TSCA Section 5(a)(3) Determination for Premanufacture Notice (PMN) P-20-0111

Number: P-20-0111
TSCA Section 5(a)(3) Determination: The chemical substance is not likely to present an unreasonable risk (5(a)(3)(C))

Chemical Name:
Specific: 1,2,4-Benzenetricarboxylic acid, 1,2,4-trinonyl ester; CASRN 35415-27-1

Conditions of Use (intended, known, or reasonably foreseen)[1]:
Intended conditions of use (generic): Import and process for use as and use as a component in flexible automotive interior parts, consistent with the manufacturing, processing, use, distribution, and disposal information described in the PMN.

Known conditions of use: Applying such factors as described in footnote 1, EPA evaluated whether there are known conditions of use and found none.

Reasonably foreseen conditions of use: Applying such factors as described in footnote 1, EPA evaluated whether there are reasonably foreseen conditions of use and found, based on previous TSCA submissions: use as a flexible PVC plasticizer for wire insulation (P-16-0271) and use as a plasticizer for PVC-based insulation applied to wires and cables (P-16-0450). The submitters of P-16-0271 and P-16-0450 are both subject to TSCA 5(e) consent orders (and the existing SNUR 40 CFR 721.11227) that require the companies to: submit to EPA certain toxicity testing (Tier I testing) before manufacturing (including import) a total of 1,750,000 kilograms of the PMN substance; submit to EPA additional toxicity testing which will be determined upon EPA review of the Tier I testing results; have workers wear dermal protection (i.e. impervious gloves); implement a hazard communication program; maintain distribution requirements; refrain from manufacturing the PMN substance in the United States (i.e., import only); refrain from using the PMN substance other than as a plasticizer in wire and cable insulation; and maintain certain records. EPA also identified use in plasticizers for halogen-free peelable blue gum composition, boroxine based dynamic thermosetting polymers, and insulating material

[1] Under TSCA § 3(4), the term "conditions of use" means "the circumstances, as determined by the Administrator, under which a chemical substance is intended, known, or reasonably foreseen to be manufactured, processed, distributed in commerce, used, or disposed of." In general, EPA considers the intended conditions of use of a new chemical substance to be those identified in the section 5(a) notification. Known conditions of use include activities within the United States that result from manufacture that is exempt from PMN submission requirements. Reasonably foreseen conditions of use are future circumstances, distinct from known or intended conditions of use, under which the Administrator expects the chemical substance to be manufactured, processed, distributed, used, or disposed of. The identification of "reasonably foreseen" conditions of use will necessarily be a case-by-case determination and will be highly fact-specific. Reasonably foreseen conditions of use will not be based on hypotheticals or conjecture. EPA's identification of conditions of use includes the expectation of compliance with federal and state laws, such as worker protection standards or disposal restrictions, unless case-specific facts indicate otherwise. Accordingly, EPA will apply its professional judgment, experience, and discretion when considering such factors as evidence of current use of the new chemical substance outside the United States, evidence that the PMN substance is sufficiently likely to be used for the same purposes as existing chemical substances that are structurally analogous to the new chemical substance, and conditions of use identified in an initial PMN submission that the submitter omits in a revised PMN. The sources EPA uses to identify reasonably foreseen conditions of use include searches of internal confidential EPA PMN databases (containing use information on analogue chemicals), other U.S. government public sources, the National Library of Medicine's Hazardous Substances Data Bank (HSDB), the Chemical Abstract Service STN Platform, REACH Dossiers, technical encyclopedias (e.g., Kirk-Othmer and Ullmann), and Internet searches.

for current transformer secondary overvoltage protector; use as additives in resin composition for civil engineering building structure and coating, in eco-friendly PVC adhesive, and in fire resistant and flame retardant cable materials; and use as a refrigerant oil base oil, based on patents on the chemical substance.

Summary: The chemical substance is not likely to present an unreasonable risk of injury to health or the environment, without consideration of costs or other nonrisk factors, including an unreasonable risk to a potentially exposed or susceptible subpopulation identified as relevant by the Administrator under the conditions of use, based on the risk assessment presented below. Although EPA estimated that the new chemical substance could be persistent, the substance has low potential for bioaccumulation, such that repeated exposures are not expected to cause food-chain effects via accumulation in exposed organisms. Based on estimated physical/chemical properties, available data on the new chemical substance, and test data on analogous chemical substances, EPA estimates that the chemical substance has low environmental hazard and potential for the following human health hazards: skin and eye irritation, developmental toxicity, and specific target organ toxicity. EPA concludes that the new chemical substance is not likely to present an unreasonable risk under the conditions of use.

