC emission rate of this UV coating is estimated to be less than 0.01 pounds of VOC per gallon (lbs VOC/gal) rim varnish applied. VOC emissions from the rim coat will be minimal, and thus are not directed to the proposed VOC air pollution control system.

The exterior label and decoration are applied in the first section of the decorators. Inks are transferred from an ink well to a series of rollers and then applied to a rubber printing blanket roll. This printing blanket roll and the cans rotate on a mandrel at the same speed in opposite directions to print the individual color onto the can, which forms the exterior label. Up to 8 colors can be applied by the

decorator's printing station. Hundreds of printing inks are applied over the course of the year, but they all have a very similar resin chemistry and composition. Crown's ink supplier (INX International Ink Co.) provided a generic SDS for the decorator inks supplied to Crown (copy included in Appendix D). This generic ink SDS states the range of hazardous air pollutant (HAP) and TAP content and provides a reasonable worst-case specification for VOC content and volume solids. The specific VOC listed in the ink SDS is dibutylaminoethanol, which ranges up to 5% of the ink formulation. These parameters were applied to the consumption rate for the full population of inks applied by the decorators to calculate VOC and TAP emissions. Isopropyl alcohol (IPA) is used as solvent to clean decorator units.

Over varnish is roll coated directly over the inks to provide a protective coating over the printed can label. This is a wet-on-wet coating application operation, with no curing step occurring between the printing and over varnish application stations on the decorator. Decorated cans are then transferred to a pin chain conveyer and fed to a curing oven. The exhaust from this pin oven will be directed to the RTO for control of VOC and TAPs emitted by the process. A minor amount of ink mist generated by the Line 3 decorators is collected by a close capture system (the "ink mist collection system") that also vents to the RTO. Fugitive ink/overvarnish emissions from the decorators are released uncontrolled through building rooftop vents. The ink mist collection systems for the Lines 1 and 2 decorators are currently vented to atmosphere, but this may also be tied into the RTO header at a later date. Once the ink and varnish has cured in the printing pin ovens, the cans are ready for the interior coating.

Typically, a single over varnish will be used for all can production at the site. This is a water-based coating that is received and stored in bulk tanks. No solvents are added to the over varnish prior to use. If any viscosity adjustment is required, it is accomplished by adding water to the coating, which has no effect on emissions and will not change the VOC content of the over varnish. The projected worst-case VOC content of the over varnish is 2.1 lbs/gal coating (excluding water) or 2.9 lb/gal coating solids, which meets the NSPS limits applicable to beverage can exterior coatings. An SDS for the over varnish most likely to be used at this facility is included in Appendix D. The worst-case volume solids and HAP content of possible over varnishes for this facility were used to estimate the overall VOC and organic HAP emissions (See Section 3.2 of this application).

Interior Coating Process

Decorated cans from the pin oven are conveyed into a bank of LSMs that apply the inside spray coating to the interior of the can. The function of this inside spray coating is to eliminate any contact between the beverage and the aluminum can surface. The inside spray coating is applied with spray nozzles positioned within the spinning can. This application technique yields a very high transfer efficiency, which is estimated to be in excess of 94%. The minor amount of overspray generated in this process step is pulled through fabric filters on the LSM housing exhaust duct to filter the overspray PM.

Crown conservatively estimates that 95% of this overspray is directed to the LSM filters for control, with the remaining 5% dropping out in the LSM enclosure as overspray deposition. These filtration devices remove dried coating droplets before directing the exhaust to the RTO for VOC control. The very high overspray PM control is achieved between the high transfer efficiency, 95% capture of overspray, and high filtration efficiency of the LSM filters. Moreover, since the majority of the overspray PM either remains on filtration media in the PM control devices vented to the VOC control

system, almost all VOCs evaporating from the overspray are still collected and directed to the RTO for final VOC destruction. Additional detail is provided in the description of emission estimating procedures presented in Section 3.2 of this application.

Coated cans are conveyed from the LSMs to an in-feed table at the IBO. The conveyors have a hood and vacuum upender that prevents the cans from falling off the conveyer. Fugitive emissions from the LSM overspray, the conveyer hood, and vacuum blower are vented to the atmosphere.

In the IBO, the cans proceed through the tunnel style oven on an open mesh conveyor to cure the interior coating. The inside spray VOCs driven off in the IBOs are collected and vented to the RTO for control.

Typically, a single inside spray coating will be used for all can production at the site. The inside spray will be a water-based coating that is received and stored in bulk tanks. No solvents are added to the inside spray prior to use. If any viscosity adjustment is required, it is accomplished by adding water to the coating, which has no effect on emissions and will not change the VOC content of the inside spray. The projected worst-case VOC content of the inside spray is 3.6 lbs/gal coating (excluding water) or 7.2 lb/gal coating solids, which meets the NSPS limits applicable to beverage can interior coatings. An SDS for the inside spray most likely to be used at this facility is included in Appendix D. The worst-case volume solids and HAP content of possible inside sprays for this facility were used to estimate the overall VOC and organic HAP emissions (See Section 3.2 of this application).

Necking / Flanging Operations

As the final manufacturing step, the top section of the can is necked down to a smaller diameter and flanged to prepare the can to receive the end (lid). Necker machines decrease the diameter of the open end of the can by forcing it through two successive dies (one type on each machine). The spin flanger machines form the can shoulder into a smooth, slightly concave transition between the neck and can body, and then turns the neck back to create a mating surface for the can end during packaging of the beverage. A necker lubricant is used in this process, but this material has no VOC content as it is comprised of a paraffin wax material. The necker lube SDS is also included in Appendix D and confirms that this lubricant has negligible volatility. Therefore, the necker/flanger operation is also considered to be an insignificant emission source. Additional information supporting this classification is included in Section 3.4 of this application. Quality control, packaging, and shipping operations follow the manufacturing process.

Air Pollution Control Device Operations

PM emissions from the LSM overspray are first controlled by LSM fabric filters, which then vent to the RTO. The RTO system includes a particulate filter (baghouse) for safety considerations (prevents build-up of combustible residue in the heat exchange media), but this filtration is not considered when estimating overall PM emissions. Most of the inside spray lacquer is transferred to the interior surface of the can (assumed 94% minimum transfer efficiency). The lacquer overspray is vented through the LSM exhaust to fabric filters which are connected to the cold exhaust header that is connected to the RTO. The PM filtration efficiency of the LSM filters is estimated to be a minimum of 99%. Based on the maximum amount of inside spray consumed and these transfer, collection, and filtration efficiencies,

and accounting for uncontrolled overspray fugitive emissions, the annual PM emissions from Line 3 are very low (< 500 pounds per year (lbs/yr)), even without consideration of the RTO pre-filter effects.

The captured exhaust gas from all of the pin ovens and IBOs will be routed directly to the RTO for VOC destruction. The VOC destruction efficiency of the RTO is expected to exceed 98%. This is verified by the manufacturer guarantee required by Crown's bid specification for the project (see Appendix C). The overall VOC capture efficiency for all of the coating operations is expected to exceed 75%. This minimum capture efficiency is based on operating experience with for VOC capture systems installed at other Crown beverage can plants. Moreover, given that the facility's production building operates at a negative pressure and a substantial amount of workplace air is pulled into the RTO system via curing oven make-up air and the ink mist collection system, the overall VOC capture is expected to easily exceed the conservative 75% estimate used in this NOC application emission calculations.

Alternative Operating Scenario – Limited Operation During RTO Bypass

Crown is also requesting an alternative operating scenario which would allow for reduced operation of production lines (combined production rate of 3,900 cpm) for up to 200 hours a year with bypass of the RTO control system. This operating scenario would accommodate required RTO maintenance activities. Either Line 1 or line 2 would be shut down, and one of the Line 3 decorators would be shut down during these RTO maintenance events. Typically, there are two preventative maintenance events per year, each lasting approximately 50 to 70 hours per year. The balance of the requested maximum time for operation during RTO bypass would cover other possible short-term maintenance events that may arise over the course of the year.

When operating the production lines during an RTO bypass event, Crown would take certain measures to reduce emissions aside from shutting down Line 1/Line 2 and one of the Line 3 decorators. For example, Crown will schedule preventative maintenance events required for the production line equipment (such as a subset of the bodymakers, LSMs, or portions of the decorators) to occur at the same time as the RTO maintenance events. Additionally, deactivating one of the two Line 3 decorators during RTO bypass will limit the Line 3 capacity to a maximum of 2,000 cpm. This would reduce the overall production capacity of the can manufacturing lines still operating (combined production rate of 3,900 cpm) during the RTO bypass event.

During the RTO bypass events, the operating can manufacturing lines will vent their VOC emission sources through a series of roof-top T-damper bypass vents. This will allow for the RTO to be cooled with ambient air flowing through its purge air damper, maintenance performed when the cooled unit is safe to enter, and then a re-heat process to bring the RTO back to its minimum required temperature, before routing the VOC emission streams back into the unit. The LSM overspray exhaust would still flow through the LSM filters before discharging to individual T-dampers proximate to each machine. For the purposes of estimating annual VOC emissions, the separate uncontrolled emissions are summed for the bypass scenario (up to 200 hours/year) with the normal controlled emission rates for the routine production scenario (minimum 8,560 hours/year). Additional details have been provided on Table 3-2 as part of the emissions calculations.

2.2 Project Description

As discussed above, the Project consists of installing and operating a third production line, replacing and removing certain existing Line 1 and 2 equipment, and installing an RTO to control VOC from the can decorating and coating operations.

Crown proposes to install and operate several natural gas-fired emission units including the can dryer, pin ovens, IBOs, and RTO burner. In accordance with ORCAA Rule 6.1(c)(26)(ii), fuel burning equipment that has a maximum heat input rate of 5 MMBtu/hr or less that burns natural gas is exempt from new source review. Additionally, ORCAA Rule 6.1(c)(81) exempts routing, turning, carving, cutting and drilling equipment used for metal. Consequently, the proposed natural gas-fired Line 3 can dryer and hot water heaters, as well as, activities associated with can forming and necking, are all exempt activities and are, therefore, not subject to new source review.

Crown proposes to install the following equipment as part of the Project, emission units that are subject to new source review are presented in bold.

New Line 3 beverage can production line, rated at 3,000 cpm, including:

- One (1) Minster DACH 165 cupping press, does not emit any air pollutants and exempt from new source review;
- Nine (9) CMB Engineering bodymakers/trimmers, does not emit any air pollutants and exempt from new source review;
- **One (1) 3,000-cpm can washer, TAP emissions vented to atmosphere**, and dryer with 2.59 MMBtu/hr natural gas-fired burner**,** burner exempt from new source review;
- **One (1) UVIO bottom rim coater, VOC emitted as fugitives**;
- **Two (2) Rutherford decorators, captured VOC emissions controlled by RTO, remaining VOC emitted as fugitives;**
- **Two (2) 2,400-cpm pin ovens each with a 2.59 MMBtu/hr natural gas-fired burner**, **VOC emissions controlled by RTO**;
- **Nine (9) CMB Engineering lacquer spray machines (LSMs), captured VOC emissions controlled by RTO, remaining VOC collected via hood and vented to atmosphere, PM emissions controlled by LSM fabric filter, very minimal PM emitted as fugitives;**
- **One (1) 3,000-cpm IBO with a 3.93 MMBtu/hr natural gas-fired burner, VOC emissions controlled by RTO**;
- One (1) CMB Engineering necking system, does not emit any air pollutants and exempt from new source review;
- One (1) Busse palletizer, does not emit any air pollutants; and
- One (1) Busse sorting system, does not emit any air pollutants.

Proposed changes to Line 1 and Line 2 equipment, including:

- Remove the existing back-up washer/dryer (a.k.a. the Line A Washer);
- Replace existing Line 2 pin oven with one (1) 2,400-cpm pin oven with a 2.59 MMBtu/hr natural gas-fired burner, VOC emissions controlled by RTO, and burner exempt from new source review;
- Replace existing Line 1 and Line 2 IBO ovens with two (2), one per line, 3,000-cpm IBO with a 3.93 MMBtu/hr natural gas-fired burner, VOC emissions controlled by RTO, and burner exempt from new source review; and
- Replace two (2) existing natural gas-fired boilers with two (2) natural gas-fired hot water heaters each with a rated heat capacity of 3.65 MMBtu/hr, exempt from new source review.

Proposed new facility equipment:

- **One (1) Anguil RTO with a natural gas-fired burner with a rated capacity of up to 11.2 MMBtu/hr.**

3. MAXIMUM EMISSIONS DATA AND CALCULATIONS

To determine the applicability of regulations, and to predict potential air quality impacts associated with the proposed Project, the types and quantities of air pollutant emission increases were identified. Pollutant emission rates are determined by the physical and operational characteristics of the proposed equipment.

The Project consists of one new production line and replacement equipment that will include the following emission units: can washing, rim coating, two exterior coating decorators, three pin ovens, nine interior LSM, three IBOs, one RTO to reduce decorating and coating processes VOC and TAP emissions, and LSM fabric filters to reduce inside coating PM emissions. This section describes the emissions attributable to the Project and the methods used to control these emissions. Detailed emissions calculations are provided in Appendix B.

Criteria pollutants generated by the non-exempt equipment from the Project include VOC, PM, PM_{10}, $PM_{2.5}$, and products of natural gas combustion. TAPs generated by the Project include hydrofluoric acid, sulfuric acid, ethylene glycol monobutyl ether (EGBE), propylene glycol methyl ether (PGME), IPA, and formaldehyde. Maximum short-term and potential annual criteria pollutant and TAP emission rates are calculated for each new emission unit.

Crown does not propose to modify the Line 1 and Line 2 production rates or make any physical changes to the existing decorators and LSMs. Therefore, there will be no increase in can decorating and coating emissions for the existing lines. Instead, there will be significant decreases in VOC and TAP emissions from Line 1 and Line 2 due to the installation and operation of the RTO (once the RTO becomes operational). However, the replacement ovens (Line 1 IBO, Line 2 pin oven and IBO) are subject to minor new source and the natural gas combustion products are included in Project emissions.

3.1 Can Washing

Once formed, the can bodies are processed in a can washer to remove any drawing lubricant solution and to treat the metal surface for improved adhesion of inks and coatings. The can washer is a multi-stage process where dilute acid wash and surface treatment aqueous solutions are sprayed on the cans via a series of nozzles within enclosed sections of the washer. Three raw materials are used during the can washing process.

The first material (Ridoline 120WN) is applied as a very dilute hydrofluoric acid solution, with aqueous solution strength of less than 0.01 weight percent (wt%) hydrofluoric acid. Can washing is conducted at approximately 140 degrees Fahrenheit (˚F). Vapor pressure data at this dilute concentration was not readily available; however, published data indicate a 2.23 wt% hydrofluoric acid solution will exert 0.37 millimeters of mercury (mmHg) partial pressure of hydrofluoric acid at 60 degrees Celsius (˚C) (140 ˚F). [2] Therefore, a 0.01 wt% hydrofluoric acid solution would be expected to exhibit a small fraction of this already low volatility. Furthermore, the Ridoline 120WN composition does not include

[2] *Vapor Pressure of Hydrofluoric Acid Solutions*. J. Brosheer, F. Lenfesty, and Kelly Elmore. Industrial & Engineering Chemistry, 1947, 39 (3), 423-427

organic constituents. Accordingly, the air space within this can washer stage would primarily contain water vapor and negligible hydrofluoric acid fumes. Based on previous studies, Crown conservatively estimates that hydrogen fluoride (HF) emissions from the use of Ridoline 120WN are less than 0.089 lbs per million cans produced. This emission factor is used to estimate the very low HF emission rate from the can washing process.

The next chemical assisted washing stage utilizes a moderate strength (8 wt%) sulfuric acid aqueous solution (Ridoline 735). There is one organic component in the sulfuric acid solution (polyoxyalkylene), which exhibits a very low vapor pressure of 0.008 mmHg. Published values for partial pressure of sulfuric acid in aqueous solutions were consulted to assess its volatility. According to Perry's Chemical Engineering Handbook[3], the sulfuric acid in a 10% aqueous solution at 60 ˚C (140 ˚F) would show a very low pressure of 1 x 10^{-16} mmHg. Similar to the hydrofluoric acid solution washer stage, the air space would contain water vapor and negligible sulfuric acid fumes. Based on previous studies, Crown conservatively estimates that sulfuric acid mist (H_2SO_4) emissions from the use of Ridoline 735 are less than 0.26 lbs per million cans produced. This emission factor is used to estimate the very low H_2SO_4 emission rate from the can washing process.

The third chemical evaluated in the can washer process is a surfactant treatment chemical (Henkel ME-50) that is used at low aqueous solution strength (3.5% surfactant in water). As applied, the surfactant concentration is less than 0.4 wt%. In reviewing the SDS for Henkel ME-50, no organic or volatile components were identified, and, thus no VOC emissions would result from this application.

Crown developed emission factors based on past studies at the facility. Short-term emissions are calculated using the applicable emission factor, provided in pounds per million cans washed, the Line 3 rated production capacity of 3,000 cpm, and one hour of continuous operation. Maximum daily emissions are calculated based on the maximum hourly emission rate and continuous operation for 24 hours. Maximum annual emissions are calculated based on the maximum hourly emission rate and continuous operation for 8,760 hours adjusted to account for the line efficiency of 90% (some production time is lost to accommodate label changeovers and make-readies at the printing heads within the decorator). Table 3-1 presents Line 3 can washing emissions.

Table 3-1: Line 3 Can Washing Maximum Potential Emissions

Pollutant	Emission Factor[1]	Emissions[2]			
	lb/MM can	lb/hr	lb/day	lb/yr	tons/yr
Hydrofluoric Acid	0.089	0.016	0.38	126	0.063
Sulfuric Acid	0.26	0.047	1.12	369	0.18

[1] Emission factors are based on past studies conducted at Crown Cork facilities.

[2] Hourly emissions based on Line 3 rated throughput of 3,000 cpm. Daily emissions based on the maximum hourly rate and continuous operation for 24 hours. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 8,760 hours per year.

[3] Perry's Chemical Engineering Handbook 7th Edition, Table 2-14 "Sulfuric Acid Partial Pressure, bar, over Aqueous Sulfuric Acid" for an assumed 10% H_2SO_4 Solution at 60 degrees Celsius.

3.2 Can Decorating and Coating

Most of the emissions generated by the Project are classified as VOCs and result from the evaporation of solvents in the coating and inks as they are applied and/or cured. Crown's primary method to minimize emissions and comply with applicable VOC control regulations is the use of waterborne low-VOC content coatings. The coatings applied at Crown easily meet the VOC content limits for metal can surface coating in the NSPS for Beverage Can Surface Coating (NSPS Subpart WW). The worst-case over varnish formulation is 2.9 lbs VOC/gal solids and is well below the NSPS limit for exterior coatings of 3.8 lbs VOC/gal solids. Similarly, the worst-case inside spray coating formulation is 7.2 lbs VOC/gal solids and is below the NSPS limit for interior coatings of 7.4 lbs VOC/gal solids.

Pre-control VOC and TAP emission are estimated using a mass balance approach. The VOC and HAP contents within the coatings and inks were derived from coating or ink vendor SDS. The maximum usage rates of these materials are based on the rated maximum design capacity of the production lines. The production capacity of Line 3 is 3,000 cpm and the proposed project does not affect the 1,900 cpm capacity of either Line 1 or 2. As discussed above, the proposed line will operate annually at a 90% efficiency as some production time is lost to accommodate label changeovers and make-readies at the printing heads within the decorator. This line efficiency is used in the calculations to estimate annual coating and ink consumption rates. This is conservative, as additional downtime will likely be lost when the line is reconfigured to produce different styles and sizes of beverage cans.

The pre-control VOC and TAP emission estimates for Line 3 are based on the following process information and assumptions:

- The maximum expected short-term production rate is 3,000 cpm; 2,700 cpm when considering a maximum annual line utilization of 90%; and
- The maximum coating and ink application rates for inside spray, over varnish, decorating ink, and rim coat are: 0.2, 0.070, 0.0089, 0.0019 gallons per 1,000 cans (gal/1,000 cans), respectively; and
- Worst case VOC and TAP content of possible inside spray, over varnish, and decorating ink, and assuming 100% of the VOC / TAP is emitted (content information provided in SDSs); and
- 8,560 hours per year of normal operation and 200 hours per year of RTO bypass.

VOC and TAP emission reductions achieved by the add-on controls (RTO) are applied to the pre-control VOC and TAP emission rates computed from the mass balance calculations to determine the final emission estimates. As the first step, the VOC and TAP capture efficiency is estimated for the various coating or printing operations as follows:

- Rim varnish UV coating – 0% capture (no close capture hoods, enclosures or other intakes)
- Decorator Printing / Over-varnish coatings – 75% capture (evaporation within the pin ovens vented to the RTO)
- Inside Spray Coating – 75% capture (evaporation within the IBO vented to the RTO)

Application of these capture efficiencies provides the basis to divide the pre-control emissions between the fugitives released with no control and the VOC load directed to the RTO system. The post-control VOC and TAP emissions are then calculated as the sum of the fugitive emissions plus the portion of

the captured emission stream that are not destroyed by the VOC control system (2% of the VOC load directed to the control system). The overall potential VOC emissions from the Line 3 can decorating and coating process are estimated by be approximately 80 tons per year (tpy). This estimate includes the emissions generated during 200 hours of RTO bypass mode, where no VOC destruction is occurring. Table 3-2 presents overall VOC emissions from decorating and coating processes, TAP emissions are provided in the facility-wide emissions tables in the next section.

Table 3-2: Line 3 Can Decorating and Coating Maximum Potential VOC Emissions

					Normal Operation[3]			RTO Bypass[4]	
Material	Use	Application Rate (gal/1,000 cans)	Vol % Solids[1]	lb VOC/gal solids[1]	Annual Usage (gal/yr)	VOC Controlled Emissions (tpy)	VOC Fugitive Emissions (tpy)	Annual Usage (gal/yr)	VOC Emissions (tpy)
Various	Inside Spray	0.20	18.5%	6.5	277,344	2.50	41.69	4,320	2.60
Various	Varnish	0.070	35.4%	2.9	97,070	0.75	12.46	1,512	0.78
Various	Ink	0.0089	83.9%	1.52	12,332	0.12	1.96	192	0.12
UV Varnish	Rim Coat	0.0019	96.4%	0.010	2,565	--	0.012	40	0.0002
IPA[2]	Cleanup IPA	--	--	6.6	9,630	--	31.58	153	0.50

[1] The solids percentage and VOC content for each material is based on the worst-case formulation out of the possible coatings/inks, based on information provided in manufacturer SDSs.

[2] IPA usage is calculated using a 1.125 gallon per hour rate for Line 3 production capacity. IPA usage rate was provided by Crown Cork personnel. Annual usage of IPO does not include the 90% line efficiency factor.

[3] Annual usage of each material during normal operation is based on the Line 3 rated capacity of 3,000 cpm, 90% line efficiency, 8,560 hr/year of normal operation, and the respective application rate. Annual emissions during normal operation assume that 100% of the VOC content will be emitted, and are based on the annual usage, and the respective capture efficiency and destruction efficiencies for each application (Inside spray 75% CE and 98% DRE, Varnish and Ink 100% CE and 98% DRE, no control for Rim Coat or Cleanup IPA).

[3] Annual usage of each material during RTO bypass is based on the reduced Line 3 capacity of 2,000 cpm, 90% line efficiency, 200 hr/year of RTO bypass operation, and the respective application rate. Annual emissions during normal operation assume that 100% of the VOC content will be emitted, and are based on the annual usage, and no control.

The over-varnish and inside spray coating that will be used at this facility do not contain formaldehyde as a listed component. However, formaldehyde will be formed when resins in the coatings cross-link and cure in the pin ovens and IBO. The waterborne coatings contain a resin base, water, and organic solvent. The coatings also contain a melamine formaldehyde resin modifier that, when heat cured, will release a minor amount of formaldehyde. Using performance data from studies conducted at the facility, Crown developed an emission factor of 11.4 pounds of formaldehyde per million cans. These formaldehyde emissions are only created when the coating resin is cross-linked during heat curing, and thus, are limited to the curing ovens and are 100% captured. Therefore, during normal operation all formaldehyde emissions are destroyed at 98% efficiency in the RTO. The overall potential formaldehyde emissions from the Line 3 can decorating and coating process are estimated by be approximately 0.3 tpy. This estimate includes the emissions generated during 200 hours of RTO bypass mode, when no formaldehyde destruction is occurring.

The inside spray application technology in the LSMs yields a very high transfer efficiency, which is estimated to be in excess of 94%. The total amount of overspray generated in this process step is estimated by multiplying the total coating use (gal/yr) by the coating density (lb/gal) by the weight percent solids (wt%) by (1 – transfer efficiency). This yields an annual overspray mass rate of over 29,000 lbs/yr, including the 90% line efficiency. Crown conservatively estimates that 95% of this overspray is directed to the LSM filters for control, with the remaining 5% dropping out in the Facility as overspray deposition. Of the overspray that is not captured and directed to the LSM filters, it is estimated that 90% is deposited within the Facility with the remaining 10% venting out of the building as fugitive PM emissions. High PM control (minimum of 99% filtration efficiency) is achieved by the LSM filters, which when applied to the overspray PM emissions entrained in the LSM exhaust, yields a Line 3 annual controlled PM emission rate of approximately 282 lbs/yr. Fugitive PM emissions are estimated to be approximately 149 lbs/yr. Line 3 PM emissions are presented in Table 3-3.

Table 3-3: Line 3 LSM Maximum Potential PM Emissions

PM Emissions	Solids Applied	Solids in Overspray	Overspray to work area	Controlled Emissions [3]	Controlled Emissions	Plant Vent Fugitives[4]	Plant Vent Fugitives	Total PM Emissions
	(lbs/yr)	(lbs/yr)	(lb/yr)	(lbs/hr)	(tpy)	(lb/hr)	(tpy)	(tpy)
Normal Operation[1]	495,076	29,705	1,485	0.037	0.14	0.02	0.074	0.22
RTO Bypass[2]	7,711	463	23	0.02	0.0022	0.01	0.001	0.003

[1] Hourly emissions during normal operation are based on Line 3 rated throughput of 3,000 cpm. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 8,560 hours per year.
[2] Hourly emissions during RTO bypass operation are based on the reduce Line 3 throughput of 2,000 cpm. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 200 hours per year.
[3] Controlled emissions are based on a 94% material transfer efficiency, 95% capture efficiency. During normal operation, the LSM exhaust vents through the LSM fabric filters, then to the RTO for a destruction efficiency of 99%. During RTO bypass, the LSM exhaust vents through the LSM fabric filters which have a removal efficiency of 99% and then atmosphere.
[4] Uncontrolled emissions that are emitted as fugitives through the plant vents are calculated based on the 94% material transfer efficiency and the 5% of the overspray that is not captured by the PM control system. Uncontrolled emissions are calculated based on 90% of the overspray particulates being deposited in the plant and 10% of the overspray exhausting through plant vents.

The UV rim varnish used at the bottom rim coater contains organic materials that cross link in the UV curing step and are primarily converted to the cured coating film on the bottom rim of the beverage cans. The VOC emission rate for this UV coating is less than 0.01 lbs VOC/gal solids, is HAP-free and was assumed to completely evaporate as fugitive VOC. The Line 3 rim coat VOC emission are less than 0.02 tpy.

IPA is used for wash-up of the printing heads on the decorator and contributes to the VOC emissions from the process. Crown estimates that up to 40% of the IPA dispensed for this wash-up is retained in shop towels used to wipe clean printing rolls. This estimate was based on data from another Crown plant that centrifuges solvent from shop towels for recovery in a distillation system. To be conservative, the calculations for this application assume that 100% of the IPA dispensed for washup is emitted as fugitive and none is retained in the shop towels. Based on process knowledge, Crown estimates that a maximum of 1.125 gallons per hour of IPA will be used on Line 3, which translates to a maximum annual IPA usage of 9,794 gallons per year. Fugitive VOC emissions from this clean-up activity are conservatively estimated to be 32.12 tpy.

3.3 Natural Gas Combustion

The Project includes natural gas-fired burners associated with the ovens and RTO. Hourly criteria pollutant emission rates for the burners are based on vendor data, BACT analysis, and Section 1.4 of U.S. Environmental Protection Agency's (EPA) AP-42 emission factor document. Maximum annual emissions are calculated based on the maximum hourly emission rate and continuous operation for 8,760 hours per year.

The combined heat input rating of the proposed ovens burners (total 19.6 MMBtu/hr) is less than the combined heat input rating of the units that will be replaced (total 27.8 MMBtu/hr). Consequently, there are no increases of TAP emissions related to the proposed natural gas-fired burners in the process equipment.

The RTO burner is used to preheat the RTO and during periods of low process gas flow (process equipment is not operating). When process gas flow increases, the RTO burner is shut-off. The Project is evaluating different burners for the RTO and anticipates a low-NOx natural gas-fired burner with maximum heat input capacity of up to 11.2 MMBtu/hr based on other similar company projects. Potential emissions from the RTO burner are based on continuous operation, but actual burner operations are limited to preheating the RTO and maintaining heat in the RTO when the process gas flow to the RTO is low.

3.4 Project Emissions

Table 3-4 presents the maximum potential criteria pollutant emissions for the Project.

Table 3-4: Project Maximum Potential Criteria Emission Rates

Pollutant	Line 3 Normal		Line 3 Normal Fugitive		Line 3 RTO Bypass		Project Combustion		Total Project	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
NOX	--	--	--	--	--	--	2.29	10.04	2.3	10.0
CO	--	--	--	--	--	--	2.02	8.83	2.0	8.8
PM	0.037	0.14	0.02	0.07	0.04	0.006	0.23	1.00	0.3	1.2
PM_{10}	0.037	0.14	0.02	0.07	0.04	0.006	0.23	1.00	0.3	1.2
$PM_{2.5}$	0.037	0.14	0.02	0.07	0.04	0.006	0.23	1.00	0.3	1.2
VOC	0.87	3.37	22.8	87.7	44.4	4.0	0.16	0.72	68.2	95.8
Sulfuric Acid Mist	0.05	0.18	--	--	--	--	--	--	0.05	0.18

In accordance with ORCAA Rule 6.1.4, if a proposed new source or modification will emit any TAPs, the source must meet all of the requirements of WAC 173-460. Under WAC 173-460, a NOC application must include an acceptable source impact (ASIL) analysis to demonstration that TAP emission increases attributable to the Project are sufficiently low to protect human health and safety from potential carcinogenic and other toxic effects. The regulations that describe the first tier review process (WAC 173-460-080) permit the inclusion of reductions in actual TAP emissions from existing emission units at the source, for the purpose of offsetting emissions of the same TAP attributable to a new or modified emission unit.

Currently, TAP emissions generated from Lines 1 and 2 are uncontrolled. As part of the Project, TAP emissions from Lines 1 and 2 decorating and coating processes will be reduced by the RTO with the same capture efficiencies and destruction efficiency applied to Line 3 emissions. Additionally, during

RTO bypass, Line 1 will be shut down which will reduce uncontrolled short-term emissions from Lines 1 and 2. To determine the decrease in actual emissions from Lines 1 and 2, past actual emissions are subtracted from future maximum potential emissions to calculate the net reduction.

Past actual annual emissions from Lines 1 and 2 are calculated based on the average of actual reported emissions over the previous two-year period (2018 and 2019). Short-term actual emissions are estimated using emission factors and assuming both Lines 1 and 2 are operating at full capacity. Future maximum potential emissions from Lines 1 and 2 are calculated for both operating scenarios, normal operation (controlled emissions from both lines operating at full capacity) and RTO bypass (uncontrolled emissions from Line 2 only), using the same methods described above for Line 3. Crown evaluated both operating scenarios. Table 3-5 presents the Lines 1 and 2 TAP emissions used in the netting analysis.

Table 3-5: Lines 1 and 2 TAP Emissions Netting

Toxic Air Pollutant	CAS	TAP Avg. Period[5]	Past Actual[1]	Future Potential Normal Operation[2]		Future Potential with RTO Bypass[3]	
			lb/avg. period	lb/avg. period	Net Reduction[4]	lb/avg. period	Net Reduction[4]
EGBE	111-76-2	24-hr	798	212	-587	399	-399
IPA	67-63-0	1-hr	9.8	9.8	0	4.9	-4.9
PGME	107-98-2	24-hr	17.1	4.5	-12.6	8.5	-8.5
Formaldehyde[6]	50-00-0	year	15,551	634	-14,916	634	-14,916
Hydrofluoric Acid	7664-39-3	24-hr	0.5	0.5	0	0.2	-0.2
Sulfuric Acid	7664-93-9	24-hr	1.4	1.4	0	0.7	-0.7

[1] Annual baseline emissions are based on the average of actual emissions over the previous two-year period. Short-term baseline emissions are calculated based on emission factors and Lines 1 and 2 operating at full capacity.

[2] Future potential hourly emissions during normal operation are based on the combined Line 1 and 2 rated throughput of 3,800 cpm. Daily emissions based on the maximum hourly rate and continuous operation for 24 hours.

[3] Future potential hourly emissions during RTO bypass operation are based on only one line operating at its rated capacity of 1,900 cpm. Daily emissions based on the maximum hourly rate and continuous operation for 24 hours.

[4] Net reduction is the minimum emission reduction comparing future potential TAP emissions to past actual TAP emissions (i.e., minimum emission decrease from either operating scenario compared to baseline actual emissions).

[5] TAP-specific averaging periods from WAC 173-460-150.

[6] The net change for formaldehyde is conservative as it does not include natural gas combustion emission reductions associated with removing the existing two boilers and the backup washer and dryer.

Tables 3-6 and Table 3-7 present emission increases associated with the Project during normal operation and RTO bypass, the actual emission decreases associated with controlling TAP emissions from the Lines 1 and 2 can decorating and coating processes, and compares potential TAP emissions attributable to the Project with the Small Quantity Emission Rates (SQERs). During normal operation, two TAPs exceeds their respective SQERs, sulfuric acid and IPA. Whereas, during RTO bypass potential emissions of EGBE also exceed its respective SQER (based on the short-term averaging period of EGBE). These three TAPs are further evaluated in Chapter 6.

