

## PRODUCT SAFETY SUMMARY: ANILINE

*This Product Safety Summary is intended to provide a general description of certain Huntsman chemical substances and products containing the chemical substance(s). The information in this Summary is not intended to replace the information included on the Safety Data Sheet (SDS), Product Safety Label, and other safe use and handling literature for the chemical substance(s).*

### Chemical Identity

This Product Safety Summary covers the chemical substance below:

CAS #	Chemical Name	Synonyms
62-53-3	Benzenamine	Aniline

### General Product Overview

In Huntsman, aniline is primarily used as a raw material in the production of methylene diphenyl diisocyanate (MDI). Aniline is not marketed by Huntsman directly for consumer use. Aniline is fully consumed in the manufacture of MDI, so it is not expected to present an exposure risk to downstream users or consumers.

### Applications and Uses

Aniline is primarily used by Huntsman as a chemical intermediate to manufacture MDI and MDI-based products. MDI is then used predominantly by downstream customers to manufacture polyurethane foam, adhesives, binders, coatings, sealants, or elastomers. Huntsman does not market aniline directly for consumer use.

## Physical and Chemical Properties

Aniline is an oily, colorless, combustible liquid with a characteristic odor.

Certain physical properties for aniline are summarized below:

<b>Melting/Freezing point</b>	-6.0°C
<b>Boiling point</b>	184°C
<b>Flash point</b>	76°C
<b>Vapor pressure</b>	0.4 hPa @ 20°C
<b>Density</b>	1.02 g/cm <sup>3</sup> @ 20°C
<b>Solubility in water</b>	ca. 35 g/L @ 20°C

Additional physical and chemical property information is available on the product Safety Data Sheet (SDS), which can be requested at [SDS@huntsman.com](mailto:SDS@huntsman.com).

## Human Health Information

The potential to experience health effects associated with overexposure to aniline depends on the exposure level, route, duration, as well as other factors, including individual susceptibility. The potential health effects from overexposure to aniline are discussed below. Different regulatory classification criteria apply in different geographic regions. These differing criteria may result in different human health regulatory classifications for the same product in different geographic regions. Specific regulatory classification information is contained in the Safety Data Sheet for each product in use in the specific geographic region. The acute and chronic health effects information below is based on Safety Data Sheets in use in the United States.

### Acute Health Effects

Overexposure by inhalation, through skin, or by ingestion may cause methemoglobin formation, resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). Aniline is considered to have high acute toxicity, based on short-term animal tests in rats.

Skin contact may cause skin sensitization. Persons who were previously sensitized may experience allergic skin reactions with symptoms of erythema, itching, swelling, and rash.

Eye contact may cause serious eye damage with symptoms of eye burns, corneal injury, and possible blindness.

## **Chronic Health Effects**

Repeated or prolonged exposure through skin, by inhalation or ingestion may cause blood disorders. In reproductive/developmental toxicity studies, no teratogenic effects were observed, and fetotoxicity was seen only with maternal toxicity.

Animal studies have shown positive and negative evidence for carcinogenicity, and aniline is therefore suspected of causing cancer. Aniline showed positive and negative evidence for mutagenicity and genotoxicity, and it is therefore suspected of causing genetic defects. More information can be obtained in the specific product Safety Data Sheet.

## **Environmental Information**

In Huntsman, aniline is an industrial raw material used in closed systems. During normal operating conditions, aniline is not expected to be released to the air, soil, or water. Procedural and/or control technologies are used to minimize emissions and potential exposure during cleaning and maintenance activities. Aniline is reacted in closed systems with other chemicals to form MDI.

## **Environmental Fate**

Aniline is readily biodegradable and photodegradable. Aniline does not show bioaccumulation potential resulting from the exposure to the organisms via water.

## **Environmental Toxicity Testing**

Environmental toxicity test data from several aquatic species show that aniline should be considered to have very high environmental toxicity to aquatic organisms. More information can be obtained in the product Safety Data Sheet.

## **Potential Occupational Exposure**

In Huntsman, aniline is used in closed systems. During normal operating conditions,

occupational exposure to aniline is not expected in the manufacturing process of MDI. Procedural and/or control technologies are used to minimize exposure during sampling, cleaning, maintenance, or in more open handling systems. In those cases, appropriate engineering controls (such as ventilation) and personal protective equipment should be used according to the exposure guidelines and workplace practices identified in the Safety Data Sheet.

## Potential Consumer Exposure

Aniline is not marketed by Huntsman directly for consumer use. Aniline is fully consumed in the manufacture of MDI, so it is not expected to present an exposure risk to downstream users or consumers.

## Safe Use Recommendations/Workplace Exposure Controls

Huntsman follows workplace exposure guidelines through a variety of industrial hygiene and ventilation measures. Workplace exposure guidelines include national/regional workplace limit values, such as:

- The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value-Time Weighted Average (TLV-TWA) – the concentration for a conventional 8-hour workday and a 40-hour workweek for a working lifetime without adverse effect). The TLV-TWA for aniline is 2 ppm (ca. 7.6 mg/m<sup>3</sup>).
- The Occupational Safety and Health Administration's permissible exposure limit (OSHA PEL) expressed as a timeweighted average – the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-hour workday or a 40-hour workweek). The OSHA PEL for aniline is 5 ppm (ca. 19 mg/m<sup>3</sup>).

More guidance and information are provided in the Safety Data Sheets.

See the Safety Data Sheets for additional information about first aid measures, accidental releases (spills and leaks), waste disposal, toxicity, transportation, regulatory requirements, and other important topics.

## Regulatory Information/Classification and Labeling

Under the Globally Harmonized System (GHS) for Hazard Communication, substances are classified according to their physical, health, and environmental hazards. The hazards are

communicated via specific labels and the Safety Data Sheets. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

Note: The hazard statements and symbols presented here refer to the hazard properties of the concentrated substance and are meant to provide a brief overview of the substance's labeling. It is not intended to be comprehensive or to replace information found in the Safety Data Sheet.

## Labeling according to OSHA 1910.1200 (GHS)



<b>Signal Word</b>
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Danger
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GHS Classification	
Flammable liquids	Category 4
Acute toxicity (oral)	Category 3
Acute toxicity (dermal)	Category 3
Acute toxicity (inhalation)	Category 3
Serious eye damage	Category 1
Skin sensitization	Category 1
Germ cell mutagenicity	Category 2
Carcinogenicity	Category 2
Specific target organ toxicity – repeated exposure	Category 1
Aquatic acute	Category 1
Aquatic chronic	Category 1

<b>Hazard Statements</b>	
H227	Combustible liquid
H301	Toxic if swallowed
H311	Toxic in contact with skin
H331	Toxic if inhaled
H318	Causes serious eye damage
H317	May cause an allergic skin reaction
H341	Suspected of causing genetic defects
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long-lasting effects

## **Additional Information**

Information on registered substances is available on the European Chemicals Agency (ECHA) website at <https://echa.europa.eu>.

## **References**

U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Aniline. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.

National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 2018.

American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices. Cincinnati, OH. 1999.



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

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