DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

A157168719

FACILITY: HUNTSMAN ADVANCED MATERIALS AMERICAS, LLC.		**SRN / ID:** A1571
LOCATION: 4917 DAWN AVE, EAST LANSING		**DISTRICT:** Lansing
CITY: EAST LANSING		**COUNTY:** INGHAM
CONTACT: Barb Myles , EHS Manager		**ACTIVITY DATE:** 08/24/2023
STAFF: Michelle Luplow	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Onsite compliance inspection to determine compliance with PTI's 358-99, 871-90, 580-88A, and 785-81.		
RESOLVED COMPLAINTS:		

Inspected by: Michelle Luplow

Personnel Present: Barb Myles, EHS Manager (barbara_myles@huntsman.com)

Jeff Little, Maintenance Manager (jeffrey_little@huntsman.com)

Offsite Personnel: Cathy Parks-Smith, Site Manager (cathy_parks@huntsman.com)

Carlos Calderon, Environmental Air Principal (Carlos_Calderon@huntsman.com)

Denis Garcia (denis_garcia@huntsman.com)

Purpose

Conduct an unannounced, onsite partial compliance evaluation (PCE) inspection by determining compliance with Huntsman's Permit to Install No's. 358-99, 871-90, 580-88A, and 785-81. This inspection was conducted as part of a full compliance evaluation (FCE).

Facility Background/Regulatory Overview

Huntsman is a chemical manufacturing facility that conducts chemical mixing and blending activities using low-hazard, low-reactivity materials. Products include epoxy anhydrides.

Huntsman currently operates three shifts, 5 days per week (Monday – Friday).

Huntsman has undergone a few major changes since the 2019 inspection, including ceasing the operations which occurred in their Epoxy Board Room (sanders, edgers, various mixers, isocyanate storage, etc). See Table 1 for updates to all changes at the facility. A Permit to Install (PTI) application is currently in-house with the Air Quality Division. Within the application, Huntsman is seeking to do the following: void PTI 785-81 and operate the equipment under exemption Rule 282(2)(a)(v); void PTI 580-88A because the process utilizing the permitted Arrestal baghouse is no longer used; and void PTI 871-80 because Huntsman believes PTI 389-99 includes the processes and control equipment included under PTI 871-80.

The facility was last inspected in December 2019.

Inspection

At approximately 8:55 a.m. on August 24, 2023, I met with Barb Myles, EHS Manager, and Jeff Little, Maintenance Manager.

I reviewed with B. Myles and J. Little the list of equipment I created from all active permits and we reviewed this information for accuracy. Table 1 contains a list of all emission units onsite, verified by Huntsman staff, and includes discussion for all equipment exempt or proposed to be exempt. The series of PTI's (noted in parentheses) indicates the PTI's the equipment came from, prior to the PTI's being consolidated into the new permit.

I verified that there are no emergency generators onsite.

Table 1. Emission Unit List

EU	Description	Control	PTI/ Exemption
EU Kettles & Mixers	Miscellaneous kettles and mixers: 230-gallon Pfaudler Kettle (PTI 134-82 series) 750-gallon Versamix (PTI 537-80 series) Two (2) 800-gallon large Marion mixer (PTI 539-80 series) 3-roll roller mill (PTI 690-80 series) Pfaudler Resin Kettle (PTI 691-80 & 663-86 series) Cowles Mixer (PTI 807-80 series) 230-gallon small Marion mixer (PTI 808-80 & 900-81 series) Pfaudler Hardener Kettle (PTI 809-80 & 663-86 series) **Kettles & Mixers Removed:** 230-gallon Nauta Mixer (PTI 538-80 series) Jaygo double planetary mixer (PTI 677-86 series) 2 15-gallon Hobart Mixers (PTI 688-80 series)	Type N, Model B, Rotoclone scrubber	358-99
Arrestall Baghouse	Permitted for recovery of phenolic microballoons and fumed silica from the 800-gallon Marion mixer covered under PTI 358-99. Baghouse was replaced by a Donaldson Torit dust collector. See discussion in this report under "PTI 580-88A: Arrestall Baghouse."	Donaldson Torit Dust Collector	580-88A

ype N, Model B, otoclone Scrubber	Controls all emissions from units under "EU Kettles & Mixers" The permitted rotoclone was replaced with a new rotoclone scrubber of equivalent or better efficiency in 2016: Original unit was 12,000 scfm, the replacement unit is also 12,000 scfm. The original unit was rated at 95% control efficiency, the replacement unit is rated at 95.18% control efficiency, as verified by C. Parks-Smith.	NA	871-90/ Rule 285(2)(d) (for replacemen
Kilo-Lab", luntsman's "pilot lant"	30-gallon Versamix 50-gallon Cowles Mixer **No longer present onsite/Removed:** 10-gallon Kettle 100-gallon Ross Kettle 50-gallon Marion mixer 3-Roll mix 12-gallon Hobart mixer	Rotoclone scrubber for the Versamix and Cowles mixer.	785-81
hree 22-gallon cold leaners/parts ashers	Each of these units has local ventilation that is routed to the rotoclone scrubber to control indoor ambient emissions. Operating instructions are required to be posted and lids are required to be closed when the units are not in-use. All 3 parts washers were closed and 2 of the 3 units had the DEQ outreach orange operating instructions stickers posted to meet the "operating instructions" requirement. The parts washer without operating instructions is empty/not operating at this time (located in the Epoxy Board Room).	Rotoclone scrubber	Rule 281(2)(h), previously PTI 122-88B (voided
0,000-gallon socyanate storage ank	Tank is currently empty and out of service, but in the past was used to store isocyanate, "Rubinate M" for Epoxy Board Room processes, which have been terminated. Tank is labeled "Out of Service."	NA	NA PTI 285-90 voided to opera under exemptio when in service
10-gallon Jaygo tirred storage tank	Tank is currently empty and out of service, but in the past was used to store polyol, a compound used with	NA	NA

	isocyanate to inject into molds for the Epoxy Board Room processes, which have been terminated. Tank is labeled “Out of Service”		PTI 689-84 voided to opera under exemptio when in service
wo 4,000 and one ,000 gallon indoor torage tank	Tanks are currently empty and out of service, but in the past, were used for the following: 6,000-gallon storage tank for amine material (Vestamin 1PD) and two 4,000-gallon storage tanks (piped together) for XTJ568 material. These chemicals were used in the Epoxy Board room processes, which have been terminated. Tanks are labeled “Out of Service.”	NA	NA PTI 942-80 voided to opera under exemptio when in service
poxy Board Room anders & edgers	Plastic and wood sanders and edgers. Not operating during the inspection. These emission units, are currently present onsite, but are no longer used because the processes associated with the Epoxy Board Room have been terminated.	Two (2) Donaldson Torit Dust Collectors, vented outside	Rule 285(2)(l)(vi (C)
poxy Board Room anders & edgers	Plastic and wood sanders located in Epoxy Board room. Not operating during the inspection. These emission units, are currently present onsite, but are no longer used because the processes associated with the Epoxy Board Room have been terminated.	Baghouses vented to general in-plant environment	Rule 285(2)(l)(vi (B)
0,000 gallon storage ank	Tank is currently empty and out of service, but in the past was used to store polyol, a compound used with isocyanate to inject into molds for the Epoxy Board Room processes, which have been terminated. Tank is labeled “Out of Service.”	NA	Exemption TBD based on what Huntsman chooses to refil the tank with
wo (2) 4,000-gallon torage tanks piped ogether	Tank is currently empty and out of service, but in the past was used to store polyol, a compound used with isocyanate to inject into molds for the Epoxy Board Room processes, which have been terminated. Tank is labeled “Out of Service.”	NA	Exemption TBD based on what Huntsman chooses to refil the tanks with

50-gallon Ross Mixer in Epoxy Board Room	Tank is currently empty and out of service, but was used in the past for Epoxy Board Room processes, which have been terminated. Tank is labeled "Out of Service."	NA	Exemption TBD based on what Huntsman chooses to refil the tank with
Bryan Boilers natural gas-fired boiler	Model CLM 300-S-150-FDG Serial # 98978 3,000,000 Btu/hr heat input (3000 mbh) Manufactured 2011 Used for six (6) steam-heated drum ovens. Ovens are used to soften the materials.	NA	Rule 282(2)(b)(i)
0 electric ovens	Electrically heated ovens used to soften materials (see attached list provided by Huntsman for details)	NA	Rule 282(2)(a)(i)

PTI 785-81 – "Kilo Lab"

This PTI covers equipment located in Huntsman's "Kilo lab" or what they refer to as "pilot plant." The equipment has smaller capacities than Huntsman's production process equipment and is largely used for research and development. J. Little and B. Myles specified during the inspection that the equipment is used as a pilot (small batches, 30 gallons) to verify that the process they've up come up with works in the equipment they have (bulk/batch processes). The products go through testing to see if they meet specs or not.

As outlined in Table 1, the following equipment was permitted under PTI 785-81, noting the list of equipment that is no longer present onsite:

- 30-gallon Versamix
- 50-gallon Cowles Mixer

  No longer present at site:
- 10-gallon Kettle
- 100-gallon Ross Kettle
- 50-gallon Marion mixer
- 3-Roll mix
- 12-gallon Hobart mixer – currently not hooked up to power source

None of the Kilo lab equipment was operating during the inspection.

Huntsman wishes to void PTI 785-81 and operate the Kilo Lab under an exemption. This request was put in writing by Huntsman in their August 2023 PTI application. The AQD is working with Huntsman and internal AQD contacts to determine if the Rule 283(2) or Rule 283(3) exemptions are appropriate and applicable for the Kilo Lab processes. At this time, voiding of PTI 785-81 is not recommended.

The permit requires that the Rotoclone Type N scrubber be installed and operating properly. It was determined during the inspection that the rotoclone was operating properly. See discussion under "PTI 358-99: EUKETTLES & MIXERS" of this report for how Huntsman is meeting this requirement.

The permit requires that records of the date, time and nature of all products produced be kept. The blends created in the Kilo lab are proprietary; however, C. Calderon provided me with the SDS for each of the raw materials and intermediates used in the kilo lab in order to demonstrate that records of the nature of all products produced is kept. See attached.

The permit requires that the total combined production per year of the product and/or the intermediate blend from the production plant and the Kilo lab not exceed the "production rate given by the application in the existing approved permits." In the permit file there is a letter dated July 14, 1986 which gives the company approval to produce 6,000 pounds of Araldite XW441A2 USA epoxy adhesive in the equipment covered by PTI 785-81. It can therefore be assumed that the company is allowed up to 6,000 pounds product per production year – the type of product produced would be reviewed under the Rule 285(2)(b) exemption, which the company is required to demonstrate according to PTI 785-81 as well ("applicant shall only blend or use raw materials and only produce chemically reacted products which have been previously reviewed and approved by the AQD…"). As requested, a summary of the annual production in the Kilo lab from 2021 – 2022 was provided and is included Tables 2 & 3, respectively. Actual Huntsman records containing this data are attached. It appears that Huntsman is meeting their production limitations, based on the records they have provided.

Table 2. 2021 Data

Month	Cowles & Versamix Production (lbs)
January	0
February	510
March	1091
April	759
May	784
June	360
July	113
August	362
September	395
October	361
November	0
December	98

TOTAL Combined (lbs)	**4,833**

Table 3. 2022 Data

Month	Cowles & Versamix Production (lbs)
January	350
February	0
March	600
April	488
May	1,199
June	358
July	1,287
August	0
September	360
October	0
November	0
December	360
TOTAL Combined (lbs)	**5,002**

PTI 580-88A: Arrestall baghouse

The Arrestall baghouse was previously used to capture and recover phenolic microballoons and fused silica from the 800-gallon Marion mixer. Huntsman replaced the Arrestall baghouse with a Donaldson Torit dust collector, which would control emissions from the Epoxy Board Room and the 800-gallon Marion mixer. The microballoon/fused silica process was a component of the Epoxy Board Room operations. Huntsman made a business decision to terminate the Epoxy Board Room processes in late 2022, and therefore they no longer use microballoons or fumed silica in the Marion mixer, nor does the dust collector control emissions from the Epoxy Board Room.

Huntsman submitted a request to void PTI 580-88A in their August 2023 PTI application. Based on the findings of this inspection, AQD agrees that this permit can be voided, with the caveat that Huntsman must apply for a PTI or use an exemption demonstration in the event they plan to install equipment or initiate a process that utilizes the Donaldson Torit dust collector for control.

PTI 871-90: Rotoclone Scrubber

As addressed in Table 1, the rotoclone scrubber permitted under this PTI was replaced by equivalent control based on an exemption demonstration provided in May 2016. The replacement is allowed under exemption Rule 285(2)(d).

The PTI references the following PTI series, and requires that Huntsman be in compliance with the emission rates specified in each of these permits in order to be in compliance with PTI 871-90:

134-82 series	**537-80 series**	**538-80 series**	**539-80 series**	**677-86 series**	**688-80 series**	**690-80 series**	**691-80 series**

663-86 series	**807-80 series**	**691-80 series**	**663-86 series**	**808-80 series**	**809-80 series**

These PTI's have been voided and combined into PTI 358-99; therefore, compliance with 358-99 will affect compliance with this PTI 871-90. See "PTI 358-99: EUKETTLES & MIXERS" for a discussion on compliance.

The permit requires that the Rotoclone Type N scrubber be installed and operating properly. It was determined during the inspection that the rotoclone was operating properly. See discussion under "PTI 358-99: EUKETTLES & MIXERS" of this report for how Huntsman is meeting this requirement.

PTI 871-90 requires that the stack height be a minimum of 70' above ground level. The newer PTI, 358-99, requires that the stack height be 76' above ground level. During the inspection, I used the AQD-issued Nikon Forestry Pro II Rangefinder to determine the Rotoclone's stack height. Using the 2-point method, I confirmed that Huntsman was meeting the minimum stack height of 76' at 76.7'. Huntsman is in compliance with the stack height requirement.

The permit also requires that Huntsman meet the production limitations and keep record of the number of batches and batch sizes made per year for each of the pieces of equipment permitted under the permits that have now been rolled into PTI 358-99. See "PTI 358-99 EUKETTLES & Mixers" for a discussion of compliance on production compliance.

PTI 358-99: EUKETTLES & MIXERS

This permit was written to consolidate the following permits into one document: 134-82 series; 537-80 series; 538-80 series; 539-80 series; 677-86 series; 688-80 series; 690-80 series; 691-80 series; 663-86 series; 807-80 series;691-80 series; 663-86 series; 808-80 series; and 809-80 series. See Table 1 for a list of all emission units covered under this permit. See Table 1 for a list of all kettles and mixers which this PTI applies to.

There is currently a PTI application in-house to revise PTI 358-99.

The kettles and mixers are controlled by the Rotoclone Type N, Model B scrubber. B. Myles and J. Littler explained that control of emissions from these two types of emission units is only conducted when operators are loading them with chemicals. Each kettle and mixer has an "elephant trunk": movable, local ductwork under vacuum and connected to the rotoclone which pulls the chemical particulate away from the operators' breathing zones. Only when the operators are dumping the chemicals into the kettles and mixers are the kettles and mixers controlled by the rotoclone. All other times the mixers and kettles are enclosed until mixing is completed.

One of the 800-gallon Marion mixers was operating during the inspection. During the previous inspection this mixer was connected to the Arrestall baghouse (for microballoon control) as well as the Rotoclone. J. Little explained that this mixer is still hooked up to the Arrestall baghouse replacement (Donaldson Torit dust collector) as well as the Rotoclone scrubber, but that there is a flange on the exhaust that is kept close to prevent emissions from the mixer from going to the Donaldson Torit dust collector, which is not operating.

Emission Limits, Material Limits, & Monitoring/Recordkeeping

VOCs from the kettles and mixers are limited to 52.6 tons per year on a 12-month rolling basis and Huntsman is required to keep records of 1) the number of batches of each product made per calendar month, 2) the pounds of VOCs emitted per batch of product and 3) the pounds of VOCs emitted per month and on a 12-month rolling basis. C. Calderon sent me electronic records for VOC emissions for January 2020 – July 2023 containing these 3 items (see attached). The 12-month rolling period with the highest VOC emissions was May 2019 – April 2020 at 1,631.6 lbs (0.82 tons). Huntsman appears to be in compliance with the 52.6-ton per year limit.

Methanol emissions are limited to 1.0 ton per year, based on a 12-month rolling time period, as determined at the end of each calendar month. Huntsman's "Center for Excellence" contacts said that methanol was replaced with Hi-Sol, the same chemical that is used in Huntsman's 3 parts washers (see attached SDS). The Hi-Sol appears to meet the "meaningful change" exemption under Rule 285(2)(c)(3); however, Huntsman is still required to record and calculate emissions of Hi-Sol usage to ensure emissions are less than 1.0 ton per year limit based on a 12-month rolling time period as established in the PTI. C. Calderon provided me with January 2020 – July 2023 monthly and 12-month rolling records for VOC emissions associated with the Hi-Sol usage. The period with he highest emissions was February 2021 – January 2022 at 35.6 lbs.

The furfuryl alcohol emission rate is limited to 0.014 lb/hr and Huntsman is required to limit the production of all hardeners using furfuryl alcohol to a maximum of 15 pilot batches per day. Records are required to be kept on a daily basis for number of batches produced. Furfuryl alcohol is no longer used. It was once used in a production product that they no longer make. This has been the case since at least 2016.

Polymeric diphenyl methane diisocyanate (PDMI, CAS # 9016-87-9) is limited to 0.02 lb/hr. "Rubinate M" was the compound that contained PDMI at a maximum of 70% by weight. Rubinate M is no longer used at this facility as they no longer conduct reaction injection molding. Huntsman's "Center for Excellence" states that Rubinate M was pumped from the 10,000 gallon storage tank to other tanks to be mixed in line with a polyol which is immediately injected into a closed mold (reaction injection molding) for board manufacturing. The reaction injection molding itself would have been exempt under Rule 285(2)(b). Because Rubinate M is no longer used at this facility, the limit of PDMI does not apply at this time.