Fate: Environmental fate is the determination of which environmental compartment(s) a chemical moves to, the expected residence time in the environmental compartment(s) and removal and degradation processes. Environmental fate is an important factor in determining exposure and thus in determining whether a chemical may present an unreasonable risk. EPA estimated physical/chemical and fate properties of the new chemical substance using data for analogue(s) (tributyl trimellitate (CASRN 1726-23-4) and tris(2-ethylhexyl) trimellitate (CASRN 3319-31-1)), data available for the new chemical substance, and EPI (Estimation Program Interface) Suite™ (http://www.epa.gov/tsca-screening-tools/epi-suitetm-estimation-program-interface). In wastewater treatment, the new chemical substance is expected to be removed with an efficiency of 90% due to sorption, biodegradation, and stripping. Removal of the new chemical substance by biodegradation is moderate. Sorption of the new chemical substance to sludge is expected to be strong and to soil and sediment is expected to be very strong. Migration of the new chemical substance to groundwater is expected to be negligible due to very strong sorption to soil and sediment. Due to moderate estimated vapor pressure and Henry's law constant, the new chemical substance is expected to undergo moderate volatilization to air. Overall, these estimates indicate that the new chemical substance has moderate potential to volatilize to air and has low potential to migrate to groundwater.

Persistence[2]: Persistence is relevant to whether a new chemical substance is likely to present an unreasonable risk because chemicals that are not degraded in the environment at rates that prevent substantial buildup in the environment, and thus increase potential for exposure, may

[2] Persistence: A chemical substance is considered to have limited persistence if it has a half-life in water, soil or sediment of less than 2 months or if there are equivalent or analogous data. A chemical substance is considered to be persistent if it has a half-life in water, soil or sediments of greater than 2 months but less than or equal to 6 months or if there are equivalent or analogous data. A chemical substance is considered to be very persistent if it has a half-life in water, soil or sediments of greater than 6 months or if there are equivalent or analogous data. (64 FR 60194; November 4, 1999)

present a risk if the substance presents a hazard to human health or the environment. EPA estimated degradation half-lives of the new chemical substance using data for analogue(s) (tributyl trimellitate (CASRN 1726-23-4) and tris(2-ethylhexyl) trimellitate (CASRN 3319-31-1)), data available for the new chemical substance, and EPI Suite™. EPA estimated that the new chemical substance's aerobic and anaerobic biodegradation half-lives range from < 2 months to 6 months. These estimates indicate that the new chemical substance may be persistent in aerobic environments (e.g., surface water) and anaerobic environments (e.g., sediment).

Bioaccumulation[3]: Bioaccumulation is relevant to whether a new chemical substance is likely to present an unreasonable risk because substances that bioaccumulate in aquatic and/or terrestrial species pose the potential for elevated exposures to humans and other organisms via food chains. EPA estimated the potential for the new chemical substance to bioaccumulate using EPI Suite™. EPA estimated that the new chemical substance has low bioaccumulation potential based on BCFBAF model result < 1,000 (bioconcentration factor = 50 [estimated by linear regression from log Kow] and bioaccumulation factor = 1 [estimated by the Arnot-Gobas method (2003)]).[4] Although EPA estimated that the new chemical substance could be persistent, the substance has low potential for bioaccumulation, such that repeated exposures are not expected to cause food-chain effects via accumulation in exposed organisms.

Human Health Hazard[5]: Human health hazard is relevant to whether a new chemical substance is likely to present an unreasonable risk because the significance of the risk is dependent upon both the hazard (or toxicity) of the chemical substance and the extent of exposure to the substance. EPA estimated the human health hazard of this chemical substance based on its

[3] Bioaccumulation: A chemical substance is considered to have a low potential for bioaccumulation if there are bioconcentration factors (BCF) or bioaccumulation factors (BAF) of less than 1,000 or if there are equivalent or analogous data. A chemical substance is considered to be bioaccumulative if there are BCFs or BAFs of 1,000 or greater and less than or equal to 5,000 or there are equivalent or analogous data. A chemical substance is considered to be very bioaccumulative if there are BCFs or BAFs of 5,000 or greater or if there are equivalent or analogous data. (64 FR 60194; November 4 1999)

[4] Arnot JA, Gobas FAPC. 2003. A generic QSAR for assessing the bioaccumulation potential of organic chemicals in aquatic food webs. *QSAR and Combinatorial Science* 22: 337-345.

