# Product Safety Summary for Dodecanedioic Acid

## SUBSTANCE NAME

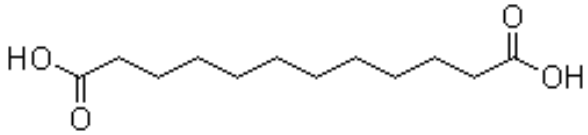
Dodecanedioic acid
1,10-Decanedicarboxylic acid
alpha,omega-DC12
C12 acid
DDA

## GENERAL STATEMENT

Dodecanedioic acid is a white solid with a slight odor. At 20°C, the relative density is 1.172, which is higher than that of water, and the vapor pressure is 0.000000015 Pa. Dodecanedioic acid has a wide range of applications. Dodecanedioic acid is used as a raw material for polyurethane, polyester, and polyamide resins, as well as a hardener for acrylic powder paints.
Dodecanedioic acid is not known to cause remarkable adverse human health or environmental effects, but it causes serious irritation to eyes. Exposure via eye contact must be avoided, specifically by industrial users and certain professional users. Always protective goggles should to be worn. If dust formation is possible during operations adequate ventilations or half mask respirators with dust filters is required.
General population will not come in contact significantly with this chemical via environment due to the production of the substance as Dodecanedioic acid is manufactured in closed processes which also minimizes exposure potential to workers. No significant exposure to the environment is expected. The substance is not intended for consumer uses. The usual general precautionary measures to prevent worker and environmental exposure to chemicals should also be taken when handling Dodecanedioic acid in industrial uses.

## CHEMICAL IDENTITY

**EC Name:** Dodecanedioic Acid
**EC-No. :** 211-746-3
**CAS-No. :** 693-23-2
**Molecular formula:** C12H22O4
**Structural formula:**




## USES AND APPLICATIONS

Dodecanedioic acid is used as a raw material for polyurethane, polyester, and polyamide resins, as well as a hardener for acrylic powder paints. When reacted with various alcohols and diamines, DDA produces polyester and polyamide resins with excellent performance, especially in hydrolytic resistance, flexibility, and heat stability.

## PHYSICAL CHEMICAL PROPERTIES

Dodecanedioic acid is a white solid with a slight odor. At 20°C, the relative density is 1.172, which is higher than that of water, and the vapor pressure is 0.000000015 Pa. The melting point of this substance is 128°C and the boiling point 250°C. Since the substance does not react with water or contain any groups that might

oxidize or spontaneously ignite, it is not expected that Dodecanedioic acid would be flammable, self-ignite, oxidize or explode at ambient conditions.

**Melting point/range:** 128 °C at 1013.25 hPa
**Boiling point/boiling range:** 250 °C at 13.33 hPa.
**Decomposition temperature:** >250 °C
**Flammability (solid, gaseous):** not highly flammable
**Explosive properties:** non-explosive
**Auto-ignition temperature:** Not applicable.
**Molecular weight:** 230.300 g/mol
**Water solubility:** 30 mg/l solution at 20°C
**logPow:** 3.2 at 25°C
**Vapor pressure:** 0.000000015 Pa at 20°C
**Relative density:** 1.172 g/cm$^3$ at 20°C
**Oxidizing properties:** No oxidizing properties

## HEALTH EFFECTS

Dodecanedioic acid has no marked health hazard properties. Based on available data, Dodecanedioic acid has no relevant acute toxicity if swallowed or in contact with skin after a one-time exposure. Due to a low vapor pressure, inhalation exposure is unlikely; therefore, no data is available. Dodecanedioic acid causes serious irritation to eyes but it is not irritating to skin. Based on available data the substance is not considered to be a skin sensitizer. Standard tests indicate Dodecanedioic acid is not mutagenic nor genotoxic. Available data show no evidence that the substance is carcinogenic. Based on available data there is no evidence that Dodecanedioic acid is a reproductive or developmental toxin. After repeated oral ingestion Dodecanedioic acid showed no relevant toxic effects up to the highest doses tested.