Huntsman is limited in how much Accelerator DY9741 is produced: 37,500 per year on a 12-month rolling basis. Huntsman is required to keep monthly records of the number of batches and pounds per batch produced for this compound. Huntsman has not produced this compound since 2006.

Process/Operational Restrictions, Design/Equipment Parameters, Monitoring & Recordkeeping

The Rotoclone is required to be installed and operating properly; proper operation includes ensuring that there is a device installed and maintained to measure the pressure differential on the Rotoclone.

The operating range that Huntsman has established for the unit, and that is posted to the magnahelic gauge is 6" – 11" water, which is the range Huntsman has determined is a good indicator for overall performance of the rotoclone, including buildup on their filters. Huntsman has 2 other gauges that they use in addition to the overall pressure drop to help troubleshoot rotoclone issues: the bag filter gauge (1/2 – 1" at time of inspection) and the demister gauge (0.5" at time of inspection).

While onsite the overall pressure drop was reading at 11". J. Little explained that Huntsman aims to keep the pressure drop at this higher end of the operating range for maximum draw. He explained that over time the filters will degrade, causing the pressure to drop, and this is the indicator they use to change the filters. Pressure drop is checked at the beginning of each shift.

It appears that the rotoclone is being operated properly, based on the indicators recorded during the inspection.

The waste from the rotoclone is a slurry/sludge of water and particulate that J. Little said is disposed of as nonhazardous waste.

The stack height is required to be at least 76' above ground level with a 20' diameter at the exit. The stack is required to be unobstructed and oriented vertically upward. During the inspection, I used the AQD-issued Nikon Forestry Pro II Rangefinder to determine the Rotoclone's stack height. Using the 2-point method, I confirmed that Huntsman was meeting the minimum stack height of 76' at 76.7'. Huntsman is in compliance with the stack height requirement. I observed no opacity from the stack at the time of the stack height reading.

B. Myles said that they hire IMPACT consultants to conduct VE readings on the rotoclone's exhaust on a quarterly basis to ensure compliance. This is not required by any of the permits at this time. VE's are limited to 0%.

Compliance statement: Huntsman appears to be in compliance with PTI's 358-99, 871-90, 580-88A, and 785-81 at this time.

Image 1(Tank: Out of Service) : Photo credit: Jeff Little, Huntsman, during inspection 8/24/23. Example of tank w/ "Out of Service" label.

NAME Michelle Luplow DATE 9/26/23 SUPERVISOR RB

The table below contains the 12-month rolling VOC emissions from the 3-roll roller mill.

Month	Year	12M End Date	12M Start Date	12MR VOC lbs
1	2020	1/31/2020	2/1/2019	0.002967722
2	2020	2/29/2020	3/1/2019	0.003566644
3	2020	3/31/2020	4/1/2019	0.00397489
4	2020	4/30/2020	5/1/2019	0.00397489
5	2020	5/31/2020	6/1/2019	0.00318529
6	2020	6/30/2020	7/1/2019	0.003784212
7	2020	7/31/2020	8/1/2019	0.002994612
8	2020	8/31/2020	9/1/2019	0.002994612
9	2020	9/30/2020	10/1/2019	0.003593535
10	2020	10/31/2020	11/1/2019	0.003593535
11	2020	11/30/2020	12/1/2019	0.002994612
12	2020	12/31/2020	1/1/2020	0.003593535
1	2021	1/31/2021	2/1/2020	0.003593535
2	2021	2/28/2021	2/29/2020	0.002994612
3	2021	3/31/2021	4/1/2020	0.002994612
4	2021	4/30/2021	5/1/2020	0.003593535
5	2021	5/31/2021	6/1/2020	0.004192457
6	2021	6/30/2021	7/1/2020	0.003593535
7	2021	7/31/2021	8/1/2020	0.004192457
8	2021	8/31/2021	9/1/2020	0.003593535
9	2021	9/30/2021	10/1/2020	0.003593535
10	2021	10/31/2021	11/1/2020	0.003593535
11	2021	11/30/2021	12/1/2020	0.004192457
12	2021	12/31/2021	1/1/2021	0.003593535
1	2022	1/31/2022	2/1/2021	0.004192457
2	2022	2/28/2022	3/1/2021	0.004192457
3	2022	3/31/2022	4/1/2021	0.004192457
4	2022	4/30/2022	5/1/2021	0.004192457
5	2022	5/31/2022	6/1/2021	0.003593535
6	2022	6/30/2022	7/1/2021	0.003593535
7	2022	7/31/2022	8/1/2021	0.002994612
8	2022	8/31/2022	9/1/2021	0.002994612
9	2022	9/30/2022	10/1/2021	0.002994612
10	2022	10/31/2022	11/1/2021	0.002994612
11	2022	11/30/2022	12/1/2021	0.00239569
12	2022	12/31/2022	1/1/2022	0.002994612
1	2023	1/31/2023	2/1/2022	0.004192457
2	2023	2/28/2023	3/1/2022	0.005989225
3	2023	3/31/2023	4/1/2022	0.005390302
4	2023	4/30/2023	5/1/2022	0.005395311
5	2023	5/31/2023	6/1/2022	0.019181551
6	2023	6/30/2023	7/1/2022	0.01918656
7	2023	7/31/2023	8/1/2022	0.023262592

The table below contains number of batches per calendar month, lbs VOC emitted per batch of all products run through the 3-roll roller mill.

Work Center	Year	Month	Prod Code No	Batches	VOC Emissions(Lbs/Batch)
ELMIXRM	2020	2	3364408	1	0.000598922
ELMIXRM	2020	3	3364408	1	0.000598922
ELMIXRM	2020	6	3364408	1	0.000598922
ELMIXRM	2020	8	3364408	1	0.000598922
ELMIXRM	2020	9	3364408	1	0.000598922
ELMIXRM	2020	12	3364408	1	0.000598922
ELMIXRM	2021	3	3364408	1	0.000598922
ELMIXRM	2021	4	3364408	1	0.000598922
ELMIXRM	2021	5	3364408	1	0.000598922
ELMIXRM	2021	7	3364408	1	0.000598922
ELMIXRM	2021	9	3364408	1	0.000598922
ELMIXRM	2021	11	3364408	1	0.000598922
ELMIXRM	2022	1	3364408	1	0.000598922
ELMIXRM	2022	3	3364408	1	0.000598922
ELMIXRM	2022	4	3364408	1	0.000598922
ELMIXRM	2022	9	3364408	1	0.000598922
ELMIXRM	2022	12	3364408	1	0.000598922
ELMIXRM	2023	1	3364408	3	0.000598922
ELMIXRM	2023	2	3364408	3	0.000598922
ELMIXRM	2023	4	I704278	2	2.5042E-06
ELMIXRM	2023	4	3364408	1	0.000598922
ELMIXRM	2023	5	3364508	1	0.000190677
ELMIXRM	2023	5	I721378	1	0.005448506
ELMIXRM	2023	5	I704278	2	2.5042E-06
ELMIXRM	2023	5	3730608	2	2.50456E-06
ELMIXRM	2023	5	I700178	4	0.00203426
ELMIXRM	2023	6	I704278	2	2.5042E-06
ELMIXRM	2023	7	I704278	3	2.5042E-06
ELMIXRM	2023	7	I700178	2	0.00203426

The table below contains lbs of VOCs emitted per month for January 2022 – July 2023, from all the products run through the 3-roll roller mill.

Year	Month	Total VOC Emissions (lbs/month)
2022	1	0.000598922
2022	2	0
2022	3	0.000598922
2022	4	0.000598922
2022	5	0
2022	6	0
2022	7	0
2022	8	0
2022	9	0.000598922
2022	10	0
2022	11	0
2022	12	0.000598922
2023	1	0.001796767
2023	2	0.001796767
2023	3	0
2023	4	0.000603931
2023	5	0.01378624
2023	6	5.0084E-06
2023	7	0.004076032

ARALDITE® GY 6010 US

Version	Revision Date:	SDS Number:	Date of last issue: 08/14/2018
3.0	02/08/2022	400001000047	Date of first issue: 11/10/2016

Print Date 09/07/2023

SECTION 1. IDENTIFICATION

Product name : ARALDITE® GY 6010 US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC

Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Epoxy constituents

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin irritation : Category 2

Eye irritation : Category 2A

Skin sensitisation : Category 1

Short-term (acute) aquatic hazard : Category 2

Chronic aquatic toxicity : Category 2

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**

P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P391 Collect spillage.
Storage:
Not available
Disposal:
P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	90 - 100

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

If inhaled : If inhaled, remove to fresh air.

Get medical attention if symptoms occur.

In case of skin contact	:	If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	:	None known.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection and use the recommended protective clothing If potential for exposure exists refer to Section 8 for specific personal protective equipment. Avoid inhalation, ingestion and contact with skin and eyes. No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	Exercise caution when using a high volume water jet as it may scatter and spread fire
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides Halogenated compounds
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must

be disposed of in accordance with local regulations.

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in properly labelled containers.
Materials to avoid	:	For incompatible materials please refer to Section 10 of this SDS. For incompatible materials please refer to Section 10 of this SDS.
Further information on	:	No decomposition if stored and applied as directed.

storage stability

Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material	:	butyl-rubber
Break through time	:	> 8 h
Material	:	Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time	:	> 8 h
Material	:	Nitrile rubber
Break through time	:	10 - 480 min
Material	:	Neoprene
Break through time	:	10 - 480 min

Remarks : Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
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.
The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and

concentration of the dangerous substance at the work place.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	colourless
Odour	:	slight
Odour Threshold	:	No data is available on the product itself.
pH	:	ca. 7 (68 °F / 20 °C) Concentration: 500 g/l
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	> 392 °F / > 200 °C
Flash point	:	> 392 °F / > 200 °C Method: Pensky-Martens closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	< 0.0001 hPa (77 °F / 25 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	1.15 - 1.17 (77 °F / 25 °C)
Density	:	1.17 - 1.2 g/cm3 (77 °F / 25 °C)
Solubility(ies)		
Water solubility	:	practically insoluble (68 °F / 20 °C)
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	log Pow: 3.8 (77 °F / 25 °C)
Auto-ignition temperature	:	does not ignite

Decomposition temperature	:	> 392 °F / > 200 °C
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity		
Viscosity, dynamic	:	10,000 - 12,000 mPa.s (77 °F / 25 °C)
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Particle size	:	No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No hazards to be specially mentioned.
Conditions to avoid	:	None known.
Incompatible materials	:	Strong acids Strong bases Strong oxidizing agents
Hazardous decomposition products	:	carbon dioxide carbon monoxide Halogenated compounds

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Acute oral toxicity	:	LD50 (Rat, female): > 2,000 mg/kg Method: OECD Test Guideline 420 Assessment: The substance or mixture has no acute oral toxicity Remarks: No mortality observed at this dose.
Acute dermal toxicity	:	LD50 (Rat, male and female): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rabbit
Exposure time	:	4 h
Assessment	:	Irritating to skin.
Method	:	OECD Test Guideline 404
Result	:	Irritating to skin.

Serious eye damage/eye irritation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rabbit
Result	:	Irritating to eyes.
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405

Respiratory or skin sensitisation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	The product is a skin sensitiser, sub-category 1B.

Germ cell mutagenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: without metabolic activation
Result: positive

Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)
Result: negative

Genotoxicity in vivo : Test Type: in vivo assay
Species: Mouse (male)
Cell type: Germ
Application Route: Oral
Dose: 3333, 10000 mg/kg
Result: negative

Test Type: gene mutation test
Species: Rat (male)

Cell type: Somatic
Application Route: Oral
Dose: 50,250,500,1000 mg/kg bw/day
Method: OECD Test Guideline 488
Result: negative

Carcinogenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rat, male
Application Route	:	Oral
Exposure time	:	24 month(s)
Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOAEL	:	15 mg/kg bw/day
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

Species	:	Mouse, male
Application Route	:	Dermal
Exposure time	:	24 month(s)
Dose	:	0, 0.1, 10, 100 mg/kg bw/day
Frequency of Treatment	:	3 days/week
NOEL	:	0.1 mg/kg body weight
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

Species	:	Rat, female
Application Route	:	Dermal
Exposure time	:	24 month(s)
Dose	:	0.1, 100, 1000 mg/kg bw/day
Frequency of Treatment	:	5 days/week
NOEL	:	100 mg/kg body weight
Method	:	OECD Test Guideline 453
Result	:	negative

Species	:	Rat, female
Application Route	:	Oral
Exposure time	:	24 month(s)
Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOAEL	:	100 mg/kg bw/day
Method	:	OECD Test Guideline 453
Result	:	negative
Target Organs	:	Digestive organs

Species	:	Rat, females
Application Route	:	Oral
Exposure time	:	24 month(s)
Dose	:	0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment	:	7 days/week
NOEL	:	2 mg/kg bw/day

Method : OECD Test Guideline 453
Result : negative
Target Organs : Digestive organs

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 0, 50, 180, 540 or 750 milligram per kilogram
Duration of Single Treatment: 238 d
Frequency of Treatment: 1 daily
General Toxicity - Parent: NOEL: 540 mg/kg body weight
General Toxicity F1: NOEL: 750 mg/kg body weight
Symptoms: No adverse effects
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Effects on foetal development : Species: Rabbit, female
Application Route: Dermal
Dose: 0, 30, 100 or 300 milligram per kilogram
Duration of Single Treatment: 28 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 30 mg/kg body weight
Developmental Toxicity: NOAEL: 300 mg/kg body weight
Method: Other guidelines
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rabbit, female
Application Route: Oral
Dose: 0, 20, 60 or 180 milligram per kilogram
Duration of Single Treatment: 13 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 60 mg/kg body weight
Developmental Toxicity: NOAEL: 180 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0, 60, 180 and 540 milligram per kilogram

Duration of Single Treatment: 10 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 180 mg/kg body weight
Developmental Toxicity: NOAEL: > 540 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species	:	Rat, male and female
NOAEL	:	50 mg/kg
Application Route	:	oral (gavage)
Exposure time	:	14 Weeks
Number of exposures	:	7 d
Dose	:	0, 50, 250, 1000 mg/kg/day
Method	:	OECD Test Guideline 408

Species	:	Rat, male and female
NOAEL	:	>= 10 mg/kg
Application Route	:	Skin contact
Exposure time	:	13 Weeks
Number of exposures	:	5 d
Dose	:	0, 10, 100, 1000 mg/kg/day
Method	:	OECD Test Guideline 411

Species	:	Mouse, male
NOAEL	:	100 mg/kg
Application Route	:	Skin contact
Exposure time	:	13 Weeks
Number of exposures	:	3 d
Dose	:	0, 1, 10, 100 mg/kg/day
Method	:	OECD Test Guideline 411

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1.8 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50: 11 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: EPA-660/3-75-009 NOEC: 4.2 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: EPA-660/3-75-009
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.3 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211
Toxicity to microorganisms	:	IC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water

Ecotoxicology Assessment

Chronic aquatic toxicity	:	Toxic to aquatic life with long lasting effects.

Persistence and degradability

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Biodegradability	:	aerobic Inoculum: activated sludge, non-adapted Concentration: 20 mg/l Result: Not readily biodegradable. Biodegradation: 5 % Exposure time: 28 d Method: OECD Test Guideline 301F

Stability in water : Degradation half life (DT50): 4.83 d (25 °C) pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 7.1 d (25 °C) pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 3.58 d (25 °C) pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

Bioaccumulative potential

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Bioaccumulation : Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3.242 (77 °F / 25 °C)
pH: 7.1
Method: OECD Test Guideline 117

Mobility in soil

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Distribution among environmental compartments : Koc: 445

Other adverse effects

Product:

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of contents and container in accordance with all local,

regional, national and international regulations.
Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Environmentally hazardous	:	yes

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	CLASS 9
ERG Code	:	171
Marine pollutant	:	yes
Remarks	:	Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

Special precautions for user

Remarks : 49CFR: no dangerous good in non-bulk packaging

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 311/312 Hazards : Respiratory or skin sensitisation
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65

WARNING: This product can expose you to chemicals including 4,4'-isopropylidenediphenol, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

WARNING: This product can expose you to chemicals including 4,4'-isopropylidenediphenol, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

DSL : All components of this product are on the Canadian DSL

AIIC : On the inventory, or in compliance with the inventory

NZIoC : On the inventory, or in compliance with the inventory

ENCS : On the inventory, or in compliance with the inventory

KECI : On the inventory, or in compliance with the inventory

PICCS : On the inventory, or in compliance with the inventory

IECSC : On the inventory, or in compliance with the inventory

TCSI : On the inventory, or in compliance with the inventory

TSCA : All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

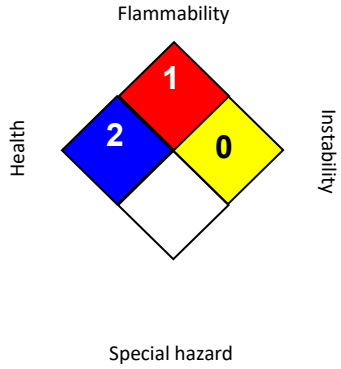
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

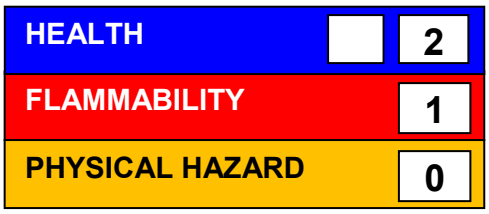
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Revision Date : 02/08/2022

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards,

toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

ARALDITE® CY 184 US

Version	Revision Date:	SDS Number:	Date of last issue: 08/31/2020
1.3	06/21/2021	400001009562	Date of first issue: 09/18/2015

Print Date 09/07/2023

SECTION 1. IDENTIFICATION

Product name : ARALDITE® CY 184 US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Non-Emergency: (800) 257-5547

E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Component used for the manufacture of electrical insulation parts

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin sensitisation : Category 1

Short-term (acute) aquatic hazard : Category 3

Chronic aquatic toxicity : Category 3

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P261 Avoid breathing mist or vapours.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves.

Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
Storage:
Not available
Disposal:
P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate	5493-45-8	90 - 100

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact : If on skin, rinse well with water.

In case of eye contact : Flush eyes with water as a precaution.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Induce vomiting immediately and call a physician.
Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed : None known.

Protection of first-aiders	:	First Aid responders should pay attention to self-protection and use the recommended protective clothing If potential for exposure exists refer to Section 8 for specific personal protective equipment. Avoid inhalation, ingestion and contact with skin and eyes. No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	Exercise caution when using a high volume water jet as it may scatter and spread fire
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides
Specific extinguishing methods	:	No data is available on the product itself.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for	:	Neutralise with acid.

containment and cleaning up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product. Do not breathe vapours or spray mist. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in properly labelled containers.
Materials to avoid	:	Do not store near acids.
Recommended storage temperature	:	36 - 104 °F / 2 - 40 °C
Further information on storage stability	:	Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines Recommended Filter type: Combined particulates and organic vapour type
Filter type	:	Filter type A-P
Hand protection		

Material	:	butyl-rubber
Break through time	:	> 8 h
Material	:	Nitrile rubber
Break through time	:	10 - 480 min
Material	:	Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time	:	> 8 h

Remarks	:	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. The suitability for a specific workplace should be discussed with the producers of the protective gloves. The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
Eye protection	:	Eye wash bottle with pure water Tightly fitting safety goggles
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	Clear
Odour	:	slight
Odour Threshold	:	No data is available on the product itself.
pH	:	10.3 (68 °F / 20 °C) Concentration: 500 g/l
Melting point/freezing point	:	No data available
Boiling point	:	> 392 °F / > 200 °C
Flash point	:	336 °F / 169 °C

Method: Pensky-Martens closed cup

Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	< 0.0001 hPa (68 °F / 20 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	1.22 (77 °F / 25 °C)
Density	:	1.22 g/cm3 (77 °F / 25 °C)
Solubility(ies)		
Water solubility	:	practically insoluble (68 °F / 20 °C)
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	> 392 °F / > 200 °C
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity		
Viscosity, dynamic	:	700 - 900 mPa.s (77 °F / 25 °C)
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Molecular weight	:	No data available
Particle size	:	No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.

Possibility of hazardous reactions	:	No hazards to be specially mentioned.
Conditions to avoid	:	None known.
Incompatible materials	:	Strong acids Strong bases Strong oxidizing agents
Hazardous decomposition products	:	carbon dioxide carbon monoxide

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : No data is available on the product itself.

Acute toxicity

Acute oral toxicity - Product : LD50 (Rat): 2,020 mg/kg

Acute inhalation toxicity : No data available

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Serious eye damage/eye irritation

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:
Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405

Respiratory or skin sensitisation

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

Assessment: No data available

Germ cell mutagenicity

Genotoxicity in vitro : No data available

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:
Genotoxicity in vivo : Application Route: Oral
Method: OECD Test Guideline 474
Result: negative

Germ cell mutagenicity-Assessment : No data available

Carcinogenicity

Product:

Remarks: Mixtures of Bisphenol A, Bisphenol F or Novolac epoxy resins and this cycloaliphatic epoxy resin may exhibit a possible risk of skin cancer under conditions of long-term skin contact. The single components however do not have this adverse effect (potentiation).

Carcinogenicity - Assessment : No data available

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:
Effects on fertility : Test Type: Pre-/postnatal development

Species: Rat, male and female
Application Route: Oral
Dose: 0, 50, 175, 300 mg/kg
General Toxicity - Parent: No observed adverse effect level: 175 mg/kg body weight
General Toxicity F1: No observed adverse effect level: 350 mg/kg body weight
Method: OECD Test Guideline 414

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate**:**

Effects on foetal development : Test Type: Pre-natal
Species: Rat, male and female
Application Route: Oral
Dose: 0, 50, 175, 300 mg/kg
General Toxicity Maternal: No observed adverse effect level: 175 mg/kg body weight
Teratogenicity: No observed adverse effect level: 350 mg/kg body weight
Method: OECD Test Guideline 414
Result: No effects on fertility and early embryonic development were detected.

Reproductive toxicity - Assessment : No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate**:**
Species: Rat, male and female
NOAEL: 350 mg/kg
Application Route: Oral
Exposure time: 90 d
Dose: 0, 10, 100, 350 mg/kg
Method: OECD Test Guideline 408

Repeated dose toxicity - Assessment : No data available

Aspiration toxicity

No data available

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

Ingestion: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxicity to fish - Product : LC50: 35 mg/l
Exposure time: 96 h

LC0: 18 mg/l
Exposure time: 96 h

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 71.6 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): > 56 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity) : No data available

Toxicity to fish (Chronic : No data available

toxicity)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : No data available

M-Factor (Chronic aquatic toxicity) : No data available

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:

Toxicity to microorganisms : EC50 (Pseudomonas putida): > 10,000 mg/l
Exposure time: 18 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38 412 Part 8

Toxicity to soil dwelling organisms : No data available

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial organisms : No data available

Ecotoxicology Assessment

Acute aquatic toxicity : No data available

Chronic aquatic toxicity : No data available

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

Persistence and degradability

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 58 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Biochemical Oxygen Demand (BOD) : No data available

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:

Chemical Oxygen Demand : 1.3 mgO2/g

(COD)
BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon (DOC) : No data available

Physico-chemical removability : No data available

Stability in water : No data available

Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential

Bioaccumulation : No data available

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:
Partition coefficient: n-octanol/water : log Pow: 1.7 (77 °F / 25 °C)
Method: OECD Test Guideline 117

Mobility in soil

Mobility : No data available

Components:

bis(2,3-epoxypropyl) cyclohexane-1,2-dicarboxylate:
Distribution among environmental compartments : Koc: 1.79
Method: OECD Test Guideline 121

Stability in soil : No data available

Other adverse effects

Environmental fate and pathways : No data available

Results of PBT and vPvB assessment : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

Hazardous to the ozone layer

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
Additional ecological information - Product	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life with long lasting effects.
Global warming potential (GWP)	:	No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations. Dispose of contents/ container to an approved waste disposal plant.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
Not regulated as dangerous goods

IATA-DGR
Not regulated as dangerous goods

IMDG-Code
Not regulated as dangerous goods

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

49 CFR
Not regulated as dangerous goods

Special precautions for user

Remarks	:	Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 311/312 Hazards : Respiratory or skin sensitisation

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

DSL	:	All components of this product are on the Canadian DSL
AIIC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

TSCA - 5(a) Significant New Use Rule List of Chemicals

No substances are subject to a Significant New Use Rule.

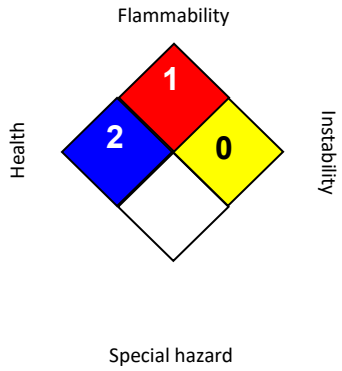
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No substances are subject to TSCA 12(b) export notification requirements.

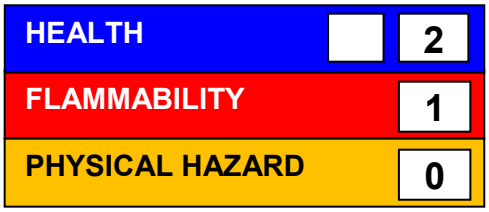
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Revision Date : 06/21/2021

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.

We create chemistry

Safety Data Sheet
Heliogen® Blue K 7097

1. Identification

Product identifier used on the label

Heliogen® Blue K 7097

Recommended use of the chemical and restriction on use
Recommended use*: colourant(s)
Suitable for use in industrial sector: plastics processing industry

* The “Recommended use” identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:
BASF Colors & Effects USA LLC
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification
Chemical family: pigment

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Combustible Dust Combustible Dust (1) Combustible Dust

Label elements

Signal Word:
Warning

Hazard Statement:

May form combustible dust concentration in air.

Hazards not otherwise classified

The product is under certain conditions capable of dust explosion.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

CAS Number	Weight %	Chemical name
Trade Secret	100.0 %	Proprietary Copper Compound

4. First-Aid Measures

Description of first aid measures

General advice:
Remove contaminated clothing.

If inhaled:
If difficulties occur after dust has been inhaled, remove to fresh air and seek medical attention.

If on skin:
Wash thoroughly with soap and water.

If in eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open. If irritation develops, seek medical attention.

If swallowed:
Rinse mouth and then drink plenty of water. Do not induce vomiting. Seek medical attention if necessary.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11.

Indication of any immediate medical attention and special treatment needed

Note to physician
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
dry powder, foam

Unsuitable extinguishing media for safety reasons:
carbon dioxide

Additional information:
Avoid whirling up the material/product because of the danger of dust explosion.

Special hazards arising from the substance or mixture
Hazards during fire-fighting:
harmful vapours
Evolution of fumes/fog. The substances/groups of substances mentioned can be released in case of fire.

Advice for fire-fighters
Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:
Dusty conditions may ignite explosively in the presence of an ignition source causing flash fire.

Impact Sensitivity:
Assessment: Product is not explosive when subjected to mechanical impact.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Use personal protective clothing.

Environmental precautions
Contain contaminated water/firefighting water. Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up
For small amounts: Pick up with suitable appliance and dispose of.
For large amounts: Contain with dust binding material and dispose of.
Avoid raising dust.

7. Handling and Storage

Precautions for safe handling
Closed containers should only be opened in well-ventilated areas.

Protection against fire and explosion:
Dust can form an explosive mixture with air.

Conditions for safe storage, including any incompatibilities

Further information on storage conditions: Keep container tightly closed and dry; store in a cool place.
Avoid all sources of ignition: heat, sparks, open flame.

8. Exposure Controls/Personal Protection

Components with occupational exposure limits

Proprietary Copper Compound	ACGIH TLV	TWA value 0.2 mg/m3 fumes/smoke (copper (Cu)); TWA value 1 mg/m3 Dust and mist (copper (Cu));

Advice on system design:
Work in well ventilated areas. Do not breathe dust.

Personal protective equipment

Respiratory protection:
Observe OSHA regulations for respirator use (29 CFR 1910.134).

Hand protection:
Chemical resistant protective gloves

Eye protection:
Safety glasses with side-shields. Wear face shield if splashing hazard exists.

Body protection:
Wear chemical resistant gloves and protective clothing.

General safety and hygiene measures:
Eye wash fountains and safety showers must be easily accessible.

9. Physical and Chemical Properties

Form:	powder	
Odour:	odourless	
Odour threshold:	not determined	
Colour:	blue	
pH value:	approx. 7 Forms a suspension.	
Melting point:	480 °C (1,013 hPa)	
Boiling point:	not determined	
Flash point:	Study does not need to be conducted.	
Flammability:	not highly flammable	
Lower explosion limit:	For solids not relevant for classification and labelling.	
Upper explosion limit:	For solids not relevant for classification and labelling.	
Autoignition:	> 530 °C 530 °C	(BAM) (BAM)
Vapour pressure:	not applicable	
Relative density:	approx. 1.6	
Bulk density:	190 kg/m3	
Vapour density:	The product is a non-volatile solid.	
Partitioning coefficient n-octanol/water (log Pow):	Study does not need to be conducted.	
Self-ignition temperature:	not self-igniting	
Thermal decomposition:	345 °C (VDI 2263, sheet 1, 1.4.1)	

Viscosity, dynamic:	Study does not need to be conducted.
Particle size:	No data available.
Solubility in water:	insoluble
Solubility (qualitative):	soluble solvent(s): organic solvents,
Molar mass:	approx. 576.1 g/mol
Evaporation rate:	The product is a non-volatile solid.

10. Stability and Reactivity

Reactivity
No hazardous reactions if stored and handled as prescribed/indicated.

Oxidizing properties:
not fire-propagating

Chemical stability
The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions
Dust explosion hazard.

Conditions to avoid
See MSDS section 7 - Handling and storage.

Incompatible materials
No substances known that should be avoided.

Hazardous decomposition products

Decomposition products:
Hazardous decomposition products: No hazardous decomposition products if stored and handled as prescribed/indicated.

Thermal decomposition:
345 °C (VDI 2263, sheet 1, 1.4.1)

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Primary routes of entry
Skin
Eyes
Inhalation.
Ingestion.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Virtually nontoxic after a single ingestion. Virtually nontoxic after a single skin contact.

Oral
Type of value: LD50
Species: rat (male/female)
Value: > 6,400 mg/kg (OECD Guideline 401)
The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Dermal
Type of value: LD50
Species: rat (male)
Value: > 5,000 mg/kg (OECD Guideline 402)
No mortality was observed. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Assessment other acute effects
Assessment of STOT single:
Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

Irritation / corrosion
Assessment of irritating effects: Not irritating to the skin. Not irritating to the eyes. The product has not been tested. The statement has been derived from the properties of the individual components.

Skin
Species: rabbit
Result: non-irritant
Method: BASF-Test
The substance was tested in olive oil.
The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Eye
Species: rabbit
Result: non-irritant
Method: BASF-Test
The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Sensitization
Assessment of sensitization: The chemical structure does not suggest a sensitizing effect.

Mouse Local Lymph Node Assay (LLNA)
Species: mouse
Result: Non-sensitizing.
Method: OECD Guideline 429
The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Aspiration Hazard
No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: No adverse effects were observed after repeated exposure in animal studies.

Genetic toxicity
Assessment of mutagenicity: Results from a number of mutagenicity studies with microorganisms, mammalian cell culture and mammals are available. Taking into account all of the information, there is no indication that the substance is mutagenic. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Carcinogenicity
Assessment of carcinogenicity: None of the components in this product at concentrations greater than 0.1% are listed by IARC; NTP, OSHA or ACGIH as a carcinogen.
Study scientifically not justified.

Reproductive toxicity
Assessment of reproduction toxicity: The results of animal studies gave no indication of a fertility impairing effect.

Teratogenicity
Assessment of teratogenicity: No teratogenic effects reported.

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11.

12. Ecological Information

Toxicity

Aquatic toxicity
Assessment of aquatic toxicity:
There is a high probability that the product is not acutely harmful to aquatic organisms. No toxic effects occur within the range of solubility. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish
LC50 (96 h) > 100 mg/l, Brachydanio rerio (Screening test, static)
Limit concentration test only (LIMIT test). No toxic effects occur within the range of solubility. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Aquatic invertebrates
EC50 (48 h) > 500 mg/l, Daphnia magna (Directive 79/831/EEC, static)
The details of the toxic effect relate to the nominal concentration. Tested above maximum solubility. No toxic effects occur within the range of solubility. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Aquatic plants
EC50 (72 h) > 100 mg/l (growth rate), Desmodesmus subspicatus (OECD Guideline 201, static)
The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. Tested above maximum solubility. The details of the toxic effect relate to the nominal concentration.

Chronic toxicity to fish

No data available.

Chronic toxicity to aquatic invertebrates
No observed effect concentration (21 d) > 1 mg/l, Daphnia magna (OECD Guideline 211, semistatic)
The details of the toxic effect relate to the nominal concentration. The product has not been tested.
The statement has been derived from substances/products of a similar structure or composition.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms
DIN EN ISO 8192 aquatic
activated sludge, domestic/EC20 (30 min): 750 mg/l
The details of the toxic effect relate to the nominal concentration. The product has not been tested.
The statement has been derived from substances/products of a similar structure or composition.

Persistence and degradability

Assessment biodegradation and elimination (H2O)
Well eliminable from water by adsorption on activated sludge. The product is not very soluble in water and can thus be removed from water mechanically in suitable effluent treatment plants.

Bioaccumulative potential

Bioaccumulation potential
Study scientifically not justified.

Additional information

Other ecotoxicological advice:
Do not discharge product into the environment without control.

13. Disposal considerations

Waste disposal of substance:
Do not discharge into drains/surface waters/groundwater. Dispose of in accordance with national, state and local regulations.

Container disposal:
Dispose of in accordance with national, state and local regulations. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

14. Transport Information

Land transport
USDOT

Not classified as a dangerous good under transport regulations

Sea transport
IMDG

Not classified as a dangerous good under transport regulations

Air transport
IATA/ICAO

Not classified as a dangerous good under transport regulations

15. Regulatory Information

Federal Regulations

Registration status:
Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Refer to SDS section 2 for GHS hazard classes applicable for this product.