Table 3-6: Project Potential TAP Emissions – Normal Operation

Pollutant	Avg. Period [1]	Line 3 Increase [2] (lb/avg. period)	Lines 1-2 Reduction [3] (lb/avg. period)	Total Increase (lb/avg. period)	SQER [1] (lb/avg. period)	Model (Y/N)?
Hydrofluoric Acid	24-hr	0.38	0	0.38	1.00	N
Sulfuric Acid	24-hr	1.1	0	1.1	0.07	Y
EGBE	24-hr	184	-587	-402	6.10	N
IPA	1-hr	7.3	0	7.3	5.90	Y
PGME	24-hr	0	-12.6	-12.6	520.00	N
Formaldehyde	year	339	-14,916	-14,577	27.00	N

[1] TAP-specific averaging periods and small quantity emission rates (SQERs) from WAC 173-460-150.
[2] TAP emission increase for new emission units according to TAP averaging period.
[3] TAP emission decrease from new RTO controlling emissions from Lines 1 & 2.

Table 3-7: Project Potential TAP Emissions – RTO Bypass

Pollutant	Avg. Period [1]	Line 3 Increase [2] (lb/avg. period)	Lines 1-2 Reduction [3] (lb/avg. period)	Total Increase (lb/avg. period)	SQER [1] (lb/avg. period)	Model (Y/N)?
Hydrofluoric Acid	24-hr	0.38	-0.2	0.14	1.00	N
Sulfuric Acid	24-hr	1.1	-0.7	0.4	0.07	Y
EGBE	24-hr	464.1	-399.2	64.9	6.10	Y
IPA	1-hr	7.3	-4.9	2.4	5.90	N
PGME	24-hr	0	-8.5	-8.5	520.00	N
Formaldehyde	year	587	-14,916	-14,330	27.00	N

[1] TAP-specific averaging periods and SQERs from WAC 173-460-150.
[2] TAP emission increase for new emission units according to TAP averaging period.
[3] TAP emission decrease from RTO bypass scenario (limited production rate for Lines 1 & 2).

3.5 Insignificant Emission Sources

As noted in Chapter 2, there are several activities that cause minimal to no evaporative VOC emission losses. Such activities include can forming and can necking. SDSs for materials associated with these process steps have been provided as Appendix D.

The can forming process includes use of a cupper lubricant in the initial cup forming step as well as a drawing lubricant in the bodymakers or can drawing / wall ironing step. The cupper lubricant (DTI SNL-3 CUPPER LUBE) is spread on the aluminum sheet metal via roll applicator. The material is a synthetic mix of mineral oil with other high molecular weight organics. These constituents have very high boiling points (in excess of 500˚F) and very low vapor pressures (< 0.01 mmHg), and thus, have negligible volatility at temperatures close to ambient conditions. The cupping lubricant will generally be maintained at or slightly above ambient temperatures through the can formation steps. There is no intentional heating in this part of the process; punch press operations could slightly increase temperature of the metal substrate and roll applied lubricant slightly above ambient. As such, with very low vapor pressure and approximate ambient temperature, little to no VOC emissions will result from the initial can formation/cupping lubricant process step.

Cups from the initial can formation step are then processed in the bodymakers to draw and iron the body of the can. During this step, a dilute aqueous solution of drawing lubricant (DTI 350 Coolant) is applied to assist in the shaping process, serving to both lubricate and cool the aluminum can and bodymaker dies. The material is a synthetic lubricant mix of water soluble, high molecular weight organics and is applied at low solution strength (approximately 3% lubricant in water). The organic constituents in this mixture have relatively low vapor pressures (< 0.1 mmHg). In this step, the drawing lubricant is re-circulated, filtered and reused, and thus realizes a nominal increase in temperature. Because most of the solution is composed of water, the partial pressures exerted by the organics in the solution are extremely low and there is no substantial temperature increases in the recirculating lubricant mixture. Therefore, the bodymaker lubricant will create negligible VOC emissions.

Line 3 will be equipped with a respray function to touch up potential defect cans. The Respray/Supersorter acts similarly to a depalletizer directly into the LSM section. This allows cans which have a minor defect on interior spray to be given a second spray and eliminate potential metal exposure issues. When the super sorter is in use it operates in place of the full line using some Line 3 LSM equipment to accomplish this task. The super sorter will operate in place of full line speeds at lower cans per minute and equal to lower lacquer application rates depending on the extent of the potential defect. The super sorter when in use will reduce line capacity and overall emission rates from the full Line 3 maximum production schedule listed. Ideally the super sorter will be used infrequently on an extremely limited basis. All emitting equipment is previously included in the line 3 line layout, respray when needed will occur on Line 3 equipment in place of full production speeds.

In the final production step, the open end of the can is necked down to a smaller diameter and flanged to prepare the can for receiving the lid in the beverage packaging operations. This process is accomplished with use of a paraffin wax-based lubricant (P. E. 837-MM) at ambient processing temperatures. The SDS lists this material with negligible volatility, as the material is composed of high molecular weight paraffins with associated boiling points above 650 ˚F. Therefore, at ambient temperatures with minimal volatility, negligible VOC emissions are expected.

4. REGULATORY REQUIREMENTS

The proposed Project is subject to Federal, State and local regulations. The following sections discuss the applicable regulations. The Project will be located in an area that is in attainment of all ambient air quality standards.

4.1 Federal Regulatory Requirements

4.1.1 Prevention of Significant Deterioration (PSD)

A PSD permit is required if a proposed new source or modification is considered "major". The major source threshold for each regulated criteria pollutant is 250 tpy, unless the facility falls under one of the listed 28 sources for which the PSD major source threshold is 100 tpy. Fugitive air emissions are not required to be included in the determination of a facility's PSD major source status unless the facility's operations are on the list of 28 source categories. The Facility is not within one of the 28 listed source categories under the PSD program and is therefore subject to the 250 tpy major source threshold.

The Facility was previously a major source under the PSD program because potential VOC emissions exceeded 250 tpy. In August of 2000, under NOC 00MOD063, Crown requested and received approval of a 249 tpy limit for facility-wide emissions of VOC. This limit established Crown as a minor stationary source with respect to PSD.

The PSD permit process is triggered when 1) a new source has potential emissions that exceed the major source threshold or 2) a minor source is modified such that the incremental increase in emissions with the Project exceeds the major source threshold. Therefore, in order to be subject to PSD review, Project potential emissions would need to exceed the major source thresholds rather than facility-wide potential emissions. As presented in Section 3.3, Project potential emissions are below the PSD major source thresholds and the Project is not subject to PSD review. Additionally, operation of the RTO on all three production lines will result in facility-wide potential emissions to be below PSD major source thresholds (approximately 211 tpy VOC), accordingly, the facility will operate as a true minor source.

4.1.2 Title V Operating Permits Program (40 CFR Part 70)

ORCAA implements the Environmental Protection Agency's (EPA's) Air Operating Permit (AOP) program, also known as "Title V," through ORCAA Rule 5.1. This program defines a "major source" of air pollutants as a stationary source that has the potential to emit 10 tons or more per year of any single HAP, 25 tons or more per year of any combination of HAPs, or 100 tons or more per year of any other air pollutant subject to regulation.

A facility that falls under this definition of a major source is required to apply for and obtain an AOP. The Facility meets the definition of a major source because potential VOC emissions exceed 100 tpy. Crown already operates under AOP No. 15AOP1129 issued on September 1, 2016, and amended on March 9, 2017, and will continue to do so after the NOC application. The current AOP expires on September 1, 2021; ORCAA requires the submittal of a complete renewal application at least twelve months prior. Crown anticipates that the OA will be been issued prior to submission of the AOP renewal application and that the renewal will reflect the conditions of approval.

4.1.3 NSPS (40 CFR Part 60)

NSPS are uniform standards that apply nationally to specific categories of stationary sources that are constructed, modified, or reconstructed after the standard was proposed. NSPS are found in Title 40, Part 60 of the Code of Federal Regulations (CFR). NSPS usually represent a minimum level of control that is required on a new source.

The following NSPS regulations potentially apply to the Project, applicability is discussed in the following sections.

- Subpart A – General Provisions
- Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
- Subpart WW - Standards of Performance for the Beverage Can Surface Coating Industry

Subpart A – General Provisions

Elements of Subpart A apply to each affected facility under any NSPS rule, as specified in each NSPS source category standard. Subpart A contains general requirements for notifications, monitoring, performance testing, reporting, recordkeeping, and operation and maintenance. These general requirements will apply to the Project as referenced in the applicable NSPS Subparts.

Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The requirements of 40 CFR part 60, Subpart Dc apply to each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity greater or equal to 10 MMBtu/hr and less than 100 MMBtu/hr. For the purposes of the subpart, steam generating units do not include process heaters where a process heater is a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst. Although exempt from new source review, the two proposed natural gas-fired hot water heaters (3.25 MMBtu/hr each) are potentially subject to the NSPS. However, the hot water heaters have heat input rates less than the applicability threshold (10 MMBtu/hr); therefore, they are not subject to the subpart.

Subpart WW - Standards of Performance for the Beverage Can Surface Coating Industry.

The requirements of 40 CFR Part 60 Subpart WW apply to new, modified, or reconstructed facilities at beverage can surface coating lines including each exterior base coat operations, each over varnish coating operations, and each inside spray coating operation provided the modification or reconstruction is commenced after November 26, 1980. The Line 3 production line is subject to Subpart WW because construction will commence after the applicability date. The following coating operations are considered part of the affected facility: over varnish coating operations (bottom varnish and over varnish) and inside spray coating operations. Each coating operation consists of the coating application station, flashoff area, and curing oven. Crown does not have any exterior base coating operations at the Facility; therefore, the exterior base coating limits are not applicable.

Compliance with the emission limitations set forth in 40 CFR 60.492(b) and (c) is achieved using compliant coatings. Specifically, clear base and over varnish coatings applied in two-piece coating operations are limited to 0.46 kilograms per liter (kg/L) of coating solids or (3.8 lb/gal solids). Inside spray coatings are limited to 0.89 kg/L coating solids or (7.4 lb/gal solids).

Compliance with the compliant coatings option is demonstrated through retention of Environmental Data Sheets (EDSs), SDSs and/or Technical Data Sheets (TDSs) supplied by the coating vendors for each coating used at the facility. Coating SDSs are attached in Appendix D. Please note that no VOC containing diluents are proposed to be added to any of the coatings applied at Crown's facility. If viscosity adjustments are required, the coatings are thinned with water, which has no effect on the VOC content expressed in lbs VOC/gal coating solids. The added water does not change either the mass of VOC or volume of solids in the as-supplied coating formulation.

4.1.4 NESHAP (40 CFR Part 61)

The facility does not emit any HAP regulated by an applicable Part 61 National Emission Standards for Hazardous Air Pollutants (NESHAP); therefore, the NESHAP 40 CFR Part 61 subparts do not apply to the Facility.

4.1.5 MACT (40 CFR Part 63)

Under the provisions of Section 112 of the 1990 Clean Air Act Amendments, EPA was required to regulate emissions of a total of 189 HAPs from stationary sources. EPA does this by specific industry categories to tailor the controls to the major sources of emissions and the HAPs of concern from that industry. The rules promulgated under Section 112 generally specify the Maximum Achievable Control Technology (MACT) that must be applied for a given industry category. Consequently, these rules are often called MACT standards.

MACT standards can require facility owners/operators to meet emission limits, install emission control technologies, monitor emissions and/or operating parameters, and use specified work practices. In addition, the standards typically include recordkeeping and reporting provisions. MACT standards are codified in 40 CFR Part 63.

For MACT purposes, a major source is defined as one with a PTE greater than 10 tpy of a single HAP or more than 25 tpy of all HAPs combined. In this case, Crown has a federally enforceable, voluntary limit (established through 05NOC420) on emissions of HAPs that establishes Crown as minor source (also referred to as 'area source') of HAPs. Additionally, facility-wide potential total HAP emissions will be approximately 4.6 tpy, below both single HAP and combined HAP major source thresholds. The following subparts potentially apply to the Project, and applicability is discussed in the following sections.

- Subpart A – General Provisions
- Subpart KKKK - National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Cans
- Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters

- Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

Subpart A – General Provisions

The provisions of subpart A apply to each affected facility under any Part 63 MACT rule. Subpart A contains general requirements for notifications, monitoring, performance testing, reporting, recordkeeping, and operation and maintenance. These general requirements will apply to the proposed Project as referenced in the applicable MACT Subparts.

Subpart KKKK - National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Cans

The National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Cans was promulgated on November 13, 2003 and applies to all metal can surface coating operations at major sources. This rule applies to owners or operators of metal can surface coating operations that use at least 5,700 liters (1,500 gallons) of coatings per year and are major sources of HAPs or are part of a major source. As a minor source of HAPs, Crown is not subject to the requirements of 40 CFR Part 63 Subpart KKKK.

Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters

On November 20, 2015 EPA issued a revised final rule for 40 CFR 63 Subpart DDDDD, commonly referred to as the Major Source Boiler MACT. The subpart applies to all existing, new, and reconstructed industrial, commercial, or institutional boiler or process heater located at a major source. As a minor source of HAPs, Crown is not subject to the requirements of 40 CFR Part 63 Subpart DDDDD.

Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

Subpart JJJJJJ applies to industrial, commercial, or institutional boilers located at area sources of HAPs. A boiler is defined as "an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam or hot water…Waste heat boilers, process heaters, and autoclaves are excluded from the definition of Boiler." New boilers are those that commenced construction or reconstruction of the affected source after June 4, 2010. The two proposed natural gas-fired hot water heaters will be constructed after the applicability date, however, in accordance with 40 CFR 63.11195(e), gas-fired boilers are exempt from the requirements of the subpart. Therefore, the two proposed hot water heaters are not subject to NESHAP Subpart JJJJJJ.

4.1.6 HAPs Major Source [FCAA §112(g)]

The facility is not a major source of HAPs. Therefore, a case-by-case control technology review, per Federal Clean Air Act (FCAA) §112(g) for major HAP sources without a corresponding MACT source category, is not required.

4.1.7 Plant-wide Applicability Limit (PAL)

No plant-wide applicability limit is being requested as part of this application.

4.2 Local and State Rule Applicability and Basis of Compliance

4.2.1 Preconstruction Permits

Rule 6.1 of ORCAA's Regulations prohibits the construction, installation, or modification of a stationary source unless an NOC application has been filed with ORCAA, and ORCAA has issued an OA. Exceptions to this rule are those sources that are exempted from the requirements under Section 6.1(c) or 6.1(d). As discussed in Section 2, the proposed natural gas-fired hot water heaters and can forming and necking operations meet exemption criteria in Section 6.1(c). However, other new equipment proposed as part of the Project do not quality for any other listed exemptions, and are, therefore, subject to the provisions of the new source review program and required to obtain an OA.

Rule 6 of ORCAA's Regulations address the review of new or modified sources of air contaminants and require that the applicant demonstrate that the new equipment will:

- not cause violations of the ambient air quality standards;
- result in TAP emission increases that are sufficiently low to protect human health and safety;
- meet applicable emission standards;
- employ BACT and BACT for toxics (tBACT); and
- obtain a State Environmental Protection Act (SEPA) determination from the appropriate lead agency.

This NOC application demonstrates the Project's compliance with all of ORCAA's new source review provisions:

- Compliance with ambient air quality standards is addressed in Chapter 6;
- Compliance with ambient TAP impact requirements is addressed in Chapter 6;
- Sections 4.1.3, 4.1.4, and 4.2.5 discuss applicable emission standards;
- A BACT/tBACT analysis is provided in Chapter 5;
- A SEPA checklist for the Project is included in Appendix E.

4.2.2 Best Available Control Technology (BACT)

Rule 6.1.4 of ORCAA's Regulations requires new stationary sources to employ BACT and t-BACT for all emission units at the facility. A BACT analysis evaluates the energy, environmental, economic, and other costs associated with each technology, and weighs those costs against the reduced emissions the technology would provide. A search of the RACT/BACT/LAER Clearinghouse (RBLC), air pollution control districts' BACT databases, and recently issued permits determined the emission levels that constitute BACT for the proposed Project.

A BACT analysis supporting the proposed Project is provided in Section 5 of this application.

4.2.3 Toxic Air Pollutants

Rule 6.1.4 of ORCAA's Regulations require a demonstration that TAP emission increases attributable to the Project are sufficiently low to protect human health and safety from potential carcinogenic and other toxic effects. TAP emission increases that do not exceed the SQERs prescribed by WAC 173-460 are assumed to be sufficiently low that no additional analyses are warranted. If TAP emission increases exceed the SQERs, the applicant must demonstrate either that the ambient impact is less than the ASIL or must conduct a second tier analysis as described in WAC 173-460.

As discussed in Section 3.3, the regulations that describe the first tier review process (WAC 173-460-080) permit the inclusion of reductions in actual TAP emissions from existing emission units at the source, for the purpose of offsetting emissions of the same TAP attributable to a new or modified emission unit. Tables 3-6 and 3-7 compare the net TAP emissions attributable to the Project minus the decrease in actual emissions attributable to employing emissions control on Lines 1 and 2 can decorating and coating processes with the SQERs.

As shown in Tables 3-6 and 3-7, the emission rates of three TAPs (sulfuric acid, IPA, and EGBE) exceed the applicable SQERs, and therefore, require further review. The air quality dispersion analysis conducted for those compounds to determine compliance with the ASILs is presented in Chapter 6. As described in Chapter 6, the maximum concentrations of all TAPs are less than the applicable ASILs.

4.2.4 State Environmental Policy Act

Because construction of the proposed Project requires Crown to obtain an OA from ORCAA, the requirements of Washington's SEPA must be satisfied. A complete SEPA checklist is included as Appendix E.

4.2.5 General Air Pollution Control Regulations

Regulations addressing general air pollution sources in Washington are contained in WAC 173-400. ORCAA has also established general regulations that apply within its jurisdiction. Note that all of these general conditions will apply to the proposed Project, which is not exempt from any general requirements.

General standards for maximum emissions from air pollution sources in Washington are outlined in WAC 173-400-040 and in the ORCAA Regulation. These regulations limit:

- Visible emissions to 20 percent opacity except for 3 minutes per hour (ORCAA Rule 8.2(a));
- Particulate matter emissions from equipment, excluding boilers using hog fuel, to 0.1 grains/standard cubic feet of gas calculated at 7 percent oxygen (ORCAA Rule 8.3(a));
- Particulate matter emissions from hogged fuel boilers to 0.20 grains/standard cubic feet of gas calculated at 7 percent oxygen (ORCAA Rule 8.3(b));
- Fugitive particulate material from process operations and equipment (ORCAA Rule 8.3(c));
- Fallout (ORCAA Rule 8.3(e));
- Nuisance Odor (ORCAA Rule 8.5);
- TAP requirements of WAC 173-460 and formaldehyde to 0.05 parts per million 1-hour average or 61 micrograms per cubic meter 1-hour average (ORCAA Rule 8.6); and

- Maintenance and Repair of Air Pollution Control Equipment (ORCAA Rule 8.8).

Crown will adhere to these regulations, as applicable, and comply through proper operation and maintenance.

5. BEST AVAILABLE CONTROL TECHNOLOGY

As discussed in Section 4, among the requirements that must be met for ORCAA to issue an OA, is the requirement that proposed new or modified emission units will employ BACT and tBACT for all pollutants not previously emitted, or whose emissions would increase as a result of the Project. New emission units associated with the proposed Project are the Line 3 can washing and Line 3 can decorating and coating processes. Modified emission units include the Line 1 and Line 2 can decorating and coating processes.

5.1.1 Results and Summary

The following emission limits and/or control technologies are proposed as BACT for the proposed new emission units (Line 3):

- Line 3 Can Washing
    - TAPs – use of low concentration can washing solutions.
- Line 3 Can Decorating and Coating System
    - VOC – compliance with NSPS Subpart WW, use of RTO guaranteed to achieve 98% reduction of VOC emissions from the curing ovens;
    - TAPs – compliance with NSPS Subpart WW, use of RTO guaranteed to achieve 98% reduction of TAP emissions from the curing ovens;
    - PM, PM_{10}, and $PM_{2.5}$ – use of LSM fabric filters that achieves 99% PM emissions reduction of the LSM overspray;
    - NO_X – 80 ppm NO_X at 3% oxygen, good operational practices to minimize NOx and CO emissions
    - CO – no limit proposed, good operational practices to minimize NOx and CO emissions
    - SO_2 – no limit proposed, fuel use restricted to pipeline quality natural gas
- Line 3 Solvent Cleaning
    - VOC/TAP – store solvents and solvent-containing materials in covered containers and cleaning up spills to minimize emissions.

Crown proposes to modify Line 1 and Line 2 can decorating and coating systems by replacing the natural gas-fired Line 2 pin oven and replacing Line 1 and Line 2 natural gas-fired IBOs. Crown is not proposing any increase or change to the Lines 1 and 2 can production rates or any changes to other existing Line 1 or Line 2 equipment (i.e., decorators, inside spray LSMs, etc.). The proposed curing oven replacements will not increase potential VOC/TAP emissions from the Line 1/Line 2 can decorating and coating systems, and combustion emissions would decrease as a result of the modification because the size of the natural gas-fired burners in the replacement curing ovens are smaller than the existing burners in the curing ovens. Therefore, additional emission controls for Line

1 and Line 2 are not required to meet BACT because they would not be cost-effective (the denominator in the cost effectiveness equation would be zero). However, Crown proposes to go beyond BACT and tie-in Line 1 and Line 2 pin ovens, LSMs, and IBOs to the future RTO that is proposed as BACT for the Line 3 can decorating and coating systems. The tie-in to the RTO will be completed after the oxidizer is operational following installation of the new Line 3 can forming, washing and coating equipment. The following emission limits and/or control technologies are proposed for the modified emission units (Line 1 and Line 2):

- Line 1 and Line 2 Can Decorating and Coating System
    - VOC – After the RTO and Line 3 becomes operational, use of RTO guaranteed to achieve 98% reduction of VOC emissions from the curing ovens; and
    - TAPs – After the RTO and Line 3 becomes operational, use of RTO guaranteed to achieve 98% reduction of organic TAP emissions from the curing ovens.

5.1.2 BACT Analysis Methodology

BACT is defined in ORCAA's Regulation 1, Rule 1.4 as:

> An emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation … emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable for such stationary source or modification through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.

ORCAA has the authority to prescribe a design, equipment, work practice, or operational standard, or combination thereof, to meet the requirements of BACT.

For many air pollution control districts, BACT can be broken down to two general categories: 1) "technologically feasible and cost-effective" and 2) "achieved in practice." The first category is a more stringent level of BACT control and is technology-forcing; it generally refers to advanced control devices or techniques. The control equipment or technology must be commercially available, demonstrated effective and reliable on a full-scale unit, and shown to be cost-effective on a dollars per ton of pollutant removed basis. The second BACT category, "achieved in practice," applies to the most effective emission control device already in use or the most stringent emission limit achieved in the field for the type and capacity of equipment comprising the source under review and operating under similar conditions, e.g., process throughput and material use, hours of operation, site-specific limitations or opportunities, etc.

This BACT analysis is consistent with general EPA guidance (USEPA 1990). The steps involved are briefly described below. The EPA BACT guidance document details a "top-down" approach for selection the appropriate control technology. The steps are as follows:

- Step 1. Identify all available control alternatives with practical potential for application to the specific emission unit for the regulated pollutant under evaluation.

- Step 2. Eliminate all technically infeasible alternatives. If any of the control techniques identified in Step 1 cannot be successfully used on the emission units due to technical difficulties, such techniques are removed from further consideration.
- Step 3. Rank the remaining alternatives by control effectiveness. Assess the performance of each technically feasible control technique and rank them beginning with the most effective.
- Step 4. Evaluate the cost effectiveness, energy impacts, and environmental impacts of the most cost-effective control alternative.
- Step 5. Select BACT, which will be the most effective alternative not rejected based on economic, energy, and/or environmental impacts.

For Step 1 of the BACT analysis, Ramboll queried EPA's Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Control Technology (LAER) Clearinghouse (RBLC) database for recent BACT determinations involving similar emission units. This initial broad search was refined by eliminating sources that did not have similar designs and that did not operate in a similar manner. In addition, the BACT workbooks and websites maintained by the Bay Area Air Quality Management District (BAAQMD), the South Coast Air Quality Management District (SCAQMD), and the Texas Commission on Environmental Quality (TCEQ) were reviewed.

5.1.3 Line 3 Can Washing

The use of acidic wash solutions during can washing will generate emissions of two TAPs, hydrofluoric acid and sulfuric acid. The expected uncontrolled short-term and annual emission rates are 0.016 lb/hr and 0.06 tpy of hydrofluoric acid, and 0.047 lb/hr and 0.18 tpy of sulfuric acid, assuming continuous operation. Given this relatively small uncontrolled emission rate, the cost of employing a wet scrubber or an RTO to further reduce emissions is not cost-effective. Crown proposes that the use of low concentration can washing solutions is BACT for the can washing.

- The low concentration sulfuric acid shall contain no more than 60 percent sulfuric acid by weight.
- Percent by weight of hydrogen fluoride in the hydrofluoric acid used to formulate the can washing solution shall not exceed 5 percent by weight.

This NOC application requests the existing can washing permit (NOC 16MOD1178, issued December 12, 2016) for the facility be modified to incorporate the additional volumes of can washing solution for the proposed Line 3 can washer. Crown proposes the following changes (with strikeout) to specific conditions in NOC 16MOD1178:

- Condition 2.a – "The total cumulative use of low concentration sulfuric acid used to formulate the can washing solution shall not exceed ~~50,000~~ 100,000 gallons per consecutive 12-month period."
- Condition 2.d – "The total cumulative use of high concentration sulfuric acid (sulfuric acid with a concentration of greater than 60% by weight) used to formulate the can washing solution shall not exceed ~~5,000~~ 10,000 gallons in any consecutive 12-month period."

5.1.4 Line 3 Can Decorating and Coating

Can decorating and coating processes generate emissions of VOC, TAPs, PM, PM_{10}, and $PM_{2.5}$, and natural gas combustion products.

5.1.4.1 Selection of BACT for VOC and Volatile TAPs

Can decorating and coating VOC and TAP emissions result from the evaporation of solvents in the coating and inks as they are applied and/or cured. Crown's primary method to minimize emissions and comply with applicable VOC control regulations is the use of waterborne low-VOC content coatings. The coatings applied at Crown easily meet the VOC content limits for metal can surface coating in the NSPS Subpart WW for Beverage Can Surface Coating.

Crown's proposed VOC control system will provide almost 78% overall VOC control of the metal can surface coating emissions. The RTO will operate above 98% destruction efficiency and the coating application processes for the decorators and LSMs will capture more than 75% of the VOC applied on these coating lines. This is achieved by full capture of the VOC driven off in the curing ovens (pin oven and IBO) and connecting other process vents to the RTO header (the decorator ink mist collection system and the LSM overspray filter system). When the relative VOC consumption rates for the worst-case inside spray, over-varnish, and inks are coupled with these control efficiencies, the overall process VOC control approaches 78%. Details on the RTO system are provided in Appendix C.

A search of the BACT/LAER Clearinghouse database identified several Lowest Achievable Emission Rate (LAER) or BACT projects for beverage can coating processes that were based on similar VOC control systems as proposed by Crown, see Table 5-1. Each of these used thermal oxidizers, with destruction efficiencies ranging from 95% to 98%. Moreover, the overall VOC capture efficiencies reported for these projects ranged from approximately 60% to 80%. Crown's proposed system meets and/or exceeds these past BACT or LAER demonstrations, and thus qualifies as the high end of the potential control technologies and meets the BACT requirement. Because Crown is not proposing a technology less robust than this high end, a cost-effectiveness, energy, environmental, or technical feasibility analysis is not required to support this BACT demonstration.

Crown proposes that BACT and t-BACT for the control of VOCs and TAPs from Line 3, respectively, is compliance with Subpart WW and use of an RTO that achieves 98% reduction of the curing oven emissions.

5.1.4.2 Selection of BACT for PM, PM_{10}, and $PM_{2.5}$

Can decorating and coating particulate emissions are generated in the LSMs that apply the inside spray coating to the interior of the can. The inside spray coating is applied with spray nozzles positioned within the spinning can. This application technique yields a very high transfer efficiency, which is estimated to be in excess of 94%. The minor amount of overspray generated in this process step is pulled into a ventilation duct that directs it through LSM fabric filters. These filtration devices remove dried coating droplets before directing the exhaust to the VOC control system. High PM control (minimum of 99% filtration efficiency) is achieved by the LSM filters.

The BACT/LAER Clearinghouse database search did not identify any BACT limits for particulate emissions generated from can decorating and coating processes. A review of other agency BACT guidelines for coating operations identified either no limit or technology for emissions of PM or use of

high transfer efficiency application equipment, or dry or water wash filters with a control efficiency of 99% or greater. The PM control system proposed by Crown exceeds these BACT guidelines, and thus qualifies as the high end of the potential control technologies and meets the BACT requirement. Because Crown is not proposing a technology less robust than this high end, a cost-effectiveness, energy, environmental, or technical feasibility analysis is not required to support this BACT demonstration.

Crown proposes that BACT for the control of PM, PM_{10}, and $PM_{2.5}$ from Line 3 is use of LSM fabric filters that achieves 99% emissions reduction.

5.1.4.3 Selection of BACT for NO_X, CO, and SO_2

During the can decorating and coating process, the cans pass through natural gas-fired ovens. These ovens generate products of combustion (NO_X, CO, and SO_2) which combined with curing emissions are exhausted through the RTO.

The BACT/LAER Clearinghouse database search did not identify any BACT limits for NO_X, CO, and SO_2 from can decorating and coating processes. Additionally, none of the burners are subject to any NSPS or NESHAP standards.

The oven manufacturer is the same manufacturer that produced the existing ovens at the facility and is familiar with the specific process requirements at the facility. The manufacturer has guaranteed a NO_X emission rate of less than 80 ppm NO_X at 3% oxygen. Given that the maximum heat input rates of these units are all at or below 4 MMBtu/hr, the cost of employing add-on controls to further reduce emissions is unlikely to be cost-effective. Crown proposes that the manufacturer guarantee, proper operation, and use of low sulfur fuel is BACT for NO_X, CO, and SO_2.

5.1.5 Solvent Cleaning

IPA is used for wash-up of the printing heads on the decorator and contributes to the VOC and TAP emissions from the process.

5.1.5.1 Selection of BACT for VOC and TAPs

In 2016, ORCAA added requirements associated with solvent cleaning, previously classified as an insignificant emission source, to the AOP. In accordance with those requirements, Crown proposes that BACT and t-BACT for the control of VOCs and TAPs, respectively is to store solvents and solvent-containing materials in covered containers and cleaning up spills to minimize emissions.

Table 5-1: RBLC Search Results Metal Can Production

Facility	Permit Number	Date	Facility Description	Process Name	Throughput	Unit	Pollutant	Control Method Description	Limit	Unit	Notes
METAL CONTAINER CORPORATION	0310097-010-AC	11/10/2015	Aluminum Bottle Coating Line No. 6 is a 16-ounce aluminum bottle coating line rated at 2,250 bottles per minute. The production line has three cuppers, fifteen body makers, two wet can elevators, two washers, three basecoaters, three printer/decorators, eight inside spray machines, fifteen neckers, and three rinsers.	Aluminum bottle coating line	2250	Bottles per minute	VOC	VOC capture system with regenerative thermal oxidizer	0.11	KG VOC PER L SOLIDS	BACT-PSD
METAL CONTAINER CORP.	3-3348-00084/00131	10/24/2016	The facility manufactures two-piece aluminum beverage cans. The emissions are from the cutting and forming of the can bodies and the coating and decorating operations. Primary emissions associated with facility operations are Volatile Organic Compounds (VOCs), Hazardous Air Pollutants (HAPs), Carbon Monoxide (CO) and Oxides of Nitrogen (NOx). The NOx and CO emissions are from the thermal oxidizer and heating sources. The thermal oxidizer functions as a control of VOCs and HAPs generated as result of aluminum can coating and decorating operations. The Backend Operations (Emission Unit U-2000) includes the coating and decorating of the formed can bodies. Emissions from the curing ovens are VOC's, and HAP's which are routed and controlled by the natural gas fired thermal oxidizer.	Big can operations			VOC	Thermal oxidizer Maximum VOC content of over-varnish, basecoat, and interior body coating limited to California South Coast District requirements.			LAER
				Line 1, 2, and 3 operations			VOC	Thermal oxidizer Maximum VOC content of over-varnish, basecoat, and interior body coating limited to California South Coast District requirements.			LAER

Facility	Permit Number	Date	Facility Description	Process Name	Throughput	Unit	Pollutant	Control Method Description	Limit	Unit	Notes
BALL METAL BEVERAGE CONTAINER CORP	N130 AND 3290	4/20/2011	Aluminum beverage cans	Can Manufacturing Line 3			VOC	Comply with NSPS WW and 30 TAC Chapter 115 Section 115.421(a)(7) compliant coatings. Thermal Oxidation with 98% destruction (80% capture). Limit VOC content by weight for inks and cleaning solvents to 20% and 50% respectively. Oxidizer may be bypassed for 240 hours per 12 month rolling period for maintenance.	41.8	T/YR	LAER
BALL METAL BEVERAGE CONTAINER CORP.	146824 AND N130M1	1/31/2020	Authorize the construction of the facility's fourth can manufacturing line. authorize the construction of the facility's fourth can manufacturing line. authorize the construction of the facility's fourth can manufacturing line.	Metal Can Painting/Surface Coating	1440	MM Can/YR	VOC	Use of high transfer efficiency application equipment (airless spray nozzles), use of 30 TAC § 105.453 compliant coatings, good housekeeping practices, vented to an RTO with a minimum control efficiency of 98%.			LAER
				Metal Can Roll Application Coating	1440	MM CAN/YR	VOC	Coatings are roll applied			LAER
				Control: Regenerative Thermal Oxidizer	18430	SCF/H	VOC	Use of good combustion practices and pipeline quality natural gas as supplemental fuel			LAER

6. AIR QUALITY IMPACT ANALYSIS

6.1 Dispersion Modeling Methodology

A new or modified source must demonstrate that proposed emission rate increases will comply with Washington's TAP regulations. These demonstrations are typically accomplished using air quality dispersion modeling to predict ambient concentrations. This section discusses the methodology and results of the air quality dispersion modeling developed to predict pollutant concentrations. Electronic copies of the modeling input and output files are provided in an electronic file archive.

