7/14/2020 DSB
10/6/2020 JJY

INITIAL REVIEW ENGINEERING REPORT [redacted]
PMN: 19-0161

Post Scoping Ready v1 10/22/2019
ENGINEER: Avcin \ CRM \ CMF
PV (kg/yr): [redacted] Import Only YX
Revision Notes / Assessment Overview: PF Draft Rev 1 (10/16/19): Based on additional information provided by submitter: under USE operation, added an exposure estimate for spray coating application.

SUBMITTER: [redacted]
USE: Intended Use: Blowing agent for use in the production of urethanes. [redacted].
P2REC: CRSS: Drop. P2 Claim: The PMN substance will be used to replace traditional foaming agents that have a negative effect on the atmospheric ozone layer.
Analogues (same use): None found.
Patents (same use): None found.

OTHER USES: Analogues (other use): [redacted]
Analogues (same use and other use): None found.
Patents (other use): None found.

MSDS: Yes Label: No

Gen Eqpt: gloves impervious to the specific material / approved eye protection (safety glasses with side-shields or goggles) / impervious clothing as needed / engineering methods to prevent or control exposure are preferred.

Respirator: NIOSH certified self-contained breathing apparatus or air purifying respirator may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Health Effects: Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation.

TLV/PEL:
none established.

CRSS (09/19/2019):

Chemical Name: [redacted]

S-H20: 500 g/L @

VP: 1.0E-6 torr @

MW: [redacted] 0.00%<500 0.00%<1000

Physical State and Misc CRSS Info:

Neat: Liquid Mfg: Solution: [redacted]% PMN substance with impurities Proc/Form: Solution: 15% PMN substance in foam formulation End Use: Destroyed. Submitted properties: Liquid; Density = 1.07-1.20 g/cm3 (Sub. Est.); WS = Very soluble; MP < -30 °C (Sub. Est.); BP > 100 °C (Sub. Est.); pH = 10.2-10.3% (80% w/w); Flash point > 96 °C (Sub. Est.); Viscosity = 200-300 cps.

[redacted]

Estimated Data: VP < 0.000001 torr (Salt); The estimated WS is based on the WS of [redacted],[redacted]

Consumer Use: No

SAT (concerns) :

Related Cases and Misc SAT Info:

Analogues: [redacted]

Migration to groundwater: Negligible

PBT rating: P1B1T2

Health: Dermal, Drinking Water, Inhalation

Eco: 2 Water (All releases to water with a CC = 820 ppb.)

OCCUPATIONAL EXPOSURE RATING: [redacted]

NOTES & KEY ASSUMPTIONS:
Occupational exposure and environmental releases were estimated using the ChemSTEER v3.2 (5/12/2016). Input to ChemSTEER tool includes information from: the PMN submission, physical / chemical properties, relevant past cases, and information from technical contacts. SAT concerns are for dermal, inhalation, drinking water and all releases to water (CC = 820 ppb). Submitter had no previous submissions, different submitter, similar use cases (foam blowing agent/catalyst) [redacted] were referenced for consistency. This IRER used [redacted]'s process description for foam blowing to augment the limited information provided by the submitter for this PMN. This IRER was import only and did not address MFG (consistent with [redacted]). PROC: this IRER addresses dermal exposure, consistent with all similar use cases, but does not address inhalation exposure due to low vapor pressure of 1E-6 torr (consistent with [redacted]). USE: this IRER addresses dermal exposure, consistent with all cases, and addreses inhalation exposure due to the submitter clarifying that the foam containing the PMN substance is appplied by spraying (not consistent with past cases since none addressed spray application).

POLLUTION PREVENTION CONSIDERATIONS:
P2 Claim:
The NCS mixture is a foaming agent, which replaces traditionally used agents that are increasingly under scrutiny for their effect on the atmospheric ozone layer.
P2REC: CRSS: Drop.