| EFFECT ASSESSMENT | RESULT |
|---|---|
| Acute Toxicity (oral/dermal/inhalation) | Dodecanedioic acid is of low acute toxicity via all routes of exposure. |
| Irritation/Corrosivity (skin/eye/respiratory tract) | Dodecanedioic acid is serious irritating to the eyes. Dodecanedioic acid is not irritating to the skin. |
| Sensitization (skin/respiratory tract) (skin/respiratory tract) | Based on the available data Dodecanedioic acid is not considered to have skin or respiratory sensitization properties. |
| Mutagenicity | All available in vitro test data indicates that Dodecanedioic acid does not cause mutagenic effects. |
| Carcinogenicity | No carcinogenicity data has been generated due to the negative mutagenicity results. |
| Reproductive Toxicity | Screening test information indicates that Dodecanedioic acid has no adverse reproductive effects. |
| Repeated Dose Exposure | Oral repeated dose test results with Dodecanedioic acid suggest that no marked toxicity should be expected. Dermal and inhalation repeated dose exposure testing is considered unnecessary based on expected exposure routes and the result of the oral repeated dose test. |

## ENVIRONMENTAL EFFECTS

The results of all acute aquatic studies on fish, algae, plants and invertebrates indicate a low environmental acute hazard potential for Dodecanedioic acid. Dodecanedioic acid is readily biodegradable and it has a low bioaccumulation potential. Considering all available data on biotic and abiotic degradation, bioaccumulation

and toxicity, it can be stated that the substance is neither persistent nor toxic to the environment and that it will not bio-accumulate. Overall, Dodecanedioic acid has a low environmental hazard potential.

| EFFECT ASSESSMENT | RESULT |
|---|---|
| Aquatic Toxicity | Fish, daphnia, algae and plant studies indicate that the aquatic toxicity of Dodecanedioic acid is low. |

| FATE AND BEHAVIOR | RESULT |
|---|---|
| Biodegradation | Dodecanedioic acid is readily biodegradable. |
| Bioaccumulation potential | Dodecanedioic acid has a low bioaccumulation potential. |
| PBT/vPvB conclusion | Based on its low toxicity, bioaccumulation potential and ready biodegradability, Dodecanedioic acid does not meet the criteria for PBT or vPvB. |

## EXPOSURE

**Human Health**

Dodecanedioic acid is used in many different applications. In industrial sites, it is used as a raw material for polyurethane, polyester, and polyamide resins, as well as a hardener for acrylic powder paints. When reacted with various alcohols and diamines, Dodecanedioic acid produces polyester and polyamide resins with excellent performance, especially in hydrolytic resistance, flexibility, and heat stability. But its main industrial use is as monomer or reactant; therefore, Dodecanedioic acid will no longer be present as such in downstream products, practically eliminating the exposure potential for consumers. General population will not come in contact significantly with this chemical via environment due to the production of the substance as Dodecanedioic acid is manufactured in closed processes which also minimizes exposure potential to workers. The direct exposure of general population is very unlikely as this substance is manufactured in industrial settings for industrial / professional use. Normal industrial practices assure limited workplace exposures.

**Environment**

The manufacture is a closed process and no significant exposure to the environment is expected. Dodecanedioic acid is solid at room temperature and it has low volatility in liquid form above its boiling point. Therefore, the probability of release in pure form to any of the environmental compartments is low, under normal industrial use conditions. There may be some release to waste water streams as a result of normal use or industrial operations. Due to its readily biodegradability, Dodecanedioic acid should not cause further environmental exposure. Any exposures will generally be lower than concern levels. Direct use by the general population is not intended and thus environmental exposure via this route is unlikely to occur.

## RISK MANAGEMENT RECOMMENDATIONS

Dodecanedioic acid poses a risk that need to be managed. Exposure via eye contact must be avoided, specifically by industrial users and certain professional users. Always protective goggles should to be worn. If dust formation is possible during operations adequate ventilations or half mask respirators with dust filters is required. Do not eat, drink, smoke where chemicals are handled, processed or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with water and seek medical attention. Dodecanedioic acid is not flammable; however, it is good practice to prevent the build-up of electrostatic charge when storing it. For environmental protection in case of accidental release: do not allow product to reach sewage system or any water course. Retain and dispose of contaminated wash water. Releases to air should be avoided by suitable measures.