State regulations

State RTK	CAS Number	Chemical name
NJ	Trade Secret	Proprietary Copper Compound
PA	Trade Secret	Proprietary Copper Compound

NFPA Hazard codes:
Health: 1 Fire: 1 Reactivity: 0 Special:

HMIS III rating
Health: 1 Flammability: 1 Physical hazard: 0

16. Other Information

SDS Prepared by:
BASF NA Product Regulations
SDS Prepared on: 2018/03/23

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

Heliogen® Blue K 7097 END OF DATA SHEET

ROYOXY™ RAR 928

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	07/25/2021	400001021488	Date of first issue: 07/25/2021

Print Date 09/07/2023

SECTION 1. IDENTIFICATION

Product name : ROYOXY™ RAR 928

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Non-Emergency: (800) 257-5547

E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Resin

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin irritation : Category 2

Eye irritation : Category 2A

Skin sensitisation : Sub-category 1B

Short-term (acute) aquatic hazard : Category 2

Chronic aquatic toxicity : Category 2

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**

P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P391 Collect spillage.
Storage:
Not available
Disposal:
P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	90 - 100

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact	:	If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	:	None known.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection and use the recommended protective clothing If potential for exposure exists refer to Section 8 for specific personal protective equipment. Avoid inhalation, ingestion and contact with skin and eyes. No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	Exercise caution when using a high volume water jet as it may scatter and spread fire
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon oxides Halogenated compounds
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in properly labelled containers.
Materials to avoid	:	For incompatible materials please refer to Section 10 of this SDS.
Recommended storage temperature	:	50 - 86 °F / 10 - 30 °C
Further information on storage stability	:	Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection	:	General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
Hand protection		
Remarks	:	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. The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection	:	Eye wash bottle with pure water Tightly fitting safety goggles Wear face-shield and protective suit for abnormal processing problems.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	light yellow
Odour	:	mild
Odour Threshold	:	No data is available on the product itself.
pH	:	No data is available on the product itself.

Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	No data is available on the product itself.
Flash point	:	No data is available on the product itself.
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	No data is available on the product itself.
Relative vapour density	:	No data is available on the product itself.
Relative density	:	No data is available on the product itself.
Density	:	No data is available on the product itself.
Solubility(ies)		
Water solubility	:	No data is available on the product itself.
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
Thermal decomposition	:	No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity	:	No data is available on the product itself.
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Particle size	:	No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.

Possibility of hazardous reactions	:	No hazards to be specially mentioned.
Conditions to avoid	:	None known.
Incompatible materials	:	None known.
Hazardous decomposition products	:	carbon dioxide carbon monoxide Halogenated compounds

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : No data is available on the product itself.

Acute toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Acute oral toxicityComponents : LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 420
Assessment: The substance or mixture has no acute oral toxicity
Remarks: No mortality observed at this dose.

Acute inhalation toxicity : No data available

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Species: Rabbit
Exposure time: 4 h
Assessment: Irritating to skin.
Method: OECD Test Guideline 404
Result: Irritating to skin.

Serious eye damage/eye irritation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Species: Rabbit
Result: Irritating to eyes.
Assessment: Irritating to eyes.
Method: OECD Test Guideline 405

Respiratory or skin sensitisation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Test Type: Local lymph node assay (LLNA)
Exposure routes: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: The product is a skin sensitiser, sub-category 1B.

Assessment: No data available

Germ cell mutagenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: without metabolic activation
Result: positive

Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)
Result: negative

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Genotoxicity in vivo : Test Type: in vivo assay
Species: Mouse (male)
Cell type: Germ
Application Route: Oral
Dose: 3333, 10000 mg/kg
Result: negative

Test Type: gene mutation test
Species: Rat (male)
Cell type: Somatic
Application Route: Oral
Dose: 50,250,500,1000 mg/kg bw/day
Method: OECD Test Guideline 488
Result: negative

Germ cell mutagenicity- : No data available

Assessment

Carcinogenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Species: Rat, male
Application Route: Oral
Exposure time: 24 month(s)
Dose: 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment: 7 days/week
NOAEL: 15 mg/kg bw/day

Method: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organs

Species: Mouse, male
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 0, 0.1, 10, 100 mg/kg bw/day
Frequency of Treatment: 3 days/week
NOEL: 0.1 mg/kg body weight

Method: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organs

Species: Rat, female
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 0.1, 100, 1000 mg/kg bw/day
Frequency of Treatment: 5 days/week
NOEL: 100 mg/kg body weight

Method: OECD Test Guideline 453
Result: negative

Species: Rat, female
Application Route: Oral
Exposure time: 24 month(s)
Dose: 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment: 7 days/week
NOAEL: 100 mg/kg bw/day

Method: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organs

Species: Rat, females
Application Route: Oral
Exposure time: 24 month(s)
Dose: 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment: 7 days/week
NOEL: 2 mg/kg bw/day

Method: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organs

Carcinogenicity - Assessment : No data available

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 0, 50, 180, 540 or 750 milligram per kilogram
Duration of Single Treatment: 238 d
Frequency of Treatment: 1 daily
General Toxicity - Parent: No-observed-effect level: 540 mg/kg body weight
General Toxicity F1: No-observed-effect level: 750 mg/kg body weight
Symptoms: No adverse effects
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Effects on foetal development : Species: Rabbit, female
Application Route: Dermal
Dose: 0, 30, 100 or 300 milligram per kilogram
Duration of Single Treatment: 28 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: No observed adverse effect level: 30 mg/kg body weight
Developmental Toxicity: No observed adverse effect level: 300 mg/kg body weight
Method: Other guidelines
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rabbit, female
Application Route: Oral
Dose: 0, 20, 60 or 180 milligram per kilogram
Duration of Single Treatment: 13 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: No observed adverse effect level: 60 mg/kg body weight
Developmental Toxicity: No observed adverse effect level: 180 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0, 60, 180 and 540 milligram per kilogram
Duration of Single Treatment: 10 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: No observed adverse effect level: 180 mg/kg body weight
Developmental Toxicity: No observed adverse effect level: > 540 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Reproductive toxicity - Assessment : No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Species: Rat, male and female
NOAEL: 50 mg/kg
Application Route: oral (gavage)
Exposure time: 14 Weeks
Number of exposures: 7 d
Dose: 0, 50, 250, 1000 mg/kg/day
Method: OECD Test Guideline 408

Species: Rat, male and female
NOAEL: >= 10 mg/kg
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 5 d
Dose: 0, 10, 100, 1000 mg/kg/day
Method: OECD Test Guideline 411

Species: Mouse, male
NOAEL: 100 mg/kg
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 3 d
Dose: 0, 1, 10, 100 mg/kg/day
Method: OECD Test Guideline 411

Repeated dose toxicity - Assessment : No data available

Aspiration toxicity
No data available

Experience with human exposure
General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution
No data available

Neurological effects
No data available

Further information
Ingestion: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1.8 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to algae/aquatic plants : EC50: 11 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: EPA-660/3-75-009

NOEC: 4.2 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: EPA-660/3-75-009

M-Factor (Acute aquatic toxicity) : No data available

Toxicity to fish (Chronic toxicity) : No data available

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.3 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : No data available

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water

Toxicity to soil dwelling organisms : No data available

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial : No data available

organisms

Ecotoxicology Assessment
Acute aquatic toxicity : No data available

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

Persistence and degradability

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Biodegradability : Test Type: aerobic
Inoculum: activated sludge, non-adapted
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Biochemical Oxygen Demand (BOD) : No data available

Chemical Oxygen Demand (COD) : No data available

BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon (DOC) : No data available

Physico-chemical removability : No data available

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Stability in water : Degradation half life(DT50): 4.83 d (77 °F / 25 °C) pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life(DT50): 7.1 d (77 °F / 25 °C) pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life(DT50): 3.58 d (77 °F / 25 °C) pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Bioaccumulation : Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Partition coefficient: n-octanol/water : log Pow: 3.242 (77 °F / 25 °C)
pH: 7.1
Method: OECD Test Guideline 117

Mobility in soil

Mobility : No data available

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Distribution among environmental compartments : Koc: 445
Stability in soil : No data available

Other adverse effects

Environmental fate and pathways : No data available

Results of PBT and vPvB assessment : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

Hazardous to the ozone layer

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A +

B).

Additional ecological information - Product	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life with long lasting effects.
Global warming potential (GWP)	:	No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Dispose of contents and container in accordance with all local, regional, national and international regulations. Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Environmentally hazardous	:	yes

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)
Class	:	9
Packing group	:	III
Labels	:	CLASS 9
ERG Code	:	171
Marine pollutant	:	yes(BISPHENOL A EPOXY RESIN)
Remarks	:	Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

Special precautions for user

Remarks	:	49CFR: no dangerous good in non-bulk packaging

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 311/312 Hazards	:	Respiratory or skin sensitisation Skin corrosion or irritation Serious eye damage or eye irritation
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

DSL	:	All components of this product are on the Canadian DSL
AIIC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory

IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

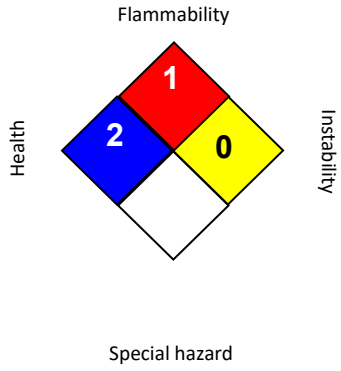
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

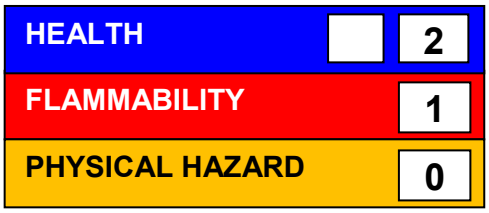
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Revision Date : 07/25/2021

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.

SAFETY DATA SHEET

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012)

Revision date: 29-Jan-2018

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name:	MOGUL® L Carbon Black
Product code:	MOGL
Synonyms:	Carbon Black, Furnace Black
This SDS is valid for the following grades:	Carbon Black grade series: BLACK PEARLS®, ELFTEX®, MOGUL®, MONARCH®, REGAL®, SPHERON®, STERLING®, VULCAN®, CSX™, CRX™, IRX™, FCX™, SHOBLACK™, DL™, PROPEL®, LITX®, and PBX® carbon black. Oxidized grades include: BLACK PEARLS® / MOGUL® L, BLACK PEARLS® / MOGUL® E, MOGUL® H, and REGAL® 400/400R carbon black. *Excludes: BLACK PEARLS® / MONARCH® 1000, 1300, 1400, 1500; BLACK PEARLS® 1300B1; Monarch® 4750; and Black Pearls® 4350/4750 carbon black; and all oil pellet grades..
Recommended use:	Additive/Filler for plastic and rubber, Pigment, Chemical reagent, Batteries, Refractories, Various
Restrictions on use:	Not Applicable.

Supplier:

Cabot Corporation
800 Tashmoo Avenue
Sarnia,
Ontario N7T 7N4
CANADA
Tel: +1 519 336 2261
Fax: +1 519 339 8273

Cabot Corporation
157 Concord Road
Billerica, MA 01821
UNITED STATES
Tel: 1-978-663-3455
Fax: 1-978-670-6955

Emergency Telephone Number: US: CHEMTREC: 1-800-424-9300 or 1-703-527-3887
International CHEMTREC: +1 703-741-5970 or +1-703-527-3887

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status: This chemical is considered hazardous by the United States 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Combustible dust

Label Elements:

Pictogram:	None
Signal Word:	WARNING
Hazard statements:	May form combustible dust concentrations in air
Precautionary Statements - Prevention	• Keep away from all ignition sources including heat, sparks and flame • Prevent dust accumulations to minimize explosion hazard

Hazards not otherwise classified (HNOC)

Do not expose to temperatures above 300°C. Hazardous products of combustion can include carbon monoxide, carbon dioxide, oxides of sulfur, and organic products.

Potential health effects

Principle Routes of Exposure:	Inhalation, Eye contact, Skin Contact
Eye Contact:	May cause mechanical irritation. Avoid contact with eyes.
Skin Contact:	May cause mechanical irritation, soiling, and skin drying. Avoid contact with skin. No cases of sensitization in humans have been reported.
Inhalation:	Dust may be irritating to respiratory tract. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated. See also Section 8.
Ingestion:	Adverse health effects are not expected. See Section 11.
Carcinogenicity:	Carbon Black is listed as an IARC (International Agency for Research on Cancer) Group 2B substance (possibly carcinogenic to humans). See also Section 11.
Target Organ Effects:	Lungs, See Section 11
Medical Conditions Aggravated by Exposure:	Asthma, Respiratory disorder
Potential Environmental Effects:	None known. See Section 12.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Carbon Black, Furnace Black.

Chemical name	CAS No	weight-%	Trade secret
Carbon Black	1333-86-4	100	

4. FIRST AID MEASURES

FIRST AID MEASURES

Skin Contact — Wash thoroughly with soap and water. Seek medical attention if symptoms develop.

Eye contact — Flush eyes immediately with large amounts of water for 15 minutes. Seek medical attention if symptoms develop.

Inhalation — If cough, shortness of breath or other breathing problems occur, move to fresh air. Seek medical attention if symptoms persist. If necessary, restore normal breathing through standard first aid measures.

Ingestion — Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Symptoms: — The most important known symptoms and effects are described in Section 2 and/or in Section 11.

Indication of any immediate medical attention and special treatment needed

Note to physicians: — Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: — Use foam, carbon dioxide (CO2), dry chemical or water spray. A fog is recommended if water is used.

Unsuitable Extinguishing Media: — DO NOT USE a solid water stream as it may scatter and spread fire. DO NOT USE high pressure media which could cause formation of a potentially explosible dust-air mixture.

Specific hazards arising from the chemical: — It may not be obvious that carbon black is burning unless the material is stirred and embers and/or sparks are apparent. Carbon black that has been on fire should be observed closely for at least 48 hours to ensure no smoldering material is present. Burning produces irritant fumes. The product is insoluble and floats on water. If possible, try to contain floating material.

Hazardous combustion products: — Carbon monoxide (CO). Carbon dioxide (CO2). Sulphur oxides.

Protective equipment and precautions for firefighters: — Wear suitable protective equipment. In the event of fire, wear self-contained breathing apparatus. Wet carbon black produces very slippery walking surfaces.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions: — CAUTION: Wet carbon black produces slippery walking surfaces. Avoid dust formation.

Ensure adequate ventilation. Use personal protective equipment. See also Section 8.

Environmental Precautions:

Environmental Precautions: Contain spilled product on land, if possible. The product is insoluble and floats on water. Any product that reaches water should be contained. Local authorities should be advised if spillages cannot be contained.

Methods and material for containment and cleaning up

Methods for containment: Prevent further leakage or spillage if safe to do so.

Methods for cleaning up: If the spilled material contains dust or has the potential to create dust, use explosion-proof vacuums and/or cleaning systems suitable for combustible dusts. Use of a vacuum with high efficiency particulate air (HEPA) filtration is recommended. Do not create a dust cloud by using a brush or compressed air. Dry sweeping is not recommended. Water spray will produce very slippery walking surfaces and will not result in satisfactory removal of carbon black contamination. Pick up and transfer to properly labelled containers. See Section 13.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling: Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated. Do not create a dust cloud by using a brush or compressed air. Dust may form explosible mixture in air.

Take precautionary measures against static discharges. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations. Fine dust is capable of penetrating electrical equipment and may cause electrical shorts. If hot work (welding, torch cutting, etc.) is required the immediate work area must be cleared of carbon black product and dust.

Conditions for safe storage, including any incompatibilities

Storage Conditions: Keep in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Do not store together with strong oxidizing agents. Do not store together with volatile chemicals as they may be adsorbed onto product. Keep in properly labeled containers.

Carbon black is not classifiable as a Division 4.2 self-heating substance under the UN test criteria. However, the UN criteria for determining if a substance is self-heating is volume dependent, i.e., the auto-ignition temperature decreases with increasing volume. This classification may not be appropriate for large volume storage containers.

Before entering vessels and confined spaces containing carbon black, test for adequate oxygen, flammable gases and potential toxic air contaminants. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosible mixture if they are released in the atmosphere in sufficient concentrations.

Incompatible materials: Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure guidelines: The table below is a summary. Please see the specific legislation for complete information.

Carbon Black, CAS RN 1333-86-4:

Argentina: 3.5 mg/m^3, TWA
Australia: 3.0 mg/m^3, TWA inhalable
Belgium: 3.6 mg/m^3, TWA
Brasil: 3.5 mg/m^3, TWA
Canada (Ontario): 3.0 mg/m^3, TWA inhalable
China: 4.0 mg/m^3, TWA; 8.0 mg/m^3, STEL
Colombia: 3.0 mg/m^3, TWA inhalable
Czech Republic: 2.0 mg/m^3, TWA
Finland: 3.5 mg/m^3, TWA; 7.0 mg/m^3, STEL
France - INRS: 3.5 mg/m^3, TWA/VME inhalable
Hong Kong: 3.5 mg/m^3, TWA
Indonesia: 3.5 mg/m^3, TWA/NABs
Ireland: 3.5 mg/m^3, TWA; 7.0 mg/m^3, STEL
Italy: 3.0 mg/m^3, TWA inhalable
Japan SOH: 4.0 mg/m^3, TWA; 1.0 mg/m^3, TWA respirable
Korea: 3.5 mg/m^3, TWA
Malaysia: 3.5 mg/m^3, TWA
Netherlands - MAC: 3.5 mg/m^3, TWA inhalable
Mexico: 3.5 mg/m^3, TWA
Norway: 3.5 mg/m^3, TWA
Poland: 4.0 mg/m^3 TWA (NDS) (applies to carbon black containing benzo(a)pyrene <35 mg in 1 kg of carbon black, total inhalable dust)
Sweden: 3.0 mg/m^3, TWA
United Kingdom - WEL: 3.5 mg/m^3, TWA inhalable; 7.0 mg/m^3, STEL inhalable
US ACGIH - TLV: 3.0 mg/m^3, TWA inhalable
US OSHA - PEL: 3.5 mg/m^3, TWA

NOTE:

(1) Unless otherwise indicated as "respirable" or "inhalable", the exposure limit represents a "total" value. The inhalable exposure limit has been demonstrated to be more restrictive than the total exposure limit, by a factor of approximately 3.
(2) In its facilities globally, Cabot Corporation manages to the US ACGIH TLV of 3.0 mg/m^3 TWA inhalable.