[5] A chemical substance is considered to have low human health hazard if effects are observed in animal studies with a No Observed Adverse Effect Level (NOAEL) equal to or greater than 1,000 mg/kg/day or if there are equivalent data on analogous chemical substances; a chemical substance is considered to have moderate human health hazard if effects are observed in animal studies with a NOAEL less than 1,000 mg/kg/day or if there are equivalent data on analogous chemical substances; a chemical substance is considered to have high human health hazard if there is evidence of adverse effects in humans or conclusive evidence of severe effects in animal studies with a NOAEL of less than or equal to 10 mg/kg/day or if there are equivalent data on analogous chemical substances. EPA may also use Benchmark Dose Levels (BMDL) derived from benchmark dose (BMD) modeling as points of departure for toxic effects. See https://www.epa.gov/bmds/what-benchmark-dose-software-bmds. Using this approach, a BMDL is associated with a benchmark response, for example a 5 or 10 % incidence of effect. The aforementioned characterizations of hazard (low, medium, high) would also apply to BMDLs. In the absence of animal data on a chemical or analogous chemical substance, EPA may use other data or information such as from in vitro assays, chemical categories (e.g., Organization for Economic Co-operation and Development, 2014 Guidance on Grouping of Chemicals, Second Edition. ENV/JM/MONO(2014)4. Series on Testing & Assessment No. 194. Environment Directorate, Organization for Economic Co-operation and Development, Paris, France. (http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2014)4&doclanguage=en)), structure-activity relationships, and/or structural alerts to support characterizing human health hazards.

estimated physical/chemical properties, available data on the new chemical substance, data on analogous chemicals, and other structural information. Absorption of the new chemical substance is expected to be poor to moderate through the skin and nil through the gastrointestinal (GI) tract and lungs based on physical/chemical properties. For the new chemical substance, EPA identified hazards including developmental toxicity based on an endocrine disruption mode of action by analogy to phthalate esters, as well as systemic effects (decreased body weight and body weight gain, decreased food consumption) and developmental effects (decreased fetal weight, litter weight, and fetal abnormalities), based on test data for an analogue, 1,2,4-benzenetricarboxylic acid, mixed decyl and octyl triesters (CASRN 90218-76-1). Test data on the new chemical substance reported the test substance as non-mutagenic/genotoxic in vitro (Organisation for Economic Co-operation and Development (OECD) test guidelines 471, 473, 476). Irritation hazards to workers via inhalation and dermal contact were identified based on test data for an analogue. EPA identified a NOAEL of 300 mg/kg-bw/day based on systemic effects from a prenatal developmental toxicity study (OECD 414), which was protective of systemic and developmental effects, and which was used to derive exposure route- and population-specific points of departure for quantitative risk assessment, described below. EPA qualitatively evaluated irritation effects.

Environmental Hazard[6]: Environmental hazard is relevant to whether a new chemical substance is likely to present unreasonable risk because the significance of the risk is dependent upon both the hazard (or toxicity) of the chemical substance and the extent of exposure to the substance. EPA estimated environmental hazard using predictions based on the negligible water solubility of the new chemical substance. This substance falls within the TSCA New Chemicals Category of Esters.[7] Acute and chronic toxicity values estimated for fish, aquatic invertebrates, and algae are all no effects at saturation. These toxicity values indicate that the new chemical substance is expected to have low environmental hazard. Because hazards are not expected up to the water solubility limit, acute and chronic concentrations of concern are not identified.

Exposure: The exposure to a new chemical substance is potentially relevant to whether a new chemical substance is likely to present unreasonable risks because the significance of the risk is dependent upon both the hazard (or toxicity) of the chemical substance and the extent of exposure to the substance.

EPA estimates occupational exposure and environmental release of the new chemical substance under the intended conditions of use described in the PMN using ChemSTEER (Chemical

[6] A chemical substance is considered to have low ecotoxicity hazard if the Fish, Daphnid and Algae LC50 values are greater than 100 mg/L, or if the Fish and Daphnid chronic values (ChVs) are greater than 10.0 mg/L, or there are not effects at saturation (occurs when water solubility of a chemical substance is lower than an effect concentration), or the log Kow value exceeds QSAR cut-offs. A chemical substance is considered to have moderate ecotoxicity hazard if the lowest of the Fish, Daphnid or Algae LC50s is greater than 1 mg/L and less than 100 mg/L, or where the Fish or Daphnid ChVs are greater than 0.1 mg/L and less than 10.0 mg/L. A chemical substance is considered to have high ecotoxicity hazard, or if either the Fish, Daphnid or Algae LC50s are less than 1 mg/L, or any Fish or Daphnid ChVs is less than 0.1 mg/L (Sustainable Futures https://www.epa.gov/sustainable-futures/sustainable-futures-p2-framework-manual).

[7] TSCA New Chemicals Program (NCP) Chemical Categories. https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/chemical-categories-used-review-new.

Screening Tool for Exposures and Environmental Releases; https://www.epa.gov/tsca-screening-tools/chemsteer-chemical-screening-tool-exposures-and-environmental-releases). EPA uses EFAST (the Exposure and Fate Assessment Screening Tool; https://www.epa.gov/tsca-screening-tools/e-fast-exposure-and-fate-assessment-screening-tool-version-2014) to estimate general population, consumer, and environmental exposures.