EXPOSURE-BASED REVIEW: [redacted]
1) # of workers exposed: [redacted] >1000? [redacted]
2) >100 workers with >10 mg/day inhalation exposure: [redacted]
3) (a) >100 workers w/1-10 mg/day inh. exp. & >100 days/yr: [redacted]
   (b) Routine Dermal Cont: >250 workers & >100 days/yr: [redacted]

INITIAL REVIEW ENGINEERING REPORT [redacted]

PMN: 19-0161

PROC: Blending Additive for Foam Manufacture

Number of Sites/ Location: [redacted]

unknown site(s)

Days/yr: 260

Basis: Submission estimates [redacted] facilities blending the PMN chemical 260 days per year. Submission also estimates the imported PMN concentration range of [redacted]% and assesses the average concentration at greater than [redacted]%. RAD assesses the concentration at [redacted]% as most conservative. /// ChemSTEER calculates a daily PMN chemical use rate of 192.31 kg/facility-day. ///Submission estimates that facilities could receive PMN chemical in drums, totes, or ISO tanks. RAD assesses receipt via drums as most conservative

Process Description: Receive PMN in drums or totes (liquid, [redacted]%) --> offload into holding/feed tank or direct connect totes to process line --> add to mixing vessel -->mix PMN with other ingredients -->package into drums (liquid, 15%). (per submission)

ENVIRONMENTAL RELEASES ESTIMATE SUMMARY

IRER Note: The daily releases listed for any source below may coincide with daily releases from the other sources to the same medium.

Water or Incineration or Landfill
High End: 6.1E+0 kg/site-day over 245 days/yr from [redacted] sites
or [redacted] kg/site-yr from [redacted] sites or [redacted] kg/yr-all sites
to: uncertain media.

from: Cleaning Liquid Residuals from Drums Used to Transport the Raw Material

basis: EPA/OPPT Drum Residual Model, CEB standard 3% residual. Submission estimates release of 15.4 kg/site to offsite incineration 100 days/year. ChemSTEER model estimates a release of 6.12 kg/site 245 days/year. Annual releases/site between two estimates are equivalent. Due to unknown sites, RAD assesses ChemSTEER model as more conservative and assesses release to uncertain media.

Water or Incineration or Landfill
Output 2: 2.9E+0 kg/site-day over 260 days/yr from [redacted] sites
or [redacted] kg/site-yr from 40 sites or [redacted] kg/yr-all sites
to: uncertain

from: Equipment Cleaning Losses of Liquids from a Single, Large Vessel

basis: User-Defined Loss Rate Model. Submission estimates 2.9 kg released/site to offsite incineration 260 days/year. ChemSTEER estimates 1.92 kg released/site 260 days/year using the EPA/OPPT Single Vessel Residual Model, CEB standard 1% residual. RAD assesses submission estimate as more conservative and assesses release to uncertain media due to unknown sites.

RELEASE TOTAL
[redacted] kg/yr - all sites

OCCUPATIONAL EXPOSURES ESTIMATE SUMMARY
Tot. # of workers exposed via assessed routes: [redacted]
Basis: Submission estimate up to 12 workers potentially exposed. RAD assumes that all workers perform all activities. RAD assumes that all workers may be exposed at the highest potential exposures for each physical form, as conservative.

Inhalation:

Negligible (VP < 0.001 torr) - No spray or mist expected in intended application.

Dermal:

Exposure to Liquid at [redacted]% concentration

High End:

> Potential Dose Rate: [redacted] mg/day over 260 days/yr

> Lifetime Average Daily Dose: [redacted] mg/kg-day over 260 days/yr

> Average Daily Dose: [redacted] mg/kg-day over 260 days/yr

> Acute Potential Dose: [redacted] mg/kg-day over 260 days/yr

Number of workers (all sites) with dermal exposure: [redacted]

Basis: Unloading Liquid Raw Material from Drums; EPA/OPPT 2-Hand Dermal Contact with Liquids Model. Submission estimates worker dermal exposure to PMN chemical at 80% concentration 260 days/year. Per PMN submission, possible concentration is up to [redacted]% and RAD assesses dermal exposure of [redacted]% as most conservative. //// Per November 2016 RAD guidance, default parameters for this model were updated: body weight (BW) was updated from 70 to 80 kg and Averaging Time over a Lifetime (ATc) was updated from 70 to 78 years.

INITIAL REVIEW ENGINEERING REPORT [redacted]

PMN: 19-0161

USE: Urethane Foam Manufacture

Number of Sites/ Location:[redacted]

unknown site(s)

Days/yr: 260

Basis: Submission estimates that [redacted] foam manufacturers will use the PMN containing additives at a concentration of 15% and will operate 260 days per year. ChemSTEER calculates daily use rate of 192.31 kg PMN/site-day. Submission estimates receipt of chemical via totes and drums. RAD assesses receipt by drums as most conservative

Process Description: PMN contianing mixture received in drums or totes (liquid, 15%) --> offloaded to storage vessel or connected in-line with the produciton process --> PMN mixture added to urethane in foam machine --> foam mixture poured or sprayed into a mold or conveyor system-->heating, PMN decomposes releasing the foaming gas (PMN destroyed). (Submission, technical contact for [redacted])

ENVIRONMENTAL RELEASES ESTIMATE SUMMARY

IRER Note: The daily releases listed for any source below may coincide with daily releases from the other sources to the same medium.