6.2 Model Selection

Ramboll reviewed regulatory modeling techniques to select an appropriate air quality model to simulate dispersion of air pollutants emitted by the Project for a near-field air quality impact analysis. The selection of regulatory modeling tools is influenced by situations where exhaust plumes have the potential to interact with onsite structures (i.e., "building downwash") or impact complex terrain. The main building on-site has the potential to interact with exhaust plumes from the Project were identified, and the modeling domain includes intermediate and/or complex terrain. As a result, the dispersion model selected for the analysis will be required to consider both complex terrain and building downwash effects to allow for the possibility of emissions from stacks shorter than dictated by Good Engineering Practice (GEP).

In this situation, EPA's "Guideline of Air Quality Models" in 40 CFR 51 Appendix W ("the Guideline") recommends the use of AERMOD. AERMOD was specifically designed to estimate impacts of air pollutants in areas containing both simple and complex terrain. AERMOD also includes the PRIME downwash algorithms to estimate effects of surrounding buildings on the dispersion of plumes. Ramboll used the latest version of AERMOD (Version 19191) for the dispersion modeling analysis.

6.3 Modeling Procedures

Ramboll applied AERMOD using the regulatory default options discussed below.

6.3.1 Averaging Periods

Predicted short-term (1-hour and 24-hour average) IPA, EGBE, and H_2SO_4 concentrations attributable to the Project were calculated using AERMOD for comparison to the applicable ASILs established for those TAPs in WAC 173-460-150.

6.3.2 Elevation Data and Receptor Network

Terrain elevations for preliminary receptor locations and emission units were prepared using 1/3rd and 1 arc-second National Elevation Dataset (NED) data developed by the United States Geological Survey (USGS), and available on the internet from the USGS National Map Viewer.[4] These data have a horizontal spatial resolution of approximately 10 and 30 meters (m), or 33 and 99 feet (ft), respectively. Terrain heights surrounding the facility indicate that some of the receptors used in the simulations were located in intermediate or complex terrain (i.e., above stack or plume height). The 20-kilometer (km) square simulation domain that was used to assess near field impacts is shown in Figure 4.

[4] http://viewer.nationalmap.gov/viewer/

For the modeling analysis, 4 nested receptor grids were used, with the grid closest to the facility having the closest spacing, 25-m, the next closest with 50-m spacing, then a 200-m grid, and, finally, an outer grid with receptors every 500-m. The ambient air boundary was defined as the facility property line and receptors spaced at 10-m (30.5-ft) intervals were placed along the boundary. The general location of the modeling domain and receptor locations are shown in Figure 4.

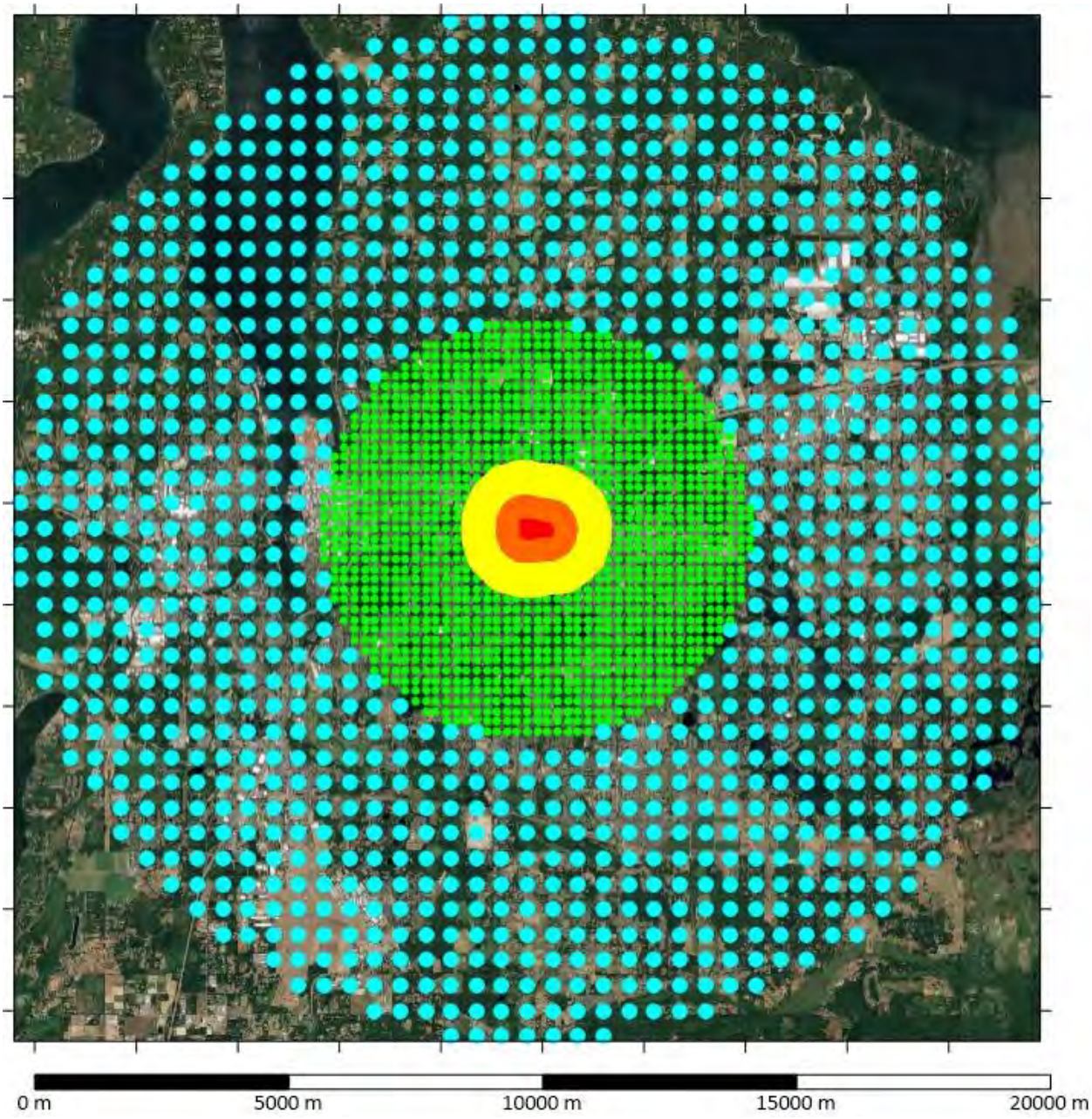

Figure 4: Receptor Locations

6.3.3 Meteorological Data

Ramboll developed a representative meteorological data set using a combination of surface data from the National Weather Service (NWS) observations at Olympia Regional Airport (KOLM) and NWS upper air data from Quillayute, Washington, (KUIL). Missing data were treated according to EPA guidance.

According to the Guideline, five years of representative meteorological data are considered adequate for dispersion modeling applications. Hourly and 1-minute average wind speed and wind direction data from January 2014 through December 2018 were obtained from the NWS. A wind rose describing the wind speed and wind direction data recorded at the KOLM meteorological monitoring station over the entire 5-year dataset is shown in Figure 5. Twice-daily sounding data recorded by the Quillayute upper air station were obtained for the same period.

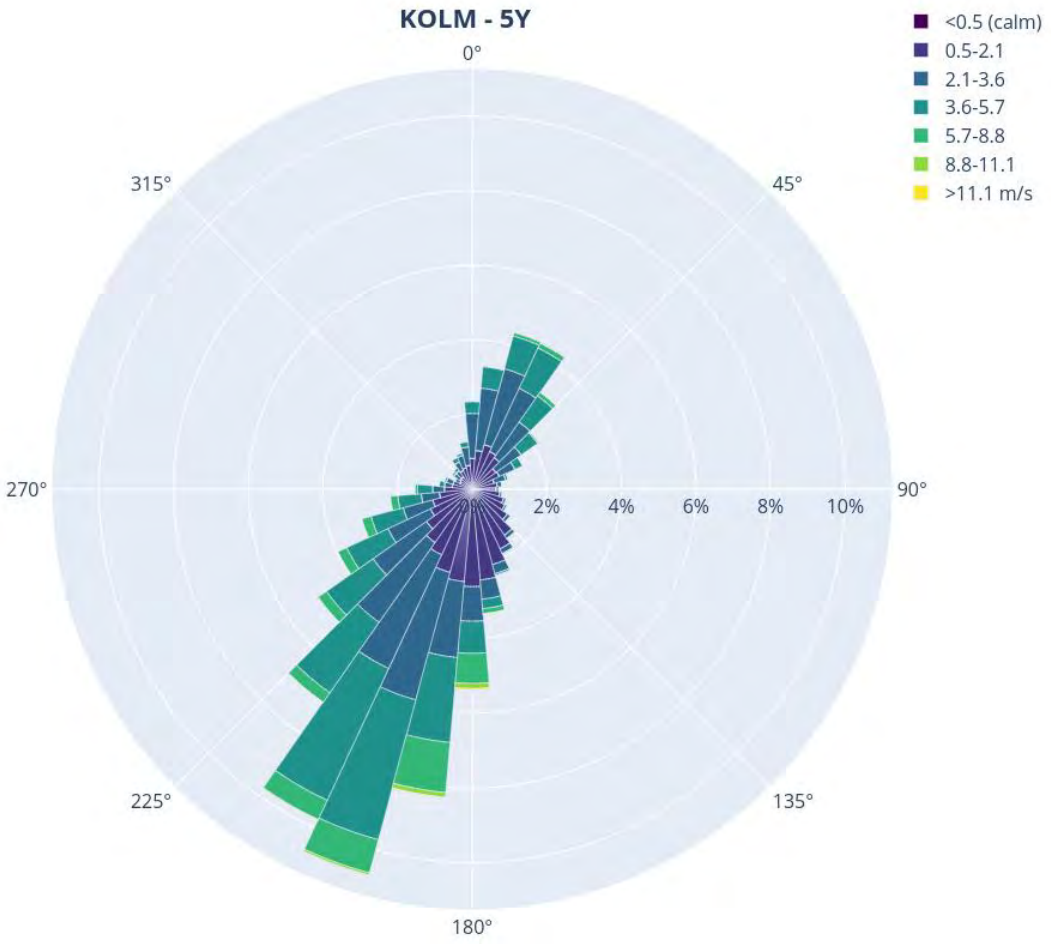

Figure 5: KOLM Windrose

Additional meteorological variables and geophysical parameters are required for use in the AERMOD dispersion modeling analysis to estimate the surface energy fluxes and construct boundary layer profiles. Surface characteristics including albedo, Bowen ratio, and surface roughness length were determined for the area surrounding the KOLM meteorological station using the AERMET surface

characteristic preprocessor, AERSURFACE (Version 13016), and the USGS 1992 National Land Cover (NLCD92) land use data set. The NLCD92 data set used in the analysis has a 30-m mesh size and 21 land use categories. Seasonal surface parameters were determined using AERSURFACE according to the EPA's guidance.

Seasonal albedo and Bowen ratio values were based on averaging over a 10-km by 10-km region centered on the KOLM meteorological station. An unweighted arithmetic average was used for calculating seasonal albedo; and an unweighted geometric average was used for calculating seasonal Bowen ratio. Seasonal surface roughness values were calculated for twelve 30-degree sectors within 1 km of the KOLM meteorological station. An inverse-distance weighted geometric average was used to calculate seasonal surface roughness length values for each of the 12 sectors.

The AERSURFACE input file requires the user to provide additional location and climatological information regarding the primary meteorological site (KOLM). The following information was used to process seasonal surface parameters for the meteorological station:

- The site is located at an airport.
- The site is not located in an arid region.
- The surface moisture conditions at the site are average.

The EPA meteorological program AERMET (Version 19191) was used to combine the KOLM meteorological station surface meteorological observations with twice-daily upper air soundings from Quillayute, and to derive the necessary meteorological variables and profiles for AERMOD. The meteorological data was processed using the ADJ_U* method. A March 8, 2013 EPA memorandum regarding the use of ASOS metrological data in AERMOD dispersion modeling recommends using the AERMINUTE program to resolve calm and variable wind conditions in the standard ASOS data. One-minute wind speed and wind direction data from KOLM were used to resolve calm and variable wind conditions using the current version of AERMINUTE (Version 15272) pre-processor, which will accept five-minute data when one-minute data is not available. The adjusted U-star (ADJ U*) option was used to adjust the u-star value for low wind speeds.

6.3.4 Emission Unit Release Parameters

Figure 6 shows the location of the Line 3 stacks associated with IPA, EGBE, and H_2SO_4 emissions (roof vent near Line 3 decorators; Line 3 bypass stacks for Pin Ovens, LSMs, and IBOs; and Line 3 can washer vent), the on-site building (with planned expansion), and the facility property boundary. Table 6-1 summarizes the parameters used to represent the equipment in the modeling.

Table 6-1: Stack Release Parameters

Stack ID	Emission Unit	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Diameter (m)
WSH361	Line 3 Can Wash Vent	18.9	319	12.4	0.46
RVENT1	Rooftop Vent (fugitives from Line 3 Decorators)	11.0	293	1.8	0.91
PO311	Line 3 Pin Oven 1 Bypass	13.7	448	18.8	0.40

Stack ID	Emission Unit	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Diameter (m)
PO312	Line 3 Pin Oven 2 Bypass	13.7	448	18.8	0.40
LSM331	Line 3 LSM Bypass	13.7	293	19.3	0.50
LSM332	Line 3 LSM Bypass	13.7	293	19.3	0.40
IBO321	Line 3 IBO – Zone 1 Bypass	13.7	383	20.0	0.30
IBO322	Line 3 IBO – Zones 2 & 3 Bypass	13.7	453	17.8	0.45

In addition to the release parameters in Table 6-1, building dimensions and facility configuration information were provided to AERMOD to assess potential downwash effects. Wind-direction-specific building profiles were prepared for the modeling using the EPA's Building Profile Input Program for the PRIME algorithm (BPIP PRIME). The facility layout and building elevations provided by Crown were used to prepare data for BPIP PRIME, which provides the necessary input data for AERMOD. The facility layout is shown in Figure 6. Building heights are provided in Table 6-2.

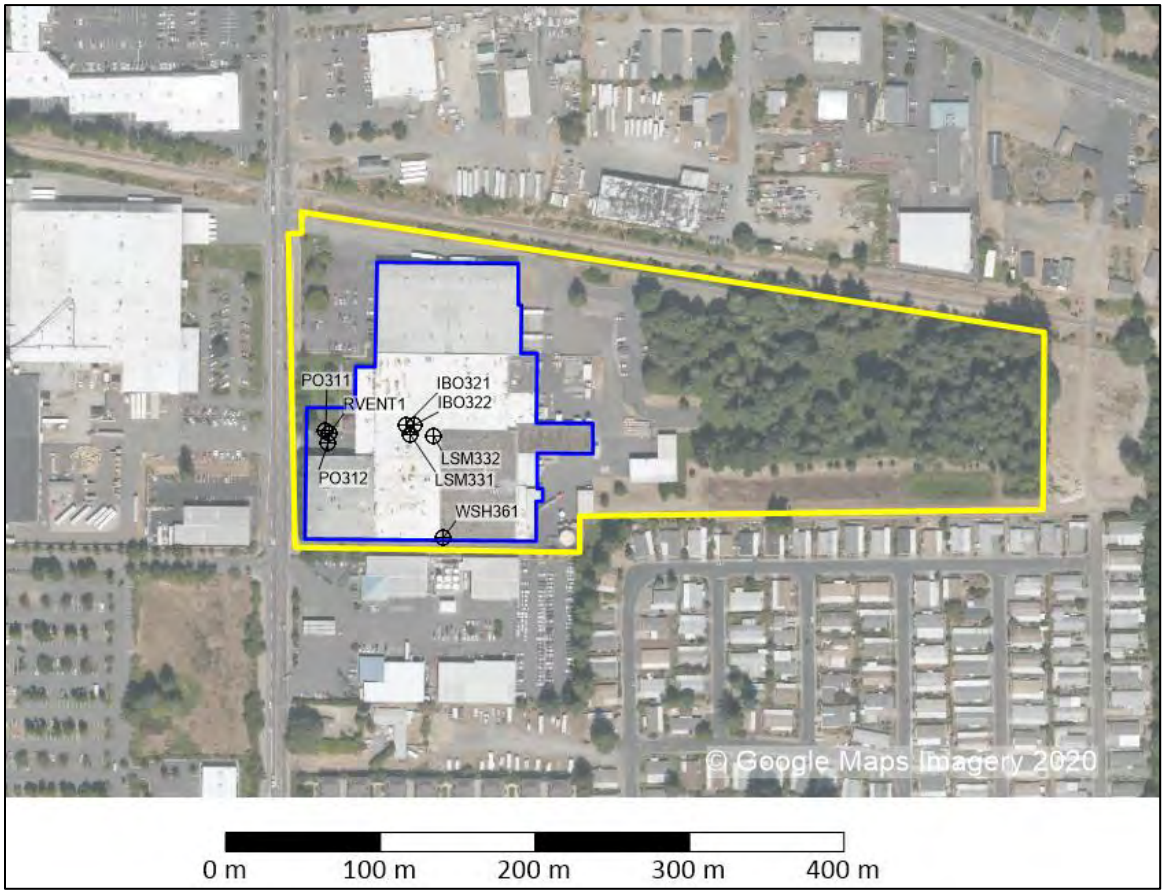

Figure 6: Site Layout with Modeled Stack Locations

Table 6-2: Building Information

Building Name	Building Height (m)
Main Building	10.7

Based on the site layout shown and the structure heights, it was assumed that emissions from the release stacks are potentially subject to downwash effects from nearby structures, and the necessary information provided by BPIP PRIME was included in the simulations to reflect these effects.

6.4 TAP Emissions

Section 3 of this application summarizes TAP emission increases attributable to the Project. IPA emissions from Line 3 decorator cleanup are above the applicable SQER, EGBE emissions from the proposed RTO bypass scenario are above the applicable SQER, and H_2SO_4 emissions from Line 3 can washing are above the applicable SQER. Table 6-3 summarizes the IPA, EGBE, and H_2SO_4 emissions for each stack release. TAP emissions were modeled using AERMOD, and maximum model-predicted concentrations were compared to the applicable ASILs.

Table 6-3: TAP Emission Rates for AERMOD

Stack ID	Modeled Emission Rate (g/s)		
	IPA [1]	EGBE [2]	H_2SO_4
RVENT1	0.923045	0.03142	--
PO311	--	0.04713	--
PO312	--	0.04713	--
LSM331	--	0.02098	--
LSM332	--	0.03278	--
IBO321	--	0.05377	--
IBO322	--	0.10753	--
WSH361	--	--	0.00590

Notes:

1 Fugitive IPA emissions from Line 3 decorator cleanup activities are assumed to exhaust the building through the rooftop vent located near the decorators.

2 EGBE emissions based on 24-hour emission increase from RTO Bypass Scenario (See Table 3-7 of this application). Emission increase from the vanrish (132.8 lb/24-hours) was split with process fugitives through the rooftop vent and collected process gas through the two pin ovens bypass vents; and emission increase from inside spray (331.4 lb/24-hours) was split between two LSM bypass vents and two IBO bypass vents.

6.5 Summary of Modeling Results

The results of the modeling simulations for Line 3 can washing and the RTO Bypass scenario are summarized and compared with the appropriate ASILs in Table 6-4. The modeled-predicted IPA, EGBE, and H_2SO_4 concentrations are less than the applicable ASILs.

Table 6-4: Model-Predicted TAP Concentrations

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)	ASIL [1] ($\mu g/m^3$)	Over ASIL?
IPA	1-Hour	2,256	3,200	No
EGBE	24-Hour	58	82	No
H_2SO_4	24-Hour	0.958	1.0	No

[1] TAP-specific acceptable source impact levels (ASILs) from WAC 173-460-150.

APPENDIX A
ORCAA FORMS

OLYMPIC REGION CLEAN AIR AGENCY

2940 Limited Lane NW - Olympia, Washington 98502 - 360-539-7610 – Fax 360-491-6308

FORM 1- NOTICE OF CONSTRUCTION

TO CONSTRUCT - INSTALL - ESTABLISH OR MODIFY AN AIR CONTAMINANT SOURCE

Form 1 Instructions:

1. Please complete all the fields below. **This NOC application is considered incomplete until signed.**
2. If the application contains any confidential business information, please complete a Request of Confidentiality of Records (www.orcaa.org/forms).
3. Duty to Correction Application: An applicant has the duty to supplement or correct an application. Any applicant who fails to submit any relevant facts or who has submitted incorrect information in a permit application must, upon becoming aware of such failure or incorrect submittal, promptly submit supplementary factors or corrected information.

Business Name:
Crown Cork & Seal Company, Inc.

Mailing Address:
1202 Fones Road, Olympia, WA 98501

Physical Address of Project or New Source:
1202 Fones Road, Olympia, WA 98501

Billing Address:
770 Township Line Road, Yardley, PA 19067

For ORCAA use only

File No:
County No:
Source No:
Application No:
Date Received:

Project or Equipment to be installed/established:

The proposed project seeks authorization for the construction of a third beverage can manufactu

Anticipated startup date: ___ / ___ / ____ Is facility currently registered with ORCAA? Yes ☑ No ☐

This project must meet the requirements of the State Environmental Policy Act (SEPA) before ORCAA can issue final approval. Indicate the SEPA compliance option:

☐ SEPA was satisfied by _____ (government agency) on ___/___/___ (date) - Include a copy of the SEPA determination

☑ SEPA threshold determination by City of Olympia (government agency) is pending - Include a copy of the environmental checklist

☐ ORCAA is the only government agency requiring a permit - Include ORCAA Environmental Checklist

☐ This project is exempt from SEPA per _____ (WAC citation).

Name of Owner of Business:
Crown Cork & Seal Company, Inc.

Title: Corporation

Email: mantry@crowncork.com Phone: 215-698-5308

Authorized Representative for Application (if different than owner):
Mike Antry

Title: Vice President - EHS

Email: mantry@crowncork.com Phone: 215-698-5308

I hereby certify that the information contained in this application is, to the best of my knowledge, complete and correct.

Signature of Owner or Authorized Representative: (sign in Blue Ink)

Michael A Antry **Date:** 7/31/20

IMPORTANT: Do not send via email or other electronic means. ORCAA must receive Original, hardcopy, signed application and payment prior to processing application.

Agency Use Only

OLYMPIC REGION CLEAN AIR AGENCY

2940 Limited Lane NW - Olympia, Washington 98502 - 360-539-7610 – Fax 360-491-6308

FORM 1D- Contact Information

Business Name	**FOR ORCAA USE**
Crown Cork & Seal Company, Inc.	**FILE #**
Physical Site Address (Street address, city, state, zip)	**CTY #**
	SRC #
1202 Fones Road, Olympia, WA 98501	**Date Received**
Previous Business Name (if applicable)	

Contact Information

Inspection Contact	
Name	Title
Phone	Email
Billing Contact	
Name Mike Antry	Title Vice President - EHS
Phone 215-698-5308	Email mantry@crowncork.com
Emission Inventory Contact	
Name Mike Antry	Title Vice President - EHS
Phone 215-698-5308	Email mantry@crowncork.com
Complaint Contact	
Name	Title
Phone	Email
Permit Contact	
Name Mike Antry	Title Vice President - EHS
Phone 215-698-5308	Email mantry@crowncork.com

The **inspection contact** is the on-site person responsible for the everyday operation of the site and is available for inspections.
The **billing contact** is the person invoices are sent.
The **emission inventory contact** is the person requests for emissions information and material use information are sent.
The **complaint contact** is the person who receives and responds to complaints received on-site and who is contacted regarding complaints ORCAA receives.
The **permit contact** is the person responsible for filling out permit applications and receiving approval from ORCAA.

OLYMPIC REGION CLEAN AIR AGENCY

2940 Limited Lane NW - Olympia, Washington 98502
Telephone: (360)-539-7610 – Fax: (360)-491-6308
www.orcaa.org

FORM 8

Fill out all the applicable equipment information requested below and submit the appropriate fees.

SPRAY COATING (Autobody)
SURFACE COATING (Aviation, Wood, Boat, Other)

Shop Information

Business Name: Crown Cork & Seal Company, Inc.	**Contact Person:** Mike Antry
	Phone Number: 215-698-5308
	Email: mantry@crowncork.com
Operating Schedule: 24 hrs/day, 7 days/wk, 52 wks/yr	**Indicate days when operating:** ■ M ■ T ■ W ■ Thu ■ F ■ Sat ■ Sun

Process Information

Flow:	☐ Cross front flow ☐ Cross reverse flow	☐ Full downdraft ☐ Semi-downdraft	☐ Side downdraft ☐ Updraft	☐ Combination ■ Other (explain in attachment)
Exhaust:	☐ Side Wall	☐ Pit/Trench Design	☐ Ceiling	☐ Rear Wall ☐ Front/Doors
Intake Type:	☐ Natural	☐ Forced (air make-up unit)		
Enclosure Type:	☐ Fully enclosed ☐ Closed top open front (CTOF)	☐ Compact/modular ☐ Curtain/tent/drape ☐ Tunnel	☐ Open table/bench ■ Other (explain in attachment)	
Width (feet):		**Length (feet):**		**Height (feet):**
Manufacturer:	Line 3 decorating and coating line: 2 Rutherford decorators, 9 CMB lacquer spray machines			
Model Number:				
Serial Number:				
Pressure Gauge:	☐ Yes ☐ No	**Filter Plenum:**	☐ Yes ☐ No	
Intended Applicator Usage (see next section):	■ Applicator #1 ■ Applicator #2	☐ Applicator #3 ☐ Applicator #4	☐ Applicator #5	
Air Pollution Control Methods:	☐ Water Wash ☐ Scrubber ■ Oxidizer (Form 35)	■ Low VOC coatings ☐ Cyclone (Form 13) ■ Baghouse (Form 12)	☐ Cartridge unit (Form 12) ☐ Enclosed spray gun cleaner	
Heater/Curing Information (if applicable)				
Heater Placement:	☐ Part of spray booth unit	■ Separate curing enclosure (Form 11)		
Curing/Heating Type :	■ Hot air dryer ☐ Ultraviolet	☐ Infrared dryer ☐ Boiler	☐ Other (explain in attachment)	
Fuel/Heat Type :	■ Natural gas ☐ Propane (LP) Gas	☐ Electric ☐ Diesel	☐ Other (explain in attachment)	
Maximum Heating Rate (MMBtu/hr):	associated curing oven < 5 MMBtu/hr			
Maximum Air Flow Rate (acfm):	Line 3 totals: Curing Oven exhausts - 19,500 acfm, Overspray filter exhaust - 5,000 acfm			

RETURN TO ORCAA

Coating Operation Information

Type:	■ Existing Stationary Source ☐ Temporary Source ☐ New Stationary Source
NAICS Code(s):	332431

Coating Equipment Information

	Applicator #1	Applicator #2	Applicator #3	Applicator #4	Applicator #5
Coating Type:**	■ Brush/Roller ☐ Web ☐ Wet spray ☐ Deposition ☐ Powder ☐ Plating	☐ Brush/Roller ☐ Web ■ Wet spray ☐ Deposition ☐ Powder ☐ Plating	☐ Brush/Roller ☐ Web ☐ Wet spray ☐ Deposition ☐ Powder ☐ Plating	☐ Brush/Roller ☐ Web ☐ Wet spray ☐ Deposition ☐ Powder ☐ Plating	☐ Brush/Roller ☐ Web ☐ Wet spray ☐ Deposition ☐ Powder ☐ Plating
Manufacturer:	Rutherford	CMB			
Model:	Decorators	LSM			
Quantity:	2	9			
Technology Type:	☐ HVLP ☐ Electrostatic ☐ Air-assisted airless ☐ Airless ☐ Air spray ■ Rotary cup ☐ Airbrush ☐ Other (explain in attachment)	■ HVLP ☐ Electrostatic ☐ Air-assisted airless ☐ Airless ☐ Air spray ☐ Rotary cup ☐ Airbrush ☐ Other (explain in attachment)	☐ HVLP ☐ Electrostatic ☐ Air-assisted airless ☐ Airless ☐ Air spray ☐ Rotary cup ☐ Airbrush ☐ Other (explain in attachment)	☐ HVLP ☐ Electrostatic ☐ Air-assisted airless ☐ Airless ☐ Air spray ☐ Rotary cup ☐ Airbrush ☐ Other (explain in attachment)	☐ HVLP ☐ Electrostatic ☐ Air-assisted airless ☐ Airless ☐ Air spray ☐ Rotary cup ☐ Airbrush ☐ Other (explain in attachment)
Automation/ Control:	☐ Manual ■ Automatic	☐ Manual ■ Automatic	☐ Manual ☐ Automatic	☐ Manual ☐ Automatic	☐ Manual ☐ Automatic
Air Supply Pressure (psi):					
Fluid Output Pressure (psi):					
Mounting:	☐ Handheld Gun ■ Machine/ Reciprocator	☐ Handheld Gun ■ Machine/ Reciprocator	☐ Handheld Gun ☐ Machine/ Reciprocator	☐ Handheld Gun ☐ Machine/ Reciprocator	☐ Handheld Gun ☐ Machine/ Reciprocator

**Only provide further information for applicators that are <u>not</u> roller/brush

Dry Filter Information

	Pre-Filter	Exhaust Filter
Manufacturer:		TBD
Model:		TBD
Media Type:		LSM filters
Overall Arrest Efficiency (%):		99.9%
Filtered Area (squared feet):		N/A

Heavy Metal Information

Application of coatings containing compounds of chromium (Cr), lead (Pb), manganese (Mn), nickel (Ni), or cadmium (Cd):	☐Yes** ☒No

**Please provide SDS/ MSDS information and estimated annual usage for each product

Other Process Information

Abrasive Blasting:	☐Yes (Form 17) ☒No
Welding:	☐Yes (Form 19) ☒No
Metal Cutting:	☐Yes (Form 31) ☒No
Fluidized Bed Coating:	☐Yes ☒No

Cleaning/Etching/Degreasing Information

Methylene Chloride Stripping:	☐Yes** ☒No
Phosphate or Chromate Conversion Coating:	☐Yes** ☒No
Chemical/Acid Rinsing or Bathing:	☒Yes** ☐No

**Please provide SDS/ MSDS information and estimated annual usage for each product

Exhaust/Stack/Building Information

Motor Power (hp):	See RTO form	
Exhaust Air Flow Rate at 0.65" w.g. (acfm):		
Fan Diameter (feet):		
Stack Type:	☐Vertical (Ceiling Outlet)	☐Horizontal (Wall Outlet)
Stack Height (feet from ground):		
Stack Inside Diameter (inches):		
Stack weatherproof damper or exhaust apparatus:	☐None ☐Hexagonal ☐Stack within stack	☐Butterfly ☐Inverted cone ☐Other (explain in attachment)
Bldg. Peak Height (feet):		
Bldg. Width (feet):		
Bldg. Length (feet)		

Air Quality Modeling Site Information

See Chapter 6 of the NOC application

Distance from the centroid of the stack to the shop's property line (feet):	
Distance from the centroid of the stack to the nearest point on the property line of a permanent residence (feet):	

Filing Fee:

See https://www.orcaa.org/services/fee-schedules/ for an up-to-date list of fees

Material Usage Information

Provide the following information and attach copies of Material Safety Data Sheets (MSDS) used in all coating operations, including but not limited to pre-treatment wash, chemical strippers, paint, primer, topcoat, clearcoat, gelcoat, lacquer, stain, catalyst, activator, hardener, resin, filler, sealer, adhesive, solvent and thinner/reducer and any other materials used which contain volatile organic compounds (VOC). Use additional pages if necessary. For similar materials such as multiple color variations of a stain or paint, enter as single item with a usage rate representing the total gallons of all variations used, and provide the MSDS for the constituent which is most used.

NAME OF MATERIAL (as on SDS/ MSDS):	ESTIMATED ANNUAL USAGE (in gallons):	**Applicator #** (as defined in the "Coating Equipment Information" section):
See Appendix D		

OLYMPIC REGION CLEAN AIR AGENCY

2940 Limited Lane NW - Olympia, Washington 98502 - 360-539-7610 – Fax 360-491-6308

FORM 35
Oxidizer

General Information

Facility Name: Crown Cork & Seal Company, Inc.	Contact Person: Mike Antry Phone Number: (215) 698-5308 Email: mantry@crowncork.com
Facility Operating Schedule: 24 hrs/day, 7 days/wk, 52 wks/yr Circle days when operating: M T W Th F Sat Sun	Oxidizer Operating Schedule: 24 hrs/day, 7 days/wk, 52 wks/yr Circle days when operating: M T W Th F Sat Sun

X new unit installation ____ modification	Manufacturer: TBD	Model & Serial #s: TBD

Technical Specifications (attach additional pages if needed)

Oxidizer Type:	Air Flow:	Burner:
____ catalytic oxidizer X regenerative thermal oxidizer ____ recuperative thermal oxidizer ____ thermal (direct fired) oxidizer	blower acfm 70,900 @ 250oF blower hp _____ combustion retention time (sec.) > 0.5 sec pressure drop (in. H_2O) ~ 9 – total system	type of fuel natural gas maximum fuel usage ~11.2 mmBTU/hr(TBD) _____ gas inlet temperature (°F) 250 set point temperature (°F) 1,500

For catalytic oxidizers:

1. What is the catalyst material?
2. What is the expected catalyst lifetime?
3. Describe the catalyst cleaning and replacement procedures and frequency.

For regenerative thermal oxidizers:

1. What is the media type? Multi-layer ceramic media (MLM-200) with layer of low-pressure ceramic saddles
2. How many chambers are there and what are the chamber dimensions? 3 chambers (absorb, desorb, purge)

For recuperative thermal oxidizers:

1. Describe the type of heat exchanger?
2. What are the dimensions of the combustion chamber?

For direct fired thermal oxidizers:

1. What are the dimensions of the combustion chamber?

Describe monitoring of oxidizer, including temperature, airflow, fuel consumption, and pressure drop. Include a description of the data analyzer and how records will be kept: RTO combustion chamber temperature monitored with thermocouples with data recorded on strip charts and data historian; pressure drop sensed across heat exchange media (Magnehelic gauges) as indicator of flow through system.