EPA considers workers to be a potentially exposed or susceptible subpopulation (PESS) on the basis of greater exposure potential compared to the general population. EPA also considers PESS in conducting general population drinking water exposures by evaluating risks associated with water intake rates for multiple age groups, ranging from infants to adults. EPA considers consumers of specific products to be a potentially exposed or susceptible subpopulation on the basis of greater exposure potential compared to the general population who do not use specific products.

For this new chemical assessment, EPA assessed worker exposure via the dermal and inhalation routes. Releases to air and landfill were estimated. No releases to water were expected. Exposures to the general population were not assessed because exposures are expected to be negligible (below modeling thresholds). Consumer exposures were not assessed because consumer uses were not identified as conditions of use.

Risk Characterization: EPA applies a margin of exposure approach to calculate potential human health risks of new chemicals. A benchmark (acceptable) margin of exposure (MOE) is derived by applying uncertainty factors (UF) for the following types of extrapolations: intra-species extrapolation (UF_H = 10 to account for variation in sensitivity among the human population), inter-species extrapolation (UF_A = 10 to account for extrapolating from experimental animals to humans) and Lowest Observed Adverse Effect Level (LOAEL)-to-NOAEL extrapolation (UF_L = 10 to account for using a LOAEL when a NOAEL is not available). Hence, in the New Chemicals Program, a benchmark MOE is typically 100 and 1,000 when NOAELs and LOAELs, respectively, are used to identify hazard. When allometric scaling or pharmacokinetic modeling is used to derive an effect level, the UF_H may be reduced to 3, for a benchmark MOE of 30. The benchmark MOE is used to compare to the MOE calculated by comparing the toxicity NOAEL or LOAEL to the estimated exposure concentrations. When the calculated MOE is equal to or exceeds the benchmark MOE, the new chemical substance is not likely to present an unreasonable risk. EPA assesses risks to workers considering engineering controls described in the PMN but in the absence of personal protective equipment (PPE) such as gloves and respirators. If risks are preliminarily identified, EPA then considers whether the risks would be mitigated by the use of PPE (e.g., impervious gloves, respirator).

Risks to human health for the new chemical substance were evaluated using the route-specific effect levels (i.e., NOAEL) described above. Risks were not identified for workers for systemic effects via inhalation exposures based on quantitative hazard data for an analogue ($MOE_{Respirable}$ = 3,360; MOE_{Total} = 1,120; Benchmark MOE = 100). Risks were identified for workers for systemic effects via dermal contact based on quantitative hazard data for an analogue (MOE = 89; Benchmark MOE = 100). Irritation hazards to workers via inhalation and dermal contact were identified based on test data for an analogue. Risks for these endpoints were not quantified due to a lack of dose-response for these hazards. Risks will be mitigated if exposures are

controlled by the use of appropriate PPE, including impervious gloves, eye protection, and respiratory protection. EPA expects that employers will require and workers will use appropriate PPE (i.e., impervious gloves, eye protection, and respiratory protection), consistent with the Safety Data Sheet (SDS) prepared by the submitter, in a manner adequate to protect them.

Risks to the general population were not evaluated because exposures are not expected. Risks to consumers were not evaluated because consumer uses were not identified as conditions of use.

Risks from acute and chronic exposures to the environment are not expected at any concentration of the new chemical substance soluble in the water (i.e., no effects at saturation).

Because worker exposures can be controlled by PPE, no unreasonable risks to the general population or environment were identified, and there are no expected consumer exposures, EPA has determined that the new chemical substance is not likely to present unreasonable risk to human health or the environment under the intended conditions of use. EPA also identified reasonably foreseen conditions of use based on previous TSCA submissions and patents on the new chemical substance. EPA previously assessed the conditions of use described in the previous TSCA submissions and identified unreasonable risk to human health or the environment. These risks were mitigated by issuing consent orders that restricted the conditions of use and by issuing a SNUR. The existing SNUR for this chemical substance defines certain conditions of use as significant new uses. The significant new uses include use of the chemical substance other than for use in wire and cable insulation, which addresses the reasonably foreseen uses based on patents on the new chemical substance. The significant new uses also include domestic manufacture, importing above an aggregate production volume, and use without worker PPE, which address the reasonably foreseen uses based on the previous TSCA submissions. Conditions of use that fall under the restrictions of the SNUR are not likely to present unreasonable risk of injury to health or the environment because those conditions of use would be prohibited unless and until EPA makes an affirmative determination that the significant new use is not likely to present an unreasonable risk or takes appropriate action under section 5(e) or 5(f). Therefore, EPA concludes that the new chemical substance is not likely to present an unreasonable risk of injury to human health or the environment under the conditions of use.

9/30/2020
Date:

/s/
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