AGW: Arbeitsplatzgrenzwert
INRS: Institut National de Recherche et de Securite (National Institute of Research and Security)
MAC: Maximaal Aanvaarde Concentraties (Maximum allowed concentration)
MHLW: Ministry of Health, Labor and Welfare
NABS: Nilai Ambang Batas (threshold limit value)
NDS: Najwyzsze dopuszczalne stezenie (8-hour occupational exposure limit)
OEL: Occupational Exposure Limit
PEL: Permissible Exposure Limit
SOH: Society of Occupational Health
STEL: Short Term Exposure Limit
TLV: Threshold Limit Value
TRGS: Technische Regeln für Gefahrstoffe (Technical Rule for Hazardous Materials)
TWA: Time Weighted Average
US ACGIH: United States American Conference of Governmental Industrial Hygienists
US OSHA: United States Occupational Safety and Health Administration
VME: Valeur Moyenne d'Exposition (Average Level of Exposure)
WEL: Workplace Exposure Limit
VLA-ED: Valor límite ambiental de exposicíon diaria (environmental value of daily exposure limit)

Engineering Controls: Ensure adequate ventilation to maintain exposures below occupational limits. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated.

Personal protective equipment [PPE]

Respiratory Protection: An approved air-purifying respirator (APR) for particulates may be permissible where airborne concentrations are expected to exceed occupational exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air supplied respirator if there is any potential for uncontrolled release, exposure levels are not known, or any circumstances where air-purifying respirators may not provide adequate protection. Use of respirators must include a complete respiratory protection program in accordance with national standards and current best practices.

The following agencies/organizations approve respirators and/or criteria for respirator programs:

US: NIOSH approval under 42 CFR 84 required. OSHA (29 CFR 1910.134). ANSI Z88.2-1992 (Respiratory Protection).

EU: CR592 Guidelines for the Selection and Use of Respiratory Protection.

Germany: DIN/EN 143 Respiratory Protective Devices for Dusty Materials.

UK: BS 4275 Recommendations for the Selection, Use and Maintenance of Respiratory Protective Equipment. HSE Guidance Note HS (G)53 Respiratory Protective Equipment.

Hand Protection: Wear protective gloves to prevent soiling of hands. Use protective barrier cream before handling the product. Wash hands and other exposed skin with mild soap and water.

Eye/face Protection: Wear eye/face protection. Wear safety glasses with side shields (or goggles).

Skin and Body Protection: Wear suitable protective clothing. Wash clothing daily. Work clothing should not be allowed out of the workplace.

Other: Handle in accordance with good industrial hygiene and safety practice. Emergency eyewash and safety shower should be located nearby.

Environmental exposure controls: In accordance with all local legislation and permit requirements.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid	Odor:	None.
Appearance:	Black powder or pellets	Odor threshold:	Not Applicable
Color:	Black		

Property	Values	**Remarks • Method**
pH:	2-11	2-4 (oxidized carbon black) and 4-11 (non-oxidized carbon black), 50 g/l water, 68ºF (20ºC), ASTM 1512
Melting point/freezing point:		Not Applicable
Boiling point / boiling range:		Not Applicable
Evaporation Rate:		Not Applicable

Vapor pressure:		Not Applicable
Vapor Density:		Not Applicable
Density:	1.7-1.9 g/cm3	@ 20 °C
Bulk Density:	200-680 kg/m^3	(Pellets)
	20-380 kg/m^3	(powder)
Specific Gravity at 20°C:	1.7-1.9	
Water solubility:	Insoluble	
Solubility(ies):	Insoluble	
Partition Coefficient (n-octanol/water):		Not Applicable
Decomposition temperature:		Not Applicable
Viscosity:		Not Applicable
Kinematic viscosity:		Not Applicable
Dynamic viscosity:		Not Applicable
Oxidizing Properties:		Not Applicable
Softening point:		Not Applicable
VOC content (%):		No information available
% Volatile (by Volume):		No information available
% Volatile (by Weight):	< 2.5%	(950ºC) non-oxidized carbon black
	2 - 8%	(oxidized carbon black)
Surface Tension:		No information available
Explosive properties:		Dust may form explosible mixture in air

Flash Point:		Not Applicable
Flammability (solid, gas):		No information available
Flammability Limit in Air:		No information available
Explosion Limits in Air - Upper (g/m^3):		No information available
Explosion Limits in Air - Lower (g/m^3):	50 g/m^3	dust
Autoignition Temperature:	> 140 °C	(transport) IMDG-Code
Minimum Ignition Temperature:	> 500 °C	(BAM Furnace) VDI 2263 (cloud)
	> 400 °C	VDI 2263 (layer)
Minimum Ignition Energy:	> 10,000 mJ	VDI 2263
Ignition Energy:		No information available
Maximum Absolute Explosion Pressure:	10 bar	VDI 2263 10 bar at an initial starting pressure of 1 bar. Higher starting initial pressures will yield higher explosion pressures
Maximum Rate of Pressure Rise:	30 - 400 bar/sec	VDI 2263 and ASTM E1226-88
Burn Velocity:	> 45 seconds	(not classifiable as "Highly Flammable", or "Easily Ignitable")
Kst Value:		No information available
Dust Explosion Classification:	ST1	

10. STABILITY AND REACTIVITY

Reactivity:	May react exothermically upon contact with strong oxidizers.
Stability:	Stable under recommended handling and storage conditions.
Possibility of hazardous reactions:	None under normal processing.
Hazardous polymerization:	Hazardous polymerization does not occur.
Conditions to avoid:	Do not expose to temperatures above 300°C. Keep away from heat and sources of ignition. Avoid dust formation.

Incompatible materials: Strong oxidizing agents.

Explosion data See also Section 9.

Sensitivity to Mechanical Impact: Not sensitive to mechanical impact.

Sensitivity to Static Discharge: Dust may form explosible mixture in air. Avoid dust formation. Do not create a dust cloud by using a brush or compressed air. Take precautionary measures against static discharges. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations.

Hazardous decomposition products: Carbon monoxide (CO). Carbon dioxide (CO2). Sulfur oxides. Organic products of combustion.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50: LD50/oral/rat = > 8000 mg/kg. (Equivalent to OECD TG 401).

Inhalation LC50: No data available

Dermal LD50: No data available.

Assessment: Non-toxic after ingestion.

Skin corrosion/irritation: Rabbit: not irritating. (Equivalent to OECD TG 404)
Edema = 0 (max. attainable irritation score: 4)
Erythema = 0 (max. attainable irritation score: 4)

Assessment: Not irritating to skin

Serious eye damage/eye irritation: Rabbit: not irritating. (OECD TG 405). Cornea: 0 (max. attainable irritation score: 4). Iris: 0 (max. attainable irritation score: 2). Conjunctivae: 0 (max. attainable irritation score: 3). Chemosis: 0 (max. attainable irritation score: 4).

Assessment: Not irritating to the eyes.

Sensitization: Guinea pig skin (Buehler Test): Not sensitizing (OECD TG 406).

Assessment: Not sensitizing in animals. No cases of sensitization in humans have been reported.

Germ Cell Mutagenicity *In Vitro*

Carbon black is not suitable to be tested in bacterial (Ames test) and other in vitro systems because of its insolubility. However, when organic solvent extracts of carbon black have been tested, results showed no mutagenic effects. Organic solvent extracts of carbon black can contain traces of polycyclic aromatic hydrocarbons (PAHs). A study to examine the bioavailability of these PAHs showed that PAHs are very tightly bound to carbon black and not bioavailable. (Borm, 2005)

In Vivo

In an experimental investigation, mutational changes in the hprt gene were reported in alveolar epithelial cells in the rat following inhalation exposure to carbon black. This observation is believed to be rat specific and a consequence of "lung overload" (Driscoll, 1997) which led to chronic inflammation and release of reactive oxygen species. This is considered to be a secondary genotoxic effect and, thus, carbon black itself would not be considered to be mutagenic,

Assessment: In vivo mutagenicity in rats occurs by mechanisms secondary to a threshold effect and is a consequence of "lung overload," which leads to chronic inflammation and the release of genotoxic oxygen species. This mechanism is considered to be a secondary genotoxic effect and, thus, carbon black itself would not be considered to be mutagenic.

Carcinogenicity:

ANIMAL TOXICITY:

Rat, oral, duration 2 years.
Effect: no tumors.

Mouse, oral, duration 2 years.
Effect: no tumors.

Mouse, dermal, duration 18 months.
Effect: no skin tumors.

Rat, inhalation, duration 2 years.
Target organ: lungs.
Effect: inflammation, fibrosis, tumors.

Note: Tumors in the rat lung are considered to be related to the "lung overload" rather than to a specific chemical effect of carbon black itself in the lung. These effects in rats have been reported in many studies on other poorly soluble inorganic particles and appear to be rat specific (ILSI, 2000). Tumors have not been observed in other species (i.e., mouse and hamster) for carbon black or other poorly soluble particles under similar circumstances and study conditions.

MORTALITY STUDIES (HUMAN DATA):

A study on carbon black production workers in the UK (Sorahan, 2001) found an increased risk of lung cancer in two of the five plants studied; however, the increase was not related to the dose of carbon black. Thus, the authors did not consider the increased risk in lung cancer to be due to carbon black exposure. A German study of carbon black workers at one plant (Morfeld, 2006; Buechte, 2006) found a similar increase in lung cancer risk but, like the Sorahan, 2001 (UK study), found no association with carbon black exposure. A large US study of 18 plants showed a reduction in lung cancer risk in carbon black production workers (Dell, 2006). Based upon these studies, the February 2006 Working Group at the International Agency for Research on Cancer (IARC) concluded that the human evidence for carcinogenicity was inadequate (IARC, 2010).

Since the IARC evaluation of carbon black, Sorahan and Harrington (2007) have re-analyzed the UK study data using an alternative exposure hypothesis and found a positive association with carbon black exposure in two of the five plants. The same exposure hypothesis was applied by Morfeld and McCunney (2009) to the German

cohort; in contrast, they found no association between carbon black exposure and lung cancer risk and, thus, no support for the alternative exposure hypothesis used by Sorahan and Harrington.

Overall, as a result of these detailed investigations, no causative link between carbon black exposure and cancer risk in humans has been demonstrated.

IARC CANCER CLASSIFICATION:

In 2006 IARC re-affirmed its 1995 finding that there is "inadequate evidence" from human health studies to assess whether carbon black causes cancer in humans. IARC concluded that there is "sufficient evidence" in experimental animal studies for the carcinogenicity of carbon black. IARC's overall evaluation is that carbon black is "possibly carcinogenic to humans (Group 2B)". This conclusion was based on IARC's guidelines, which generally require such a classification if one species exhibits carcinogenicity in two or more animal studies (IARC, 2010).

Solvent extracts of carbon black were used in one study of rats in which skin tumors were found after dermal application and several studies of mice in which sarcomas were found following subcutaneous injection. IARC concluded that there was "sufficient evidence" that carbon black extracts can cause cancer in animals (Group 2B).

ACGIH CANCER CLASSIFICATION:

Confirmed Animal Carcinogen with Unknown Relevance to Humans (Category A3 Carcinogen).

ASSESSMENT:

Applying the guidelines of self-classification under the Globally Harmonized System of Classification and Labeling of Chemicals, carbon black is not classified as a carcinogen. Lung tumors are induced in rats as a result of repeated exposure to inert, poorly soluble particles like carbon black and other poorly soluble particles. Rat tumors are a result of a secondary non-genotoxic mechanism associated with the phenomenon of lung overload. This is a species-specific mechanism that has questionable relevance for classification in humans. In support of this opinion, the CLP Guidance for Specific Target Organ Toxicity – Repeated Exposure (STOT-RE), cites lung overload under mechanisms not relevant to humans. Human health studies show that exposure to carbon black does not increase the risk of carcinogenicity.

Reproductive and Developmental Toxicity: ASSESSMENT: No effects on reproductive organs or fetal development have been reported in long-term repeated dose toxicity studies in animals.

STOT - single exposure: ASSESSMENT: Based on available data, specific target organ toxicity is not expected after single oral, single inhalation, or single dermal exposure.

STOT - repeated exposure: ANIMAL TOXICITY:

Repeated dose toxicity: inhalation (rat), 90 days, No Observed Adverse Effect Concentration (NOAEC) = 1.1 mg/m^3 (respirable). Target organ effects at higher doses are lung inflammation, hyperplasia, and fibrosis.

Repeated dose toxicity: oral (mouse), 2 yrs, No Observed Effect Level (NOEL) = 137 mg/kg

(body wt.)

Repeated dose toxicity: oral (rat), 2 yrs, NOEL = 52 mg/kg (body wt.)

Although carbon black produces pulmonary irritation, cellular proliferation, fibrosis, and lung tumors in the rat under conditions of "lung overload", there is evidence to demonstrate that this response is principally a species-specific response that is not relevant to humans.

MORBIDITY STUDIES (human data):

Results of epidemiological studies of carbon black production workers suggest that cumulative exposure to carbon black may result in small, non-clinical decrements in lung function. A U.S. respiratory morbidity study suggested a 27 ml decline in FEV1 from a 1 mg/m^3 8 hour TWA daily (inhalable fraction) exposure over a 40-year period (Harber, 2003). An earlier European investigation suggested that exposure to 1 mg/m^3 (inhalable fraction) of carbon black over a 40-year working lifetime would result in a 48 ml decline in FEV1 (Gardiner, 2001). However, the estimates from both studies were only of borderline statistical significance. Normal age-related decline over a similar period of time would be approximately 1200 ml.

In the U.S. study, 9% of the highest non-smokers exposure group (in contrast to 5% of the unexposed group) reported symptoms consistent with chronic bronchitis. In the European study, methodological limitations in the administration of the questionnaire limit the conclusions that can be drawn about reported symptoms. This study, however, indicated a link between carbon black and small opacities on chest films, with negligible effects on lung function.

INHALATION ASSESSMENT:

Applying the guidelines of self-classification under GHS, carbon black is not classified under STOT-RE for effects on the lung. Classification is not warranted on the basis of the unique response of rats resulting from the "lung overload" following exposure to poorly soluble particles such as carbon black. The pattern of pulmonary effects in the rat, such as inflammation and fibrotic responses, are not observed in other rodent species, non-human primates, or humans under similar exposure conditions. Lung overload does not appear to be relevant for human health. Overall, the epidemiological evidence from well-conducted investigations has shown no causative link between carbon black exposure and the risk of non-malignant respiratory disease in humans. A STOT-RE classification for carbon black after repeated inhalation exposure is not warranted.

ORAL ASSESSMENT:

Based on available data, specific target organ toxicity is not expected after repeated oral exposure.

DERMAL ASSESSMENT:

Based on available data and the chemical-physical properties (insolubility, low absorption potential), specific target organ toxicity is not expected after repeated dermal exposure.

Aspiration Hazard: ASSESSMENT: Based on industrial experience and the available data, no aspiration hazard is expected.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity: Fish (Brachydanio rerio): LC50 (96hr) > 1,000 mg/L. (Method: OECD 203).
Daphnia magna: EC50 (24hr) > 5,600 mg/L. (Method: OECD 202).
Algae (Scenedesmus subspicatus): EC50 (72hr) > 10,000 mg/L.
Algae (Scenedesmus subspicatus): NOEC >= 10,000 mg/L (Method: OECD 201).
Activated sludge: EC0 (3hr) >= 800 mg/L. (Method: DEV L3 TTC test).

ENVIRONMENTAL FATE

Persistence and degradability: The methods for determining biodegradability are not applicable to inorganic substances

Bioaccumulation: Not expected due to physicochemical properties of the substance.

Mobility: Not expected to migrate. Insoluble.

Distribution to Environmental Compartments: Insoluble. Expected to remain on soil surface. Expected to float on water.

PBT and vPvB Assessment: This substance does not fulfill the criteria for PBT or vPvB.

Other adverse effects: No information available.

13. DISPOSAL CONSIDERATIONS

Disclaimer: Information in this section pertains to the product as shipped in its intended composition as described in Section 3 of this SDS. Contamination or processing may change waste characteristics and requirements. Regulations may also apply to empty containers, liners or rinsate. State/provincial and local regulations may be different from federal regulations.

RCRA: Not a hazardous waste under U.S. RCRA, 40 CFR 261.

Canadian Waste Classification: Canada: Not a hazardous waste under provincial regulations.

Disposal considerations: Waste should not be released to sewers. Product, as supplied, can be burned in suitable incineration facilities or should be disposed of in accordance with the regulations issued by the appropriate federal, state and local authorities. Same consideration should be given to containers and packaging.

14. TRANSPORT INFORMATION

Seven (7) ASTM reference carbon blacks were tested according to the UN method, Self Heating Solids, and found to be “Not a self-heating substance of Division 4.2”; the same carbon blacks were tested according to the UN method, Readily Combustible Solids, and found to be “Not a readily combustible solid of Division 4.1”; under current UN Recommendations on the Transport of Dangerous Goods.

The following organizations do not classify carbon black as a "hazardous cargo" if it is "carbon, non-activated, mineral origin". Cabot carbon blacks meet this definition.

US Rail Regulations: Not regulated.

DOT

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

ICAO (air)

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

IATA

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

IMDG

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

RID

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

ADR

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

15. REGULATORY INFORMATION

Hazard Classification

United States - OSHA (29 CFR 1910.1200): Hazardous
Mexico - NOM-018-STPS-2000: Not hazardous
Mexico - NOM-018-STPS-2015: Not hazardous.
Canada - WHMIS Classification (CPR, SOR/88-66): Class D2A
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the M/SDS

contains all the information required by the Controlled Products Regulations.

Canada - WHMIS Classification (HPR, SOR/2015-17) This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the M/SDS contains all the information required by the Hazardous Products Regulations.