Water or Incineration or Landfill
High End: 5.8E+0 kg/site-day over 260 days/yr from [redacted] sites
or [redacted] kg/site-yr from [redacted] sites or [redacted] kg/yr-all sites
to: uncertain media
from: Cleaning Liquid Residuals from Drums Used to Transport the Raw Material
basis: EPA/OPPT Drum Residual Model, CEB standard 3% residual. Submission estimates a release of 2.9 kg/site-day to offsite incineration. ChemSTEER calculates a release of 5.77 kg/site-day. RAD assesses ChemSTEER estimation as more conservative and assesses release to uncertain media, due to unknown sites.

Water or Incineration or Landfill
High End of Range: 6.0E-1 kg/site-day over 260 days/yr from [redacted] sites
or [redacted] kg/site-yr from [redacted] sites or [redacted] kg/yr-all sites
to: uncertain media
from: Equipment Cleaning Losses of Liquids from a Single, Large Vessel
basis: User-Defined Loss Rate Model. Submission estimates a release of 0.6 kg/site-day to off-site incineration. /// Per March 2015 guidance on assessing releases of a chemical intermediate from reactor cleaning, RAD assumes 95-99% reaction, with 1% residual. Therefore, LF = (1-0.95 to 0.99) x 0.01 = 0.0001 to 0.0005. Following the EPA/OPPT Single Process Vessel Residual Model and the parameters above, ChemSTEER estimates a release of 0.02 to 0.10 kg/site-day. RAD assesses submission as more conservative and release to uncertain media due to unknown sites.

RELEASE TOTAL
[redacted] kg/yr - all sites

OCCUPATIONAL EXPOSURES ESTIMATE SUMMARY
Tot. # of workers exposed via assessed routes: [redacted]
Basis: Submission estimates up to 8 workers potentially exposed and RAD assumes that all workers perform all activities. RAD assumes that all workers may be exposed at the highest potential exposures for each physical form, as conservative.

Inhalation:

Exposure to Particulate (non-volatile) (Class I)
Upper Bound:
> Potential Dose Rate: 2.2E+1 mg/day over 250 days/yr
> Air conc, duration: 2.3E+0 mg/m3 for 8.00 hr/day
> Lifetime Average Daily Dose: 9.9E-2 mg/kg-day over 250 days/yr
> Average Daily Dose: 1.9E-1 mg-kg/day over 250 days/yr
> Acute Potential Dose: 2.8E-1 mg-kg/day over 250 days/yr
Number of workers (all sites) with inhalation exposure: [redacted]
Basis: Spray Coating; OSHA PNOR PEL-Limiting Model. Per November 2016 RAD guidance, default parameters for this model were updated: body weight (BW) was updated from 70 to 80 kg and Averaging Time over a Lifetime (ATc) was updated from 70 to 78 years. Concentration: Cm = 2.25 mg/m3; exposure duration: h = 8 hr/day.

NOTE: The respirator class is: I. Particulate (including solid or liquid droplets).

INHALATION MONITORING DATA REVIEW

1)	Uncertainty (estimate based on model, regulatory limit, or data not specific to industry):	Yes
2)a)	Exposure level > 1 mg/day?	Yes
	OR	
b)	Hazard Rating for health of 2 or greater?	No

=> Inhalation Monitoring Data Desired? **No**

Dermal:

Exposure to Liquid at 15.00% concentration
High End:
> Potential Dose Rate: 3.4E+2 mg/day over 250 days/yr
> Lifetime Average Daily Dose: 1.5E+0 mg/kg-day over 250 days/yr
> Average Daily Dose: 2.9E+0 mg/kg-day over 250 days/yr
> Acute Potential Dose: 4.2E+0 mg/kg-day over 250 days/yr
Number of workers (all sites) with dermal exposure: [redacted]
Basis: Unloading Liquid Raw Material from Drums; EPA/OPPT 2-Hand Dermal Contact with Liquids Model. Per November 2016 RAD guidance, default parameters for this model were updated: body weight (BW) was updated from 70 to 80 kg and Averaging Time over a Lifetime (ATc) was updated from 70 to 78 years.