Emissions

VOC control efficiency (%) > 98%	Maximum NOx emissions (ppm or lbs/hr) 2.3
Maximum VOC emissions (ppm or lbs/hr) 2.0	Maximum CO emissions (ppm or lbs/hr) 2.0

Exhaust Parameters

Stack height (feet) 60	Exhaust airflow (scfm) 55,000
Stack internal diameter (feet) 6	Exhaust temperature (°F) 350

Other Information

The following information is needed to complete the application:

1. Brochure or technical fact sheet from manufacturer or consultant.
2. Scaled technical drawings of the oxidizer, including location of thermocouple and other monitoring equipment.
3. Plan of facility showing locations of oxidizer, stack, and nearby buildings (including maximum heights).
4. Describe any concentrators or particulate control devices associated with the oxidizer.

APPENDIX B
DETAILED EMISSION CALCULATIONS

Crown Cork & Seal Company, Inc.
Olympia, WA

Facility-Wide Emissions Summary - Maximum Rates

Criteria Pollutants

Pollutant	Line 3 Normal		Line 3 Normal Fugitive		Line 3 RTO Bypass		Project Combustion		Total Project	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
NO_X	--	--	--	--	--	--	2.29	10.04	2.3	10.0
CO	--	--	--	--	--	--	2.02	8.83	2.0	8.8
PM	0.037	0.14	0.02	0.07	0.04	0.006	0.23	1.00	0.3	1.2
PM10	0.037	0.14	0.02	0.07	0.04	0.006	0.23	1.00	0.3	1.2
PM2.5	0.037	0.14	0.02	0.07	0.04	0.006	0.23	1.00	0.3	1.2
VOC	0.87	3.37	22.8	87.7	44.43	4.0	0.16	0.72	68.2	95.8
Sulfuric Acid Mist	0.05	0.18	--	--	--	--	--	--	0.05	0.2

Toxic Air Pollutants (Maximum Emission Increase from Project) - Normal Operation

Pollutant	Avg. Period	Line 3	Lines 1-2	Total	SQER	Model (Y/N)?
Hydrofluoric Acid	24-hr	0.38	0	0.38	1.00	N
Sulfuric Acid	24-hr	1.12	0	1.12	0.07	Y
EGBE	24-hr	184	-586.9	-402.4	6.10	N
IPA	1-hr	7.3	0	7.3	5.90	Y
PGME	24-hr	0.0	-12.6	-12.6	520.00	N
Formaldehyde	year	339.1	-14916.2	-14577.1	27.00	N

Toxic Air Pollutants (Maximum Emission Increase from Project) - RTO Bypass Operation

Pollutant	Avg. Period	Line 3	Lines 1-2	Total	SQER	Model (Y/N)?
Hydrofluoric Acid	24-hr	0.38	-0.2	0.14	1.00	N
Sulfuric Acid	24-hr	1.12	-0.7	0.41	0.07	Y
EGBE	24-hr	464.1	-399.2	64.9	6.10	Y
IPA	1-hr	7.3	-4.9	2.4	5.90	N
PGME	24-hr	0.0	-8.5	-8.5	520.00	N
Formaldehyde	year	586.7	-14916.2	-14330	27.00	N

Crown Cork & Seal Company, Inc.
Olympia, WA

Facility-Wide Emissions Summary - Maximum Rates

Hazardous Air Pollutants

Pollutant	Line 3		Project Combustion		Total Project	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EGHE	1.0	1.6	--	--	1.0	1.6
Formaldehyde[3]	1.4	0.3	1.4E-03	6.3E-03	1.4	0.3
Sulfuric Acid Mist	0.05	0.18	--	--	4.7E-02	1.8E-01
Arsenic	--	--	3.8E-06	1.7E-05	3.8E-06	1.7E-05
Benzene	--	--	4.0E-05	1.8E-04	4.0E-05	1.8E-04
Beryllium	--	--	2.3E-07	1.0E-06	2.3E-07	1.0E-06
Cadmium	--	--	2.1E-05	9.2E-05	2.1E-05	9.2E-05
Chromium	--	--	2.7E-05	1.2E-04	2.7E-05	1.2E-04
Cobalt	--	--	1.6E-06	7.0E-06	1.6E-06	7.0E-06
Dichlorobenzene	--	--	2.3E-05	1.0E-04	2.3E-05	1.0E-04
Hexane	--	--	3.4E-02	1.5E-01	3.4E-02	1.5E-01
Lead	--	--	9.5E-06	4.2E-05	9.5E-06	4.2E-05
Manganese	--	--	7.2E-06	3.2E-05	7.2E-06	3.2E-05
Mercury	--	--	5.0E-06	2.2E-05	5.0E-06	2.2E-05
Naphthalene	--	--	1.2E-05	5.1E-05	1.2E-05	5.1E-05
Nickel	--	--	4.0E-05	1.8E-04	4.0E-05	1.8E-04
Selenium	--	--	4.6E-07	2.0E-06	4.6E-07	2.0E-06
Toluene	--	--	6.5E-05	2.8E-04	6.5E-05	2.8E-04
Acenaphthene	--	--	3.4E-08	1.5E-07	3.4E-08	1.5E-07
Acenaphthylene	--	--	3.4E-08	1.5E-07	3.4E-08	1.5E-07
Anthracene	--	--	4.6E-08	2.0E-07	4.6E-08	2.0E-07
Benz(a)anthracene	--	--	3.4E-08	1.5E-07	3.4E-08	1.5E-07
Benzo(a)pyrene	--	--	2.3E-08	1.0E-07	2.3E-08	1.0E-07
Benzo(b)fluoranthene	--	--	3.4E-08	1.5E-07	3.4E-08	1.5E-07
Benzo(k)fluoranthene	--	--	3.4E-08	1.5E-07	3.4E-08	1.5E-07
Chrysene	--	--	3.4E-08	1.5E-07	3.4E-08	1.5E-07
Benzo(a,h)anthrance	--	--	2.3E-08	1.0E-07	2.3E-08	1.0E-07
Fluoranthene	--	--	5.7E-08	2.5E-07	5.7E-08	2.5E-07
Fluorene	--	--	5.3E-08	2.3E-07	5.3E-08	2.3E-07
Indeno(1,2,3-cd)pyren	--	--	3.4E-08	1.5E-07	3.4E-08	1.5E-07
2-Methylnaphthalene	--	--	4.6E-07	2.0E-06	4.6E-07	2.0E-06
3-Methylcholanthrene	--	--	3.4E-08	1.5E-07	3.4E-08	1.5E-07
Dimethylbenz[a]anthr	--	--	3.1E-07	1.3E-06	3.1E-07	1.3E-06
Phenanthrene	--	--	3.2E-07	1.4E-06	3.2E-07	1.4E-06
Pyrene	--	--	9.5E-08	4.2E-07	9.5E-08	4.2E-07
TOTAL						**2.3**

Crown Cork & Seal Company, Inc.
Olympia, WA

Line 3 Can Washing
Can Washer Stack

Detail:
Operating Parameters

Normal Production (hrs/yr)	8,560
RTO Bypass (hrs/yr)	200
Line 3 Rated Capacity (cans/min)	3,000
Line 3 Efficiency	90%
Line 3 Normal Production Rate (cans/min)	2,700
Capture Efficiency	100.0%

Pollutant	Emission Factor[1]	Emissions[2]			
	lb/MM can	lb/hr	lb/day	lb/yr	tons/yr
Hydrofluoric Acid	0.089	**0.016**	0.38	126.30	**0.063**
Sulfuric Acid	0.26	**0.047**	1.12	368.97	**0.18**

[1] Emission factors are based on past studies conducted at Crown Cork facilities.

[2] Hourly emissions based on Line 3 rated throughput of 2,800 cpm. Daily emissions based on the maximum hourly rate and continuous operation for 24 hours. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 8,760 hours per year.

RE US ENGINEERS

Crown Cork & Seal Company, Inc.
Olympia, WA

Line 3 Process Line - VOC Emissions, including RTO Bypass Scenario

Detail:

Operating Parameters

Normal Production (hrs/yr)	8,560
RTO Bypass (hrs/yr)	200
Line 3 Rated Capacity - Normal (cans/min)	3,000
Line 3 RTO Bypass Rate (cans/min)	2,000
Line 3 Production Efficiency	90%
Inside Spray Capture Efficiency	75%
Inside Spray Destruction Efficiency	98.0%
Varnish/Ink Capture Efficiency	75%
Varnish/Ink Destruction Efficiency	98.0%
UV Varnish Capture and Control	0%

VOC Emissions

					Normal Operation[3]			RTO Bypass[4]	
Material	**Use**	**Application Rate (gal/1,000 cans)**	**Vol % Solids[1]**	**lb VOC/gal solids[1]**	**Annual Usage (gal/yr)**	**VOC Controlled Emissions (tpy)**	**VOC Fugitive Emissions (tpy)**	**Annual Usage (gal/yr)**	**VOC Emissions (tpy)**
Various	Inside Spray	0.20	18.5%	6.5	277,344	2.50	41.69	4,320	2.60
Various	Varnish	0.070	35.4%	2.9	97,070	0.75	12.46	1,512	0.78
Various	Ink	0.0089	83.9%	1.52	12,332	0.12	1.96	192	0.12
UV Varnish	Rim Coat	0.0019	96.4%	0.010	2,565	--	0.012	40	0.0002
IPA[2]	Cleanup IPA	--	--	6.6	9,630	--	31.58	153	0.50

[1] The solids percentage and VOC content for each material is based on the worst case formulation out of the possible coatings/inks, based on information provided in manufacturer SDSs.

[2] IPA usage is calculated using a 1.125 gallon per hour rate for production of 2,800 cans per hour. IPA usage rate was provided by Crown Cork personnel. Annual usage of IPO does not include the 90% line efficiency factor.

[3] Annual usage of each material during normal operation is based on the Line 3 rated capacity of 3,000 cpm, 90% line efficiency, 8,560 hr/year of normal operation, and the respective application rate. Annual emissions during normal operation assume that 100% of the VOC content will be emitted, and are based on the annual usage, and the respective capture efficiency and destruction efficiencies for each application (Inside spray 75% CE and 98% DRE, Varnish and Ink 75% CE and 98% DRE, and no control for Rim Coat or Cleanup IPA).

[4] Annual usage of each material during RTO bypass is based on the reduced Line 3 capacity of 2,000 cpm, 90% line efficiency, 200 hr/year of RTO bypass operation, and the respective application rate. Annual emissions during normal operation assume that 100% of the VOC content will be emitted, and are based on the annual usage, and no control.

Crown Cork & Seal Company, Inc.
Olympia, WA

Material	Use	Density (lb/gal)	Speciated VOC (% By Weight)[1]								
			n-Butanol	Ethylene Glycol Monobutyl Ether (EGBE)	Dimethyl ethanolamine (DMEA)	n-Amyl Alcohol (n-AmOH)	Isopropyl Alcohol (IPA)	Propylene Glycol Methyl Ether (PGME)	Tricdecyl alcohol (TDA)	Ethylene Glycol Monohexyl Ether (EGHE)	Formaldehyde
		CAS No. :	71-36-3	111-76-2	108-01-0	71-41-0	67-63-0	107-98-2	112-70-9	112-25-4	50-00-0
		TAP?		TAP			TAP	TAP			TAP
		HAP?								HAP	HAP
Various	Inside spray	8.46	5.20%	6.80%	1.10%	3.20%	0.00%	0.00%	0.00%	0.50%	0.00%
Various	Varnish	8.90	2.20%	7.40%	2.70%	0.00%	0.00%	0.00%	0.30%	0.00%	0.01%
Various[2]	Ink	9.78	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IPA	Cleanup	6.56	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%

[1] Material content based on the worst case formulation of the possible coating/ink, based on manufacturer SDSs.

[2] More than 500 types of ink products are used, this calculation uses a reasonable worst-case density (9.78 lb/gal) and VOC content (5%)

Material	Use	Application (gal/hr)	Speciated VOC Emissions (lb/hr)[1]								
			n-Butanol	EGBE	DMEA	n-AmOH	IPA	PGME	TDA	EGHE	Formaldehyde[2]
		CAS No. :	71-36-3	111-76-2	108-01-0	71-41-0	67-63-0	107-98-2	112-70-9	112-25-4	50-00-0
		TAP?		TAP			TAP	TAP			TAP
		HAP?								HAP	HAP
Various	Inside spray	36.0	15.84	20.71	3.35	9.75	0.00	0.00	0.00	1.52	0.00
Various	Varnish	12.6	2.47	8.30	3.03	0.00	0.00	0.00	0.34	0.00	0.01
Various	Ink	1.6	0.00	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
IPA	Cleanup	1.12	0.00	0.00	0.00	0.00	7.33	0.00	0.00	0.00	0.00
Total Uncontrolled Emission Factor			**18.30**	**29.01**	**7.16**	**9.75**	**7.33**	**0.00**	**0.34**	**1.52**	**2.06**
Total Fugitive Emissions			**4.58**	**7.25**	**1.79**	**2.44**	**7.33**	**0.00**	**0.08**	**0.38**	**0.00**
Total Controlled Speciated VOC Emissions			**0.27**	**0.44**	**0.11**	**0.15**	**0.00**	**0.00**	**0.01**	**0.02**	**0.04**

[1] Hourly emissions are based on the Line 3 rated capacity of 2,800 cpm, the material application rate, speciated VOC content, and respective capture efficiency and destruction efficiency for the application.

[2] Resin curing in the oven forms formaldehyde. It is captured 100% in the oven and routed to the RTO. The formation rate is from 2009 stack test at Crown's Olympia Washington plant.

Formaldehyde Emissions[2]	
11.4	lbs formed/MM can
100%	Capture Efficiency
2.05	Uncontrolled Emissions, lb/hr

Speciated VOC Emissions

		Normal Operation[1]			RTO Bypass[2]			Maximum Emissions			
Pollutant	CAS	lb/hr	lb/day	lb/yr	lb/hr	lb/day	lb/yr	lb/hr	lb/day	lb/yr	tpy
n-Butanol	**71-36-3**	4.9	116.4	37369	12.2	292.9	2196.5	12.2	292.9	39566	19.8
EGBE	**111-76-2**	7.7	184.5	59222	19.3	464.1	3481.0	19.3	464.1	62703	31.4
DMEA	**108-01-0**	1.9	45.5	14619	4.8	114.6	859.3	4.8	114.6	15479	7.7
n-AmOH	**71-41-0**	2.6	62.0	19897	6.5	155.9	1169.5	6.5	155.9	21066	10.5
IPA	**67-63-0**	7.3	175.8	62708	4.9	117.2	976.8	7.3	175.8	63685	31.8
PGME	**107-98-2**	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	0.0
TDA	**112-70-9**	0.1	2.1	687	0.2	5.4	40.4	0.2	5.4	727	0.4
EGHE	**112-25-4**	0.4	9.7	3109	1.0	24.4	182.7	1.0	24.4	3292	1.6
Formaldehyde	**50-00-0**	0.04	1.1	339	1.4	33.0	247.6	1.4	33.0	587	0.3

[1] Hourly emissions during normal operation are based on Line 3 rated throughput of 2,800 cpm. Daily emissions based on the maximum hourly rate operated for 24 hours continuously. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 8,560 hours per year.

[2] Hourly emissions during RTO bypass operation are based on the reduce Line 3 throughput of 2,000 cpm. Daily emissions based on the maximum hourly rate operated for 24 hours continuously. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and operation for 200 hours per year.

RE US ENGINEERS

Crown Cork & Seal Company, Inc.
Olympia, WA

Line 3 Process Line - PM Emissions, including RTO Bypass Scenario

Detail:

Operating Parameters

Normal Production (hrs/yr)	8,560
RTO Bypass (hrs/yr)	200
Line 3 Rated Capacity (cans/min)	3,000
Line 3 RTO Bypass Rate (cans/min)	2,000
Line 3 Efficiency	90%

VOC Emissions

Material	Use	Application Rate (gal/1,000 cans)	Vol % Solids	lb VOC/gal solids	Normal Annual Usage (gal/yr)	RTO Bypass Annual Usage (gal/yr)
Various	Inside Spray	0.20	18.5%	6.5	277,344	4,320

Crown Cork & Seal Company, Inc.
Olympia, WA

Overspray (LSM) PM

21.1% solids content by weight
94% material transfer efficiency
95% capture efficiency
90% deposition of PM escaping capture
99.0% removal efficiency of LSM filters
99.0% removal efficiency of LSM filters (RTO Bypass)

PM Emissions	Solids Applied	Solids in Overspray	Overspray to work area	Controlled Emissions[3]	Controlled Emissions	Controlled Emissions	Plant Vent Fugitives[4]	Plant Vent Fugitives	Plant Vent Fugitives	Total PM Emissions
	(lbs/yr)	(lbs/yr)	(lb/yr)	(lbs/hr)	(lbs/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(tpy)
Normal Operation[1]	495,076	29,705	1,485	0.037	282	0.14	0.02	149	0.074	0.22
RTO Bypass[2]	7,711	463	23	0.02	4	0.0022	0.01	2	0.001	0.003

[1] Hourly emissions during normal operation are based on Line 3 rated throughput of 3,000 cpm. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 8,560 hours per year.

[2] Hourly emissions during RTO bypass operation are based on the reduce Line 3 throughput of 2,000 cpm. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 200 hours per year.

[3] Controlled emissions are based on a 94% material transfer efficiency, 95% capture efficiency. During normal operation, the LSM exhaust vents through the LSM fabric filters, then to the RTO for a combined destruction efficiency of 99%. During RTO bypass, the LSM exhaust vents through the LSM fabric filters which have a removal efficiency of 99% and then atmosphere.

4 Uncontrolled emissions that are emitted as fugitives through the plant vents are calculated based on the 94% material transfer efficiency and the 5% of the overspray that is not captured by the PM control system. Uncontrolled emissions are calculated based on 90% of the overspray particulates being deposited in the plant and 10% of the overspray exhausting through plant vents.

Lines 1 & 2 Process Lines - Normal Control Operating Scenario
Crown Cork & Seal Company, Inc.
Olympia, WA

Detail:

Operating Parameters

Normal Production (hrs/yr)	8,560
RTO Bypass (hrs/yr)	200
Combined Lines 1 & 2 Rated Capacity (cans/min	3,800
Line 1 / Line 2 RTO Bypass Rate (cans/min)	1,900
Line 1 and Line 2 Production Efficiency	90%
Inside Spray Capture Efficiency	75%
Inside Spray Destruction Efficiency	98.0%
Varnish/Ink Capture Efficiency	75%
Varnish/Ink Destruction Efficiency	98.0%
UV Varnish Capture and Control	0.0%
IPA Retention in Shop Towels (Waste)	0.0%

					Normal Operation[3]			RTO Bypass[4]	
Material	**Use**	**Application Rate (gal/1,000 cans)**	**Vol % Solids[1]**	**lb VOC/gal solids[1]**	**Annual Usage (gal/yr)**	**VOC Controlled Emissions (tpy)**	**VOC Fugitive Emissions (tpy)**	**Annual Usage (gal/yr)**	**VOC Emissions (tpy)**
Various	Inside Spray	0.18	18.5%	7.2	297,000	2.97	49.45	3,786	2.52
Various	Varnish	0.060	35.4%	2.90	90,000	0.69	11.55	1,239	0.64
Various	Ink	0.0089	83.9%	1.52	15,621	0.15	2.49	182	0.12
UV Varnish	Rim Coat	0.00185	96.4%	0.01	3,250	--	0.004	38	0.0002
IPA[2]	Cleanup IPA	--	--	6.56	12,840	--	42.11	150	0.49

[1] The solids percentage and VOC content for each material is based on the worst case formulation out of the possible coatings/inks, based on information provided in manufacturer SDSs.

[2] IPA usage is calculated using a 1.5 gallon per hour rate for production of 3,800 cans per hour. IPA usage rate was provided by Crown Cork personnel. Annual usage of IPO does not include the 90% line efficiency factor.

[3] Annual usage of each material during normal operation is based on the combined Line 1 and 2 rated capacity of 3,800 cpm, 90% line efficiency, 8,560 hr/year of normal operation, and the respective application rate. Annual emissions during normal operation assume that 100% of the VOC content will be emitted, and are based on the annual usage, and the respect capture efficiency and destruction efficiencies for each application (Inside spray 75% CE and 98% DRE, Varnish and Ink 75% CE and 98% DRE, no control for Rim Coat and IPA).

[4] Annual usage of each material during RTO bypass is based on only Line 2 operating at its rated capacity of 1,900 cpm, 90% line efficiency, 200 hr/year of RTO bypass operation, and the respective application rate. Annual emissions during normal operation assume that 100% of the VOC content will be emitted, and are based on the annual usage, and no control.

Lines 1 & 2 Process Lines - Normal Control Operating Scenario
Crown Cork & Seal Company, Inc.
Olympia, WA

Material	Use	Density (lb/gal)	Speciated VOC (% By Weight)[1]			
			Ethylene Glycol Monobutyl Ether (EGBE)	Isopropyl Alcohol (IPA)	Propylene Glycol Methyl Ether (PGME)	Ethylene Glycol Monohexyl Ether (EGHE)
		CAS No. :	111-76-2	67-63-0	107-98-2	112-25-4
		TAP?	TAP	TAP	TAP	
		HAP?				HAP
Various	Inside spray	8.46	6.80%	0.00%	0.20%	0.50%
Various	Varnish	8.90	7.40%	0.00%	0.00%	0.00%
Various[2]	Ink	9.78	0.00%	0.00%	0.00%	0.00%
IPA	Cleanup	6.56	0.00%	100.00%	0.00%	0.00%

[1] Material content based on the worst case formulation of the possible coating/ink, based on manufacturer SDSs.

[2] More than 500 types of ink products are used, this calculation uses a reasonable worst-case density (9.78 lb/gal) and VOC content (5%)

Material	Use	Application (gal/hr)	Speciated VOC Emissions (lb/hr)[1]				
			EGBE	IPA	PGME	EGHE	Formaldehyde[2]
		CAS No. :	111-76-2	67-63-0	107-98-2	112-25-4	50-00-0
		TAP?	TAP	TAP	TAP		TAP
		HAP?				HAP	HAP
Various	Inside spray	42.1	24.20	0.00	0.71	1.78	--
Various	Varnish	13.8	9.07	0.00	0.00	0.00	--
Various	Ink	2.0	0.00	0.00	0.00	0.00	--
IPA	Cleanup	1.50	0.00	9.84	0.00	0.00	--
Total Uncontrolled Emission Factor			**33.27**	**9.84**	**0.71**	**1.78**	**2.60**
Fugitive Emissions			**8.32**	**9.84**	**0.18**	**0.44**	**0.00**
Total Controlled Speciated VOC Emissions			**0.50**	**0.00**	**0.01**	**0.03**	**0.05**

Formaldehyde Emissions[2]	
11.4	lbs formed/MM can
100%	Capture Efficiency
2.60	Uncontrolled Emissions, lb/hr

Can Washer Hydrofluoric Acid Emissions[3]	
0.089	lbs formed/MM can
100%	Capture Efficiency
0.02	Normal Emissions, lb/hr
0.01	RTO Bypass Emissions, lb/hr

Can Washer Sulfuric Acid Emissions[3]	
0.26	lbs formed/MM can
100%	Capture Efficiency
0.06	Normal Emissions, lb/hr
0.03	RTO Bypass Emissions, lb/h

[1] Hourly emissions are based on the Line 3 rated capacity of 2,800 cpm, the material application rate, speciated VOC content, and respective capture efficiency and destruction efficiency for the application.

[2] Resin curing in the oven forms formaldehyde. It is captured 100% in the oven and routed to the RTO. The formation rate is from 2009 stack test at Crown's Olympia Washington plant.

[3] Emission factors are based on past studies conducted at Crown Cork facilities.

Potential TAP Emissions

		Normal Operation[1]			RTO Bypass[2]			Total Annual	
Pollutant	CAS	lb/hr	lb/day	lb/yr	lb/hr	lb/day	lb/yr	lb/yr	tons/yr
EGBE	111-76-2	8.8	211.6	67922	16.6	399.2	2994.2	70916	35.5
IPA	67-63-0	9.8	236.1	75801	4.9	118.1	885.5	76687	38.3
PGME	107-98-2	0.2	4.5	1453	0.4	8.5	64.1	1517	0.8
EGHE	112-25-4	0.5	11.3	3633	0.9	21.4	160.1	3793	1.9
Formaldehyde	50-00-0	0.05	1.2	400	1.3	31.2	233.9	634	0.3
Hydrofluoric Acid	7664-39-3	0.02	0.5	156	0.01	0.2	1.8	158	0.1
Sulfuric Acid	7664-93-9	0.06	1.4	457	0.03	0.7	5.3	462	0.2

[1] Hourly emissions during normal operation are based on the combined Line 1 and 2 rated throughput of 3,800 cpm. Daily emissions based on the maximum hourly rate and continuous operation for 24 hours. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 8,560 hours per year.

[2] Hourly emissions during RTO bypass operation are based on only Line 2 operating at its rated capacity of 1,900 cpm. Daily emissions based on the maximum hourly rate and continuous operation for 24 hours. Annual emissions based on the maximum hourly rate, the 90% line efficiency, and continuous operation for 200 hours per year.

RE US ENGINEERS

Lines 1 & 2 Process Lines - Normal Control Operating Scenario
Crown Cork & Seal Company, Inc.
Olympia, WA

TAP Emissions Netting

		Past Actual[1]			Future Potential - Normal Operation				
Pollutant	**CAS**	**lb/hr**	**lb/day**	**lb/yr**	**lb/hr**	**lb/day**	**lb/yr**	**Avg. Period**	**Net Change (lb/avg. period)**
EGBE	**111-76-2**	33.3	798.5	101,201	8.8	211.6	70,916	24-hr	-587
IPA	**67-63-0**	9.8	236.1	68,301	9.8	236.1	76,687	1-hr	0
PGME	**107-98-2**	0.7	17.1	--	0.2	4.5	1,517	24-hr	-12.6
Formaldehyde	**50-00-0**	2.6	62.4	15,551	0.1	1.2	634	year	-14,916
Hydrofluoric Acid	**7664-39-3**	0.02	0.5	143	0.02	0.5	158	24-hr	0
Sulfuric Acid	**7664-93-9**	0.06	1.4	418	0.06	1.4	462	24-hr	0

[1] Annual baseline emissions are based on the average of actual emissions over the previous two year period. Short-term baseline emissions are calculated based on emission factors and Lines 1 and 2 operating at full capacity.

TAP Emissions Netting

		Past Actual[1]			Future Potential - RTO Bypass				
Pollutant	**CAS**	**lb/hr**	**lb/day**	**lb/yr**	**lb/hr**	**lb/day**	**lb/yr**	**Avg. Period**	**Net Change (lb/avg. period)**
EGBE	**111-76-2**	33.3	798.5	101,201	16.6	399.2	70,916	24-hr	-399
IPA	**67-63-0**	9.8	236.1	68,301	4.9	118.1	76,687	1-hr	-4.9
PGME	**107-98-2**	0.7	17.1	--	0.4	8.5	1,517	24-hr	-8.5
Formaldehyde	**50-00-0**	2.6	62.4	15,551	1.3	31.2	634	year	-14,916
Hydrofluoric Acid	**7664-39-3**	0.0	0.5	143	0.01	0.2	158	24-hr	-0.2
Sulfuric Acid	**7664-93-9**	0.1	1.4	418	0.03	0.7	462	24-hr	-0.7

[1] Annual baseline emissions are based on the average of actual emissions over the previous two year period. Short-term baseline emissions are calculated based on emission factors and Lines 1 and 2 operating at full capacity.

Lines 1 & 2 Process Lines - Baseline Emissions Data
Crown Cork & Seal Company, Inc.
Olympia, WA

Annual Emissions (tpy)

Year	Month	VOC	HF	EGHE	Formaldehyde	EGBE	n-Butanol	DMEA	Amyl Alcohol	IPA	PGME	Sulfuric Acid
	CAS:	VOC	7664-39-3	112-25-4	50-00-0	111-76-2	71-36-3	108-01-0	71-41-0	67-63-0	107-98-2	7664-93-9
	HAP?		HAP	HAP	HAP							
	TAP?		TAP		TAP	TAP				TAP	TAP	TAP
2018	JANUARY	17.82	0.01	0.48	0.63	4.40	4.42	1.07	2.67	1.97	0.00	0.02
2018	FEBRUARY	14.99	0.01	0.38	0.57	3.51	3.56	0.85	2.09	1.97	0.00	0.02
2018	MARCH	15.24	0.01	0.37	0.55	3.37	3.40	0.82	2.02	2.87	0.00	0.01
2018	APRIL	16.66	0.01	0.40	0.58	3.71	3.74	0.90	2.23	3.12	0.00	0.02
2018	MAY	22.13	0.01	0.55	0.75	5.22	5.12	1.27	3.05	3.61	0.00	0.02
2018	JUNE	20.40	0.01	0.49	0.72	4.56	4.53	1.10	2.68	3.92	0.00	0.02
2018	JULY	20.99	0.01	0.52	0.76	4.85	4.84	1.19	2.87	3.30	0.00	0.02
2018	AUGUST	20.86	0.01	0.50	0.75	4.73	4.73	1.16	2.74	3.79	0.00	0.02
2018	SEPTEMBER	19.77	0.01	0.49	0.72	4.62	4.62	1.14	2.67	3.30	0.00	0.02
2018	OCTOBER	18.99	0.01	0.46	0.70	4.39	4.46	1.07	2.45	3.02	0.00	0.02
2018	NOVEMBER	18.61	0.01	0.46	0.67	4.37	4.30	1.09	2.54	2.89	0.00	0.02
2018	DECEMBER	15.06	0.01	0.38	0.55	3.47	3.47	0.85	2.11	2.53	0.00	0.01
2019	JANUARY	18.54	0.01	0.48	0.71	4.43	4.41	1.09	2.67	2.69	0.00	0.02
2019	FEBRUARY	15.28	0.00	0.40	0.54	3.85	3.74	0.94	2.18	2.26	0.00	0.01
2019	MARCH	15.00	0.01	0.37	0.56	3.60	3.63	0.89	2.00	2.39	0.00	0.01
2019	APRIL	13.04	0.00	0.29	0.50	3.01	3.04	0.74	1.51	2.48	0.00	0.01
2019	MAY	16.41	0.01	0.37	0.62	3.87	3.95	0.95	1.86	2.80	0.00	0.02
2019	JUNE	19.03	0.01	0.46	0.74	4.46	4.59	1.08	2.41	3.01	0.00	0.02
2019	JULY	19.61	0.01	0.49	0.74	4.60	4.56	1.14	2.67	3.19	0.00	0.02
2019	AUGUST	18.86	0.01	0.42	0.71	4.40	4.57	1.07	2.13	3.36	0.00	0.02
2019	SEPTEMBER	12.32	0.00	0.27	0.45	2.83	2.98	0.68	1.34	2.16	0.00	0.01
2019	OCTOBER	17.34	0.01	0.42	0.66	4.14	4.16	1.03	2.27	2.53	0.00	0.02
2019	NOVEMBER	23.53	0.01	0.70	0.66	6.44	6.53	1.57	3.81	1.80	0.00	0.02
2019	DECEMBER	18.79	0.01	0.44	0.69	4.37	4.32	1.10	2.34	3.36	0.00	0.02
2-Year Average (tpy)		214.64	0.07	5.30	7.78	50.60	50.84	12.39	28.66	34.15	0.00	0.21
2 Year Average (lb/yr)		429,278	143	10,592	15,551	101,201	101,675	24,787	57,316	68,301	0.00	418

Project Combustion Source Emissions
Crown Cork & Seal Company, Inc.
Olympia, WA

Summary:

Emission Source	Future Potential Pollutant Emissions (tpy)											
	CO	CO_2	CH_4	N_2O	NO_x	PM	PM_{10}	$PM_{2.5}$	Pb	SO_x	VOC	CO_2e
Project Combustion Sources	8.83	15,760.05	0.30	0.03	10.04	1.00	1.00	1.00	0.00	0.08	0.72	15,776.32

Detail:

Emission Source	Heat Input Rating (MMBTU/hr)	Hourly Fuel Flow (MMCF/hr)	Max. Operating Hours	Annual Fuel Flow (MMcf/yr)
Pin Oven 2 (single burner)	2.6	2.52E-03	8760	22.11
Pin Oven 3a (single burner)	2.59	2.52E-03	8760	22.11
Pin Oven 3b (single burner)	2.59	2.52E-03	8760	22.11
IBO 1 (three burners)	3.93	3.83E-03	8760	33.55
IBO 2 (three burners)	3.93	3.83E-03	8760	33.55
IBO 3 (three burners)	3.93	3.83E-03	8760	33.55
RTO Burner (single burner)	11.2	1.09E-02	8760	95.63

Pollutant	CO	CO_2	CH_4	N_2O	NO_x	PM	PM_{10}	$PM_{2.5}$	Pb	SO_x	VOC	CO_2e
AP-42 Emission Factors (lb/MMscf)[a,b]	84	120,017	2.3	0.2	100	7.6	7.6	7.60	0.0005	0.6	5.50	*see below*
New Burner (Ovens) NOx Emission Factors (lb/MMscf) [c]	84	120,017	2.3	0.2	99	7.6	7.6	7.60	0.0005	0.6	5.50	see below
New Burner (RTO) NOx Emission Factors [d]	38	120,017	2.3	0.2	37	7.6	7.6	7.60	0.0005	0.6	5.50	see below

a Emission factors obtained from AP-42 Chapter 1.4, Table 1.4-2.
b Greenhouse gas emission factors obtained from 40 CFR Part 98 Subpart C, Tables C-1 and C-2 for natural gas. CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).
c NOx emission factor for oven burners based on the manufacturer guarantee (80 ppm NOx at 3% O2), vendor data indicates NOx concentrations range from 9 - 50 ppm @ 3% O2 during normal operation.
d Typical NOx and CO emission factors for RTO Maxon Kinedizer LE burner is 30 ppm NOx @ 3% O2 (0.036 lb/MMBtu) and 50 ppm CO @ 3% O2 (0.037 lb/MMBtu).