Chemical name	WHMIS - Ingredient Disclosure
Carbon Black 1333-86-4	1%

International Inventories

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory	Complies
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List	Complies
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances	Complies
ENCS - Japan Existing and New Chemical Substances	Complies
IECSC - China Inventory of Existing Chemical Substances	Complies
KECL - Korean Existing and Evaluated Chemical Substances	Complies
PICCS - Philippines Inventory of Chemicals and Chemical Substances	Complies
AICS - Australian Inventory of Chemical Substances	Complies
NZIoC - New Zealand Inventory of Chemicals	Complies
TCSI - Taiwan Chemical Substance Inventory	Complies

US Federal Regulations

SARA 311/312 Hazard Categories

Acute Health Hazard	NO
Chronic Health Hazard	YES
Fire hazard	YES
Sudden release of pressure hazard	NO
Reactive Hazard	NO

See GHS classification in section 2 for applicable SARA 311/312 hazard categories under the revised 40 CFR 370 (June 13, 2016)

SARA Section 313 (40 CFR 372) Toxics Release Inventory
Under EPA's Toxics Release Inventory (TRI) program, the reporting threshold for the polycyclic aromatic compounds (PAC) category is 100 pounds/year manufactured, processed, or otherwise used. The 100 pounds/year reporting threshold applies to the cumulative total of 25 specific PACs. In addition, the TRI reporting threshold for benzo(g,h,i)perylene is 10 pounds/year manufactured, processed, or otherwise used. Carbon black may contain certain PACs and/or benzo(g,h,i)perylene. The user is advised to evaluate their own TRI reporting responsibilities.

Clean Air Act Amendments of 1990
(CAA, Section 112, 40 CFR 82):
This product does not contain any components listed as a Hazardous Air Pollutant, Flammable Substance, Toxic Substance, or Class 1 or 2 Ozone Depletor

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive

Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

Food and Drug Administration (FDA)

Carbon Black is permitted for food contact when used as a filler in rubber articles intended for repeated use under 21 CFR (code of Federal Regulations) 177.2600.

LIMITATIONS:

-Total carbon black (channel process and furnace process) in the rubber may not exceed 50% by weight of the rubber products. Cabot carbon blacks are furnace process blacks.

- Not for use in contact with infant formula and human milk (see TOR 2016-002).

Pharmaceutical Information
Not permitted.

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals.

• "carbon black (airborne, unbound particles of respirable size)" is a California Proposition 65 listed substance. Please note that all three listing qualifiers (airborne, unbound (not bound within a matrix), and respirable size (10 micrometers or less in diameter)) must be met for this substance to be considered a Proposition 65 substance. Please contact your sales representative for additional information.
• Certain polycyclic aromatic hydrocarbons (PAHs) that may be found adsorbed onto the surface of carbon black are California Proposition 65 listed substances.
• "Carbon-black extracts" is a California Proposition 65 listed substance.
• Certain metals, including arsenic, cadmium, lead, mercury, or nickel, may be present on and/or in carbon black and are California Proposition 65 listed substances.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania	Louisiana:
Carbon Black 1333-86-4	X	X	X	

16. OTHER INFORMATION

Carbon Black Extracts:
Manufactured carbon blacks generally contain less than 0.1% of solvent extractable polycyclic aromatic hydrocarbons (PAH). Solvent extractable PAH content depends on numerous factors including, but not limited to, the manufacturing process, desired product specifications, and the analytical procedure used to measure and identify solvent extractable materials. Questions concerning PAH content of carbon black and analytical procedures should be addressed to your carbon black supplier

Cosmetic Use:
Cabot Corporation does not support the use of this product in any cosmetic application.

References:

Borm, P.J.A., Cakmak, G., Jermann, E., Weishaupt C., Kempers, P., van Schooten,FJ., Oberdorster, G., Schins, RP. (2005) Formation of PAH-DNA adducts after in-vivo and vitro exposure of rats and lung cell to different commercial carbon blacks. Tox.Appl. Pharm. 1:205(2):157-67.

Buechte, S, Morfeld, P, Wellmann, J, Bolm-Audorff, U, McCunney, R, Piekarski, C. (2006) Lung cancer mortality and carbon black exposure – A nested case-control study at a German carbon black production plant. J.Occup. Env.Med. 12: 1242-1252.

Dell, L, Mundt, K, Luipold, R, Nunes, A, Cohen, L, Heidenreich, M, Bachand, A. (2006) A cohort mortality study of employees in the United States carbon black industry. J.Occup. Env. Med. 48(12): 1219-1229.

Driscoll KE, Deyo LC, Carter JM, Howard BW, Hassenbein DG and Bertram TA (1997) Effects of particle exposure and particle-elicited inflammatory cells on mutation in rat alveolar epithelial cells. Carcinogenesis 18(2) 423-430.

Gardiner K, van Tongeren M, Harrington M. (2001) Respiratory health effects from exposure to carbon black: Results of the phase 2 and 3 cross sectional studies in the European carbon black manufacturing industry. Occup. Env. Med. 58: 496-503.

Harber P, Muranko H, Solis S, Torossian A, Merz B. (2003) Effect of carbon black exposure on respiratory function and symptoms. J. Occup. Env. Med. 45: 144-55.

ILSI Risk Science Institute Workshop: The Relevance of the Rat Lung Response to Particle to Particle Overload for Human Risk Assessment. Inh. Toxicol. 12:1-17 (2000).

International Agency for Research on Cancer: IARC Monographs on the Evaluation of Carcinogenic Risks to Humans (2010), Vol. 93, February 1-14, 2006, Carbon Black, Titanium Dioxide, and Talc. Lyon, France.

Morfeld P, Büchte SF, Wellmann J, McCunney RJ, Piekarski C (2006). Lung cancer mortality and carbon black exposure: Cox regression analysis of a cohort from a German carbon black production plant. J. Occup.Env.Med.48(12):1230-1241.

Morfeld P and McCunney RJ, (2009). Carbon Black and lung cancer testing a novel exposure metric by multi-model inference. Am. J. Ind. Med. 52: 890-899.

Sorahan T, Hamilton L, van Tongeren M, Gardiner K, Harrington JM (2001). A cohort mortality study of U.K. carbon black workers, 1951-1996. Am. J. Ind. Med. 39(2):158-170.

Sorahan T, Harrington JM (2007) A ''Lugged'' Analysis of Lung Cancer Risks in UK Carbon Black Production Workers, 1951–2004. Am. J. Ind. Med. 50, 555–564.

In compliance with Mexican regulation NMX-R-019-SCFI-2011, the following is the Mexican supplier:

CABOT SPECIALTY CHEMICALS MEXICO, SAPI DE CV-Planta Altamira
Carretera Tampico-Mante Km. 13.5
Col. Laguna de la Puerta, CP 89603
Altamira, Tamps. México
Tel. (833) 229 05 63
Fax. (833) 229 03 53
RFC NHU920612M83
Web:www.nhumo.com.mx

Disclaimer:
The information set forth is based on information that Cabot Corporation believes to be accurate. No warranty, expressed or implied, is intended. The information is provided solely for your information and consideration and Cabot assumes no legal responsibility for use or reliance thereon. In the event of a discrepancy between the information on the non-English document and its English counterpart, the English version shall supersede.

Prepared by: Cabot Corporation - Safety, Health and Environmental Affairs
Revision date: 29-Jan-2018

End of Safety Data Sheet

SunChemical
a member of the DIC group

SAFETY DATA SHEET

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2015/830 - Germany

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

654491100

1.1 Product identifier

Product name : 2480061 SUNFAST® BLUE 15:1

Product code : 2480061_C020/654491100A

Trade name : SUNFAST®
BLUE 15:1

Date of issue/ Date of revision : 12 November 2016

Version : 2.03

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses
Colorant; Printing ink related material; Printing ink.

Uses advised against	Reason
Not applicable.	

1.3 Details of the supplier of the safety data sheet

Manufacturer/ Distributor : Sun Chemical S.A./N.V.
Performance Pigments
Parc Industriel de la Noire Epine
Av. Fleming 2
1300 Wavre
Belgium
T: +45 56 67 75 85

Sun Chemical Corporation
5020 Spring Grove Avenue
Cincinnati, OH 45232-1999
Phone: +1 (513) 681-5950

e-mail address of person responsible for this SDS : regulatory.affairs@sunchemical.com

1.4 Emergency telephone number

Supplier

Telephone number : 0800-181-7059 (Chemtrec - 24 hours)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Not classified.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

SECTION 2: Hazards identification

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Supplemental label elements : Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : Fine dust clouds may form explosive mixtures with air. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

SECTION 3: Composition/information on ingredients

Substance/mixture : Mixture

Type

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
[5] Substance of equivalent concern

SECTION 4: First aid measures

4.1 Description of first aid measures

General : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and seek medical advice.

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with room temperature water for at least 15 minutes, keeping eyelids open. In case of accidental eye contact, avoid concurrent exposure to the sun or other sources of UV light which may increase the sensitivity of the eyes.

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.

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.

Ingestion : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

There are no data available on the mixture itself. The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.

Repeated or prolonged contact with the mixture may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin.Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.Fine dust clouds may form explosive mixtures with air.

4.3 Indication of any immediate medical attention and special treatment needed

SECTION 4: First aid measures

Notes to medical doctor : 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.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard.

Fine dust clouds may form explosive mixtures with air.

Hazardous thermal decomposition products : Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.

5.3 Advice for firefighters

Special protective actions for fire-fighters : Cool closed containers exposed to fire with water. Do not release runoff from fire to drains or watercourses.

Special protective equipment for fire-fighters : Appropriate breathing apparatus may be required.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Avoid breathing vapor or mist. Refer to protective measures listed in sections 7 and 8.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions : Do not allow to enter drains or watercourses. If the product contaminates lakes, rivers, or sewers, inform the appropriate authorities in accordance with local regulations.

6.3 Methods and materials for containment and cleaning up : 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). Preferably clean with a detergent. Avoid using solvents.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in area where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. 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. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Empty containers retain product residue and can be hazardous. Do not reuse container.

7.2 Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations.

Notes on joint storage

Keep away from: oxidizing agents, strong alkalis, strong acids.

Additional information on storage conditions

Store in a dry, cool and well-ventilated area. Keep container tightly closed.
No smoking. Prevent unauthorized access. Containers that have been opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

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 monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ ingredient name	Type	Exposure	Value	Population	Effects
No DELs available.					

PNECs

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
No PECs available.				

SECTION 8: Exposure controls/personal protection

8.2 Exposure controls

Appropriate engineering controls : Provide adequate ventilation. Where reasonably practicable, this should be achieved by the use of local exhaust ventilation and good general extraction.

Individual protection measures

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.

Eye/face protection : Safety eyewear should be used when there is a likelihood of exposure.

Skin protection

Hand protection : Barrier creams may help to protect the exposed areas of the skin but should not be applied once exposure has occurred.

Gloves : 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.

Body protection : Not applicable.

Respiratory protection : Not applicable.

Environmental exposure controls : Do not allow to enter drains or watercourses.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	: Solid. [Powder.]
Color	: Blue.
Odor	: Odorless.
Odor threshold	: Not applicable.
Melting point/freezing point	: Not applicable.
Flash point	: Not applicable.
VOC	: Not applicable.
pH	: Not tested
Explosion limits	: Not available.
Evaporation rate	: Not tested
Vapor pressure	: Not tested
Vapor density	: Not tested
Relative density	: 1.77
Solubility(ies)	: Insoluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: Not applicable.
Auto-ignition temperature	: 339°C (642.2°F)
Decomposition temperature	: Not applicable.
Viscosity	: Not tested
Explosive properties	: Not applicable.
Oxidizing properties	: Not applicable.

9.2 Other information

No additional information.

SECTION 9: Physical and chemical properties

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : Stable under recommended storage and handling conditions (see Section 7).

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid : When exposed to high temperatures may produce hazardous decomposition products.

10.5 Incompatible materials : Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

There are no data available on the mixture itself. The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.

Repeated or prolonged contact with the mixture may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin.Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.Fine dust clouds may form explosive mixtures with air.

11.1 Information on toxicological effects

Acute toxicity

Not determined - Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Irritation/Corrosion

Not determined - Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Sensitization

Not determined - Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Mutagenicity

Not applicable.

Carcinogenicity

Not applicable.

Reproductive toxicity

Not determined - Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Teratogenicity

Not applicable.

Specific target organ toxicity (single exposure)

Not determined - Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Specific target organ toxicity (repeated exposure)

Not determined - Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Aspiration hazard

SECTION 11: Toxicological information

Not determined - Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

SECTION 12: Ecological information

There are no data available on the mixture itself.
Do not allow to enter drains or watercourses.

The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure

Not available.

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

Not available.

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

Do not allow to enter drains or watercourses.
Dispose of according to all federal, state and local applicable regulations.
If this product is mixed with other wastes, the original waste product code may no longer apply and the appropriate code should be assigned.
For further information, contact your local waste authority.

13.1 Waste treatment methods

Product

Methods of 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.

Packaging

SECTION 13: Disposal considerations

Methods of disposal : The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	-	-	-	-
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

14.6 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.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

SECTION 15: Regulatory information

Other EU regulations

National regulations

Industrial use : The information contained in this safety data sheet does not constitute the user's own assessment of workplace risks, as required by other health and safety legislation. The provisions of the national health and safety at work regulations apply to the use of this product at work.

Storage code : 13

Hazard class for water : 1 Appendix No. 4

AOX : The product contains organically bound halogens and can contribute to the AOX value in waste water.

International lists:

Canada inventory: All components are listed or exempted.
Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory (ENCS): All components are listed or exempted.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Europe Inventory: Please contact your supplier to get the information.

TSCA 8(b) inventory: Listed

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still to be received.

SECTION 16: Other information

CEPE code : 7

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Not classified.	

Full text of abbreviated H statements : Not applicable.

Full text of classifications [CLP/GHS] : Not applicable.

Date of printing : 1 August 2019

Date of previous issue : 5 February 2016

Notice to reader

The information in this SDS is based on the present state of our knowledge and on current laws. The product is not to be used for purposes other than those specified under section 1 without first obtaining written handling instructions. It is always the responsibility of the user to take all necessary steps to fulfill the demands set out in the local rules and legislation. The information in this SDS is meant to be a description of the safety requirements for our product. It is not to be considered a guarantee of the product's properties.

Annex

Code Number:
C459778
SDS Date:
5/15/15
Date Received:
11/3/2020

DOMINION COLOUR CORPORATION

515 Consumers Road, Suite 700, Toronto, Ontario, Canada, M2J 4Z2
Telephone: +1 416 791 4200 Facsimile: Main +1 416 497 5198

Working Together for Quality®

DCC YELLOW 2GTM

Safety Data Sheet

Revision date: 15/05/2015 : Version: 2.0

SECTION 1: IDENTIFICATION OF THE SUBSTANCE & THE COMPANY

1.1. Product identifier

Product name : DCC YELLOW 2GTM
CAS No : 14059-33-7
C.I. Name: : Pigment Yellow 184

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/preparation : Colouring agent, pigment.

1.2.2. Uses advised against

Uses advised against : Not recommended for any sensitive application, toy, food (direct or indirect), cosmetics; not for consumer use.

1.3. Details of the supplier of the safety data sheet

Manufacturer's Name:
Dominion Colour Corporation
515 Consumers Road, Suite 700
M2J 4Z2 Toronto - Canada
T +1 416 791-4200 - F +1 416 497-5198
GManarang-Pena@dominioncolour. com

1.4. Emergency telephone number

Emergency number : +1 613 996-6666 (CANUTEC) 24 hours, 7 days a week

SECTION 2: HAZARD IDENTIFICATION

2.1. Classification of the substance or mixture

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS):

Repr. 1B H360FD

Full text of H-phrases: see section 16.

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS):

Hazard Pictogram :

GHS08

Signal Word : Danger

Hazard Statements : H360FD - May damage fertility. May damage the unborn child.

Precautionary Statements : P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P281 - Use personal protective equipment as required
P308+P313 - IF exposed or concerned: Get medical advice/attention
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local, national and international regulation.

OTHER INFORMATION : Contains Boric Acid CAS 10043-35-3.

2.3. Other hazards

SECTION 3: COMPOSITION /INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	GHS Classification:
Pigment Yellow 184 (Bismuth Vanadium Tetraoxide) (Main constituent)	(CAS No) 14059-33-7	>= 87	Not classified
Boric Acid	(CAS No) 10043-35-3	13 - 17	Repr. 1B, H360FD

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: FIRST-AID MEASURES

4.1. Description of first aid measures

First-aid measures after inhalation : Move to fresh air. Seek medical attention if you feel unwell or if exposure prolonged.

First-aid measures after skin contact : Wash affected skin with soap and plenty of water. Remove contaminated clothing.

First-aid measures after eye contact : Rinse immediately with plenty of water for at least 10 minutes taking care to wash under the eyelids.

First-aid measures after ingestion : If swallowed, rinse mouth. Consult a doctor/medical service.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media : Foam, Dry Powder, Water Spray.

Unsuitable extinguishing media : Carbon Dioxide.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Thermal decomposition or burning may release oxides of bismuth and vanadium, toxic gases/vapours.

Explosion hazard : Product is not explosive when subjected to the effect of heat.

Reactivity : Product is chemically stable and generally compatible with other substances when stored and handled as prescribed.

5.3. Advice for firefighters

Protection during firefighting : Full protective clothing. Wear a self-contained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Avoid inhalation and ingestion. Avoid contact with skin, eyes and clothing.

6.1.2. For emergency responders

Protective equipment : Full protective clothing. Wear a self-contained breathing apparatus.

