

TSCA Section 5(a)(3) Determination for Premanufacture Notice (PMN) P-18-0116

Number: P-18-0116

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

Chemical Name:

Generic: Fatty acid oil reaction product with fatty acid oil

Conditions of Use (intended, known, or reasonably foreseen)¹:

Intended conditions of use (generic): Import for use as an intermediate for an industrial chemical, 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 none.

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 chemical substance has low potential for bioaccumulation, such that repeated exposures are not expected to be cumulative. Based on analogous chemical substances, EPA estimates that the chemical substance has high environmental hazard and the potential for the following human health hazards: sensitization. EPA has determined that the new chemical substance is not likely to present unreasonable risk to human health or the environment under the conditions of use.

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.

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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 a number of physical-chemical and fate properties of this new chemical substance using received data for the new chemical substance and EPI (Estimation Programs Interface) Suite™, a suite of physical/chemical property and environmental fate estimation programs (<http://www.epa.gov/tsca-screening-tools/epi-suite-estimation-program-interface>). The chemical substance is estimated to be removed with an efficiency of 90% during wastewater treatment due to sorption and biodegradation. Sorption to sludge is estimated to be strong, and sorption to soil and sediment is estimated to be moderate. Volatilization to air is estimated to be negligible because the substance is estimated to have low vapor pressure and a low Henry's Law constant. Overall, these estimates are indicative of low potential for this chemical substance to volatilize into the air and low potential for this chemical to migrate into groundwater.

Persistence²: 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 present a risk if the substance presents a hazard to human health or the environment. EPA estimated biodegradation half-lives of this new chemical substance using data on the new chemical substance and EPI Suite™. The aerobic biodegradation half-life is estimated to be less than two months and the anaerobic biodegradation half-life estimated to be two to six months. These estimates indicate that the new chemical substance is not likely to be persistent in aerobic environments (e.g., surface water), but may be persistent in anaerobic environments (e.g., sediment).

Bioaccumulation³: 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 data on the new chemical substance and EPI Suite™. These estimates indicate that the chemical substances have low bioaccumulation potential (bioconcentration factor = 32; bioaccumulation factor = 15). Although EPA estimated that the new chemical substance could be persistent, the chemical substance has low potential for bioaccumulation, such that repeated exposures are not expected to cause food chain effects via accumulation in exposed organisms.

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 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 there are equivalent or analogous data. (64 FR 60194; November 4, 1999)

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 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 there are equivalent or analogous data. (64 FR 60194; November 4 1999)

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Human Health Hazard⁴: 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 physical/chemical properties, available data for the new chemical substance, and analogous chemical substances for which there is information on human health hazard, and other structural information. The absorption of the new chemical substance is estimated to be nil to poor by the dermal route, poor in the lung, and moderate in the GI based on physical/chemical properties. Data on the new chemical substance includes acute toxicity tests with an oral LD₅₀ > 2000 mg/kg and dermal LD₅₀ > 2000 mg/kg, indicating low acute oral and dermal toxicity. Other data (OECD TG 471 and 487) for the new chemical substance indicate it is not genotoxic and does not cause eye and skin irritation. However, positive results were obtained in a local lymph node assay (LLNA; OECD TG 429), indicating skin sensitization as a hazard of the new chemical substance. No other hazards were identified. Risks for sensitization were qualitatively assessed, as described below.

Environmental Hazard⁵: 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 of this new chemical substance using the Ecological Structure Activity Relationships (ECOSAR) Predictive Model

⁴ 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](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.

⁵ 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).

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(<https://www.epa.gov/tsc-screening-tools/ecological-structure-activity-releationships-ecosar-predictive-model>); specifically the QSAR for esters. Acute toxicity values estimated for fish, aquatic invertebrates, and algae are 1.1 mg/L, 1.6 mg/L, and 0.44 mg/L, respectively. Chronic toxicity values estimated for fish, aquatic invertebrates, and algae are 0.04 mg/L, 0.49 mg/L, and 0.28 mg/L, respectively. Based on these toxicity values, EPA expects the new chemical substance to have high environmental hazard. Application of assessment factors of 4 and 10 to acute and chronic toxicity values, respectively, results in acute and chronic concentrations of concern of 0.110 mg/L (110 ppb) and 0.004 mg/L (4 ppb), respectively.

Exposure and Risk Characterization: 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 Screening Tool for Exposures and Environmental Releases; <https://www.epa.gov/tsc-screening-tools/chemsteer-chemical-screening-tool-exposures-and-environmental-releases>). EPA uses EFAST (the Exposure and Fate Assessment Screening Tool; <https://www.epa.gov/tsc-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 exposure via dermal and inhalation routes to workers during processing and exposure to the general population via drinking water and fish ingestion. Inhalation exposure to the general population was not estimated because air releases were estimated to be low (below modeling thresholds). Exposures to consumers were not assessed because consumer uses were not identified as conditions of use.

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 for sensitization were evaluated qualitatively because dose-response information is not available for this endpoint. Risks to workers for sensitization via inhalation are not expected because inhalation exposure to workers is expected to be negligible. Risks to workers for sensitization from dermal exposure would be mitigated with the use of PPE, including impervious gloves. EPA expects that workers will use appropriate personal protective equipment

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(i.e., impervious gloves and chemical goggles or equivalent eye protection), consistent with the Safety Data Sheet prepared by the PMN submitter, in a manner adequate to protect them.

Risks were not estimated for the general population for sensitization via inhalation because inhalation exposures are expected to be low (below modeling thresholds). Risks to the general population are not expected for sensitization via oral exposure. Risks to consumers were not evaluated because consumer uses were not identified as conditions of use.

Risks to the environment are evaluated by comparing estimated surface water concentrations with the acute and chronic COCs. Risks to the environment were not identified because the estimated maximum surface water concentrations did not exceed the acute COC, and the chronic COC was exceeded less than 20 days⁶, indicating organisms would not be exposed long enough for chronic effects to occur.

Because worker exposures can be controlled by PPE, there are no expected consumer exposures, and no unreasonable risks to the general population or environment were identified, EPA has determined that the new chemical substance is not likely to present unreasonable risk to human health or the environment under the conditions of use.

10/5/18
Date:

/s/
Jeffery T. Morris, Director
Office of Pollution Prevention and Toxics

⁶ The 20-day criterion for concluding chronic risk is not likely is based on partial life cycle tests (daphnid chronic and fish early life stage tests) that typically range from 21 to 28 days in duration.