



## Material Safety Data Sheet

### Polyurethane Enamel X-310A

**Code:** X-310A

Akzo Nobel Coatings Inc. encourages and expects you to read and understand this entire MSDS, as there is important information throughout the document. Further, Akzo Nobel Coatings Inc. expects you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

To promote safe handling, each customer or recipient should: 1) Notify its employees, agents, contractors, and others whom it knows or believes will use this material of the information contained in this MSDS and any other information regarding hazards and safety; 2) Furnish this same information to each of its customers for the product; 3) Request its customers to notify their employees, customers, and other users of the product of this information; and 4) Notify its employees, agents, contractors, and others that the precautions identified for this product and any other products with which mixtures may be created are transferable and cumulative to the mixture.

## Section 1. Chemical product and company identification

### Manufacturer

Akzo Nobel Coatings, Inc.  
1 East Water Street  
Waukegan, IL 60085  
USA  
+1(847) 625-4200

#### IN CASE OF EMERGENCY (HEALTH OR SPILLS):

CHEMTREC 1 (800) 424-9300 (Inside the US)

CHEMTREC International +1 (703) 527-3887 (Outside the US, collect calls accepted)

**Product code : X-310A**

**Product name : Polyurethane Enamel X-310A**

**Product use : Coatings or Coatings Component**

**MSDS # : 0039587B20**

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For the most recent update to this Material Safety Data Sheet, visit our website at <http://www.akzonobel.com/aerospace>  
For additional information call (847) 625-4200.

## Section 2. Hazards identification

### Emergency overview

: DANGER!

FLAMMABLE LIQUID AND VAPOR. MAY CAUSE SEVERE ALLERGIC RESPIRATORY REACTION. HARMFUL IF INHALED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. POSSIBLE CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER, BASED ON ANIMAL DATA. POSSIBLE BIRTH DEFECT HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE BIRTH DEFECTS, BASED ON ANIMAL DATA.

### Potential acute health effects

#### **Inhalation**

: Toxic by inhalation. Irritating to respiratory system. May cause sensitization by inhalation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

## Section 2. Hazards identification

- Ingestion** : Harmful if swallowed.
- Skin** : Harmful in contact with skin. Severely irritating to the skin.
- Eyes** : Severely irritating to eyes. Risk of serious damage to eyes.

### Potential chronic health effects

- Chronic effects** : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Carcinogenicity** : Contains material which may cause cancer, based on animal data. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : Contains material which may cause birth defects, based on animal data.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Target organs** : Contains material which may cause damage to the following organs: blood, kidneys, lungs, the nervous system, liver, gastrointestinal tract, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), ears, eye, lens or cornea.

### Over-exposure signs/symptoms

- Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing  
wheezing and breathing difficulties  
asthma  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations
- Skin** : Adverse symptoms may include the following:  
irritation  
redness  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations
- Eyes** : Adverse symptoms may include the following:  
pain or irritation  
watering  
redness  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations

- Medical conditions aggravated by over-exposure** : Pre-existing respiratory disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

See toxicological information (Section 11)

### Section 3. Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>% by weight</u>
Hexamethylene diisocyanate, oligomers	28182-81-2	70 - 100
n-butyl acetate	123-86-4	10 - 25
xylene	1330-20-7	5 - 10
ethylbenzene	100-41-4	1 - 5
hexamethylene-di-isocyanate	822-06-0	0.1 - 1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

### Section 4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

### Section 5. Fire-fighting measures

- Flammability of the product** : Flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on fire hazards** : Not available.

## Section 5. Fire-fighting measures

**Special remarks on explosion hazards** : Not available.

## Section 6. Accidental release measures

**Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods for cleaning up

**Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

**Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Persons with a history of asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure during pregnancy. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## Section 8. Exposure controls/personal protection

### Product name

n-butyl acetate

### Exposure limits

**ACGIH TLV (United States, 3/2012).**

STEL: 200 ppm 15 minutes.

TWA: 150 ppm 8 hours.

**NIOSH REL (United States, 6/2009).**STEL: 950 mg/m<sup>3</sup> 15 minutes.

STEL: 200 ppm 15 minutes.

TWA: 710 mg/m<sup>3</sup> 10 hours.

TWA: 150 ppm 10 hours.

**OSHA PEL (United States, 6/2010).**TWA: 710 mg/m<sup>3</sup> 8 hours.

TWA: 150 ppm 8 hours.

xylene

**ACGIH TLV (United States, 3/2012).**STEL: 651 mg/m<sup>3</sup> 15 minutes.

STEL: 150 ppm 15 minutes.

TWA: 434 mg/m<sup>3</sup> 8 hours.

TWA: 100 ppm 8 hours.

**OSHA PEL (United States, 6/2010).**TWA: 435 mg/m<sup>3</sup> 8 hours.

TWA: 100 ppm 8 hours.

ethylbenzene

**ACGIH TLV (United States, 3/2012).**

TWA: 20 ppm 8 hours.

**NIOSH REL (United States, 6/2009).**STEL: 545 mg/m<sup>3</sup> 15 minutes.

STEL: 125 ppm 15 minutes.

TWA: 435 mg/m<sup>3</sup> 10 hours.

TWA: 100 ppm 10 hours.

**OSHA PEL (United States, 6/2010).**TWA: 435 mg/m<sup>3</sup> 8 hours.

TWA: 100 ppm 8 hours.

hexamethylene-di-isocyanate

**ACGIH TLV (United States, 3/2012).**TWA: 0.03 mg/m<sup>3</sup> 8 hours.

TWA: 0.005 ppm 8 hours.