6.2. Environmental precautions

Prevent contamination of soil, drains and surface waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Vacuum with high efficiency filter or use wet clean up technique to avoid dusting. Take up mechanically and collect in suitable container (adequately labelled) for disposal. Collect waste in suitable containers, which can be labelled and sealed. Do not wash indiscriminately down the drains. Wear self-contained breathing apparatus. Wear suitable protective equipment.

6.4. Reference to other sections

No additional information available

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Additional hazards when processed : Processing machines must be fitted with local exhaust ventilation.

Precautions for safe handling	: Handle and open container with care. Avoid dust formation and ignition sources. Dust clouds from finely particulated pigments may be hazardous (dust explosion risk). Listed product is not sensitive to static discharge. There is potential for build up of static discharge in packaging during transit, handling and charging of pigment into vessels. Accordingly, appropriate safety procedures should be followed and grounding of equipment is recommended.
Hygiene measures	: Wash thoroughly after handling and before eating, drinking or smoking. Do not eat, drink or smoke at the workplace.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	: Keep containers tightly closed in a dry, cool and well ventilated place.
Storage area	: Keep away from heat and sources of ignition.

7.3. Specific end use(s)

Restricted to Professional Users

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

ACGIH TLV	10 mg/m³ Nuisance Dust

DCC YELLOW 2GTM (14059-33-7)	
DNEL/DMEL (Workers)	
Long-term - local effects, inhalation	0.02 mg/m³
DNEL/DMEL (General population)	
Long-term - local effects, inhalation	0.005 mg/m³
PNEC (STP)	
PNEC sewage treatment plant	10000 mg/l

PNEC (additional information) : PNEC for water, sediment and soil could not be derived as the substance showed no toxic effects in studies performed in the range of its solubility. At the present state of knowledge, no negative ecological effects are expected.

8.2. Exposure controls

Appropriate engineering controls	: Exposure limit(s) should be monitored using suitable analytical equipments.
Hand protection	: Chemical resistant gloves (EN374). Suitable materials also prolonged, direct contact (Recommended: Protective index 6, corresponding >480 minutes of permeation time according to EN 374.
Eye protection	: Safety glasses with side-shields.
Skin and body protection	: Working clothes. Closed footwear.
Respiratory protection	: Wear a respirator type APF 20, FFP3 (EN 149:2001) or equivalent.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state	: Low Dusting Granules
Appearance	: Odourless Yellow Powder.
Colour	: Yellow.
Odour	: Odourless.
Odour threshold	: Not Applicable
pH	: 6 - 8 (100 g/l, 20°C) (as suspension)
pH solution	: Not Applicable
Melting point	: > 800 °C
Solidification point	: Not Applicable
Boiling point	: Not Applicable
Flash point	: Not Applicable
Relative evaporation rate (butylacetate=1)	: No data available
Flammability (solid, gas)	: Not Flammable
Explosive limits	: Not Applicable
Vapour pressure	: Not Applicable
Vapour pressure at 50°C	: Not Applicable
Relative vapour density at 20 °C	: Not Applicable
Relative density	: No data available
Specific Gravity:	: 3.6
Bulk Density	: 0.6
Density	: 3 - 6.5 g/cm³
Solubility	: Insoluble in Organic Solvents. Water: Insoluble

Log Pow	:	No data available
Log Kow	:	Not Applicable
Self ignition temperature	:	Not Available
Decomposition temperature	:	> 400 °C Lütolf's method
Viscosity, kinematic	:	Not Applicable
Viscosity, dynamic	:	Not Applicable
Explosive properties	:	Non Explosive.
Oxidising properties	:	Not Applicable.
Burn Class:	:	Does Not Catch Fire at 100°C

9.2. Other information

No additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Product is chemically stable and generally compatible with other substances when stored and handled as prescribed.

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

Product is chemically stable and generally compatible with other substances.

10.4. Conditions to avoid

Avoid electro-static discharge.

10.5. Incompatible materials

Avoid contact with strong oxidizing agents.

10.6. Hazardous decomposition products

Thermal decomposition or burning may release oxides of bismuth and vanadium, toxic gases/vapours.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity : Not classified

DCC YELLOW 2GTM (14059-33-7)	
LD50 oral rat	> 5000 mg/kg bodyweight (OECD 401 method)
LD50 dermal rat	No Data Available
LC50 inhalation rat (mg/l)	> 5.15 mg/l OECD 403

Skin corrosion/irritation : Not classified

(Rabbit / Non-Irritant (OECD 404))

As substance is not irritating, corrosivity is not expected.

Serious eye damage/irritation : Not classified

(Rabbit / Non-Irritant (OECD 405))

Respiratory or skin sensitisation : Not classified

(Guinea pig/Non-Sensitizing (OECD 406))

Germ cell mutagenicity : Not classified

Ames Test/Non-Mutagenic (OECD 471) with and without S9 metabolic activation.
Mouse / Non Mutagenic (OECD 474)
Hamster / Non-Mutagenic (OECD 473),(with and without S9 metabolic activation)

Carcinogenicity : Not classified

(No Data Available. The substance is non-mutagenic both in vivo and in vitro. The bioavailability of the test material is low following inhalation exposure and systemic effects were absent after oral and intraperitoneal exposure. The only adverse effects caused by the pigment were irritation of the lung following inhalation which reminiscent of a purely particle-driven effect and, additionally, local effects in the stomach following oral exposure. Based on the available data there is no indication to justify a carcinogenicity study.)

Reproductive toxicity : May damage fertility. May damage the unborn child.

May cause harm to the unborn child

Boric Acid (10043-35-3)	
Reproductive toxicity	May damage fertility. May damage the unborn child.

Specific target organ toxicity (single exposure) : Not classified

(No Data Available)

Specific target organ toxicity (repeated exposure) : Not classified

(The test material causes local effects in the lung following inhalation exposure. The inflammatory response is reversible. The bioavailability of the test substance is low following oral, inhalation and intraperitoneal administration and the substance causes only local lesions in the lung following inhalation but no systemic toxicity. In addition, the dermal route is not relevant route of exposure.)

DCC YELLOW 2GTM (14059-33-7)	
LOAEL (inhalation, rat,dust/mist/fume, 90 days)	0.7 mg/m³ air OECD 413 (dust)
NOAEL (inhalation, rat, dust/mist/fume, 90 days)	0.1 mg/m³ air (Dust)
NOAEL (subacute, oral, animal/male, 28 days)	200 mg/kg bodyweight
NOAEL (subacute, oral, animal/female, 28 days)	200 mg/kg bodyweight
Additional information	The test material causes local effects in the lung following inhalation exposure. The inflammatory response is reversible. The bioavailability of the test substance is low following oral, inhalation and intraperitoneal administration and the substance causes only local lesions in the lung following inhalation but no systemic toxicity. In addition, the dermal route is not relevant route of exposure.

Aspiration hazard : Not classified

(No Data Available. No aspiration hazard expected.)

Other information : The toxicological tests were carried out on a product with comparable composition.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

DCC YELLOW 2GTM (14059-33-7)	
LC50 fishes 1	> 10000 mg/l Brachydanio Rerio 96 h (OECD 203)
EC50 Daphnia 1	> 100 mg/l 48h (OECD 202)
EC50 other aquatic organisms 1	> 10000 ml/l Pseudomonas putida 16h
EC50 other aquatic organisms 2	> 100 mg/l Desmodesmus subspicatus 72h (OECD 201)
LOEC (chronic)	> 100 mg/l Desmodesmus subspicatus 72h
NOEC chronic algae	> 100 mg/l Desmodesmus subspicatus 72h
Additional ecotoxicological information	Ecotoxicity data based on tests on similar product. With high probability, not acutely harmful to fish, aquatic invertebrates or algae. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. Long term toxicity in fish is not provided because the hazard assessment for C.I. Pigment 184 shows that it is not dangerous for the environment.

Boric Acid (10043-35-3)	
LC50 fishes 1	50 - 100 mg/l Onchorhychus mykiss 96h

12.2. Persistence and degradability

DCC YELLOW 2GTM (14059-33-7)	
Persistence and degradability	No Data Available. According to structural properties, hydrolysis is not expected/probable.
Biodegradation	Not data available. The substance is an inorganic substance and insoluble in water. Biodegradation is not expected.

12.3. Bioaccumulative potential

DCC YELLOW 2GTM (14059-33-7)	
Log Kow	Not Applicable
Bioaccumulative potential	No Data Available.

12.4. Mobility in soil

DCC YELLOW 2GTM (14059-33-7)	
Ecology - soil	No Data Available.

12.5. Other adverse effects

Other information : Barely water soluble inorganic product. May be eliminated from water by chemical flocculation. May be separated largely mechanically in sewage treatment plants. Do not discharge product uncontrolled into the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Regional legislation (waste) : Dispose of in accordance with national, state and local regulations.

Additional information : Contaminated packaging should be emptied as far as possible and disposed of in the same manner as the substance/product. Uncontaminated packaging can be recycled.

SECTION 14: TRANSPORT INFORMATION

Special transport precautions : No special requirements.
Not classified as a dangerous good under transport regulations.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

CANADA

DCC YELLOW 2GTM (14059-33-7)	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

Listed on the Canadian Domestic Substance List (DSL) Inventory
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all of the information required by those regulations.

USA

DCC YELLOW 2GTM (14059-33-7)	
SARA Section 313	This product contains the following listed chemical(s) subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.
Vanadium compounds (N770)	Bismuth Vanadium Tetraoxide (see section 3)

Listed on the United States Toxic Substance Control Act (TSCA) Inventory

SECTION 16: OTHER INFORMATION

Repr. 1B	Reproductive toxicity, Category 1B
H360FD	May damage fertility. May damage the unborn child.

HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability : 1 Slight Hazard
Physical : 0 Minimal Hazard

The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.

DCC pigment, pigment preparations and special dyes are technical grade products. Unless otherwise stated or agreed DCC products are recommended only for industrial use in applications involving coloration of inks, plastics and coatings. Other intended uses including their use in consumer products governed by specific legislation or standards should be referred to the manufacturer. The use of this product is not authorized for the direct coloration of food, the coloration of articles that come into contact with internal organs or body fluids, tattoo inks, nor for cosmetic use. The customer must perform its own tests to determine the suitability of the supplied product for the intended purpose. It is also the customer's responsibility to ensure that its intended uses shall be fully in compliance with all applicable laws and regulations in each relevant country or region. The data contained in the SDS apply only to DCC products sold under the stated trade names.

The table shown below contains the HI-sol emissions for the time period requested.

Month	Year	VOC Emissions(lbs/month)	12MR VOC Emissions(lbs)
1	2020	2.052296071	24.62755285
2	2020	2.052296071	24.62755285
3	2020	2.052296071	24.62755285
4	2020	2.052296071	24.62755285
5	2020	2.052296071	24.62755285
6	2020	2.052296071	24.62755285
7	2020	2.052296071	24.62755285
8	2020	2.052296071	24.62755285
9	2020	2.052296071	24.62755285
10	2020	2.052296071	24.62755285
11	2020	2.052296071	24.62755285
12	2020	2.052296071	24.62755285
1	2021	2.021664786	24.59692157
2	2021	2.021664786	24.56629028
3	2021	2.021664786	24.535659
4	2021	2.021664786	24.50502771
5	2021	2.021664786	24.47439643
6	2021	2.021664786	24.44376514
7	2021	2.021664786	24.41313386
8	2021	2.021664786	24.38250257
9	2021	2.021664786	24.35187129
10	2021	2.021664786	24.32124
11	2021	2.021664786	24.29060872
12	2021	2.021664786	24.25997744
1	2022	2.97123461	25.20954726
2	2022	2.97123461	26.15911708
3	2022	2.97123461	27.10868691
4	2022	2.97123461	28.05825673
5	2022	2.97123461	29.00782655
6	2022	2.97123461	29.95739638
7	2022	2.97123461	30.9069662
8	2022	2.97123461	31.85653603
9	2022	2.97123461	32.80610585
10	2022	2.97123461	33.75567567
11	2022	2.97123461	34.7052455
12	2022	2.97123461	35.65481532
1	2023	1.684720655	34.36830137
2	2023	1.684720655	33.08178741
3	2023	1.684720655	31.79527346
4	2023	1.684720655	30.5087595
5	2023	1.684720655	29.22224555
6	2023	1.684720655	27.93573159
7	2023	1.684720655	26.64921764

Total combined production for calendar years 2021 and 2022 of product and/or intermediate blend from the kilo-lab.

kilo-lab	Mixer	Product Code	Lbs
Feb-21	ELMIXPC	3730608	510
Mar-21	ELMIXPC	3364508	355
Mar-21	ELMIXPC	3730608	736
Apr-21	ELMIXPC	3364508	360
Apr-21	ELMIXPC	3730608	399
May-21	ELMIXPC	3730608	402
May-21	ELMIXPC	I721178	382
Jun-21	ELMIXPC	3364508	360
Jul-21	ELMIXPC	I721378	113
Aug-21	ELMIXPC	3364508	362
Sep-21	ELMIXPC	I700778	395
Oct-21	ELMIXPC	3364508	361
Dec-21	ELMIXPC	I721378	98
Jan-22	ELMIXPC	3364508	350
Mar-22	ELMIXPC	I704278	600
Apr-22	ELMIXPC	3364508	488
May-22	ELMIXPC	3730608	1,199
Jun-22	ELMIXPC	3364508	358
Jul-22	ELMIXPC	3364508	395
Jul-22	ELMIXPC	I721178	248
Jul-22	ELMIXPV	I704278	644
Sep-22	ELMIXPC	3364508	360
Dec-22	ELMIXPC	3364508	360

KILO LAB PERMIT APPLICATION

THIS APPLICATION covers equipment which will be used for pilot runs of small quantities of products. The Company refers to this equipment as the "Kilo lab" because the size of the batches run would be in the low kilogram range. The Company proposes to install the Kilo lab at its Dawn Avenue Plant. Laboratory equipment, which is exempted from the permit program, will also be installed. The equipment described in this application and the other laboratory equipment will be brought to the Dawn Avenue Plant from the Cedar Street Plant to consolidate operations at the Dawn Avenue Plant. No new building or building addition will be involved. Existing space will be repartitioned to accommodate the Kilo lab.

The Kilo Lab is intended as an intermediate step between the development laboratory and the manufacturing plant. It contains scaled-down versions of the process equipment found in the plant. For the most part, it is used to determine the parameters needed to successfully manufacture the material in the plant equipment. The parameters examined are the type of blender, mixing temperature, time and speed. These all relate to the physical characteristics of the blend such as viscosity, thixotrophy, dispersion and specific gravity. On a limited basis, the Kilo Lab will be used to blend products that have been successfully manufactured in the plant, but the quantity required is not large enough to warrant the use of plant equipment. The total equipment usage averages 20 hours per week, 50 weeks per year.

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The following environmental and siting aspects should be noted:

1) The Kilo lab will reduce the volume of materials stored at Dawn Avenue. There are several reasons for this:

   i) To make room for the Kilo lab within the existing building, the packaging function will be moved to the warehouse. This means that storage area will decrease and that volumes stored will decrease.

   ii) Because of the reduced storage area tighter inventory controls will be utilized to reduce inventory.

   iii) The Kilo lab vessels are much smaller than the existing production vessels. The Kilo lab vessels will allow the Company to make small batches when only a small quantity is needed, thereby avoiding storage of the excess amount that would have to be produced in the existing production vessels (due to the minimum production volume required for the regular production vessel to operate properly).

2) The Kilo lab equipment (and the canning operation) would be connected to the existing Rotoclone. This will eliminate emissions at Cedar Street, and improve control of emissions from the Kilo lab overall.

3) As a practical matter the Kilo lab would result in no overall capacity increase at Dawn Avenue because it would be utilized, in part, to produce <u>smaller</u> batches than would be necessary in the existing vessels. The existing production vessels are also not currently used to capacity.

4) All required containment would be provided for the equipment.

5) The Kilo lab will comply with all applicable emission limits.

The rules of the Air Pollution Control Commission provide, in Rule 283(a), for an exemption from the permit program for laboratory equipment used exclusively for analysis or experimentation. There are no definitions of "experimentation", "laboratory equipment" or "pilot plant" in the rules. Rule 281(1) requires permits for process equipment (or, under some interpretations, "processes" themselves). It is not clear whether the Kilo lab equipment involved in this application is process equipment, i.e., it may be within the "laboratory" concept or it may not be a "process" because of the nature of its use. In any event we are applying for a permit to cover the Kilo lab equipment.

For the most part, the Kilo lab will use the same raw materials as are used in the regular production equipment. Use of the Kilo lab, however, requires maximum flexibility from a timing standpoint. If the Company had to apply for, and await receipt of, an air use permit every time a raw material was changed or moved among the different Kilo lab vessels the economic viability of the Kilo lab would be very questionable. On the other hand, we understand the Air Quality Division Staff's view that newly introduced materials must be reviewed and approved. The goals of the Company and the goals of the Air Quality Division Staff need not be mutually exclusive. The Company proposes the following:

1) The Special Conditions of the permit for the Kilo lab equipment should authorize the use of all of the raw materials previously reviewed under the Company's existing permits where, either, (i) <u>any</u> blend is produced, or (ii) a product, which is formed

by chemical reaction (with the exception of the propylene oxide reaction), has been previously reviewed under the Company's existing permits.

2) Where new raw materials will be used and a blend is produced or where either new or existing raw materials are used and a chemically reacted new product is produced, the Company would prepare, pursuant to a Special Condition in the permit issued for the Kilo lab vessels, a notification for submission to Staff. If Staff did not veto the use of the new raw material or the production of the new chemically reacted product within seven (7) days of receipt of the notification then the Company could proceed with the production in the Kilo lab of that product.

3) If the Staff vetoed the new raw material or chemically reacted product, the Company would be required to submit a formal permit application and obtain a permit before proceeding.