Dodecanedioic acid poses low human health and environmental risks. However it is a good practice to train personnel handling the substance and to protect workers who may be exposed to Dodecanedioic acid by taking the usual precautionary measures to protect against chemical exposure.

## STATE AGENCY REVIEW

This substance has been registered under REACH (EC) No. 1907/2006.
Dodecanedioic acid is included in the OECD list of High Production Volume (HPV) chemicals.
Dodecanedioic acid is listed in the following Chemical Inventories: TSCA, EINECS, ENCS, AICS, Canadian DSL, KECI, PICCS, IECSC, and NZIoC.

## REGULATORY INFORMATION/CLASSIFICATION AND LABELING

Classification of the substance according to REGULATION (EC) No 1272/2008:

**Skin/Eye (Corrosion/irritation):** Category 2; H319 Causes serious eye irritation.

Labeling according to REGULATION (EC) No 1272/2008:

**Pictogram:**

**Signal word:** Warning

**Hazard statements:**
H319: Causes serious eye irritation.

## CONTACT INFORMATION WITHIN COMPANY

For further information on this substance or product safety summaries in general, please contact:

**Company:** UBE Chemical Europe, S.A
**Department:** Product Liability
**Address:** Poligono Industrial El Serrallo, s/n
**Town/Country:** Grao de Castellon (Castellon), Spain
**Postal code:** 12100
**E-mail:** sds.ube.eu@ube.es

Additional information can be found at:
http://www.ube.es
http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/

## GLOSSARY

| | |
|---|---|
| Acute toxicity | Harmful effect resulting from a single or short term exposure to a substance. |
| Biodegradation | Decomposition or breakdown of a substance under natural conditions (actions of micro organisms etc). |
| Bioaccumulation | Progressive accumulation in living organisms of a |

| | |
|---|---|
| | chemical substance present in the environment. |
| Canadian DSL | Domestic Substances List of Canada. |
| Carcinogenicity | Substance effects causing cancer. |
| CAS | Chemical Abstracts Service (division of the American Chemical Society). |
| Chronic toxicity | Harmful effect after repeated exposures or long term exposure to a substance. |
| EINECS | European Inventory of Existing Commercial Chemical Substances |
| Flash point | The lowest temperature at which vapor of the substance may form an ignitable mixture with air. |
| Genotoxicity | Substance effect that causes damage to genes, including mutagenicity and clastogenicity. |
| GHS | Globally Harmonized System of Classification and Labelling of Chemicals |
| HPV | High Production Volume Chemicals. |
| Hydrolyze | Undergo hydrolysis; decompose by reacting with water. |
| Intermediate | Substance that is manufactured for and consumed in or used for chemical processing in order to be transformed into another substance. |
| Monomer | Means a substance which is capable of forming covalent bonds with a sequence of additional like or unlike molecules under the conditions of the relevant polymer-forming reaction used for the particular process. |
| Mutagenicity | Substance effect that cause mutation on genes. |
| PBT | Persistent, bioaccumulative, toxic chemical. |
| Persistence | Refers to the length of time a compound stays in the environment, once introduced. |
| Risk Management Measures | Engineering controls, conditions and protective equipment needed to be implemented to ensure that the risks to human health and the environment are adequately controlled. |
| REACH (EC) No. 1907/2006 | European Commission Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals. |
| REGULATION (EC) No 1272/2008 | European Commission Regulation on Classification, Labelling and Packaging of Substances and Mixtures. |
| Reprotoxicity | Including teratogenicity, embryotoxicity and harmful effects on fertility. |
| Sensitizing | Allergenic. |
| Sediment | Topsoil, sand and minerals washed from land into water forming in the end a layer at the bottom of rivers and sea. |
| TSCA | Toxic Substance Control Act |
| Vapor pressure | A measure of a substance's property to evaporate. |
| vPvB | Very persistent, very bioaccumulative. |

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## REVISION

Version 1.0

## DISCLAIMER

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