GWP	GHG
1	CO_2
25	CH_4
298	N_2O

1,026	Btu/scf, NG HHV
100%	percent of burner rating; max. sustained firing rate
24	Daily Operating hours
8760	Annual Operating hours

RE US ENGINEERS

Project Combustion Source Emissions
Crown Cork & Seal Company, Inc.
Olympia, WA

Emission Source	Pollutant Emissions (lb/hr)											
	CO	CO_2	CH_4	N_2O	NO_x	PM	PM_{10}	$PM_{2.5}$	Pb	SO_x	VOC	CO_2e
Pin Oven 2 (single burner)	0.21	303	5.71E-03	5.71E-04	0.25	1.92E-02	1.92E-02	1.92E-02	1.26E-06	0.0015	0.014	303
Pin Oven 3a (single burner)	0.21	303	5.71E-03	5.71E-04	0.25	1.92E-02	1.92E-02	1.92E-02	1.26E-06	0.0015	0.014	303
Pin Oven 3b (single burner)	0.21	303	5.71E-03	5.71E-04	0.25	1.92E-02	1.92E-02	1.92E-02	1.26E-06	0.0015	0.014	303
IBO 1 (three burners)	0.32	460	8.66E-03	8.66E-04	0.38	2.91E-02	2.91E-02	2.91E-02	1.92E-06	0.0023	0.021	460
IBO 2 (three burners)	0.32	460	8.66E-03	8.66E-04	0.38	2.91E-02	2.91E-02	2.91E-02	1.92E-06	0.0023	0.021	460
IBO 3 (three burners)	0.32	460	8.66E-03	8.66E-04	0.38	2.91E-02	2.91E-02	2.91E-02	1.92E-06	0.0023	0.021	460
RTO Burner (single burner)	0.41	1,310	2.47E-02	2.47E-03	0.40	8.30E-02	8.30E-02	8.30E-02	5.46E-06	0.0065	0.060	3,602
New Equipment (non-exempt) Total	**2.02**	**3,598.18**	**0.07**	**6.78E-03**	**2.29**	**0.23**	**0.23**	**0.23**	**1.50E-05**	**0.02**	**0.16**	**5,892**

- Non-exempt new equipment includes Pin Ovens 2, 3a, and 3b; and IBO 1, 2, and 3.

Emission Source	Pollutant Emissions (tpy)											
	CO	CO_2	CH_4	N_2O	NO_x	PM	PM_{10}	$PM_{2.5}$	Pb	SO_x	VOC	CO_2e
Pin Oven 2 (single burner)	0.93	1,327	0.03	0.003	1.1	0.08	0.08	0.08	5.53E-06	0.007	0.061	1,328
Pin Oven 3a (single burner)	0.93	1,327	0.03	0.003	1.1	0.08	0.08	0.08	5.53E-06	0.007	0.061	1,328
Pin Oven 3b (single burner)	0.93	1,327	0.03	0.003	1.1	0.08	0.08	0.08	5.53E-06	0.007	0.061	1,328
IBO 1 (three burners)	1.4	2,014	0.04	0.004	1.7	0.13	0.13	0.13	8.39E-06	0.010	0.092	2,016
IBO 2 (three burners)	1.4	2,014	0.04	0.004	1.7	0.13	0.13	0.13	8.39E-06	0.010	0.092	2,016
IBO 3 (three burners)	1.4	2,014	0.04	0.004	1.7	0.13	0.13	0.13	8.39E-06	0.010	0.092	2,016
RTO Burner (single burner)	1.8	5,738	0.11	0.011	1.8	0.36	0.36	0.36	2.39E-05	0.029	0.26	5,744
New Equipment (non-exempt) Total	**8.8**	**15,760.05**	**0.30**	**0.030**	**10.0**	**1.00**	**1.00**	**1.00**	**6.57E-05**	**0.079**	**0.72**	**15,776**

- Non-exempt new equipment includes Pin Ovens 2, 3a, and 3b; and IBO 1, 2, and 3.

Project Combustion Source Emissions
Crown Cork & Seal Company, Inc.
Olympia, WA

Toxic Air Pollutants

Pollutant[a]	Emission Factor	Pin Oven 2	Pin Oven 3a	Pin Oven 3b	IBO 1	IBO 2	IBO 3	New Equipment (non-exempt) Emissions		
	(lb/MMscf)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/day)	(lb/yr)
NOx	1.00E+02	0.25	0.25	0.25	0.38	0.38	0.38	1.91	45.8	16,700
CO	8.40E+01	0.21	0.21	0.21	0.32	0.32	0.32	1.60	38.4	14,028
SO_2	6.00E-01	1.51E-03	1.51E-03	1.51E-03	2.30E-03	2.30E-03	2.30E-03	0.01	0.3	100
Arsenic	2.00E-04	5.05E-07	5.05E-07	5.05E-07	7.66E-07	7.66E-07	7.66E-07	3.81E-06	9.15E-05	3.34E-02
Benzene	2.10E-03	5.30E-06	5.30E-06	5.30E-06	8.04E-06	8.04E-06	8.04E-06	4.00E-05	9.61E-04	3.51E-01
Beryllium	1.20E-05	3.03E-08	3.03E-08	3.03E-08	4.60E-08	4.60E-08	4.60E-08	2.29E-07	5.49E-06	2.00E-03
Cadmium	1.10E-03	2.78E-06	2.78E-06	2.78E-06	4.21E-06	4.21E-06	4.21E-06	2.10E-05	5.03E-04	1.84E-01
Chromium	1.40E-03	3.53E-06	3.53E-06	3.53E-06	5.36E-06	5.36E-06	5.36E-06	2.67E-05	6.41E-04	2.34E-01
Cobalt	8.40E-05	2.12E-07	2.12E-07	2.12E-07	3.22E-07	3.22E-07	3.22E-07	1.60E-06	3.84E-05	1.40E-02
Copper	8.50E-04	2.15E-06	2.15E-06	2.15E-06	3.26E-06	3.26E-06	3.26E-06	1.62E-05	3.89E-04	1.42E-01
Dichlorobenzene	1.20E-03	3.03E-06	3.03E-06	3.03E-06	4.60E-06	4.60E-06	4.60E-06	2.29E-05	5.49E-04	2.00E-01
Formaldehyde	7.50E-02	1.89E-04	1.89E-04	1.89E-04	2.87E-04	2.87E-04	2.87E-04	1.43E-03	3.43E-02	1.25E+01
Hexane	1.80E+00	4.54E-03	4.54E-03	4.54E-03	0.007	0.007	0.007	0.03	0.8	301
Lead	5.00E-04	1.26E-06	1.26E-06	1.26E-06	1.92E-06	1.92E-06	1.92E-06	9.53E-06	2.29E-04	8.35E-02
Manganese	3.80E-04	9.59E-07	9.59E-07	9.59E-07	1.46E-06	1.46E-06	1.46E-06	7.24E-06	1.74E-04	6.35E-02
Mercury	2.60E-04	6.56E-07	6.56E-07	6.56E-07	9.96E-07	9.96E-07	9.96E-07	4.96E-06	1.19E-04	4.34E-02
Naphthalene	6.10E-04	1.54E-06	1.54E-06	1.54E-06	2.34E-06	2.34E-06	2.34E-06	1.16E-05	2.79E-04	1.02E-01
Nickel	2.10E-03	5.30E-06	5.30E-06	5.30E-06	8.04E-06	8.04E-06	8.04E-06	4.00E-05	9.61E-04	3.51E-01
Selenium	2.40E-05	6.06E-08	6.06E-08	6.06E-08	9.19E-08	9.19E-08	9.19E-08	4.58E-07	1.10E-05	4.01E-03
Toluene	3.40E-03	8.58E-06	8.58E-06	8.58E-06	1.30E-05	1.30E-05	1.30E-05	6.48E-05	1.56E-03	5.68E-01
Vanadium	2.30E-03	5.81E-06	5.81E-06	5.81E-06	8.81E-06	8.81E-06	8.81E-06	4.38E-05	1.05E-03	3.84E-01
Acenaphthene	1.80E-06	4.54E-09	4.54E-09	4.54E-09	6.89E-09	6.89E-09	6.89E-09	3.43E-08	8.24E-07	3.01E-04
Acenaphthylene	1.80E-06	4.54E-09	4.54E-09	4.54E-09	6.89E-09	6.89E-09	6.89E-09	3.43E-08	8.24E-07	3.01E-04
Anthracene	2.40E-06	6.06E-09	6.06E-09	6.06E-09	9.19E-09	9.19E-09	9.19E-09	4.58E-08	1.10E-06	4.01E-04
Benz(a)anthracene	1.80E-06	4.54E-09	4.54E-09	4.54E-09	6.89E-09	6.89E-09	6.89E-09	3.43E-08	8.24E-07	3.01E-04
Benzo(a)pyrene	1.20E-06	3.03E-09	3.03E-09	3.03E-09	4.60E-09	4.60E-09	4.60E-09	2.29E-08	5.49E-07	2.00E-04
Benzo(b)fluoranthene	1.80E-06	4.54E-09	4.54E-09	4.54E-09	6.89E-09	6.89E-09	6.89E-09	3.43E-08	8.24E-07	3.01E-04
Benzo(k)fluoranthene	1.80E-06	4.54E-09	4.54E-09	4.54E-09	6.89E-09	6.89E-09	6.89E-09	3.43E-08	8.24E-07	3.01E-04
Chrysene	1.80E-06	4.54E-09	4.54E-09	4.54E-09	6.89E-09	6.89E-09	6.89E-09	3.43E-08	8.24E-07	3.01E-04
Dibenzo(a,h)anthrancene	1.20E-06	3.03E-09	3.03E-09	3.03E-09	4.60E-09	4.60E-09	4.60E-09	2.29E-08	5.49E-07	2.00E-04
Fluoranthene	3.00E-06	7.57E-09	7.57E-09	7.57E-09	1.15E-08	1.15E-08	1.15E-08	5.72E-08	1.37E-06	5.01E-04
Fluorene	2.80E-06	7.07E-09	7.07E-09	7.07E-09	1.07E-08	1.07E-08	1.07E-08	5.34E-08	1.28E-06	4.68E-04
Indeno(1,2,3-cd)pyrene	1.80E-06	4.54E-09	4.54E-09	4.54E-09	6.89E-09	6.89E-09	6.89E-09	3.43E-08	8.24E-07	3.01E-04
2-Methylnaphthalene	2.40E-05	6.06E-08	6.06E-08	6.06E-08	9.19E-08	9.19E-08	9.19E-08	4.58E-07	1.10E-05	4.01E-03
3-Methylcholanthrene	1.80E-06	4.54E-09	4.54E-09	4.54E-09	6.89E-09	6.89E-09	6.89E-09	3.43E-08	8.24E-07	3.01E-04
7,12-Dimethylbenz[a]anthracene	1.60E-05	4.04E-08	4.04E-08	4.04E-08	6.13E-08	6.13E-08	6.13E-08	3.05E-07	7.32E-06	2.67E-03
Phenanthrene	1.70E-05	4.29E-08	4.29E-08	4.29E-08	6.51E-08	6.51E-08	6.51E-08	3.24E-07	7.78E-06	2.84E-03
Pyrene	5.00E-06	1.26E-08	1.26E-08	1.26E-08	1.92E-08	1.92E-08	1.92E-08	9.53E-08	2.29E-06	8.35E-04
Total HAP								**0.04**	**0.86**	**315.38**

[a] Natural gas combustion emissions are based on emission factors obtained from vendor data (NOx) and AP-42 Chapter 1.4, Table 1.4-2.

[b] Maximum potential hourly emissions are based on operation of all natural gas combustion sources (ovens, and dryers). Maximum daily emissions are calculated based on the maximum hourly emission rate and continuous emissions are conservatively based on continuous operation (8,760 hours per year).

RE US ENGINEERS

APPENDIX C
EQUIPMENT SPECIFICATION DATA SHEETS

Crown Cork & Seal Co (USA) Inc.
Olympia, Washington State
USA

RTO Bid Specification Package
May 4, 2020

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ADDENDUM

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INCINERATOR SPECIFICATIONS

I. INTRODUCTION

The purpose of this specification is to provide the supplier with Crown Cork & Seal Co (USA) Inc's (Crown) requirements for a VOC and odor control device for our Olympia, WA plant.

II. EQUIPMENT DESCRIPTION

A. NAME

Hydrocarbon Vapor and/or Fume oxidizer

B. FUNCTION

This device will completely oxidize hydrocarbon vapors into non-photochemical reactive products of combustion, thereby bringing oven emissions into compliance with WA Air Pollution Control Regulations for VOC emissions and also eliminate nuisance odors and visible plume emissions. The RTO system must be capable of achieving and maintaining the minimum of 98.5% VOC destruction efficiency (DRE) and tested per EPA Method 25A at the following conditions:

1. 50,000 SCFM normal to a max. of 55,000 SCFM and VOC loading from three 2-pc Beverage Can manufacturing lines.

The emissions in contact with the flame are heated to or exceed 1600 degrees F (871C) for a minimum 0.5 seconds. The calculated retention time excludes the volume of the canister where some oxidation will take place; therefore, 0.5 seconds is a minimum figure.

III. FURNISHED EQUIPMENT

A. SUPPLIER

Shall design, produce and provide a complete unit described in this specification and guarantee the extended performance to be in compliance with the WA Air Pollution Control Rules and Regulations for VOC emissions. The system as supplied shall consist of an insulated housing, ceramic heat exchanger, exhaust fan, support structure, burner, regulators, valves, switches, safety controls, temperature controls, recorders, motors, starters and drives, electrical panel with all circuit components, etc., to meet all local and applicable Crown codes. The incinerator must be compatible with and incorporated into the Crown Olympia plant's oven fume exhaust system and oven electrical interlocks. Crown shall obtain necessary building and construction permits with the help of the supplier as required.

B. CROWN

Shall provide the location for the incinerator installation and will extend air, gas, water and electrical facilities to the installation site. Crown will obtain and pay for operating permits, as well as arrange for incinerator performance tests and a local air permit, if required. If the unit does not meet the DRE requirements as a result of the unit's performance, the supplier shall pay for further tests until compliance has been met.

IV. ACCEPTANCE

A. PRELIMINARY

Supplier shall prepare preliminary structural and general arrangements, piping and electrical drawings and submit same to Crown for approval together with all prints and operating instructions required for the permit application.

At the completion of the fabrication of major components and before shipment from the fabrication site, representatives of Crown will be given the opportunity to inspect same for quality of workmanship and to confirm that all components are being furnished in accordance with these specifications i.e., fan, burner, gas train, electrical panel, controls, etc.

B. FINAL

Following completion of installation, unless previously agreed upon, a supplier's representative shall start the incinerator at Crown Olympia plant and make all adjustments, and with the help of CCK employees balance the ovens/RTO system so that the RTO will operate in accordance with the performance specifications contained herein. The final acceptance of the incinerator will be given following a period of 3 months of normal operation and the performance tests confirming that hydrocarbon concentrations are in compliance with all applicable EPA and local emission control and safety regulations.

Before final acceptance the contractor shall demonstrate that the entire installation is functioning properly and to the complete satisfaction of the owner's representative. The contractor shall conduct such tests and adjustments of equipment as specified or necessary to verify performance requirements.

V. DOCUMENTATION

The supplier shall furnish complete mechanical, electrical and piping drawings (detail and assembly) with bills-of-material, technical brochures and operating instructions. A minimum of three manuals, including the above technical material, shall be furnished with the equipment.

Inspection adjustment check sheets (identified by machine serial number) shall be maintained through fabrication, final assembly and start up. These sheets

shall be retained with the operating manuals. Data shall include fan speed, damper settings, temperature limit switch, pressure switches, air flow switch, and temperature control settings.

VI. DESIGN/CONSTRUCTION

A. GENERAL

The fume incinerator of maximum 55,000 SCFM flow capacity and associated components shall be designed and employed in accordance with NFPA Standards for Ovens and Furnaces and Factory Mutual/IRI Standards.

The fume incinerator shall be of rigid construction, supported on a stable structure and concrete pad with catwalks and easy access. The unit will be fabricated of heat and corrosion resistant metals and will utilize high temperature, lightweight insulation to limit external surface temperatures to an average of no higher than 135 degrees F at normal operating temperatures, excluding solar gain.

The burner capacity shall be adequate to attain temperatures in excess of required operating temperatures and bring the incinerator to production condition in less than four (4) hours cold start and less than two (2) hours at a week-end start time period, i.e., from stand-by temperature/flow condition from 900^0F. Also, the burner must have a wide turn-down range for correct system control.

A heat exchanger of appropriate effectiveness (95%) must be supplied to provide the most favorable operating economics and lowest fuel consumption.

The system will be equipped with a temperature controller to accurately maintain temperatures to sustain the required performance effectiveness, with a ramp-up feature on initial startup. Additional limit switches will be furnished to protect the equipment and also to verify system effectiveness.

B. PHYSICAL REQUIREMENTS

1. DIMENSIONS

Dimensions of the incinerator are a function of volumetric capacity and the heat exchanger's effectiveness. With the above constrictions, the supplier should strive to design the most compact unit possible. The supplier's proposal should include a schematic G/A drawing for Crown approval, showing the weight, length, width and the height of the unit to be furnished. The supplier must be certain that major components of the incinerator can be transported to the erection site i.e. through the building, across the roof, etc.

2. GENERAL

The housing shall be fabricated of heavy gauge, mild steel plate and heavy gauge reinforcing ribs. The interior shall be lined with a combination of very high temperature fiber blocks and soft ceramic blankets attached to the interior surface with wire studs, and welded to the outer shell and push on washers or a Crown approved technology.

Mating joints of companion modules shall be flanged with high temperature gasketing if the operating temperature at the joint is not excessively high. Otherwise a light seal weld is required along the inside of the joint. Mating flanges must not leak.

The insulating application should limit the outer skin temperature to an average of 135 degrees, which could require a 6” to 8” or more for application for the burner section while 4” could suffice for some areas of a regenerative section.

The heat exchanger’s heat transfer effectiveness must be carefully selected to be compatible with the burner’s characteristics, exhaust volume, and hydrocarbon concentrations while providing the most economical operating conditions. The heat exchanger must be designed and fabricated to permit thermal expansion without damaging components or creating leakage.

Where internal metal parts of the incinerator are subjected to high temperatures, the same must be fabricated from 316L stainless steel.

Fully insulated access doors shall be appropriately located, for access with tools to maintain or replace burner parts, heat exchange components, insulating materials, etc. Doors shall be of furnace construction with heavy duty hinges and articulated, wing, and handle latches. Doors must be gasketed to prevent leakage.

The burner shall be of the raw gas, nozzle mixing type where all air for combustion is available from the emission stream, unless your design must use pre-mixed air. The Natural Gas Injection System is also acceptable by Crown as long as the system complies with all applicable NFPA regulations.

Because the burner is relatively inaccessible with a flame rod, a UV type flame detector must be used. Precautions must be taken to protect the UV flame detector from excess heat during sudden shutdowns.

The pilot flame must be interrupted once a flame is established on the main burner. A continuous or sustained pilot flame is unacceptable.

Permanent thermocouples shall be installed to control, record, monitor or test temperatures at: 1) inlet of all chambers 2) operating temperature 3) stack temperature.

The incinerator shall be equipped with a high temperature, induced draught, insulated centrifugal fan capable of exhausting the required volume from the ovens while developing a minimum of -3" static pressure to overcome resistance in the system duct work. The fan will be equipped with Allen-Bradley V.F. drive for volumetric control.

The unit will have an airflow switch to monitor fan operation, a temperature limit switch to protect the equipment, and fan vibration and fan bearing temperature limit switches.

The temperature control instrument must be electronic and programmable, in turn controlling a reversible electrical gas valve operating motor.

A multiple channel chart recorder is required to monitor a number of process variables consisting of inlet and outlet temperatures, control temperatures, and duct static pressure. A separate monitor should be provided to monitor air flow as scfm. On top of a multiple channel chart recorder a quote for the data logger installation should be provided separately.

A complete free standing electrical control panel with a main disconnect switch is required. Control relays, motor starter, push buttons, flame detector, indicating lights, alarm, temperature control, and recorder are to be mounted in the panel.

3. AIR DISTRIBUTION SYSTEM

The combined exhaust from process ovens in the plant will be drawn through the incinerator fan and delivered through a volume control V.F. drive to the inlet of the heat exchanger "cold pass." Air enters the exchanger at relatively low temperatures, which rises in the passage through the "cold pass." Exiting the exchanger "cold pass," the emission stream passes through the burner where the temperature is raised to 1600 degrees F.

In a regenerative system the emissions are retained within the combustion chamber for no less than 1/2 second and then enter the heat exchange "hot pass." It is within the combustion chamber that hydrocarbon oxidation occurs. In a regenerative unit the heat exchanger is a bed of ceramic. After a retention time of a minimum of 1/2 second the emissions pass back through the heat exchanger as a "hot pass."

Within this “hot pass” emission temperatures drop, as heat is transferred to emissions in the “cold pass.” Exiting the “hot pass” the clean emission gasses are exhausted out of the stack, into the atmosphere.

4. EXHAUST STACK

The oxidizer exhaust stack shall be of the “concentric” type, not requiring a rain cap which would impede emission flow. The stack should have two 3” port holes 90 degrees apart for testing and located to satisfy EPA requirements.

The stack shall be fabricated of mild steel which will withstand bake out temperatures and not require frequent painting. It will be insulated on the exterior in locations where excess heat radiation or personnel safety is a problem.

The discharge height should be 60 feet above ground and such that high temperature exhaust gases do not cause injury or damage to personnel or property and will not be recirculated back into the plant.

C. FUNCTIONAL REQUIREMENTS

1. SAFETY

The incinerator’s design and construction shall conform to safety standards covered in NFPA and other applicable safety standards.

Emergency stop pushbuttons shall be located in the electrical control panel and adjacent to the gas train on the incinerator itself.

A remote motor disconnect switch shall be located near the fan motors at the incinerator site.

2. PERFORMANCE

The supplier shall guarantee the hydrocarbon oxidation’s effectiveness (at its rated volume capacity) of a minimum of 98.5% DRE and tested per EPA Method 25A. The DRE shall not go below 98.5% at the end of the three years of operation. These effectiveness levels are at an operating temperature of 1450 - 1700 degrees F.

3. OPERATING CONDITIONS AND COSTS

Before being able to light the fume incinerator, a five minute purge is required and a fresh air RTO purge damper must be open. With multiple ovens exhausting into one incinerator, each oven must go through a minimum five minute purge before an oven burner can be established.

With one or more ovens in operation and the incinerator in operation, it is not necessary to shut off any burner of the oven that is in operation or the incinerator burner to purge or light an oven that has not been in production. The bypass damper of any oven will always be open to atmosphere unless the oven is lit and in operation.

It is essential that the product feed to each oven in the system is interlocked with the incinerator burner. Thus, unless the incinerator burner is lit and up to control temperature, product cannot be fed into any oven.

Operational Costs -- The definition of the operating costs in BTU/HR and Kwh for both natural gas and electricity based on two operational flow rates (50,000 SCFM and 55,000 SCFM).

4. RTO Valves

The main valves of the RTO must be air operated by a pneumatic system provided by the contractor. The system shall include an air compressor designed to supply the required amount of 90 psi air to operate the pneumatic poppet valves on the RTO unit complete with an air dryer that will produce -40F dry air along with the compressed air piping to the RTO unit.

D. SUBSYSTEM/COMPONENTS

1. ELECTRICAL COMPONENTS

Refer to the attached Crown Specifications

Fan motors must have internal thermal protection and be sized to safely operate at the design volume when cold. The motor must be controlled by a variable frequency drive for volumetric controls.

2. BURNERS

The preferred burner manufacturer is Maxon (Kinemax). If another burner is to be considered, Crown approval is required.

3. TEMPERATURE CONTROL AND RECORDER instrument shall be a Honeywell 450R, time versus temperature ramp on initial start, primary and auxiliary outputs, four alarm switches, and 4 pen recording capability. Output for controlling the fuel valve will be 4 to 20 ma.

4. Thermocouples to be Type K (chromel-alumel) 18 GA wire, ungrounded, duplex couples in 1/4” diameter stainless steel sheathing with 1/2” I.P.S. connector for mounting.

5. Dwyer Magnahelic indicating type differential pressure gauges to establish pressure drops across 1) burner 2) each ceramic bed, and 3) RTO inlet duct.

6. SAFETY/CONTROL COMPONENT
Safety devices in accordance with NFPA 86 standards and F.M. and IRI approval are to include but are not limited to the following:

NOTE: (ELECTRICAL CONTROL AND SAFETY CIRCUITS MUST BE APPROVED BY CROWN BEFORE PANEL IS ASSEMBLED AND WIRED).

VII. Olympia

A. SCOPE OF WORK

Design, build and install one **50,000 SCFM (90,000 Nm3/h) nominal and capable of continuously running at max. flow of 55,000 SCFM, 2 or 3-CHAMBER Regenerative Oxidizer.** The Oxidizer should be built to fit the constraints of the area.

Line No.	Exhaust Rate	Exhaust Temperature	Solvent Load
4 Pin Ovens	**4,000 SCFM**	350F	
3 IBOs	**5,000 SCFM**	325F	
Total (HOT):	**31,000 SCFM**		
27 LSMs @ 550 SCFM		**14,850 SCFM**	
Mass Conveyor Exhaust (New Line Only)		**4,500 SCFM**	

Total Flow: 50,000 SCFM

Solvent Load: to be determined

Estimated Solvent Heating Value: 13,500 But/lb.

This installation includes diverter boxes, all duct work, electrical interconnects between RTO and by-pass dampers, all control wires between the RTO and oven for interlocks, and necessary support structures. It will also be a turnkey operation. Each line will be equipped with a baghouse for ambient air exhausts

Optional equipment such as Direct Gas Injection and associated costs and gas savings are to be quoted separately.

1. SHIPPING
All component parts shall be shipped F.O.B. destination. All freight charges and import duties shall be paid for by the supplier.

2. DESIGN DATA
Source – Total of Four (4) Pin Chain Ovens
Total of three (3) IBO Oven

B. QUOTES
Costs are for a turnkey operation with equipment billed F.O.B. destination with freight & import duties arranged and paid for by the supplier. The quote is to be accompanied by an installation schedule with a starting date being the date of receiving the order.

C. OXIDIZER DESIGN REQUIREMENTS

1. DESTRUCTION: Initially 98.5% and guaranteed not to drop below 98.5% in next three years.

2. THERMAL EFF. (TER): 95% thermal energy at average solvent load.

3. EXHAUST FAN: Induced draught, direct drive variable frequency with control capability to allow full range from 25,000 SCFM to 50,000 SCFM. The fan shall be designed for the full volumetric flow and shall include a 3" w.g. pressure loss in the ductwork system. The unit will have an airflow switch, vibration switch, and a high temperature limit switch to protect the equipment.

4. DUCT WORK: Inlet to the oxidizer and ducting at the incinerator to be minimum 14 gauge aluminized steel with welded longitudinal seam with readily accessible clean out openings at all valving and incinerator fans.

5. INSULATION: Oxidizer should be insulated such that the outside shell does not exceed 135 degrees F. This includes the exhaust fan and stack to 10 ft. above the ground.

6. STACK: Free standing – 60 feet above ground –highest point. Stack must have two 3" diameter sampling ports 90 degrees apart and positioned to meet EPA requirements for testing, with OSHA-approved

access platform and ladder, and thermal protection for employees at ladder and platform.

7. Regenerative Heat Recovery Stoneware: Low pressure ceramic elements (Combination of 1" low pressure saddles and MLM-200 or, Structured Media) designed for rapid heat up and cool down.

7a. High Temperature shutdown to Minimize Running Costs: The oxidizer should be designed to shut down, after production has been completed, at the maximum possible combustion chamber temperature. All of the canister dampers shall be closed after the burner has shut down and the main fan has had sufficient time to come to a stop. This will maintain the heat in the ceramic media beds, thereby enabling a quick re-start when required, but also minimize the gas consumption required to bring the unit back up to operating temperature.

8. Bake Out Control: This unit should be equipped with an 800^0F -- 900^0F automatic bake out control, capable of cleaning ceramic elements and process valves (inlet and outlet) should they become contaminated. During the bake out the system will operate off-line from the process and the process would normally be performed as part of a planned maintenance shutdown. A tempering air damper must be installed in front of the fan in order to protect it during this operation.

9. Painting: Prior to shipment the unit shall be shot-blasted, have a minimum of one coat of primer, and be undercoated and finished with a top coat (color specified by the plant).

10. Foundation: Oxidizer manufacturer shall provide a concrete foundation for the oxidizer including exhaust fan and free standing stack based on 3000 PSF soil conditions. Layouts shall be submitted to the plant for approval. Excavation waste is to be removed by the incinerator manufacturer.

11. Spare Parts: Vendor shall include the following spare parts:

- VFD (programmed and installed in parallel)
- Main Fan Motor
- Main Fan Bearing
- Main Fan Shaft with Impeller
- Spare Bench Programmed HMI

12. Duct Work: Duct work should be constructed of 14 gauge aluminized steel with a longitudinal welded seam. Fully insulated access doors shall be appropriately located, for access with tools to maintain or replace burner parts, heat exchange components, insulating materials, etc. Doors shall be of furnace construction with heavy duty hinges and articulated,

wing, and handle latches. Doors must be gasketed to prevent leakage. Duct clean-out insulated access plugs are to be installed every 20 feet. All "hot" duct work is to be insulated from roof to incinerator with 4" thick mineral wool and covered with 0.020 inch thick aluminum, with all joints sealed for weather protection. Oven to atmosphere and oven to incinerator bypass dampers and control system should be provided. All dampers, including face to by-pass dampers, are to have access doors for cleaning. Ductwork will be designed to maintain a velocity of 3000 ft. /min. throughout. All duct work support systems, duct dimension weights, and layouts are to be submitted to the plant for approval prior to fabrication. The ductwork support structure where applicable should penetrate the roof to pick up the building support steel. The through roof supports will be sealed free of any leaks. The ductwork design will include the proper amount of expansion joints to allow for temperature changes. Expansion joints are to be spaced properly for the temperature changes and constructed of stainless steel bellows or a fabric type to allow for 700 degrees F operation. A fresh air bypass inlet shall be provided for the startup of the oxidizer and to prevent excess temperatures. All dampers are to have steel machined seats.

12A. Ductwork is to include 11 face and by-pass dampers and an emergency shut off (isolation) damper at the entrance to the RTO. These dampers are to be spring loaded for a fail-safe position. The oven face & by-pass dampers are to fail open to atmosphere, while the emergency damper is to fail in a closed position. Anytime the RTO is down the emergency damper must be closed.

12B.The tie–in of each process source to the main ductwork will be done on a scheduled basis in agreement with the plant schedule.

12C Dampers
Fresh Air/Inlet Purge Damper – A fresh air damper with pneumatic actuator shall be provided for oxidizer start up and purging.

Oxidizer Isolation damper – One damper shall be provided to isolate the oxidizer from the process. This allows the oxidizer to be started up in isolation from the process and provides an additional safety feature.

Tempering Air Damper – A damper shall be provided in the outlet manifold of the oxidizer which will open during bake out to allow cooling air into the duct, thus protecting the exhaust fan and stack.

13. Electrical: All electrical panels are to be self-standing. Controls are to be an Allen Bradley PLC, and Allen Bradley push buttons and monitoring lights. A damper monitoring and troubleshooting display will be part of the

control system, designed to show a colored pictorial display of the RTO and associated damper operation.

All electrical wires will be numbered with PLC addresses used as wire numbers and 3 complete sets of electrical prints and programs will be provided by the manufacturer. V.F. drive specified as Allen Bradley or equivalent. Temperature controls will be Honeywell 450 R and Honeywell UDC 200. The 450 R will have 4 pens recording capability, recording a minimum of inlet temperature, main chamber temperature, exhaust temperature, and inlet duct static pressure. The electrical control system should provide for individual oven purging to the atmosphere. After the flame is established and the incinerator is at temperature, the ovens switch from atmosphere to the oxidizer. Damper position monitoring should be provided. A damper bypass switch should be provided for each oven in the control monitor.

14. All interconnecting wires between the RTO and the bypass dampers and oven are to be provided by the contractor.

15. Piping: Gas burners are to be Lo-NOx burners with a piping train satisfactory for NFPA Standards and approval. A gas totalizing meter should be part of the piping train.

E. Installation: Installation is to be a turnkey installation that supplies equipment that will give the plant air quality that is compliant with EPA regulations. All “hot” ductwork above the roof should be insulated. Unless otherwise approved by Crown, the contractor must take the necessary precautions in making roofing penetration to prevent roof leaks.

F. Warranty: A five year guarantee to meet and maintain 98.5% destruction with 95% thermal recovery. A five year warranty should include diverter valves, valve operators, exhaust blower and V.F. drive, stoneware, and /or heat exchanger.

G. Maintenance: Manufacturer should provide 3 sets of manuals detailing spare parts, operation procedures, and maintenance.

H. Training: An annual inspection with time allotted for training should be a separate part of the quote. The contract is to cover a period of five years.

The manufacturer should provide necessary training on electrical, mechanical and maintenance.

I. Crown will provide:

1. Insulated duct work (ovens) below the roof.
2. EPA and local operating permits.
3. 3000 PSF soil conditions.
4. Natural Gas at 5.0 PSIG within 25 ft. of center line of units.
5. Adequate storage area and work area for contractors.
6. Sufficient power within 25 ft. of control panels.
7. Assistance in balancing system at start up.
8. Compliance testing by independent third party to establish oxidizer Hydrocarbon Destruction Efficiency -- First test only.

J. Quote:
a) Should also contain an installation schedule (Gantt Chart) that includes detailing and has clear milestones that can be related to a payment schedule. The schedule should indicate key deliverables by day and month.
b) The schedule must have a defined overall duration.
c) Project Management – include a Project Management structure and how you will interface with Crown and the procedures that will be used to ensure compliance to all Crown expectations of health and safety and for contractor selection etc.
c) Costs -- The costs associated with this project should be split into management costs (Installation, supervision, commissioning etc.) and then the actual equipment costs.

K. Organize Quote as Follows:

1. Equipment description and costs quoted in U.S. Dollars.
2. Operating costs
   a. Utilities
   b. Cost for extended five year annual maintenance contract
3. Installation schedule
4. Engineering drawings

APPENDIX D
SAFTEY DATA SHEETS

Bodymaker Coolant
(prior to dilution with water to an approximate 3% solution strength)

Material Safety Data Sheet

Material Name: DTI 350 COOLANT ID: 239481BULK / IDH No. 772640

* * * Section 1 - Chemical Product and Company Identification * * *

Product Trade Name DTI 350 COOLANT

Manufacturer Information

Henkel Technologies
Henkel Corporation
32100 Stephenson Highway
Madison Heights, MI 48071

Contact Phone: (248) 583-9300

Chemtrec Emergency # (800) 424-9300

* * * Section 2 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
Proprietary	Amine soap	10-30
111-75-1	N-Butylethanolamine	1-10
64-02-8	Tetrasodium EDTA	1-10
7747-35-5	Industrial Preservative	1-10
102-71-6	Triethanolamine	1-10
64665-57-2	Tolyltriazole, sodium salt	1-10

* * * Section 3 - Hazards Identification * * *

Emergency Overview:

WARNING! Contact with this product may cause severe eye irritation. This product may cause irritation to the skin.