4) This procedure would apply for all of the vessels involved in the Kilo lab. All of those vessels will be vented to the same air control device.

5) The Special Conditions of the Kilo lab permit would specify what information would be required in the notification. It is anticipated that the notification would contain such information as:

   (a) Toxicological data for the new raw material or chemically reacted product.

   (b) Calculations to show acceptable concentrations under the Air Advisory Committee Model.

(c) Calculations to indicate the expected emissions. This would be accomplished through Dr. Anderson's (of Michigan State University) Mass Transfer Model.

(d) Other information where applicable, i.e., disposal of any wastes generated, temperatures and pressures involved in a new chemical reaction.

The information to be provided in the notification should be sufficient since the underlying equipment and air control devices would already have been reviewed and permitted and since the Company and Staff have developed agreed upon uses of the Air Advisory Committee Model and Dr. Anderson's Model. The Company and the Staff would also agree, and specify in the Special Conditions of the permit, what type of literature search must be conducted for toxicological data.

The permits for the existing production vessels at Dawn Avenue contain a Special Condition which allows "reviewed" raw materials and products to be manufactured in "similar equipment of the same size or smaller capacity". The proposals in the preceding paragraphs are merely an extension of that concept based upon further refinements of the various models involved. To show that no increase in emission concentrations would occur from the Kilo lab equipment, a study to determine the sensitivity of the mass transfer coefficient to changes in air flow was undertaken. This was done by calculating the coefficient at different air velocities. The highest velocity was 100 times the lowest. The effect was to lower the concentration of the contaminant in the exhausted gas. The transfer coefficient is not

very sensitive to changes in air volume. A 100 times increase in volume resulted in a decrease in concentration to 37% of the initial value.

In practice, air volume changes of 2 orders of magnitude would not be expected. A doubling from the lowest value to the highest value of air flow is the most change that could be anticipated while the equipment is in use.

It is planned that each piece of equipment would be connected to the Rotoclone scrubber through a system of ducts with a shutoff at each unit. Only the equipment in use would be ventilated. The nominal flow rate would be 500 cfm.

To confirm that emissions from the Kilo lab equipment would not result in increased concentrations, coefficients were calculated for each piece of Kilo lab equipment at 100 and 700 cfm.

The values are as follows:

(C_L) = Equilibrium concentration

	100 cfm	700 cfm
Versamix	0.0166 (C_L)	0.0112 (C_L)
Kettle	0.0086 (C_L)	0.0058 (C_L)
Rosskettle	0.0193 (C_L)	0.0130 (C_L)
Marion	0.0274 (C_L)	0.0186 (C_L)
Cowles	0.0146 (C_L)	0.099 (C_L)
3 Roll Mill	0.0415 (C_L)	0.0281 (C_L)
Hobart	0.0120 (C_L)	0.0081 (C_L)

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The transfer coefficients in use for the plant equipment currently are as follows:

Versamix (537-80)	0.0134 (C_L)	@ 2083 cfm
Nauta (538-80	0.0458 (C_L)	@ 376 cfm
Large Nauta (539-80)	0.0332 (C_L)	@ 1091 cfm
Hobarts (688-80)	0.0032 (C_L)	@ 1000 cfm
3 Roll Mill (690-80)	0.0469 (C_L)	@ 670 cfm
Resin Kettle (691-80)	0.0175 (C_L)	@ 653 cfm
Small Kettle (806-80)	0.0146 (C_L)	@ 425 cfm
Cowles (807-80)	0.0124 (C_L)	@ 455 cfm
Small Marion (808-80)	0.0146 (C_L)	@ 735 cfm
Hardener Kettle (809-80)	0.0172 (C_L)	@ 617 cfm

By comparing this listing to the one of the Kilo lab equipment, it is apparent that the transfer coefficients are easily within the same ranges. It is therefore our conclusion that processes which have been evaluated and permitted in plant equipment can be made in the Kilo lab with no increase in the quantity of emissions.

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The following codes pertain to the SDS of the raw materials used in the Kilo Lab.
The SDS for each material code listed below will be sent in a separate submittal.

MATERIAL CODE
107661424
107896100
87447800
1539408
C313278
C406078
C573278
C413478
1328708
C459778

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Jul-22	ELMIXPC	I721178	248
Jul-22	ELMIXPV	I704278	644
Sep-22	ELMIXPC	3364508	360
Dec-22	ELMIXPC	3364508	360

The table below contains the 12-month rolling VOC emissions from the kettles and mixers named on the request except for the 3-roll roller mill. The 12 month rolling emission report for the 3-roll roller mill will be submitted in a separate submittal at a later date as approved by EGLE.

Month	Year	12M End Date	12M Start Date	12MR VOC lbs	Column1
1	2020	1/31/2020	2/1/2019	1504.991303	0.002968
2	2020	2/29/2020	3/1/2019	1488.549183	0.003567
3	2020	3/31/2020	4/1/2019	1549.908872	0.003975
4	2020	4/30/2020	5/1/2019	1631.614483	0.003975
5	2020	5/31/2020	6/1/2019	1534.446085	0.003185
6	2020	6/30/2020	7/1/2019	1336.0756	0.003784
7	2020	7/31/2020	8/1/2019	1335.24472	0.002995
8	2020	8/31/2020	9/1/2019	1150.789829	0.002995
9	2020	9/30/2020	10/1/2019	1048.722939	0.003594
10	2020	10/31/2020	11/1/2019	948.6356429	0.003594
11	2020	11/30/2020	12/1/2019	906.2674691	0.002995
12	2020	12/31/2020	1/1/2020	840.298857	0.003594
1	2021	1/31/2021	2/1/2020	903.055723	0.003594
2	2021	2/28/2021	2/29/2020	909.4741402	0.002995
3	2021	3/31/2021	4/1/2020	810.8541503	0.002995
4	2021	4/30/2021	5/1/2020	682.2436439	0.003594
5	2021	5/31/2021	6/1/2020	656.6682936	0.004192
6	2021	6/30/2021	7/1/2020	660.9683967	0.003594
7	2021	7/31/2021	8/1/2020	686.0727973	0.004192
8	2021	8/31/2021	9/1/2020	782.2491639	0.003594
9	2021	9/30/2021	10/1/2020	842.1545185	0.003594
10	2021	10/31/2021	11/1/2020	902.8417704	0.003594
11	2021	11/30/2021	12/1/2020	908.12198	0.004192
12	2021	12/31/2021	1/1/2021	872.9461068	0.003594
1	2022	1/31/2022	2/1/2021	812.5220265	0.004192
2	2022	2/28/2022	3/1/2021	771.3244424	0.004192
3	2022	3/31/2022	4/1/2021	723.6252964	0.004192
4	2022	4/30/2022	5/1/2021	733.4636818	0.004192
5	2022	5/31/2022	6/1/2021	823.1688646	0.003594
6	2022	6/30/2022	7/1/2021	853.2133694	0.003594
7	2022	7/31/2022	8/1/2021	785.6150172	0.002995
8	2022	8/31/2022	9/1/2021	664.8472909	0.002995
9	2022	9/30/2022	10/1/2021	625.2165996	0.002995
10	2022	10/31/2022	11/1/2021	470.7698595	0.002995
11	2022	11/30/2022	12/1/2021	441.7308923	0.002396
12	2022	12/31/2022	1/1/2022	417.9712888	0.002995
1	2023	1/31/2023	2/1/2022	325.4385741	0.004192
2	2023	2/28/2023	3/1/2022	238.4526234	0.005989
3	2023	3/31/2023	4/1/2022	238.5059205	0.00539
4	2023	4/30/2023	5/1/2022	214.971433	0.005395
5	2023	5/31/2023	6/1/2022	125.1821926	0.019182
6	2023	6/30/2023	7/1/2022	87.05803192	0.019187
7	2023	7/31/2023	8/1/2022	88.805963	0.023263

The table shown below contains the batches made and lbs of VOC emissions per batch from the kettles and mixers named on the request except for the 3-roll roller mill.
The batches made and lbs of VOC emissions per batch from the 3-roll roller mill will be submitted in a separate submittal at a later date as approved by EGLE.

Work Center	Product Code	Month	Year	Batches	Product Emissions (lbs/batch)
ELMIXHK	278488	1	2022	3	0.036068386
ELMIXNM	395758	1	2022	10	9.507155
ELMIXSK	L281288	1	2022	1	0.0520539
ELMIXVM	336538	1	2022	7	0.527441927
ELMIXVM	L27788	1	2023	2	0.02066844
ELMIXVM	336548	1	2023	1	0.478040692
ELMIXVM	336538	1	2023	11	0.527441927
ELMIXVM	448818	1	2023	2	0.0320295
ELMIXVM	L267598	1	2023	2	0.002945
ELMIXHK	278488	2	2022	2	0.036068386
ELMIXNM	395758	2	2022	3	9.507155
ELMIXNM	I538978	2	2022	4	17.199468
ELMIXVM	448818	2	2022	3	0.0320295
ELMIXVM	L27788	2	2022	2	0.02066844
ELMIXVM	336538	2	2022	10	0.527441927
ELMIXVM	L267598	2	2022	2	0.002945
ELMIXVM	336538	2	2023	30	0.527441927
ELMIXHK	451338	3	2023	6	0.069506
ELMIXHK	I56478	3	2023	3	0.1679233
ELMIXLM	I539578	3	2022	3	1.148498
ELMIXSK	I512978	3	2023	1	0.552317
ELMIXSK	I51878	3	2023	1	0.4252
ELMIXVM	L267598	3	2022	2	0.002945
ELMIXVM	448818	3	2022	2	0.0320295
ELMIXVM	336538	3	2023	3	0.527441927
ELMIXVM	L267598	3	2023	5	0.002945
ELMIXVM	L27788	3	2023	2	0.02066844
ELMIXVM	448818	3	2023	1	0.0320295
ELMIXHK	4513308	4	2023	2	0.023623145
ELMIXHK	L265898	4	2023	1	0.000812033
ELMIXNM	395758	4	2022	2	9.507155
ELMIXRK	4521508	4	2023	3	3.21696E-05
ELMIXRK	4530408	4	2023	2	0.000218076
ELMIXRK	4530508	4	2023	1	0.000519152
ELMIXVM	336538	4	2022	10	0.527441927
ELMIXVM	L267598	4	2022	5	0.002945
ELMIXVM	L27788	4	2022	1	0.02066844
ELMIXVM	3365308	4	2023	6	0.067580344
ELMIXVM	L270788	4	2023	1	0.075936291
ELMIXVM	2783208	4	2023	5	0.001328638

ELMIXVM	3389608	4	2023	5	0.027294625
ELMIXVM	L265888	4	2023	6	0.008612513
ELMIXVM	L067188	4	2023	9	0.002303358
ELMIXVM	4488108	4	2023	1	0.00460696
ELMIXVM	L271488	4	2023	5	0.000606192
ELMIXVM	2218008	4	2023	1	0.005991619
ELMIXVM	L267598	4	2023	2	0.001893437
ELMIXVM	2217908	4	2023	1	0.026168705
ELMIXNM	395758	5	2022	9	9.507155
ELMIXPC	3730608	5	2023	1	1.71652E-07
ELMIXRK	2533008	5	2023	3	0.007408427
ELMIXRK	4530508	5	2023	2	0.00052311
ELMIXRK	4487808	5	2023	1	0.006444275
ELMIXVM	336538	5	2022	18	0.527441927
ELMIXVM	2281108	5	2023	1	0.001012103
ELMIXVM	4488008	5	2023	1	0.010377778
ELMIXVM	L267598	5	2023	3	0.001895666
ELMIXVM	L067188	5	2023	4	0.002338229
ELMIXVM	3365308	5	2023	5	0.06758715
ELMIXVM	3389608	5	2023	7	0.02645251
ELMIXVM	3487308	5	2023	7	0.651895465
ELMIXVM	3621308	5	2023	16	0.007911995
ELMIXHK	4521708	6	2023	1	0.197169694
ELMIXHK	L265898	6	2023	1	0.000812033
ELMIXNM	395758	6	2022	5	9.507155
ELMIXRK	2399708	6	2023	1	0.001912007
ELMIXRK	4487808	6	2023	3	0.006473383
ELMIXSK	2815908	6	2023	1	0.002114936
ELMIXVM	L267598	6	2022	2	0.002945
ELMIXVM	448818	6	2022	3	0.0320295
ELMIXVM	336558	6	2022	1	0.009153399
ELMIXVM	4488108	6	2023	1	0.004598737
ELMIXVM	2281108	6	2023	2	0.001002239
ELMIXVM	L270788	6	2023	1	0.065060746
ELMIXVM	L267598	6	2023	2	0.001891279
ELMIXVM	3487308	6	2023	14	0.651893547
ELMIXVM	3621308	6	2023	6	0.00790926
ELMIXVM	4488008	6	2023	5	0.010381142
ELMIXHK	L265898	7	2023	2	0.000811673
ELMIXHK	2815908	7	2023	1	0.005148316
ELMIXRK	4530508	7	2023	1	0.000237016
ELMIXRK	2399708	7	2023	1	0.001244544
ELMIXVM	L27788	7	2022	4	0.02066844
ELMIXVM	L267598	7	2023	3	0.00188766
ELMIXVM	L271488	7	2023	4	0.000607978
ELMIXVM	2281108	7	2023	5	0.000999396
ELMIXVM	2218008	7	2023	2	0.006018796

ELMIXVM	2217908	7	2023	2	0.031951026
ELMIXVM	2783208	7	2023	6	0.001123492
ELMIXVM	L265888	7	2023	2	0.008889938
ELMIXVM	3487308	7	2023	2	0.651894311
ELMIXVM	3365308	7	2023	6	0.067501775
ELMIXLM	I539578	8	2022	1	1.148498
ELMIXVM	L267598	8	2022	2	0.002945
ELMIXVM	448818	8	2022	1	0.0320295
ELMIXNM	395758	9	2022	2	9.507155
ELMIXSK	I51878	9	2022	1	0.4252
ELMIXSK	I512978	9	2022	1	0.552317
ELMIXVM	336548	9	2022	1	0.478040692
ELMIXVM	336538	9	2022	9	0.527441927
ELMIXVM	L27788	9	2022	1	0.02066844
ELMIXVM	L267598	9	2022	5	0.002945
ELMIXVM	L267598	10	2022	2	0.002945
ELMIXVM	336538	10	2022	16	0.527441927
ELMIXVM	448818	10	2022	1	0.0320295
ELMIXHK	451338	11	2022	1	0.069506
ELMIXHK	I56478	11	2022	1	0.1679233
ELMIXVM	336538	11	2022	3	0.527441927
ELMIXVM	448818	11	2022	2	0.0320295
ELMIXVM	336558	11	2022	1	0.009153399
ELMIXHK	I56478	12	2022	2	0.069506
ELMIXHK	I56478	12	2022	1	0.1679233
ELMIXVM	L267598	12	2022	5	0.002945
ELMIXVM	336538	12	2022	16	0.527441927
ELMIXVM	L27788	12	2022	2	0.02066844

The table below contains the lbs of VOC emitted per month from the kettles and mixers named on the requ
The lbs VOC emitted per month from the 3-roll roller mill will be submitted in a separate submittal at a late

Year	Month	Month End	Month Start	Total VOC Emissions (lbs/month)
2022	1	1/31/2022	1/1/2022	98.92390255
2022	2	2/28/2022	2/1/2022	102.8092084
2022	3	3/31/2022	3/1/2022	3.515443
2022	4	4/30/2022	4/1/2022	24.32412271
2022	5	5/31/2022	5/1/2022	95.05834969
2022	6	6/30/2022	6/1/2022	47.6469069
2022	7	7/31/2022	7/1/2022	0.08267376
2022	8	8/31/2022	8/1/2022	1.1864175
2022	9	9/30/2022	9/1/2022	25.25223848
2022	10	10/31/2022	10/1/2022	8.476990334
2022	11	11/30/2022	11/1/2022	1.89296748
2022	12	12/31/2022	12/1/2022	8.802068014
2023	1	1/31/2023	1/1/2023	6.391187771
2023	2	2/28/2023	2/1/2023	15.82325781
2023	3	3/31/2023	3/1/2023	3.568740061
2023	4	4/30/2023	4/1/2023	0.789635218
2023	5	5/31/2023	5/1/2023	5.269109229
2023	6	6/30/2023	6/1/2023	9.522746264
2023	7	7/31/2023	7/1/2023	1.830604835

uest except for the 3-roll roller mill.

DEPARTMENT OF ENVIRONMENTAL QUALITY

AIR QUALITY DIVISION

FCE Summary Report

Facility :	DE SAEGHER ENERGY LLC	**SRN :**	P1256
Location :	8068 W BUCHANAN ROAD	**District :**	Lansing
		County :	GRATIOT
City :	MIDDLETON **State:** MI **Zip Code :** 48856	**Compliance Status :**	Compliance
Source Class :	SM OPT OUT	**Staff :**	Michelle Luplow
FCE Begin Date :	7/11/22	**FCE Completion Date :**	9/18/2023
Comments :			

List of Partial Compliance Evaluations :

Activity Date	Activity Type	Compliance Status	Comments
07/11/2023	On-site Inspection	Compliance	Onsite inspection to determine compliance with PTI 94-22.
07/10/2023	Other Non ROP	Compliance	Flare Notification of Installation. Flare construction completed on June 22, 2023.
07/10/2023	Other Non ROP	Compliance	FGBOILERS notification of installation. Construction of EUBOILER1 and EUBOILER2 was completed on June 27, 2023.
05/19/2023	MAERS	Compliance	2022 MAERS received electronically on 5/18/23. Audit completed 5/19/23. Check MAERS for any review comments.

Name: Michelle Luplow **Date:** 9/18/23 **Supervisor:** RB