Eye Contact:

This product may be severely irritating to the eyes.

Skin Contact:

This product may cause irritation to the skin.

Skin Absorption:

None expected.

Ingestion:

Ingestion of this product is unlikely. However, ingestion of product may produce gastrointestinal irritation and disturbances.

Inhalation:

Inhalation of vapors or mists of the product may be irritating to the respiratory system.

Medical Conditions Aggravated by Exposure:

Pre-existing eye, skin and respiratory disorders.

* * * Section 4 - First Aid Measures * * *

Eye Contact:

Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

Skin Contact:

For skin contact, flush with large amounts of water. Seek immediate medical attention.

Ingestion:

If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting.

Inhalation:

If symptoms are experienced, remove source of contamination or move victim to fresh air. Call a physician if symptoms develop or persist.

First Aid: Notes to Physician

Provide general supportive measures and treat symptomatically.

*** Section 5 - Fire Fighting Measures ***

Flash Point:	>212 °F	**Method Used:**	Calculated	**Flammability Classification:**	Non-flammable
Upper Flammable Limit (UFL):	Not applicable	**Lower Flammable Limit (LFL):**	Not applicable		

Fire & Explosion Hazards:
This product is an aqueous mixture which will not burn.

Decomposition Products:
Irritating and toxic gases or fumes may be released during a fire.

Extinguishing Media:
Use any media suitable for the surrounding fires.

Fire-Fighting Instructions:
Firefighters should wear full protective clothing including self contained breathing apparatus.

*** Section 6 - Accidental Release Measures ***

Containment Procedures:
Stop the flow of material, if this is without risk. Wear appropriate protective equipment and clothing during clean-up.

Clean-Up Procedures:
Absorb spill with inert material. Shovel material into appropriate container for disposal. Dispose of collected material according to regulation.

*** Section 7 - Handling and Storage ***

Handling Procedures:
Avoid contact with eyes, skin and clothing. Avoid breathing vapors or mists of this product. Use this product with adequate ventilation. Wash thoroughly after handling. Do not take internally.

Do not mix with nitrates.

Storage Procedures:
Manufacturer recommends storing above 40 °F. Do not store above 100 °F. Thaw and mix thoroughly if frozen. Keep container tightly closed and in a cool, well-ventilated place away from incompatible materials.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines:
A: General Product Information
Follow all applicable exposure limits.

B: Component Exposure Limits
Triethanolamine (102-71-6)
ACGIH: 5 mg/m3 TWA

Engineering Controls:
Ventilation should effectively remove and prevent buildup of any vapor or mist generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT
As prescribed in the OSHA Standard for Personal Protective Equipment (29 CFR 1910.132), employers must perform a Hazard Assessment of all workplaces to determine the need for, and selection of, proper protective equipment for each task performed.

Eyes/Face Protective Equipment:
Wear safety glasses; chemical goggles (if splashing is possible).

Skin Protection:

Use impervious gloves. Gloves should be tested to determine suitability for prolonged contact. Use of impervious apron and boots are recommended.

Respiratory Protection:

If ventilation is not sufficient to effectively prevent buildup of aerosols or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Work Practices:

Eye wash fountain and emergency showers are recommended.

* * * Section 9 - Physical & Chemical Properties * * *

Physical State:	Liquid	**Appearance:**	Pale Yellow
Odor:	Mild Amine	**Vapor Pressure:**	Not applicable
Vapor Density:	Not applicable	**Boiling Point:**	>212 °F or 100°C
Specific Gravity:	1.018 at 72 °F (22 °C)	**pH:**	9.9
Viscosity:	Not applicable	**VOC:**	Not applicable
Solubility Water:	Complete	**Evaporation Rate:**	Not applicable
Octanol-Water Coefficient:	Not applicable	**Percent Volatile:**	Not determined
Percent Solids:	>40		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability:

Stable under normal conditions.

Conditions to Avoid:

None expected.

compatibility:

This product may react with strong acids or oxidizing agents. Do not mix with nitrites.

Decomposition Products:

Upon decomposition, this product may yield oxides of nitrogen and ammonia, carbon dioxide, carbon monoxide and other low molecular weight hydrocarbons.

Hazardous Polymerization:

Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity:

A: General Product Information

No information available for the product.

B: Component Analysis - LD50/LC50

N-Butylethanolamine (111-75-1)
Oral LD50 Rat: 1150 mg/kg

Tetrasodium EDTA (64-02-8)
Oral LD50 Rat: 1658 mg/kg

Triethanolamine (102-71-6)
Oral LD50 Rat: 4190 mg/kg; Dermal LD50 Rabbit: >2000 mg/kg

Carcinogenicity:

A: General Product Information

No information available for the product.

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Chronic Toxicity

None expected.

Epidemiology:

No information available for the product.

Neurotoxicity:

No information available for the product.

Mutagenicity:

No information available for the product.

Teratogenicity:

No information available for the product.

Other Toxicological Information:

None available.

* * * Section 12 - Ecological Information * * *

Ecotoxicity:

A: General Product Information

No data available for this product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Tetrasodium EDTA (64-02-8)

Test & Species		Conditions
96 Hr LC50 bluegill sunfish	490 mg/L	static

Triethanolamine (102-71-6)

Test & Species		Conditions
24 Hr LC50 goldfish	5000 mg/L	
96 Hr LC50 fathead minnow	11800 mg/L	flow-through

Environmental Fate:

No data available for this product.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Numbers & Descriptions:

A: General Product Information

Material, if discarded, is not expected to be a characteristic hazardous waste under RCRA.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions:

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

* * * Section 14 - Transportation Information * * *

US DOT Information

Shipping Name: Please refer to the container label for transportation information.

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

B: Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

SARA 311/312: Acute: Yes **Chronic:** No **Fire:** No **Pressure:** No **Reactive:** No

State Regulations

A: General Product Information

No additional information available.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Triethanolamine	102-71-6	No	No	Yes	Yes	No	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.

Other Regulations

A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
N-Butylethanolamine	111-75-1	Yes	Yes	Yes
Tetrasodium EDTA	64-02-8	Yes	Yes	Yes
Industrial Preservative	7747-35-5	Yes	Yes	Yes
Triethanolamine	102-71-6	Yes	Yes	Yes
Tolyltriazole, sodium salt	64665-57-2	Yes	Yes	Yes
Industrial Preservative	2224-44-4	No	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Triethanolamine	102-71-6	1 %

* * * Section 16 - Other Information * * *

NFPA Ratings: Health: 2 **Fire:** 0 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
HMIS Ratings: Health: 2 **Fire:** 0 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NFPA = National Fire Protection Association; HMIS = Hazardous Material Identification System; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act

The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Henkel Surface Technologies bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

Contact: Regulatory Affairs and Product Acceptance
Contact Phone: (248) 583-9300

This is the end of MSDS # 239481BULK / IDH No. 772640

Technical Process Bulletin

This Revision: 03/28/2012

DTI SNL-3 Cupper

1. Introduction:

DTI SNL-3 Cupper is a semi-synthetic Cupper lubricant which is designed for handling a wide range of cupping requirements and is particularly beneficial in its ability to eliminate bleed through, provide outstanding interior can cleanliness and long tool life. This lubricant can be used in neat form when applied with Henkel's APPLI-COATER™ system. The DTI SNL-3 Cupper is considered the core of a total lubricant package which includes the DTI series of post lubricants and bodymaker lubricants.

2. Operating Summary:

Operation and Control:

Concentration	Neat
Temperature	Ambient
Lubricant Feed Rate	Adjustable to achieve desired cup weight
Cup Weight	15-30 mg/cup

3. The Process:

The complete process normally consists of the following steps:

A. Adding DTI SNL-3 Cupper lubricant to the day or supply tank.
B. An in-line heater may be utilized between the tank and the injectors.
C. The utilization of the APPLI-COATER™ system(a neat cupping lubricant applicator available from Henkel) to apply a thin and uniform coating of DTI SNL-3 Cupper lubricant to both sides of the aluminum coil surface.
D. Adjusting the cupper stroke counting system to achieve the desired cup weight (15-30 mg/cup).
E. Feeding the lubricated aluminum sheet to the cupping press using feed rolls.
F. Blanking the sheet to form a round disk and then drawing the disk to form a cup.
G. Sending the cups to the bodymakers for redrawing and ironing.

4. Materials:

DTI SNL-3 Cupper
Testing Reagents and Apparatus

5. Equipment:

The APPLI-COATER™ unit is to be installed on the in-feed side of traditional neat oil dip tank application systems.

Squeegee rolls must be at 80-85 durometer hardness. Periodically these rolls should be re-covered. This should be accomplished on an annual basis or more often if roll conditions warrant. Hypalon™ is the roll covering of choice. The normal grind finish is satisfactory.

The lower (driven) feed roll on the cupper must have a rough "shot blasted" surface. A smooth feed roll may result in coil indexing problems.

Process piping and pumps should be constructed of corrosion resistant steel. Special care must be used when selecting metal fittings to minimize "mixed-metal" cell corrosion potential whereby accelerated corrosion may take place.

All process circulation pump seals, valve seats, etc., which come into contact with the process solution should manufactured from Viton, Teflon, or 26% Nitrile Buna-N.

Chemical feed pump parts and other elastomers which may come into contact with the concentrated replenishing chemical should be constructed of Viton, Teflon, or 26% Nitrile Buna-N. Polyurethanes, Acetal, Natural Rubber and Polyolefins are not suitable.

It is preferred that cupper tooling be constructed tungsten carbide with nickel binder. Cobalt binder may also be used per the specifications supplied by the equipment manufacturer.

6. Pretreatment - Post Lubricant:

DTI series post lubricants are preferred for all metal which will be cupped by DTI SNL-3 Cupper to ensure proper lubrication and metal control.

7. Lubrication of D&I cans with DTI SNL-3 Cupper:

Operation:

Temperature:	Ambient
Feed Rate:	Adjustable to achieve desired cup weight
Filtration:	80 mesh strainer

8. Testing and Control:

The following tests should be performed at least once every 12 hours.

Cup Weight:

The cup weights are measured by using WI MH - Research & Development 942 A.6.1-14.

Cup Weight Range: 15-30 mg/cup.

9. After Treatment:

Drawing and Ironing:

The DTI series body maker lubricants are designed to work synergistically with DTI SNL-3 Cupper to ensure proper lubrication and metal control during the redraw and ironing operation.

After Forming:

The cans should be cleaned and conditioned with the appropriate Henkel Corporation cleaners, surface conditioners and mobility enhancers.

Your Henkel representative will recommend an overall body maker coolant and cleaner/conditioner/mobility package which suits your specific needs and requirements.

10. Storage Requirements:

The DTI SNL-3 Cupper should be protected from water contamination. DTI SNL-3 Cupper has good temperature stability; however, keeping the product below 100° F will ensure maximum shelf life.

11. Waste Disposal Information:

Applicable regulations covering disposal and discharge of chemical should be consulted and followed.

Disposal information for the chemicals, in the form as supplied, is given on the Material Safety Data Sheet.

The plant effluent and sludge can contain ingredients other than those present in the chemical as supplied and analysis of the solution and/or sludge may be required prior to disposal.

12. Precautionary Information:

When handling the chemical products used in this process, the first aid and handling recommendations on the Material Safety Data Sheet should be read, understood, and followed.

DTI SNL-3 Cupper concentrate may cause irritation of the skin and eyes. Do not get in eyes, on skin, or on clothing. In case of contact, follow the recommendations on the Material Safety Data Sheet.

Henkel Technologies
32100 Stephenson Highway
Madison Heights, MI 48071
Telephone: 248-583-9300
Fax: 248-583-2976

Form Revised 04 June 2001

Cupper Lubricant

Material Safety Data Sheet

Revision Number: 001.0

Issue date: 01/19/2012

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: DTI SNL-3 CUPPER LUBE
Product type: Lubricant

IDH number: 1662535

Region: United States

Company address:
Henkel Corporation
32100 Stephenson Highway
Madison Heights, MI 48071

Contact information:
Telephone: 248.583.9300
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Physical state: Liquid
Color: Amber
Odor: Mild

HMIS:
HEALTH: 1
FLAMMABILITY: 1
PHYSICAL HAZARD: 0
Personal Protection: See MSDS Section 8

CAUTION: CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION. ASPIRATION HAZARD IF SWALLOWED.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: This product is irritating to the respiratory system.
Skin contact: Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis. Contact with skin can cause irritation and allergic reaction (sensitization) in some individuals.
Eye contact: Contact with eyes can cause eye irritation. May cause severe eye irritation.
Ingestion: Ingestion can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Small amounts of this product, if aspirated into the lungs, may cause mild to severe pulmonary injury.

Existing conditions aggravated by exposure: Eye, skin and respiratory disorders.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Petroleum distillates, solvent-refined heavy paraffinic	Proprietary	30 - 60
Stearic acid ester	Proprietary	10 - 30
Fatty acid ester	Proprietary	10 - 30
Isooctadecanoic acid	30399-84-9	5 - 10
Tris(2-ethylhexyl) phosphate	78-42-2	1 - 5

4. FIRST AID MEASURES

Inhalation:	If mist or vapor of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.
Skin contact:	Immediately wash skin thoroughly with soap and water. Obtain medical attention if irritation persists.
Eye contact:	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Ingestion:	Seek medical advice. DO NOT induce vomiting unless directed to do so by medical personnel.
Notes to physician:	This material, if aspirated into the lungs, may cause chemical pneumonitis; treat the affected person appropriately.

5. FIRE FIGHTING MEASURES

Flash point:	> 175 °C (> 347°F) calculated
Autoignition temperature:	Not determined
Flammable/Explosive limits - lower:	Not determined
Flammable/Explosive limits - upper:	Not determined
Extinguishing media:	Water spray (fog), foam, dry chemical or carbon dioxide.
Special firefighting procedures:	Wear full protective clothing. Wear self-contained breathing apparatus.
Unusual fire or explosion hazards:	This product is combustible at high temperatures.
Hazardous combustion products:	Irritating and toxic gases or fumes may be released during a fire. Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Prevent further leakage or spillage if safe to do so. Wear appropriate protective equipment and clothing during clean-up.
Clean-up methods:	Absorb spill with inert material. Shovel material into appropriate container for disposal. Dispose of according to Federal, State and local governmental regulations.

7. HANDLING AND STORAGE

Handling:	Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling. Do not take internally. For industrial use only. Launder work clothes frequently. Do not pressurize, cut, heat or weld containers. Empty product containers may contain product residue. Do not reuse empty containers.
Storage:	For safe storage, store between 10 °C (50°F) and 40 °C (104°F) Keep closed in a cool, dry area.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Petroleum distillates, solvent-refined heavy paraffinic	5 mg/m3 TWA Inhalable fraction. 5 mg/m3 TWA mist 10 mg/m3 STEL mist	500 ppm (2,000 mg/m3) TWA 5 mg/m3 TWA Mist. 5 mg/m3 TWA mist	None	None
Stearic acid ester	None	None	None	None
Fatty acid ester	None	None	None	None
Isooctadecanoic acid	None	None	None	None
Tris(2-ethylhexyl) phosphate	None	None	None	None

Engineering controls: Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.

Respiratory protection: If ventilation is not sufficient to effectively prevent buildup of aerosols, mists or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Eye/face protection: Wear chemical goggles; face shield (if splashing is possible).

Skin protection: Wear impervious gloves for prolonged contact. Use of impervious apron and boots are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid
Color: Amber
Odor: Mild
Odor threshold: Not available.
pH: Not applicable
Vapor pressure: Not determined
Boiling point/range: Not determined
Melting point/ range: Not determined
Specific gravity: 0.866
Vapor density: Not determined
Flash point: > 175 °C (> 347°F) calculated
Flammable/Explosive limits - lower: Not determined
Flammable/Explosive limits - upper: Not determined
Autoignition temperature: Not determined
Evaporation rate: Not determined
Solubility in water: Not available.
Partition coefficient (n-octanol/water): Not determined
VOC content: Not available.

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions.

Hazardous reactions: Will not occur.

Hazardous decomposition products: Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons. Oxides of phosphorus.

Incompatible materials: This product may react with strong oxidizing agents. This product may react with strong reducing agents.

Conditions to avoid: Avoid excessive heat and ignition sources.

11. TOXICOLOGICAL INFORMATION

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Petroleum distillates, solvent-refined heavy paraffinic	No	No	No
Stearic acid ester	No	No	No
Fatty acid ester	No	No	No
Isooctadecanoic acid	No	No	No
Tris(2-ethylhexyl) phosphate	No	No	No

Hazardous components	Health Effects/Target Organs
Petroleum distillates, solvent-refined heavy paraffinic	Irritant
Stearic acid ester	Irritant
Fatty acid ester	Skin
Isooctadecanoic acid	No Target Organs
Tris(2-ethylhexyl) phosphate	Irritant, Some evidence of carcinogenicity

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal. This chemical contains phosphates.

Hazardous waste number: Material, if discarded, is not expected to be a characteristic hazardous waste under RCRA.

14. TRANSPORT INFORMATION

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12(b) Export Notification: None above reporting de minimus

CERCLA/SARA Section 302 EHS: None above reporting de minimus
CERCLA/SARA Section 311/312: Immediate Health

CERCLA/SARA 313:	None above reporting de minimus
California Proposition 65:	No California Proposition 65 listed chemicals are known to be present.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
WHMIS hazard class:	D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: First issue.

Prepared by: John DiCerbo, Sr. Regulatory Affairs Specialist

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INX®

Typical Decorator Ink

MATERIAL SAFETY DATA SHEET

Hazardous Materials Information System (HMIS) Ratings

HEALTH = 1 **FIRE = 1** **REACTIVITY = 0** **PROTECTIVE EQUIPMENT = B**

Revision Date: 11-10-2006 **Supercedes Date:** 10-28-2004

I. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Number:	GEN0003
Material Description:	Product Line MSDS for 2-Piece Metal Deco Inks (AP, Poly & WBV Inks)
Manufacturers Name:	INX International Ink Co.
Manufacturers Address:	150 N Martingale Rd, Suite 700, Schaumburg, IL 60173
24 Hour Emergency Phone:	800.535.5053 INFOTRAC 24 Hour Spill and Emergency
Product Safety (EHS) Phone:	630-382-1800 x1450
MSDS Email Information:	msds@inxintl.com

II. COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS

Chemical Name	CAS #	Weight %	OSHA PEL	ACGIH TLV
Resin, Melamine Formaldehyde	N/AV	7 - 18	Formaldehyde: 0.75 ppm 8hr TWA; 2ppm 15min STEL	Formaldehyde: 0.3ppm ceiling
Diethylene Glycol Monohexyl Ether	112-59-4	5 - 15	No PEL established	ND
Dibutylaminoethanol	102-81-8	1 - 7	No PEL established	0.5 ppm TWA 3.5 mg/m3 TWA

Black inks contain carbon black, which has been reclassified by IARC as a Class 2B carcinogen. Refer to Section III.

III. HAZARDS IDENTIFICATION

Routes of Entry: Eyes, skin, and inhalation.

Aggravated Medical Conditions: Respiratory disease including asthma and bronchitis. Skin allergies such as eczema.

Immediate (Acute) Health Effects:

Eye Contact: Can cause moderate irritation, tearing and reddening, but not likely to permanently injure eye tissue.

Skin Contact: Can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.

Inhalation: Can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache. At high processing temperatures, formaldehyde may be released in excess of 0.5 ppm. Inhalation of formaldehyde at concentrations as low as 1.0 to 2.0 ppm or less may irritate the nose and throat of some individuals. Symptoms of exposure to higher levels may include burning of the nose and throat, tearing of the eyes, cough, chest tightness, and difficulty in breathing.

Ingestion: Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.

Long-Term (Chronic) Health Effects:

Eye Contact:	Upon prolonged or repeated contact, can cause moderate irritation, tearing and reddening, but not likely to permanently injure eye tissue.
Skin Contact:	Upon prolonged or repeated contact, can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.
Inhalation:	Upon prolonged and/or repeated exposure, can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache. Respiratory tract sensitization, characterized by asthma-like symptoms such as tightness in the chest, difficulty breathing, and wheezing may result from prolonged or repeated inhalation of dust/processing fumes of this product. Prolonged inhalation may be harmful.
Skin Absorption:	Moderate absorption skin hazard. May cause minor systemic damage.
Carcinogenicity/Mutagenicity:	Contains a substance that is a possible cancer hazard based on high dose animal studies and/or a human study. Formaldehyde may be released in excess of 0.5 ppm at elevated processing temperatures. Formaldehyde is classified as a Class 2A (suspect human) carcinogen by ACGIH. No data available to indicate product or any components present at greater than 0.1% is mutagenic or genotoxic.
Reproductive Toxicity:	No data available to indicate product or any components present at greater than 0.1% may cause birth defects.

NIOSH Listed Target Organs for Hazardous Components:

2-N-Dibutylaminoethanol	102-81-8	eyes, skin, respiratory system
Carbon black	1333-86-4	respiratory system, eyes, lymphatic cancer (in dust form only)

IV. FIRST AID

Eyes:	Flush eyes for 20 minutes. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Seek medical advice if symptoms persist.
Inhalation:	Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen.
Skin Contact:	Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists.
Ingestion:	Do not induce vomiting and seek medical attention if any symptoms occur. If necessary, drink two glasses of water or milk to dilute. Provide medical care provider with this MSDS.

V. FIRE FIGHTING MEASURES

Flammability Summary:	**Combustible at elevated temperatures. NFPA Class IIIB Liquid.**
Flash Point:	Flash point is > 100 C (212 F).
Explosive Limits, % in air:	1.1 Lower 6.3 Upper
Fire Hazards:	Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire. Material will burn in a fire.
Extinguishing Media:	Use alcohol resistant foam, carbon dioxide, or dry chemical when fighting fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the surface of the fire. Do not direct a stream of water into the hot burning liquid.
Fire Fighting Instructions:	Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.
Hazardous Combustion Products:	Carbon monoxide. Formaldehyde. Nitrogen containing gases. Hydrocarbons. Carbon dioxide.

VI. ACCIDENTAL RELEASE MEASURES

Spill Health Precautions:	Avoid unnecessary contact and reference the health effects listed in Section III. Follow personal protective equipment recommendations in Section VIII.

Spill Mitigation Procedures

General Methods:	Prevent the spread of any spill to minimize harm to human health and the environment if safe to do so. Dike liquid materials with a suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal evaluation.
Water Spills:	Avoid runoff into storm sewers and ditches that lead to waterways.
Land Spills:	Do not flush to sewer.

VII. HANDLING AND STORAGE

Handling:	Mildly irritating material. Avoid unnecessary exposure. Follow all protective equipment recommendations provided in Section VIII. As with all chemicals, good industrial hygiene practices should be followed when handling this material. Wash hands before eating.
Storage:	Store in a cool dry place. Isolate from incompatible materials.

VIII. ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

Engineering Controls:	Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure. Engineering controls must be designed to control vapor concentrations to below levels published in 29 CFR 1910.1000. Ventilation should effectively remove and prevent buildup of any vapor/mist/fume generated from the handling of this product. Good general room ventilation should be sufficient to control airborne contaminates to safe levels.

Protective Equipment

Respiratory:	A respirator may be required to avoid overexposure when handling this product, however general or local exhaust ventilation will typically provide sufficient protection. Follow a respiratory protection program that meets 29 CFR 1910.134 and ANSI Z88.2 requirements whenever work place conditions warrant the use of a respirator. If an exposure limit is exceeded or if an operator is experiencing symptoms of inhalation overexposure as explained in Section III, provide respiratory protection. Wear a NIOSH/MSHA-approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions
Eyes:	Wear safety glasses when handling this product to avoid splashing or misting. Wear chemical splash goggles if splashing or high-pressure system is used.
Skin:	Wear protective gloves. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work. Have a safety shower available. Natural rubber Neoprene

IX. PHYSICAL DATA

Physical State & Color:	Depends upon product selection. The color additives do not affect product hazards. Paste
Odor:	Moderate Irritating.
Vapor Density:	~ 6.56
Evaporation Rate:	~ 0.99

Specific Gravity, Density, Volatile Percent, VOC Percent, and Coating VOC values are given as ranges representative of the base colors for this product line. Physical data for a specific formulation may be derived from the CPDS (Certified Product Data Sheet). Customers may also request an itemized report of regulated constituents based on sales history for a given period.

Boiling Point:	200 - 259 deg. C	392 - 498 deg. F
Specific Gravity / Density Range:	1.06 - 1.68	8.83 - 13.99 lb/gal
Volatile Percent Range:	9.65 - 21.90 Weight %	17.70 - 25.46 Volume %
VOC Percent Range:	9.75 - 21.90 Weight %	17.85 - 25.46 Volume %
Coating VOC Range:	1.36 - 1.93 lb/gal	163 - 232 g/L

X. STABILITY AND REACTIVITY

Stability Information:	Stable under normal conditions.
Conditions to Avoid:	Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition. High temperatures and pressures.
Chemical Incompatibility:	Oxidizing materials. Strong acids.

XI. TOXICOLOGICAL INFORMATION

Chemical Name	CAS Number	LD50/LC50
1,3,5-Triazine-2,4,6-triamine, polymer with formaldehyde, methylated	N/AV	Oral LD50 Rat : 12300 uL/kg
Ethanol, 2-((2-hexyloxy)ethoxy)-	112-59-4	Oral LD50 Rat : 2400 mg/kg; Dermal LD50 Rabbit : 1500 uL/kg
Ethanol, 2-(dibutylamino)-	102-81-8	Oral LD50 Rat : 1070 mg/kg; Dermal LD50 Rabbit : 1680 uL/kg
Carbon black	1333-86-4	Oral LD50 Rat : >15400 mg/kg; Dermal LD50 Rabbit : >3 gm/kg

XII. ECOLOGICAL INFORMATION

Overview (for ingredients): Keep out of waterways.

XIII. DISPOSAL CONSIDERATIONS

Spent Material Characteristics:	Spent or discarded material is not expected to be a hazardous waste. The waste may be a "special" waste.
Disposal Methods:	Clean up and dispose of according to federal, state, and local environmental regulations.
Potential EPA Waste Codes:	None Known.

Components Subject to USEPA Land Disposal Restrictions:
No chemicals subject to land disposal restrictions.

XIV. TRANSPORTATION INFORMATION

Proper Shipping Name	Hazard Class	UN/NA Number	Packing Group	ERG Number	Subsidiary Risks
DOT & IATA: Not Restricted.	N/AP	N/AP	N/AP	N/AP	

XV. REGULATORY INFORMATION

This MSDS covers multiple products as described by Section I Chemical Product and Company Information. The regulatory information listed below is representative of an average amount that could be expected within the product line. Disclosure of a specific chemical does not indicate that the chemical is present in all formulations covered by this Generic MSDS, but rather that it is present in one or more formulations. Regulatory information for a specific formulation may be derived from the CPDS (Certified Product Data Sheet). Customers may also request an itemized report of regulated constituents based on sales history for a given period.

Toxic Substances Control Act (TSCA): All components in this product are on the TSCA Inventory.

SARA Title III, Section 313; Toxic Chemicals:	**CASRN:**	**Weight %:**
Glycol Ethers	112-59-4	5.83 - 14.85

Red, Maroon, Purple, Brown, Tan, and Orange colors MAY contain Barium Compounds from the pigment. Blue DYE colors MAY contain Copper Compounds from the colorant. Black DYE colors MAY contain Chromium Compounds from the colorant. Metallic Silver colors MAY contain Aluminum Compounds from the pigment. Metallic Gold colors MAY contain Copper and Zinc from the pigment.

Clean Air Act; Hazardous Air Pollutants:	**CASRN:**	**Weight %:**
Glycol Ethers	112-59-4	5.83 - 14.85

California; Proposition 65:	**CASRN:**	**Weight %:**

carcinogen - initial date 1/1/88 Formaldehyde (gas)	50-00-0	<10ppm

Red colors MAY contain D&C Red No. 9 (CASRN 5160-02-1)
carcinogen - initial date 7/1/90

Toxic Substances Control Act (TSCA); Section 12(b): **CASRN:**
No TSCA 12(b) listed chemicals present

XVI. ADDITIONAL INFORMATION Disclaimer: The information provided herein is presented in good faith and complies with the OSHA Hazard Communication Standard, 29 CFR 1910.1200 (g). Nothing contained herein constitutes a specification nor does it guarantee warranty for said product. HMIS ratings are provided only as a suggestion, and should be used in conjunction with the complete MSDS information presented herein.

Can Washer - Surface Treatment Chemical

Revision Number: 002.3

Issue date: 02/13/2013

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: #ME-50
Product type: Surfactant Mixtures

IDH number: 721138

Region: United States

Company address:
Henkel Corporation
32100 Stephenson Highway
Madison Heights, MI 48071

Contact information:
Telephone: 248.583.9300
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state:	Liquid	**HEALTH:**	2
Color:	Colorless	**FLAMMABILITY:**	0
Odor:	Surfactant	**PHYSICAL HAZARD:**	0
		Personal Protection:	See MSDS Section 8

WARNING: CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: Inhalation of vapors or mists of the product may be irritating to the respiratory system.
Skin contact: This product may cause irritation to the skin.
Eye contact: This product may be severely irritating to the eyes.
Ingestion: Ingestion of this product may cause nausea, vomiting and diarrhea.

Existing conditions aggravated by exposure: Eye, skin and respiratory disorders.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Surfactant(s)	Proprietary	5 - 10

4. FIRST AID MEASURES

Inhalation: If mist or vapor of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.

Skin contact: Immediately wash skin thoroughly with soap and water. If symptoms develop and persist, get medical attention.

Eye contact: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Ingestion: Get medical attention. DO NOT induce vomiting unless directed to do so by medical personnel.

5. FIRE FIGHTING MEASURES

Flash point: Not applicable

Autoignition temperature: Not applicable

Flammable/Explosive limits - lower: Not applicable

Flammable/Explosive limits - upper: Not applicable

Extinguishing media: Use media appropriate for surrounding material.

Special firefighting procedures: Wear full protective clothing. Wear self-contained breathing apparatus.

Unusual fire or explosion hazards: This product is an aqueous mixture which will not burn.

Hazardous combustion products: Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Wear appropriate protective equipment and clothing during clean-up.

Clean-up methods: Absorb spill with inert material. Shovel material into appropriate container for disposal. Dispose of according to Federal, State and local governmental regulations.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Do not take internally. For industrial use only.

Storage: For safe storage, store between 32 °F (0°C) and 110 °F (43.3 °C)
Keep container tightly closed and in a cool, well-ventilated place away from incompatible materials. Protect from freezing.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Surfactant(s)	None	None	None	None

Engineering controls: Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.

Respiratory protection: If ventilation is not sufficient to effectively prevent buildup of aerosols, mists or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Eye/face protection: Wear chemical goggles; face shield (if splashing is possible).

Skin protection: Chemical resistant, impermeable gloves. Gloves should be tested to determine suitability for prolonged contact. Use of impervious apron and boots are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Colorless
Odor:	Surfactant
Odor threshold:	Not available.
pH:	3 - 7
Vapor pressure:	Not determined
Boiling point/range:	> 98.9 °C (> 210°F)
Melting point/ range:	0 °C (32°F)
Specific gravity:	1.0 - 1.1
Vapor density:	1
Flash point:	Not applicable
Flammable/Explosive limits - lower:	Not applicable
Flammable/Explosive limits - upper:	Not applicable
Autoignition temperature:	Not applicable
Evaporation rate:	0.3 Same as water.
Solubility in water:	Complete
Partition coefficient (n-octanol/water):	Not determined
VOC content:	Not applicable

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions.

Hazardous reactions: Will not occur.

Hazardous decomposition products: Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Incompatible materials: This product may react with strong reducing agents. This product may react with strong oxidizing agents.

Conditions to avoid: Store away from incompatible materials.

11. TOXICOLOGICAL INFORMATION

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Surfactant(s)	No	No	No

Hazardous components	Health Effects/Target Organs
Surfactant(s)	No Records

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal:	Follow all local, state, federal and provincial regulations for disposal.
Hazardous waste number:	Material, if discarded, is not expected to be a characteristic hazardous waste under RCRA.

14. TRANSPORT INFORMATION

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

International Air Transportation (ICAO/IATA)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

Water Transportation (IMO/IMDG)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12(b) Export Notification:	None above reporting de minimus
CERCLA/SARA Section 302 EHS:	None above reporting de minimis
CERCLA/SARA Section 311/312:	Immediate Health
CERCLA/SARA 313:	None above reporting de minimis
California Proposition 65:	No California Proposition 65 listed chemicals are known to be present.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
WHMIS hazard class:	D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: Updated Contact Information in Section 1.

Prepared by: John DiCerbo, Sr. Regulatory Affairs Specialist

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Pariffin Necker Lubricant

POLY ENVIRO LABORATORY, INC.

Material Safety Data Sheet

Section I – Product Identification

Product Name: P. E. 837-MM

Issue Date: February 2013

Manufacturer: Poly Enviro Laboratory Inc.

Generic Name: Petrolatum

Chemical Family: Petroleum derived hydrocarbon

Section II – Ingredients

Paraffin wax fumes, if generated: 2.00 MG/M^3 ACGIH Full term TWA

Paraffin wax fumes, if generated: 2.00 MG/M^3 OSHA, regulation 29 CFR 1910.100

The identities of ingredients that are trade secret are excluded from the list.

Section III – Fire and Explosion Hazard Data

NFPA Hazard Class [Hazard Ranking 0=Least, 1=Slight, 2=Moderate, 3=High, 4=Extreme]:

Health Hazard: = 0 Flammability = 1 Reactivity = 0 Other = Not applicable

DOT Flammability Classification: Not regulated

Flash Point: 480° F

Fire Fighting Procedures: Water spray may be useful in minimizing vapors and cooling containers exposed to heat and flame. Avoid spreading burning liquid with water used for cooling purpose. Move undamaged containers from fire if you can do so without risk.

Section IV – Emergency First Aid Procedure

♦9960 W 191ST STREET UNIT K ♦ MOKENA ILLINOIS 60448 ♦♦TEL: 708-478-1638 ♦ FAX: 708-478-3079♦

Eye Contact:

For exposure to fumes generated during hot melt processing operations, move away from exposure and into fresh air. If redness or irritation develops, seek medical attention. If there is contact with molten product, flush affected eye[s] with cold water and seek medical attention.

Skin Contact:

For contact with molten product, leave material on skin and flush or immerse affected area using cold water. Seek medical attention.

Inhalation [Breathing]:

If irritation of nose and throat develop from exposure to fumes emitted by molten material, move away from source of exposure and into fresh air, If irritation persists, seek medical attention.

Ingestion [Swallowing]:

If irritation of digestive tract develops and persists, seek medical attention.

Section V – Potential Adverse Health Effects

Eye Contact:

Prolonged or repeated exposure to fumes or vapors emitted by the molten material may cause tearing. Contact with molten material may cause thermal burns.

Skin Contact:

Contact with molten material may cause thermal burns.

Inhalation [Breathing]:

Solid material is not volatile, so exposure by inhalation is unlikely. If working with molten material, prolonged or repeated exposure to fumes or vapors may cause irritation of nose and throat.

Ingestion [Swallowing]:

Accidental ingestion of this material may cause irritation of the digestive tract.

Section VI – Special Protection Information

Eye Protection:

Approved eye protection to safeguard against potential eye contact or injury during hot melt processing is recommended.

Protective Gloves:

The use of heat resistant gloves is recommended during hot melt processing.

Respiratory Protection:

No respiratory protection is required when working with solid material. Protection from fumes or vapors emitted from molten material may be necessary if airborne concentrations exceed recommended limits, a suitable filter type respirator should be worn. [See section II]

Ventilation:

Local exhaust is recommended during hot melt processing operations. None required under normal conditions of use.

Section VII – Reactivity Data

Stability: Stable

Conditions to Avoid: Avoid contact with any source of heat.

Incompatibility [Conditions to avoid]: Any contact with strong oxidizing agents.

Hazardous Decomposition Products: Thermal decomposition in the presence of air may yield major amounts of oxides of carbon and minor amounts of oxides of sulfur and nitrogen.

Hazardous Polymerization: Will not occur.

Section VIII – Spill or Leak Procedures

Precautions In Case of Release or Spill:

Sweep up and package appropriately for disposal. For molten material absorb with sand or inert absorbent. Notify appropriate state / local agencies.

Waste Disposal Method:

Dispose of product in accordance with local, county, state and federal regulations.

Section IX – Storage and Special Precautions

Handling and Storage Precautions:

Store in a cool dry location. Keep away from incompatible materials. Contact with any source of heat may cause melting. Avoid prolonged or repeated skin contact.

Water spray may be useful in minimizing vapors and cooling containers exposed to heat and flame. Avoid spreading burning liquid with water used for cooling purpose. Move undamaged containers from fire if you can do so without risk.

Section X – Physical Data

Approximate Boiling Range: Above 650°F

Vapor Density: Not applicable

Evaporation Rate: Not applicable

% Volatile: Negligible

% Solubility: Negligible

Specific Gravity: 0.8 – 0.9

Appearance and Odor: White to dark brown waxy solid. Typical wax odor.

See product data sheet for specifications.

Section XI – Disclaimer of Expressed and Implied Warranties

The information in this document is believed to be correct as of the data issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from the use of this information or the product, the safety of this product, or the hazards related to its use.

This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he or she assume the risk of his or her use thereof.

♦9960 W 191ST STREET UNIT K ♦ MOKENA ILLINOIS 60448 ♦♦TEL: 708-478-1638 ♦ FAX: 708-478-3079♦

Can Washer - HF Acid solution - prior to dilution to a 0.01% HF solution strength

Material Safety Data Sheet

Material Name: RIDOLINE 120WN **ID: 234293PST330 / IDH No. 593980**

* * * Section 1 - Chemical Product and Company Identification * * *

Product Trade Name RIDOLINE 120WN

Manufacturer Information

Henkel Technologies
Henkel Corporation
32100 Stephenson Highway
Madison Heights, MI 48071

Contact Phone: (248) 583-9300

Chemtrec Emergency # (800) 424-9300

* * * Section 2 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
7664-39-3	Hydrogen fluoride	10-30

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Fluorides.

* * * Section 3 - Hazards Identification * * *

Emergency Overview:

DANGER -- CORROSIVE! TOXIC Contact with this material will cause burns to the skin, eyes and mucous membranes. This product is harmful or fatal if swallowed, inhaled, or absorbed through the skin.

Eye Contact:

This product is severely irritating to the eyes and may cause irreversible damage including burns and blindness.

Skin Contact:

This product is severely irritating to the skin and may cause burns. Following skin exposure to this product, the sensation of irritation or pain may be delayed.

Skin Absorption:

A component in this product may be harmful or fatal if absorbed through the skin, especially if skin is damaged. Hydrofluoric acid will penetrate the skin and attack underlying tissue and bone. Large burns (over 25 square inches) may also cause hypocalcemia and other systemic effects which may be fatal.

Ingestion:

This product may produce corrosive damage to the gastrointestinal tract if it is swallowed. Ingestion of small amounts of this product may result in potentially fatal hypocalcemia and systemic toxicity. Ingestion of large amounts of this product may result in fluoride poisoning including symptoms of calcification of the ligaments and severe bone changes making normal movements painful, mottling of the teeth, pulmonary fibrosis, anemia, anorexia, dental effects, and possibly death.

Inhalation:

Inhalation of mists of this product may cause severe irritation and burns to the respiratory tract.

Medical Conditions Aggravated by Exposure:

Pre-existing eye, skin and respiratory disorders.

* * * Section 4 - First Aid Measures * * *

Eye Contact:

In case of contact with the eyes, rinse immediately with plenty of water for 15 minutes, and seek immediate medical attention.

Skin Contact:

Immediately take off all contaminated clothing. Flush with large amounts of water. Soak the affected area for one hour in an iced solution (0.13%) of Zephiran chloride (30 cc of 17% concentrate per gallon of iced distilled water.) GET MEDICAL ATTENTION IMMEDIATELY.

Ingestion:

If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting. Give one to two glasses of water or milk. Never give anything by mouth to a victim who is unconscious or is having convulsions.

Inhalation:

If mist or vapor of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.

First Aid: Notes to Physician

Ocular exposure to corrosive fluoride compounds has been treated with isotonic sodium chloride or magnesium chloride. Dermal exposure to corrosive fluoride compounds has been treated with calcium gluconate or calcium carbonate gel applied topically to the affected areas to relieve pain at the site of exposure. Treatment of hypocalcemia associated with corrosive fluoride compounds exposure may be corrected by intravenous calcium gluconate or calcium chloride. Treatment of hypomagnesemia may be corrected by intravenous magnesium sulfate.

* * * Section 5 - Fire Fighting Measures * * *

Flash Point:	Not applicable	**Method Used:**	Not applicable	**Flammability Classification:**	Non-flammable
Upper Flammable Limit (UFL):	Not applicable	**Lower Flammable Limit (LFL):**	Not applicable		

Fire & Explosion Hazards:

This product is an aqueous mixture which will not bum.

Decomposition Products:

Irritating and toxic gases or fumes may be released during a fire. Flammable and explosive hydrogen gas may be formed when hydrofluoric acid reacts with certain metals. Hydrogen fluoride gas may evolve when chemical is subjected to prolonged high temperature.

Extinguishing Media:

Dry chemical.

Fire-Fighting Instructions:

Firefighters should wear full protective clothing including self contained breathing apparatus.

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures:

Stop the flow of material, if this is without risk. Wear appropriate protective equipment and clothing during clean-up. Block any potential routes to water systems.

Clean-Up Procedures:

Absorb spill with inert material. Shovel material into appropriate container for disposal. Dispose of collected material according to regulation.

* * * Section 7 - Handling and Storage * * *

Handling Procedures:

Do not get this material in your eyes, on your skin, or on your clothing. Do not inhale vapors or mists of this product. Wash thoroughly after handling. Do not take internally. For industrial use only.

Storage Procedures:

Keep container tightly closed and in a cool, well-ventilated place away from incompatible materials. Thaw and mix thoroughly if frozen.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Exposure Guidelines:

A: General Product Information

Follow all applicable exposure limits.

B: Component Exposure Limits

Hydrogen fluoride (7664-39-3)

ACGIH: 0.5 ppm TWA (as F)
2 ppm Ceiling (as F)
OSHA: 3 ppm TWA
6 ppm STEL (as F)
NIOSH: 3 ppm TWA; 2.5 mg/m3 TWA
6 ppm Ceiling (15 min); 5 mg/m3 Ceiling (15 min)

Engineering Controls:

Ventilation should effectively remove and prevent buildup of any vapor or mist generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT

As prescribed in the OSHA Standard for Personal Protective Equipment (29 CFR 1910.132), employers must perform a Hazard Assessment of all workplaces to determine the need for, and selection of, proper protective equipment for each task performed.

Eyes/Face Protective Equipment:

Wear chemical goggles; face shield (if splashing is possible).

Skin Protection:

Use impervious gloves. Gloves should be tested to determine suitability for prolonged contact. Use of impervious apron and boots are recommended.

Respiratory Protection:

If ventilation is not sufficient to effectively prevent buildup of aerosols or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Work Practices:

Eyewash fountains and emergency showers are required.

*** Section 9 - Physical & Chemical Properties ***

Physical State:	Liquid	**Appearance:**	Clear, red
Odor:	Sharp acid	**Vapor Pressure:**	Not determined
Vapor Density:	Not determined	**Boiling Point:**	>212 °F (>100 °C)
Specific Gravity:	1.05 - 1.10 @ 60 °F	**pH:**	<1.0
Viscosity:	Not determined	**VOC:**	Not applicable
Solubility Water:	Complete	**Evaporation Rate:**	Not determined
Percent Volatile:	Not determined	**Percent Solids:**	15-30%

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability:

Stable under normal conditions.

Incompatibility:

This product may react with strong alkalies. This material will react with glass, concrete, certain metals, silica containing materials, rubber, leather, and many organics.

Decomposition Products:

May liberate hydrogen fluoride.

Hazardous Polymerization:

Will not occur.

Environmental Fate:

No data is available concerning the environmental fate, biodegradation or bioconcentration for this product.

*** Section 13 - Disposal Considerations ***

US EPA Waste Numbers & Descriptions:

A: General Product Information

This product, if discarded directly, would be a characteristic RCRA corrosive waste (D002). This product contains a component identified as hazardous under 40 CFR 261.24.

B: Component Waste Numbers

Hydrogen fluoride (7664-39-3)

RCRA: waste number U134 (Corrosive waste, Toxic waste)

Disposal Instructions:

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: Please refer to the container label for transportation information.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Hydrogen fluoride (7664-39-3)

SARA 302: 100 lb TPQ
SARA 313: 1.0 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

SARA 311/312: **Acute:** Yes **Chronic:** Yes **Fire:** No **Pressure:** No **Reactive:** No

State Regulations

A: General Product Information

No additional information available.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Hydrogen fluoride	7664-39-3	Yes	No	Yes	Yes	Yes	Yes

Other Regulations

A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Hydrogen fluoride	7664-39-3	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Hydrogen fluoride	7664-39-3	1 %

*** Section 16 - Other Information ***

NFPA Ratings: Health: 4 **Fire:** 0 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
HMIS Ratings: Health: 4* **Fire:** 0 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NFPA = National Fire Protection Association; HMIS = Hazardous Material Identification System; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act

The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Henkel Surface Technologies bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

Contact: Product Safety and Regulatory Affairs
Contact Phone: (248) 583-9300

This is the end of MSDS # 234293PST330 / IDH No. 593980

Can Washer - H2SO4 Acid Cleaner - Prior to dilution to 8% H2SO4 acid solution strength

Revision Number: 001.0

Issue date: 05/16/2012

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: P3 RIDOLINE 735
Product type: Acidic Cleaner for Industrial Application

IDH number: 1671213

Region: United States

Company address:
Henkel Corporation
32100 Stephenson Highway
Madison Heights, MI 48071

Contact information:
Telephone: 248.583.9300
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state:	Liquid	**HEALTH:**	*3
Color:	Amber	**FLAMMABILITY:**	0
Odor:	Sharp acid	**PHYSICAL HAZARD:**	1
		Personal Protection:	See MSDS Section 8

DANGER–CORROSIVE!: CAUSES EYE, SKIN, DIGESTIVE TRACT, AND RESPIRATORY TRACT BURNS.
POSSIBLE CANCER HAZARD.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: Mists, vapors or liquid may cause severe irritation or burns.
Skin contact: This product is severely irritating to the skin and may cause burns.
Eye contact: This product is severely irritating to the eyes and may cause irreversible damage including burns and blindness.
Ingestion: This product may produce corrosive damage to the gastrointestinal tract if it is swallowed.

Existing conditions aggravated by exposure: Eye, skin and respiratory disorders.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Sulfuric acid	7664-93-9	30 - 60
Polyoxyalkylene	Proprietary	1 - 5
Surfactant	Proprietary	1 - 5
Ferric sulfate	10028-22-5	1 - 5

4. FIRST AID MEASURES

Inhalation: If mist or vapor of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.

Skin contact:	Immediately remove soiled or soaked clothing. For skin contact, flush with large amounts of water. Seek immediate medical attention. If irritation persists, repeat flushing and get medical attention. Discard any shoes or clothing items that cannot be decontaminated.
Eye contact:	In case of contact with the eyes, rinse immediately with plenty of water for 15 minutes, and seek immediate medical attention.
Ingestion:	Seek medical advice. DO NOT induce vomiting unless directed to do so by medical personnel. Give one to two glasses of water or milk. Never give anything by mouth to a victim who is unconscious or is having convulsions.

5. FIRE FIGHTING MEASURES

Flash point:	Not applicable
Autoignition temperature:	Not determined
Flammable/Explosive limits - lower:	Not determined
Flammable/Explosive limits - upper:	Not determined
Extinguishing media:	Use media appropriate for surrounding material.
Special firefighting procedures:	Wear full protective clothing. Wear a self-contained breathing apparatus with a full face piece operated in pressure-demand or other positive pressure mode.
Unusual fire or explosion hazards:	This product is an aqueous mixture which will not burn.
Hazardous combustion products:	Irritating and toxic gases or fumes may be released during a fire.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Prevent further leakage or spillage if safe to do so. Wear appropriate personal protective equipment. Dike the spilled material, where this is possible.
Clean-up methods:	Absorb spill with inert material. Shovel material into appropriate container for disposal.

7. HANDLING AND STORAGE

Handling:	Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling. Do not take internally. For industrial use only. NEVER ADD WATER TO PRODUCT. For dilutions, add product slowly to water while stirring. Use caution; heat may be generated.
Storage:	For safe storage, store at or below 120 °F (48.9 °C) Keep container tightly closed and in a cool, well-ventilated place away from incompatible materials. Thaw and mix thoroughly if frozen.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Sulfuric acid	0.2 mg/m3 TWA Thoracic fraction.	1 mg/m3 TWA	None	None
Polyoxyalkylene	None	None	None	None
Surfactant	None	None	None	None
Ferric sulfate	1 mg/m3 TWA (as Fe)	None	None	None

Engineering controls: Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.

Respiratory protection: If ventilation is not sufficient to effectively prevent buildup of aerosols, mists or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Eye/face protection: Wear chemical goggles; face shield (if splashing is possible).

Skin protection: Chemical resistant, impermeable gloves. Gloves should be tested to determine suitability for prolonged contact. Use of impervious apron and boots are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Amber
Odor:	Sharp acid
Odor threshold:	Not available.
pH:	< 1
Vapor pressure:	Not determined
Boiling point/range:	> 100 °C (> 212°F) calculated
Melting point/ range:	< 0 °C (< 32°F)
Specific gravity:	1.24 - 1.28
Vapor density:	Not determined
Flash point:	Not applicable
Flammable/Explosive limits - lower:	Not determined
Flammable/Explosive limits - upper:	Not determined
Autoignition temperature:	Not determined
Evaporation rate:	Not determined
Solubility in water:	Complete
Partition coefficient (n-octanol/water):	Not determined
VOC content:	Not available.

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions.

Hazardous reactions: None under normal processing.

Hazardous decomposition products: Upon decomposition, this product may yield sulfur dioxide, carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Incompatible materials: This product may react with strong alkalies. Adding water to this product may cause localized overheating and splattering.

Conditions to avoid: Excessive heat.

11. TOXICOLOGICAL INFORMATION

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Sulfuric acid	Known To Be Human Carcinogen.	Group 1	No
Polyoxyalkylene	No	No	No
Surfactant	No	No	No
Ferric sulfate	No	No	No

Hazardous components	Health Effects/Target Organs
Sulfuric acid	Carcinogen, Corrosive, Irritant, Lung
Polyoxyalkylene	No Records
Surfactant	No Target Organs
Ferric sulfate	Eyes, Gastrointestinal, Irritant, Liver, Lung, Metabolic, Vascular

12. ECOLOGICAL INFORMATION

Ecological information: Because of the low pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: This product, if discarded directly, would be a characteristic RCRA corrosive waste (D002).

14. TRANSPORT INFORMATION

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Sulfuric acid
Hazard class or division: 8
Identification number: UN 2796
Packing group: II
DOT Reportable quantity: Sulfuric acid

International Air Transportation (ICAO/IATA)

Proper shipping name: Sulphuric acid
Hazard class or division: 8
Identification number: UN 2796
Packing group: II

Water Transportation (IMO/IMDG)

Proper shipping name: SULPHURIC ACID
Hazard class or division: 8
Identification number: UN 2796
Packing group: II

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12(b) Export Notification: None above reporting de minimus

CERCLA/SARA Section 302 EHS: Sulfuric acid (CAS# 7664-93-9).
CERCLA/SARA Section 311/312: Immediate Health, Delayed Health, Reactive

CERCLA/SARA 313:	This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Sulfuric acid (CAS# 7664-93-9).
CERCLA Reportable quantity:	Sulfuric acid (CAS# 7664-93-9) 1,000 lbs. (454 kg)
California Proposition 65:	This product contains a chemical known in the State of California to cause cancer.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
WHMIS hazard class:	D.1.A, D.2.A, D.2.B, E

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: Updated composition in Section 3.

Prepared by: Jennifer Mckay, Regulatory Affairs Specialist

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UV Bottom Rim Coating

R

MATERIAL SAFETY DATA SHEET

FOR COATING, RESINS, AND RELATED MATERIALS

Prepared by: Regulatory Affairs
Date Prepared- 12-17-08
Manufacturer: WATSON-STANDARD CO.
Address: P.O. Box 11250
Pittsburgh, PA 15328

: CROWN CORK & SEAL, INC
2501 N FRAZIER STREET
CONROE TX 77303

ephone #: (724) 275-1000 Night and Emergency (USA):(800) 424-9300 or
'S Last Prepared: 01-22-08 International Emergency :(703) 527-3887

SECTION I PRODUCT IDENTIFICATION

---

ufacturer's Code Identification: 980-5005 Revision
duct Class:
de Name: UV RIM COAT
S Information: Health- 2 Flammability- 1
Reactivity- 1 Personal Protective Equipment- G

SECTION II HAZARDOUS INGREDIENTS

. PROPRIETARY EPOXY RESIN
WT: 35 - 50

IER LIMITS:
E IRRITANT POSSIBLE SKIN ALLERGEN

---

2 TRADE SECRET MONOMER
BY WT: 5 - 10

IER LIMITS:
OSSIBLE SKIN ALLERGEN

---

3 TRADE SECRET ACRYLIC
BY WT: 1 - 5

POSURE LIMIT:
ACGIH-TLV NOT ESTABLISHED
OSHA-PEL NOT ESTABLISHED

HER LIMITS:
YE IRRITANT SKIN IRRITANT SKIN ALLERGEN

OPYLENE CARBONATE
4 1,2-PROPANEDIOL CARBONAT CAS# 108-32-7
BY WT: 1 - 5 VAPOR PRESSURE: .03 MMHG @ 20C

POSURE LIMIT:
ACGIH-TLV NOT ESTABLISHED

SECTION II HAZARDOUS INGREDIENTS

OSHA-PEL	NOT ESTABLISHED
MAK/TRK (Germany)	NOT ESTABLISHED

This product contains no reported carcinogens or suspected carcinogens.

SECTION III PHYSICAL DATA

.ling Range: High- 468.0 Low- N/A
)or Pressure: See Section II
)or Density: Heavier Than Air
.poration Rate: Slower than Ether
.ght per Gallon: 9.50
:cific Gravity: 1.14
'olatile by Volume: N/A
'olatile by Weight: N/A
:: N/A
'sical State: LIQUID
)earance: MILKY
)r: SWEET
)r Threshold: N/A
: N/A
e' ng Point: N/A
:e Solubility: SLIGHT
efficient of Water/Oil Distribution: N/A
:hanical Impact Explosion: NO
atic Electricity Explosion: NO

SECTION IV FIRE AND EXPLOSION HAZARD DATA

ammability Classification: Class 3B US DOT: Not Regulated
tual Flashpoint TCC: 256.0 F
)er Flammability Limit: N/A
wer Flammability Limit: N/A
to Ignition Temperature: N/A
)ort Classification: Not Regulated
ECIAL FIRE FIGHTING PROCEDURES
move all ignition sources. Wear self-contained breathing apparatus and
mplete personal protective equipment when entering confined areas where
tential for exposures to vapors or products of combustion exists.

SECTION V HEALTH HAZARD DATA

FECTS OF EXCESSIVE OVEREXPOSURE
ports have associated repeated and prolonged occupational overexposure to
lvents with permanent brain and nervous system damage. Intentional
s by deliberately concentrating and inhaling the contents may be

mful or fatal. Do not breathe vapors or spray mist. Wear an appro-
, properly fitted respirator (NIOSH/MSHA approved) during and after
lication unless air monitoring demonstrates vapor/mist levels are below
licable limits. Follow respirator manufacturer's directions for
pirator use.

SECTION V HEALTH HAZARD DATA

'ECTS OF EXCESSIVE OVEREXPOSURE

estion: No specific information available.
itains materials that may be moderately toxic.

alation: No specific information available.
r volatility makes vapor inhalation unlikely. Aerosol can be irritating.

n Absorption: No specific information available.
itains material that may be moderately toxic.

e Contact: May cause severe eye injury -- damage reversible.

onic Effects of Overexposure: No specific information available.

SECTION V HEALTH HAZARD DATA

FECTS OF EXCESSIVE OVEREXPOSURE

gestion: No specific information available.
ntains materials that may be moderately toxic.

halation: No specific information available.
w volatility makes vapor inhalation unlikely. Aerosol can be irritating.

in Absorption: No specific information available.
ntains material that may be moderately toxic.

e Contact: May cause severe eye injury -- damage reversible.

ronic Effects of Overexposure: No specific information available.

RST AID
E CONTACT: Flush with luke warm water for 15 minutes. Seek physician
mediately.
IN CONTACT: Flush wash with copious amounts of luke warm water. Remove
ntaminated clothing promptly. Contact a physician immediately.
HALATION: Remove exposed individual to fresh air. Restore breathing
required. Contact a physician immediately.
GESTION: Rinse mouth immediately. If appreciable quanties are swallowed
ek medical attention.

SECTION VI REACTIVITY DATA

ARDOUS PRODUCTS OF DECOMPOSITION
to the presence of some component(s) thermal decomposition
the presence of air may yield carbon monoxide ,carbon dioxide and oxides
nitrogen.
DUCT STABILITY: Unstable HAZARDOUS POLYMERIZATION: May occur

DITIONS TO AVOID: Storage >100 F, exposure to light, loss of disolved
, contamination with incompatible strong acids or bases

ERIALS TO AVOID: Polymerization initators including peroxides, strong
dizing agents, copper, copper alloys, carbon steel,iron, rust and
ong oxidizers.

SECTION VII SPILL OR LEAK PROCEDURES

STE DISPOSAL METHOD
NOT FLUSH TO SEWER, WATERSHED, OR WATERWAY.
spose of product in accordance with applicable local, county, state, and
deral regulations. Do not incinerate closed containers.

SECTION VIII SAFE HANDLING AND USE INFORMATION

OTECTIVE GLOVES
quired for prolonged or repeated contact. Wear resistant gloves such as
tural rubber, neoprene, buna N or nitrile. An apron should be worn to
oid skin contact.
OTECTIVE EYEWEAR
oid contact with eyes. Wear goggles if there is a likelihood of contact
th eyes.
GIENIC PRACTICES
SH HANDS THOROUGHLY BEFORE EATING AND USING WASHROOM.
move contaminated clothing immediately and do not wear it until it has
en properly laundered.
SPIRATORY PROTECTION
outdoor or open areas use (NIOSH/MSHA approved) mechanical filter
spirator to remove solid airborne particles of overspray during
ray application. In restricted ventilation areas use (NIOSH/MSHA
proved) chemical-mechanical filters designed to remove a combination of
rticulate and gas and vapor. In confined areas use (NIOSH/MSHA approved)
r line type respirators or hoods. Respiratory protection may also be
cessary in any later manufacturing operations in which the product may
come airborne in the form of vapor or dust.
NTILATION
ovide general dilution or local exhaust ventilation in volume and pattern
keep TLV of the most hazardous ingredient in Section II below acceptable
mit, LEL in Section IV below stated limit, and to remove decomposition
ducts during welding or flame cutting on surfaces coated with this

)duct.

SECTION IX SPECIAL PRECAUTIONS

ıd and ground metal containers when transferring liquid.
IDLING AND STORAGE: Use in accordance with good industrial workplace ıctices; avoid unnecessary contact; wash thoroughly after handling; store a dry area away form excessive heat.

IER PRECAUTIONS: For industrial use only.
:sonnel should avoid inhalation of vapors. Personal contact with the)duct should be avoided. Should contact be made, remove saturated)thing and flush affected skin areas with water. Containers of this :erial may be hazardous when emptied. Since emptied containers retain)duct residues (vapor, liquid, and/or solid), all hazard precautions ven in this sheet must be observed. Do not take internally.
IDLING AND STORING PRECAUTIONS
IDLING AND STORING PRECAUTIONS
ep product containers cool, dry, and away from sources of ignition. Use l store this product with adequate ventilation. Do NOT smoke in storage eas.

SECTION X SECTION 313 TOXIC CHEMICALS

is product contains the following toxic chemicals subject to the p ing requirements of section 313 of the Emergency Planning and mmunity Right-To-Know Act of 1986 and of 40 CFR 372:

emical	CAS Number	Weight %

THE INFORMATION CONTAINED HEREIN IS INFORMATION RECEIVED FROM OUR RAW MATERIAL SUPPLIERS AND OTHER SOURCES AND IS BELIEVED TO BE RELIABLE. THIS DATA IS NOT TO BE TAKEN AS A WARRANTY OR REPRESENTATION FOR WHICH WATSON-STANDARD COMPANY ASSUMES LEGAL RESPONSIBILITY.

Water-borne Inside Spray Coating

This record is only valid on Thu Sep 17 2015

Supplier's Code: 40Q60AA **Supplier:** Valspar **Version:** 2 **Version Status:** Accepted

Material Description

Coating Type : Water Based
Dry Film Colour : Colorless
Major Resin Type : Acrylic
Limitations Of Use Crown : Original code was 27Q04AA

Purchasing Codes (1)
COT 02252

Supplier Aliases (1)

1096

Physical Properties

pH : 7 +/- 0.2
Flash Point : 130 F
Pct Solids Half Gram (% by weight at the recommended cure schedule) - for NA only : 21 +/- 0.5 %
Pct Solids 1 Gram (% by weight at the recommended cure schedule) :
Specific Gravity @ 20C / 80F : 1.002 +/- 0.012

Storage and Handling

Storage Temperature Optimum : 80 F
Storage Temperature Minimum : 50 F
Storage Temperature Maximum : 120 F
Shelf Life At Optimum Temperature : 6 Months
Storage And Handling Comments : KEEP FROM FREEZING.

Material Ingredients

Volatile Ingredients (5)

CAS Number	Name	Weight % to Volatile	Weight % to Total	Volume % to Volatile

		Ingredients	Material	Ingredients
0000111-76-2	Ethylene glycol monobutyl ether	5.7	4.5	6.1
0000071-36-3	n-butanol	5.7	4.5	6.8
0007732-18-5	Water	83.7	66.1	81.3
0000108-01-0	Dimethylethanolamine (DMEA)	1.4	1.1	1.5
0000071-41-0	1-Pentanol (n-Amyl alcohol)	3.5	2.8	4.2

VOC Data

Liquid Density (ASTM D1475 - US, or other accredited measurement method - EU) : 8.35 lb/gal

VOC Content (Method 24 ASTM D3960 - US, or other accredited measurement method - EU) : 3.2 lb/gal

Density Wt VOC By Vol Solids (Method 24 ASTM D3960 - US, or other accredited measurement method -EU) : 5.8 lb/gal

Solvent System Density : 8.09 lb/gal

Solids Non Volatiles Weight (Method 24 ASTM D2369) : 21 %

Water Content Weight : 66.1 %

Solids Non Volatiles Volume (Method 24 ASTM D2369) : 18.5 %

Water Content Volume : 66.2 %

Water Content Method : ASTM 3792

VOC Calculation

Total Volatiles(Water included) Volume% : 81.50 %

Total Volatiles(Less water) Volume% : 15.30 %

Data Sheets

Safety Data Sheets (SDS) (1)

	Name	Issue Date	Review Date	Verification Date	Language	Uploaded By
	40Q60AA msds	11/18/2013	11/18/2015		English	Morris, Mary

Applications (1)

CCS Code	Version	Application Status	Action By	Action Date	End Use Codes
20.06.503	2	Accepted	Butzow, Mark	9/15/2015	X3030 - Beverage, Interior, Aluminium DWI. For CSD's, X3030 - Beverage, Interior, Aluminium DWI. For CSD's

This record is only valid on Thu Sep 17 2015

valspar
if it matters, we're on it.®

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identification

Product ID:	**40Q60AA**
Product Name:	WATER BASED INTERIOR SPRAY
Product Use:	Paint product.
Print date:	22/Jul/2011
Revision Date:	22/Jul/2011

Company Identification
The Valspar Corporation - Packaging Division
2001 Tracy St.
Pittsburgh, PA 15233

Manufacturer's Phone:	1-412-766-9300
24-Hour Medical Emergency Phone:	1-888-345-5732

2. HAZARDS IDENTIFICATION

Primary Routes of Exposure:
Inhalation
Ingestion
Skin absorption

Eye Contact:

- Causes severe eye burns.
- Risk of serious damage to eyes.

Skin Contact:

- Causes skin burns.
- Harmful if absorbed through skin.

Ingestion:

- Causes digestive tract burns.
- Harmful if swallowed.

Inhalation:

- Severe respiratory irritant
- Harmful by inhalation.
- May cause pulmonary edema.

Target Organ and Other Health Effects:
- Causes headache, drowsiness or other effects to the central nervous system.
- Liver injury may occur.
- Kidney injury may occur.
- Hearing loss.
- Blood disorders
- Contains glycol ether which has been shown to cause blood effects damage in laboratory animals.
- Spleen damage may occur.

This product contains ingredients that may contribute to the following potential chronic health effects:
- Notice: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

3. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS

Ingredient Name CAS-No.	Approx. Weight %	Chemical Name
ETHYLENE GLYCOL MONOBUTYL ETHER 111-76-2	5 - 10	2-Butoxyethanol
N-BUTYL ALCOHOL 71-36-3	5 - 10	n-Butyl alcohol
PRIMARY AMYL ALCOHOL 71-41-0	1 - 5	Amyl alcohol
DIMETHYLAMINOETHANOL 108-01-0	1 - 5	Ethanol, 2-(dimethylamino)-

If this section is blank there are no hazardous components per OSHA guidelines.

4. FIRST AID MEASURES

Eye Contact:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. If medical assistance is not immediately available, flush an additional 15 minutes. Get medical attention immediately.

Skin Contact:
Remove contaminated clothing and shoes. Wash off immediately with plenty of water for at least 15 minutes. Do not use soap. If skin surface is damaged, apply a clean dressing. Do not apply greases or ointments. If medical assistance is not immediately available, flush an additional 15 minutes. Get medical attention immediately.

Ingestion:
Give one or two glasses of water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than hips to prevent aspiration. Get medical attention immediately. Rinse mouth with water. Only induce vomiting at the instruction of medical personnel.

Inhalation:
Move injured person into fresh air and keep person calm under observation. Get medical attention immediately. For breathing difficulties, oxygen may be necessary. If breathing stops, provide artificial respiration.

Medical conditions aggravated by exposure:
Any respiratory or skin condition.

5. FIRE FIGHTING MEASURES

Flash point (Fahrenheit):	129
Flash point (Celsius):	54
Lower explosive limit (%):	1
Upper explosive limit (%):	11
Autoignition temperature:	not determined
Sensitivity to impact:	no
Sensitivity to static discharge:	Can be sensitive to static discharge hazards. Please see bonding and grounding information in Section 7.
Hazardous combustion products:	See Section 10.

Unusual fire and explosion hazards:
None known.

Extinguishing media:
Carbon dioxide, dry chemical, foam and/or water fog.

Fire fighting procedures:
Firefighters should be equipped with self-contained breathing apparatus and turn out gear. Keep containers and surroundings cool with water spray.

6. ACCIDENTAL RELEASE MEASURES

Action to be taken if material is released or spilled:
Ventilate the area. Avoid breathing dust or vapor. Use self-containing breathing apparatus or airmask for large spills in a confined area. Wipe, scrape or soak up in an inert material and put in a container for disposal. See section 7, "Handling and Storage", for proper container and storage procedures. Remove all sources of ignition. Soak up with inert absorbent material. Use only non-sparking tools. Avoid contact with eyes.

7. HANDLING AND STORAGE

Precautions to be taken in handling and storage:
Keep away from heat, sparks and open flame. - No smoking. Keep container closed when not in use. Do not store above 120 degrees F. (49 degrees C). Based on flash point and vapor pressure, suitable storage should be provided in accordance with OSHA regulation 1910.106, Ontario OH&S regulation 851 section 22. Empty containers may contain product residue, including flammable or explosive vapors. Do not cut, puncture or weld on or near container. All label warnings must be observed until the container has been commercially cleaned or reconditioned. If the product is used near or above the flashpoint, an ignition hazard may be present. Activities, uses, or operations which liberate vapor (such as mixing or free fall of liquids) may also present an ignition hazard. Please ensure containers and other interconnected equipment are properly bonded and grounded at all times.

8. PERSONAL PROTECTIVE EQUIPMENT AND EXPOSURE CONTROLS

Personal Protective Equipment

Eye and face protection:
Wear chemical goggles with splash shields or face shield. Contact lenses should not be worn when working with chemicals because contact lenses may contribute to the severity of an eye injury in case of exposure.

Skin protection:
Appropriate chemical resistant gloves should be worn.

Other Personel Protection Data:
Ensure that eyewash stations and safety showers are close to the workstation location. To prevent skin contact wear protective clothing covering all exposed areas.

Respiratory protection:
Wear appropriate, properly fitted respirator (NIOSH approved) during spray application or in other situation where mists may be generated unless air monitoring vapor mist levels are below applicable limits-- where applicable limits have been established. When respirators are used, follow respirator manufacturers directions for use.

Ventilation
Use only in well-ventilated areas. Ensure adequate ventilation, especially in confined areas. Ovens used for curing should contain a fresh air purge to prevent vapours from accumulating and creating a possible explosive mixture. Where the product is used in a hazardous classified area, use explosion-proof electrical/ventilating/lighting/equipment.

Exposure Guidelines

OSHA Permissible Exposure Limits (PEL's)

Ingredient Name CAS-No.	Approx. Weight %	TWA (final)	Ceilings limits (final)	Skin designations
ETHYLENE GLYCOL MONOBUTYL ETHER 111-76-2	5 - 10	240 mg/m^3 TWA 50 ppm TWA		prevent or reduce skin absorption
N-BUTYL ALCOHOL 71-36-3	5 - 10	100 ppm TWA 300 mg/m^3 TWA		

ACGIH Threshold Limit Value (TLV's)

Ingredient Name CAS-No.	Approx. Weight %	TWA	STEL	Ceiling limits	Skin designations
ETHYLENE GLYCOL MONOBUTYL ETHER 111-76-2	5 - 10	20 ppm TWA			
N-BUTYL ALCOHOL 71-36-3	5 - 10	20 ppm TWA			

9. PHYSICAL PROPERTIES

Odor:	Normal for this product type.
Physical State:	liquid
pH:	not determined
Vapor pressure:	24 mmHg @ 77°F (25°C)
Vapor density (air = 1.0):	4.1
Boiling point:	not determined
Solubility in water:	not determined
Coefficient of water/oil distribution:	not determined
Density (lbs per US gallon):	8.35
Specific Gravity:	1.002
Evaporation rate (butyl acetate = 1.0):	0.5
Flash point (Fahrenheit):	129
Flash point (Celsius):	54
Lower explosive limit (%):	1
Upper explosive limit (%):	11
Autoignition temperature:	not determined

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Heat.
Incompatibility:	Strong oxidizing agents

10. STABILITY AND REACTIVITY

Hazardous Polymerization: None anticipated.

Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

Sensitivity to static discharge: Can be sensitive to static discharge hazards. Please see bonding and grounding information in Section 7.

11. TOXICOLOGICAL INFORMATION

Ingredient Name CAS-No.	Approx. Weight %	NIOSH - Selected LD50s and LC50s
ETHYLENE GLYCOL MONOBUTYL ETHER 111-76-2	5 - 10	= 2.21 mg/L Inhalation LC50 Rat 4 h = 220 mg/kg Dermal LD50 Rabbit = 2270 mg/kg Dermal LD50 Rat = 450 ppm Inhalation LC50 Rat 4 h = 470 mg/kg Oral LD50 Rat
N-BUTYL ALCOHOL 71-36-3	5 - 10	= 3400 mg/kg Dermal LD50 Rabbit = 790 mg/kg Oral LD50 Rat = 8000 ppm Inhalation LC50 Rat 4 h > 17.7 mg/L Inhalation LC50 Rat 4 h
PRIMARY AMYL ALCOHOL 71-41-0	1 - 5	= 2306 mg/kg Dermal LD50 Rabbit = 4613 mg/kg Oral LD50 Rat
DIMETHYLAMINOETHANOL 108-01-0	1 - 5	= 1370 µL/kg Dermal LD50 Rabbit = 1641 ppm Inhalation LC50 Rat 4 h = 1803 mg/kg Oral LD50 Rat = 6.1 mg/L Inhalation LC50 Rat 4 h

Mutagens/Teratogens/Carcinogens: None known.

Ingredient Name CAS-No.	Approx. Weight %	NTP Known Carcinogens	NTP Suspect Carcinogens	NTP Evidence of Carcinogenicity
ETHYLENE GLYCOL MONOBUTYL ETHER 111-76-2	5 - 10			male rat-no evidence; female rat-equivocal evidence; male mice-some evidence; female mice-some evidence

Ingredient Name CAS-No.	Approx. Weight %	OSHA - Hazard Communication Carcinogens	OSHA - Specifically Regulated Carcinogens	ACGIH Carcinogens
ETHYLENE GLYCOL MONOBUTYL ETHER 111-76-2	5 - 10			A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans

12. ECOLOGICAL DATA

No information on ecology is available.

13. DISPOSAL CONSIDERATIONS

Disposal should be made in accordance with federal, state and local regulations.

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation

Water-borne Over-Varnish Coating

This record is only valid on Thu Sep 17 2015

Supplier's Code: PPG3805802 **Supplier:** PPG **Version:** 3 **Version Status:** Accepted

Material Description

Coating Type : Water Based
Dry Film Colour : Colorless
Major Resin Type : Acrylic
Limitations Of Use Crown :

Purchasing Codes (1)
COT02239

Physical Properties

pH : 7.8 +/- 0.5
Flash Point : 200 C
Pct Solids Half Gram (% by weight at the recommended cure schedule) - for NA only : 36.5 +/- 2 %
Pct Solids 1 Gram (% by weight at the recommended cure schedule) : 34.5 +/- 2 %
Specific Gravity @ 20C / 80F : 1.068 +/- 0.024

Storage and Handling

Storage Temperature Optimum : 75 C
Storage Temperature Minimum : 40 C
Storage Temperature Maximum : 100 C
Shelf Life At Optimum Temperature : 6 Months
Storage And Handling Comments :

Material Ingredients

Resin Modifiers (2)
Melamine Formaldehyde
Polyether Polyol

Internal Lubricant on Dry Film (1)		
Name	Level	Unit
Hydrocarbon	0.8	%

Volatile Ingredients (6)				
CAS Number	Name	Weight % to Volatile Ingredients	Weight % to Total Material	Volume % to Volatile Ingredients
0000111-76-2	Ethylene glycol monobutyl ether	8.3	5	9
0000071-36-3	n-butanol	2.3	1.4	2.8
0000078-83-1	Isobutanol	0.4	0.2	0.5
0007732-18-5	Water	83.8	50.7	82.1
0000108-01-0	Dimethylethanolamine (DMEA)	4.3	2.6	4.8
0000111-46-6	Diethylene glycol (DEG)	0.9	0.5	0.8

VOC Data

Liquid Density (ASTM D1475 - US, or other accredited measurement method - EU) : 8.9 lb/gal

VOC Content (Method 24 ASTM D3960 - US, or other accredited measurement method - EU) : 1.9 lb/gal

Density Wt VOC By Vol Solids (Method 24 ASTM D3960 - US, or other accredited measurement method -EU) : 2.6 lb/gal

Solvent System Density : 8.2 lb/gal

Solids Non Volatiles Weight (Method 24 ASTM D2369) : 39.5 %

Water Content Weight : 50.7 %

Solids Non Volatiles Volume (Method 24 ASTM D2369) : 34.3 %

Water Content Volume : 54.2 %

Water Content Method : ASTM 4017

VOC Calculation

Total Volatiles(Water included) Volume% : 65.70 %

Total Volatiles(Less water) Volume% : 11.50 %

Data Sheets

Safety Data Sheets (SDS) (1)

	Name	Issue Date	Review Date	Verification Date	Language	Uploaded By
	PPG3805802msd	2/21/2014	2/21/2015		English	Royse, Amy

Technical Data Sheets (1)

	Name	Issue Date	Review Date	Verification Date	Language	Uploaded By
	Low varnish weight letter	2/21/2014	2/21/2016		English	Royse, Amy

Applications (1)

CCS Code	Version	Application Status	Action By	Action Date	End Use Codes
20.06.110	5	Accepted	Smith, Steven	9/9/2015	X2124 - Beverage, Exterior, Aluminium DWI.

This record is only valid on Thu Sep 17 2015

Water-borne Over-Varnish Coating

Material Safety Data Sheet

Date of issue 7 January 2014
Version 18

1. Product and company identification

Product name : PPG3805802 Water Reducible Varnish
Code : PPG3805802
Supplier : PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272
Emergency telephone number : (412) 434-4515 (U.S.)
(514) 645-1320 (Canada)
01-800-00-21-400 (Mexico)
Technical Phone Number : (513) 576-3179 (PACKAGING COATINGS) 8:00 a.m. - 5:00 p.m. EST

2. Hazards identification

Emergency overview : WARNING!

HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED. MAY CAUSE RESPIRATORY TRACT AND EYE IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Do not swallow. Do not get in eyes or on skin or clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Potential acute health effects

Inhalation : May be harmful if inhaled. Moderately irritating to the respiratory system. Can irritate eyes, nose, mouth and throat. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Ingestion : Harmful or fatal if swallowed.
Skin : Toxic in contact with skin. Slightly irritating to the skin.
Eyes : Moderately irritating to eyes.

Over-exposure signs/symptoms

Repeated exposure to high vapor concentrations may cause irritation of the respiratory system and permanent brain and nervous system damage. Inhalation of vapor/aerosol concentrations above the recommended exposure limits causes headaches, drowsiness and nausea and may lead to unconsciousness or death. There is some evidence that repeated exposure to organic solvent vapors in combination with constant loud noise can cause greater hearing loss than expected from exposure to noise alone. **1-component mixtures:** formaldehyde is released during curing. Formaldehyde may cause irreversible effects, is irritating to the mucous membranes and may cause skin sensitization.

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

This Material Safety Data Sheet has been prepared in accordance with Canada's Workplace Hazardous Materials Information System (WHMIS) and the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See toxicological information (Section 11)

3. Composition/information on ingredients

Name	CAS number	%
2-butoxyethanol	111-76-2	1 - 5
2-dimethylaminoethanol	108-01-0	1 - 5
butan-1-ol	71-36-3	0.5 - 1.5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Material Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek immediate medical attention.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Ingestion : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous combustion products : Decomposition products may include the following materials:
carbon oxides
nitrogen oxides
Formaldehyde.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6. Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7. Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Do not swallow. Do not get in eyes or on skin or clothing. Avoid breathing vapor or mist. Avoid prolonged or repeated contact with skin. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Vapors are heavier than air and may spread along floors. Empty containers retain product residue and can be hazardous. Do not reuse container. If this material is part of a multiple component system, read the Material Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Do not store above the following temperature: 120F / 49C.

8. Exposure controls/personal protection

Name	Result	ACGIH	OSHA	Ontario	Mexico	PPG
2-butoxyethanol	TWA	20 ppm	50 ppm S	20 ppm S	26 ppm S	Not established
	STEL	Not established	Not established	Not established	75 ppm S	Not established
2-dimethylaminoethanol	TWA	Not established	Not established	3 ppm	Not established	1 ppm
	STEL	Not established	Not established	6 ppm	Not established	3 ppm
butan-1-ol	TWA	20 ppm	100 ppm	20 ppm	Not established	Not established
	STEL	Not established	Not established	Not established	50 ppm S C	Not established

Key to abbreviations

A = Acceptable Maximum Peak
ACGIH = American Conference of Governmental Industrial Hygienists.
C = Ceiling Limit
F = Fume
IPEL = Internal Permissible Exposure Limit
OSHA = Occupational Safety and Health Administration.
R = Respirable
S = Potential skin absorption
SR = Respiratory sensitization
SS = Skin sensitization
STEL = Short term Exposure limit values
TD = Total dust
TLV = Threshold Limit Value
TWA = Time Weighted Average

8. Exposure controls/personal protection

Z = OSHA 29CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Eyes : Safety glasses with side shields.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Gloves : For prolonged or repeated handling, use the following type of gloves:

Recommended: nitrile rubber, butyl rubber

Respiratory : If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid.

Flash point : Closed cup: 93.33°C (200°F) [Product does not sustain combustion.]

Explosion limits : Lower: 9.9%

Color : Not available.

Odor : Not available.

pH : Not available.

Boiling/condensation point : >37.78°C (>100°F)

Melting/freezing point : Not available.

Specific gravity : 1.07

Density (lbs / gal) : 8.93

Vapor pressure : 2.3 kPa (17.1 mm Hg) [room temperature]

9 . Physical and chemical properties

Vapor density	: Not available.
Volatility	: 63% (v/v), 58.06% (w/w)
Evaporation rate	: 0.32 (butyl acetate = 1)
Partition coefficient: n-octanol/water	: Not available.
% Solid. (w/w)	: 41.94

10 . Stability and reactivity

Stability	: Stable under recommended storage and handling conditions (see Section 7).
Conditions to avoid	: No specific data.
Materials to avoid	: Reactive or incompatible with the following materials:,oxidizing materials,strong acids, strong alkalis
Hazardous decomposition products	: Formaldehyde.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-butoxyethanol	LD50 Oral	Rat	250 mg/kg	-
	LD50 Dermal	Rabbit	220 mg/kg	-
	LC50 Inhalation Vapor	Rat	450 ppm	4 hours
2-dimethylaminoethanol	LD50 Oral	Rat	1.803 g/kg	-
	LD50 Dermal	Rabbit	1.37 g/kg	-
	LC50 Inhalation	Rat	1641 ppm	4 hours
butan-1-ol	LD50 Oral	Rat	0.79 g/kg	-
	LD50 Dermal	Rabbit	3400 mg/kg	-
	LC50 Inhalation Vapor	Rat	8000 ppm	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Defatting irritant : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Target organs : Contains material which causes damage to the following organs: brain.
Contains material which may cause damage to the following organs: blood, kidneys, lungs, liver, spleen, lymphatic system, upper respiratory tract, skin, bone marrow, central nervous system (CNS), ears, eye, lens or cornea.

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	NTP	OSHA
2-butoxyethanol	A3	3	-	-

Carcinogen Classification code: ACGIH: A1, A2, A3, A4, A5
IARC: 1, 2A, 2B, 3, 4
NTP: Proven, Possible
OSHA: +
Not listed or regulated as a carcinogen: -

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
2-butoxyethanol	Acute LC50 1490000 ug/L Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute EC50 >1000 mg/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Chronic NOEC 1000 mg/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
butan-1-ol	Acute LC50 100 to 500 mg/L Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute EC50 1983000 to 2072000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees. Section 6. Accidental release measures

14. Transport information

	DOT	TDG	Mexico	IMDG
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Marine pollutant substances	Not applicable.	Not applicable.	Not applicable.	Not applicable.

Additional information

DOT : None identified.

14. Transport information

TDG : None identified.
Mexico : None identified.
IMDG : None identified.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

15 . Regulatory information

United States inventory (TSCA 8b) : All components are listed or exempted.
Australia inventory (AICS) : This product contains a component which may restrict import to the notifier and/or to other parties holding a concurrent notification or agreement.
Canada inventory (DSL) : At least one component is not listed.
China inventory (IECSC) : Not determined.
Europe inventory (REACH) : Please contact your supplier for information on the inventory status of this material.
Japan inventory (ENCS) : Not determined.
Korea inventory (KECI) : Not determined.
New Zealand (NZIoC) : Substance Use Restricted
Philippines inventory (PICCS) : Not determined.

United States

U.S. Federal regulations :
SARA 302/304: Formaldehyde
CERCLA: Hazardous substances.: 2-butoxyethanol: No RQ is being assigned to the generic or broad class.; 2-methylpropan-1-ol: 5000 lbs. (2270 kg); butan-1-ol: 5000 lbs. (2270 kg);

SARA 311/312 SDS Distribution - Chemical Inventory - Hazard Identification:

Chemical name	CAS #	Acute	Chronic	Fire	Reactive	Pressure
2-butoxyethanol	111-76-2	Y	N	Y	N	N
2-dimethylaminoethanol	108-01-0	Y	N	Y	N	N
butan-1-ol	71-36-3	Y	N	Y	N	N
Product as-supplied :		Y	N	N	N	N

SARA 313
Supplier notification

Chemical name	CAS number	Concentration
2-butoxyethanol	111-76-2	1 - 5
butan-1-ol	71-36-3	0.5 - 1.5

Additional environmental information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.

Canada

WHMIS (Canada) : Class E: Corrosive liquid. Class D-1A: Material causing immediate and serious toxic effects (Very toxic). Class D-1B: Material causing immediate and serious toxic effects (Toxic). Class D-2B: Material causing other toxic effects (Toxic).

Mexico

Classification

Flammability : 1 Health : 3 Reactivity : 0

16 . Other information

Organization that prepared the MSDS : EHS

Indicates information that has changed from previously issued version.

Disclaimer

The information contained in this data sheet is based on present scientific and technical knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by PPG, and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee is given in respect of the properties of the products. No liability can be accepted for any failure to observe the precautionary measures described in this data sheet or for any misuse of the products.

7200

This record is only valid on Thu Mar 07 2019

Supplier's Code:V70Q38AA**Supplier:**Valspar **Version:**2**Version Status:**Accepted

Material Description

Coating Type : Water Based
Dry Film Colour : Colourless
Major Resin Type : Epoxy
Limitations Of Use Crown :

Purchasing Codes (0)

Supplier Aliases (0)
No Record found

Crown Aliases (0)
No Record found

Physical Properties

pH :
Flash Point : 130 F
Pct Solids Half Gram (% by weight at the recommended cure schedule) - for NA only : 21.1 +/- 0.5 %
Pct Solids 1 Gram (% by weight at the recommended cure schedule) :
Specific Gravity @ 20C / 80F : 1.013
Glass Transition Temp :

Storage and Handling

Storage Temperature Optimum : 80 F
Storage Temperature Minimum : 50 F
Storage Temperature Maximum : 12 F
Shelf Life At Optimum Temperature : 6 months
Storage And Handling Comments : KEEP FROM FREEZING.

Material Ingredients

Resin Modifiers (0)
No Record found

Pigments (0)
No Record found

Internal Lubricant on Dry Film (0)

No Record found

Hazardous Ingredients (0)
No Records found

Volatile Ingredients (8)				
CAS Number	Name	Weight % to Volatile Ingredients	Weight % to Total Material	Volume % to Volatile Ingredients
0007732-18-5	Water	82.6	65.2	80.6
0000111-76-2	Ethylene glycol monobutyl ether	8.6	6.8	9.3
0000071-36-3	n-butanol	3.9	3.1	4.7
0000071-41-0	1-Pentanol (n-Amyl alcohol)	2.6	2.1	3.1
0000137-32-6	2-Methyl-1-butanol	1.1	0.9	1.3
0000108-01-0	Dimethylethanolamine (DMEA)	0.8	0.6	0.9
0000112-25-4	*Ethylene glycol monohexyl ether	0.1	0.1	0.1
0000123-51-3	Isoamyl alcohol	0.3	0.2	0

VOC Data

Liquid Density (ASTM D1475 - US, or other accredited measurement method - EU) : 8.44 lb/gal

VOC Content (Method 24 ASTM D3960 - US, or other accredited measurement method - EU) : 3.4 lb/gal

Density Wt VOC By Vol Solids (Method 24 ASTM D3960 - US, or other accredited measurement method -EU) : 6.5 lb/gal

Solvent System Density : 8.10 lb/gal

Solids Non Volatiles Weight (Method 24 ASTM D2369) : 21.1 %

Water Content Weight : 65.2 %

Solids Non Volatiles Volume (Method 24 ASTM D2369) : 17.8 %

Water Content Volume : 66.1 %
Water Content Method : ASTM 3792

VOC Calculation

Total Volatiles(Water included) Volume% : 82.20 %

Total Volatiles(Less water) Volume% : 16.10 %

Data Sheets

Safety Data Sheets (SDS) (1)

	Name	Issue Date	Review Date	Verification Date	Language	Uploaded By	
	V70Q38AA sds	9/20/2018	9/20/2020		English	Morris, Mary	

Technical Data Sheets (0)

	Name	Issue Date	Review Date	Verification Date	Language	Uploaded By	

Applications (1)

CCS Code	Version	Application Status	Action By	Action Date	End Use Codes
20.15.725	1	Accepted	Smith, Steven	12/11/2017	X3030 - Beverage, Interior, Aluminium DWI. For CSD's

This record is only valid on Thu Mar 07 2019

Crown Materials Database

Coating - Material View

Material

View : EHS

Michael Herron

Unit Region : America

Add To Favourites | Print

Supplier's Code:22Q14AG **Supplier:**Valspar **Version:**4 **Version Status:**Accepted

Mat Properties | Mat Ingredients | Mat Regulatory | Applications

Material Ingredients

Resin Modifiers (2)

Melamine Formaldehyde
Epoxy

Pigments (0)

No Record found

Internal Lubricant on Dry Film (3)

Name	Level	Unit
Carnauba	0.8	%
Hydrocarbon	0.7	%
PTFE	0.8	%

Hazardous Ingredients (1)

CAS Number	Name	Maximum Weight % to Total Material
0000050-00-0	*Formaldehyde	0.01

Volatile Ingredients (6)

CAS Number	Name	Weight % to Volatile Ingredients	Weight % to Total Material	Volume % to Volatile Ingredients
0000111-76-2	Ethylene glycol monobutyl ether	10.5	6.3	11.4
0000078-83-1	Isobutanol	0.3	0.2	0.4
0007732-18-5	Water	84.9	51	83.2
0000108-01-0	Dimethylethanolamine (DMEA)	2.7	1.6	3
0064742-47-8	Distillates (petroleum), hydrotreated light	1.3	0.8	1.6
0068526-86-3	Isotridecyl alcohol	0.3	0.2	0.4

VOC Data

Liquid Density (ASTM D1475 - US, or other accredited measurement method - EU) : 8.90 lb/gal
VOC Content (Method 24 ASTM D3960 - US, or other accredited measurement method - EU) : 1.8 lb/gal
Density Wt VOC By Vol Solids (Method 24 ASTM D3960 - US, or other accredited measurement method -EU) : 2.3 lb/gal
Solvent System Density : 8.17 lb/gal
Solids Non Volatiles Weight (Method 24 ASTM D2369) : 39.9 %
Water Content Weight : 51.0 %
Solids Non Volatiles Volume (Method 24 ASTM D2369) : 34.5 %
Water Content Volume : 54.5 %
Water Content Method : ASTM 4017

VOC Calculation

Total Volatiles(Water included) Volume% : 65.50 %
Total Volatiles(Less water) Volume% : 11.00 %

APPENDIX E
WASHINGTON STATE SEPA CHECKLIST

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable:
   - Crown Cork & Seal Olympia Facility Addition and Renovation
2. Name of applicant:
   - Crown Cork & Seal Co (USA) Inc.

3. Address and phone number of applicant and contact person:
   - Luis Wanderley
   - 1202 Fones Road SE
   - Olympia, Wa 98501

4. Date checklist prepared:
   - July 22, 2020

5. Agency requesting checklist:
   - City of Olympia

6. Proposed timing or schedule (including phasing, if applicable):
   - Construction will commence as soon as permits are obtained. It is estimated that permits could be obtained in the fall of 2020 or early 2021. Construction activities are estimated to last approximately 9 months.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.
   - Not at this time

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
   - SEPA Checklist
   - Stormwater Site Plan
   - Grading and Drainage Plan
   - Water and Sanitary Sewer Plan
   - Stormwater Pollution Prevention Plan
   - Landscape Planting Plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.
   - None known

10. List any government approvals or permits that will be needed for your proposal, if known.
   - Environmental determination by the City of Olympia
   - Site Plan approval by City of Olympia
   - Building Permits by City of Olympia
   - Plumbing/Electrical/Mechanical Permits by City of Olympia
   - Grading Permit by City of Olympia
   - Watermain Connection by City of Olympia
   - Sanitary Sewer Connection by City of Olympia

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

- This project proposes a small addition of approximately 10,960 square feet to the existing manufacturing building. The addition will be less that 5% of the total building size. Landscaping to match or complement the existing landscaping is proposed between the addition and the street. Bicycle parking will be included as part of the addition.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

- 1202 Fones Road, Olympia, WA 98501
- Section 19 Township 18 Range 1W Quarter NE NE NE EX PTN LY WLY FOLL DES LINE: BAP ON N LN SUB N87-24-02W 601.06F FROM NE COR; S1-54-15W 660.86F TAP ON S LN SD SUB, N87-26-06W 610.59F FROM SE COR SD
- Site plan and vicinity map are included in the submittal

B. Environmental Elements [HELP]

1. *Earth* [help]

a. General description of the site:

(circle one): Flat, ~~rolling, hilly, steep slopes, mountainous, other~~ _____

b. What is the steepest slope on the site (approximate percent slope)?

- 5 percent

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

- Review of the USDA Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx) shows that the project site is predominately Yelm Fine Sandy Loam. No know agricultural soils are known or will be removed.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

- No

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

- The proposed project will impact approximately 0.80 acres. The site will be graded to allow construction of the approximate 10,960 square feet of facility footprint and associated site improvements.
    - Total new impervious surfaces are anticipated to be approximately 3,110 sq ft.

- Estimated excavation is approximately 500 cubic yards. Estimated fill is approximately 250 cubic yards. New fill will be a combination of excavated soils that meet the site fill standards and off-site fill material obtained locally from reputable sources.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.
- Erosion may occur during site clearing and construction. To address this possibility, erosion and sediment control measures will be employed and maintained throughout the construction process as site conditions warrant.
- Upon completion of construction, the site will be stabilized with pavement and vegetation including grass and landscaping. Once stabilized, no erosion is expected due to use of the completed project improvements.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?
- The site will have approximately 57% impervious surface coverage after construction.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:
- None are proposed at this time other than the erosion and sediment control measures described in the answer above.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.
- No significant emissions are anticipated during construction other than those associated with construction vehicles.. VOC and fuel combustion emissions during operation are expected once the project is completed.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.
- Per review of the ORCAA public records (https://www.orcaa.org/public-records/registered-business-sources/) there are several business located on the same road as the project site, including the Crown Cork & Seal manufacturing plant, that are registered sources of emissions. These business include Georgia Pacifc Manufacturing and two gas stations. These sources or emissions are not anticipated to affect this proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:
- Regenerative thermal oxidizer (RTO) will be installed.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.
- Seasonal creek on Patomac Ln SE

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.
- No

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.
- None

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.
- No

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.
- No, the project site is located in FEMA map 53067C0186E, effective on10/16/2012.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.
- No

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.
- The project does not propose withdrawal of groundwater.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.
- Project will not discharge waste material into the groundwater from septic tanks or other sources.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.
- Runoff from parking lot, roof, and run on from Fones Rd. Outfall to bioswale/groundwater and to primary outfall to seasonal creek on Patomac Ln SE. Water is filtered for metals before discharged and sampled per permit.

2) Could waste materials enter ground or surface waters? If so, generally describe.
- No waste materials are anticipated to enter ground or surface waters from this site.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.
- No

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

- Containment
- Storm drainage system will be designed per City standards and constructed to control water runoff.

4. Plants [help]

a. Check the types of vegetation found on the site:

_X__deciduous tree: alder, maple, aspen, other
_X__evergreen tree: fir, cedar, pine, other
_X__shrubs
_X__grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
_X__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

- 500 sq ft of grass at front of site

c. List threatened and endangered species known to be on or near the site.

- Review of the U.S. Fish and Wildlife Service IPaC site (https://ecos.fws.gov/ipac/location/7G464TVA6VFQ7EUEO56CF7OXRE/resources) shows that golden paintbrush has been known to be in the area. Visual review of the project site does not indicate any presence.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

- City approved street front beautification

e. List all noxious weeds and invasive species known to be on or near the site.

- Review of the EDDMapS system (https://www.eddmaps.org/tools/query/) shows no invasive species on the project site. Scotch broom is located in the area near the site.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

- Crows, Seaguls, Doves, Falcons, Hawks, Deer, Rabbits

b. List any threatened and endangered species known to be on or near the site.
- Review of the U.S. Fish and Wildlife Service IPaC shows that pocket gophers, marbeled murrelet, streak horned lark, and yellow billed cuckoo are known to be in the area. None are known to be present at the site due to the current activity on the site.

c. Is the site part of a migration route? If so, explain.
- The project site is located along the Pacific Flyway migration route which extends from Alaska down to Patagonia.

d. Proposed measures to preserve or enhance wildlife, if any:
- None

e. List any invasive animal species known to be on or near the site.
- No invasive species are known to be on or near the site per review of the EDDMapS system.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.
- Electric, natural gas, propane for manufacturing

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.
- No

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:
- Support Equipment on VSD's. LED lighting

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal?
If so, describe.

- Small amounts of hazardous waste will be created. Flammable materials stored and used on-site.

1) Describe any known or possible contamination at the site from present or past uses.
- Review of the Department of Ecology site (https://apps.ecology.wa.gov/neighborhood/) shows no known contamination at the project site. There are a few contamination locations in the area around the site per Ecology but have all been processed for cleanup and are currently not needing any further action. These are not expected to have any affect on the project site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

- Natural gas lines running from street to building but are outside building area

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.
- Acids, coating materials, solvents

4) Describe special emergency services that might be required.
- Spill response

5) Proposed measures to reduce or control environmental health hazards, if any:
- Storage tanks will be equipped with proper containment.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?
- Manufacturing equipment from the current use of the building, sources of noise related to auto and transit traffic and some delivery vehicles from the road in front of the building. These are not expected to affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.
- Short term – typical construction nois level, during operation trucking operations and noise from Regenerative Thermal Oxidizer (noise treatment will be installed)

3) Proposed measures to reduce or control noise impacts, if any:
- RTO installed in enclosure, noise barrier along property line

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.
- Site is manufacturing. Surrounding area is mixed Manufacturing, Commercial, and Residential. Project will not affect uses

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?
- No

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:
- No

b. Describe any structures on the site.

- Main manufacturing building (270,000 sq ft) Storage Shed (7,500 sq ft) 2x covered storage areas (2,000 sq ft each)

d. Will any structures be demolished? If so, what?
   - Not in total – There will be selective demolition of about 4,000sf of existing building.

e. What is the current zoning classification of the site?
   - Light Industrial

f. What is the current comprehensive plan designation of the site?
   - Light Industry

g. If applicable, what is the current shoreline master program designation of the site?
   - Not applicable to this site

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.
   - Review of the Thurston County GIS data (https://geodata.org/) shows no critical areas on the site. There is a small wetland mapped just west of the property but it is not anticipated that this proposal will affect that wetland.

i. Approximately how many people would reside or work in the completed project?
   - 150

j. Approximately how many people would the completed project displace?
   - None

k. Proposed measures to avoid or reduce displacement impacts, if any:
   - Not applicable – no displacement

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:
   - Work with city planning to conform with current city zoning and design standards.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:
   - The project will not have any impact on agricultural or forest lands.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.
   - None

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.
   - None

c. Proposed measures to reduce or control housing impacts, if any:
   - None

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?
- Regenerative thermal oxidizer stack is the tallest point of the building and will not exceed 60 feet in height. The exterior building materials will match the existing building.

b. What views in the immediate vicinity would be altered or obstructed?
- Work on site will not affect views for other neighborhood properties. However, a screen wall will be constructed to shield most of the RTO equipment at ground level. A stack will extend above the screen wall.

b. Proposed measures to reduce or control aesthetic impacts, if any:
- None required

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?
- None

b. Could light or glare from the finished project be a safety hazard or interfere with views?
- No

c. What existing off-site sources of light or glare may affect your proposal?
- No

d. Proposed measures to reduce or control light and glare impacts, if any:
- None

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?
- The Chehalis Western Trail is located within walking distance of the project site.

b. Would the proposed project displace any existing recreational uses? If so, describe.
- No

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:
- None are proposed at this time as no impacts are anticipated.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.
- Review of available data from the Washington State Department of Archaeolocial and Historic Preservation database (https://wisaard.dahp.wa.gov/Map) shows no historic buildings, structures, or sites on or near the project site.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts,

or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

- There are no known landmarks, features of evidence of Indian or historic occupation on the project site. Review of the WA Department of Archaeolocial and Historic Preservation database shows the site in an area of low risk for archaeological discovery.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

- The applicant has consulted the data provided on the State of Washington's main database of historic and cultural resources (WISAARD).
- Previous construction projects in this area have not yielded any evidence of cultural or historical findings.
- In the event that archeological deposits are inadvertently discovered during construction, ground-disturbing activities should be halted immediately, and the City of Olympia Historic Preservation representative should be notified.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

- With no previous evidence of cultural or historical findings, no measures are proposed relative to these types of resources. As noted in the answer above, the project proponent indicates that construction will be halted and the City's Historic Preservation representative consulted if archeological deposits are encountered during development.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

- Fones Rd. Access will not change

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

- Yes, at Pacific Ave

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

- Additional 40 spots. 13 Existing spots will be eliminated from front of site

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

- No

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

- No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

- Currently 25 trucks per day. Adding 15 addititional trucks for production volume

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.
- No

h. Proposed measures to reduce or control transportation impacts, if any:
- No transporation impacts expected

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.
- No

b. Proposed measures to reduce or control direct impacts on public services, if any.
- Not applicable

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other

c. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.
- No new services are anticipated for this proposal. Current utilities will be connected to for the new addition.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Wanderley
Name of signee LUIS WANDERLEY
Position and Agency/Organization PLANT MANAGER / OLYMPIA FACILITY
Date Submitted: 7/22/20

D. Supplemental sheet for nonproject actions [HELP]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or

at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?
   VOC emissions will be reduced. RTO will be installed to control existing as well as new sources. Can production will increase by 50%. Water discharge will increase.

   Proposed measures to avoid or reduce such increases are:
   Noise enclosure of RTO

2. How would the proposal be likely to affect plants, animals, fish, or marine life?
   No effect

   Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?
   Project will not deplete natural resources

   Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

   Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?
   No impact

   Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

APPENDIX F
ELECTRONIC MODELING FILES (DVD)