**NIOSH REL (United States, 6/2009).**

CEIL: 0.02 ppm 10 minutes.

CEIL: 140 µg/m<sup>3</sup> 10 minutes.

TWA: 0.005 ppm 10 hours.

TWA: 35 µg/m<sup>3</sup> 10 hours.

### Consult local authorities for acceptable exposure limits.

**Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

**Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

## Section 8. Exposure controls/personal protection

Dry sanding, flame cutting and/or welding of the dry paint film will give rise to dust and/or hazardous fumes. Wet sanding/flatting should be used wherever possible. If exposure cannot be avoided by the provision of local exhaust ventilation, suitable respiratory protective equipment should be used.

### Personal protection

#### Respiratory

- : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

#### Hands

- : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

#### Eyes

- : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

#### Skin

- : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

#### Environmental exposure controls

- : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## Section 9. Physical and chemical properties

Physical state	: Liquid.
Flash point	: Closed cup: 32.8°C (91°F)
Auto-ignition temperature	: Not available.
upper flammability limit	: Not determined.
Lower flammability limit	: Not determined.
Appearance	: Colorless.
Odor	: Solvent.
Odor threshold	: Not available.
Specific gravity	: 1.06
pH	: Not available.
Boiling/condensation point	: 126°C (258.8°F)
Melting/freezing point	: Not available.
Vapor pressure	: Not available.
Vapor density	: Heavier than air
Density	: 8.85 lbs/gal 1.06 g/cm³
Evaporation rate	: Not determined.
Coefficient of water/oil distribution	: Not determined.
Weight Volatiles	: 25% (w/w)
Volume Volatiles	: 30.3 %(v/v)



## Section 9. Physical and chemical properties

<b>Weight Solids</b>	: 75.00 % (w/w)
<b>Volume Solids</b>	: 69.70 % (v/v)
<b>VOC, minus water and exempt solvents</b>	: 2.21 lbs/gal (265 g/l)

## Section 10. Stability and reactivity

<b>Stability</b>	: The product is stable.
<b>Hazardous polymerization</b>	: Under normal conditions of storage and use, hazardous polymerization will not occur.
<b>Conditions to avoid</b>	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
<b>Materials to avoid</b>	: Reactive or incompatible with the following materials: oxidizing materials
<b>Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
<b>Conditions of reactivity</b>	: Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge. Flammable in the presence of the following materials or conditions: oxidizing materials.

## Section 11. Toxicological information

### Acute toxicity

Product/ingredient name	Result	Species	Dose
n-butyl acetate	LD50 Dermal	Rabbit	>17600 mg/kg
	LD50 Oral	Rat	10768 mg/kg
	LC50 Inhalation Vapor	Rat	390 ppm
hexamethylene-di-isocyanate	LD50 Dermal	Rabbit	570 uL/kg
	LD50 Oral	Rat	710 uL/kg
xylene	LD50 Intraperitoneal	Rat	2459 mg/kg
	LD50 Oral	Rat	4300 mg/kg
	LD50 Subcutaneous	Rat	1700 mg/kg
	TDLo Dermal	Rabbit	4300 mg/kg
ethylbenzene	LD50 Dermal	Rabbit	>5000 mg/kg
	LD50 Dermal	Rabbit	17800 uL/kg
	LD50 Oral	Rat	3500 mg/kg
	TDLo Dermal	Rat	0.08 mL/kg
	TDLo Intraperitoneal	Rat	1062 mg/kg
	Not available.		
	Not available.		

### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Hexamethylene diisocyanate, oligomers	Eyes - Moderate irritant	Rabbit	-	100 milligrams	-
	Skin - Moderate irritant	Rabbit	-	500 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	100 milligrams	-
n-butyl acetate	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	87 milligrams	-
	Eyes - Severe irritant	Rabbit	-	24 hours 5 milligrams	-
xylene	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams	-

## Section 11. Toxicological information

ethylbenzene	Skin - Moderate irritant	Rabbit	-	100 Percent	-
	Eyes - Severe irritant	Rabbit	-	500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams	-

### Carcinogenicity

Not available.

### Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
n-butyl acetate	A4	-	-	None.	-	-
xylene	A4	3	-	None.	-	-
ethylbenzene	A3	2B	-	None.	-	-
hexamethylene-di-isocyanate	-	-	-	None.	-	-

### Mutagenicity

Not available.

### Teratogenicity

**Conclusion/Summary** : Not available.

### Reproductive toxicity

Not available.

## Section 12. Ecological information

**Environmental effects** : No known significant effects or critical hazards.

**Aquatic ecotoxicity** : Not available.

**Biodegradability** : Not available.

**Other adverse effects** : No known significant effects or critical hazards.

**Ecotoxicological data for one or more components are known and will be made available on request.**

## Section 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.



## Section 14. Transport information

The transportation description provided below is based on a one gallon container shipped within the United States, by highway only.

**UN number**    **Proper shipping name**    **Class**    **Packing group**    **Additional information**

UN1866    RESIN SOLUTION    3    III

## Section 15. Other Regulatory Information and Pictograms

### United States

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**United States inventory (TSCA 8b)** : All components are listed or exempted.

### SARA 313

### **Form R - Reporting requirements**

<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
xylene	1330-20-7	5 - 10
ethylbenzene	100-41-4	1 - 5
hexamethylene-di-isocyanate	822-06-0	0.1 - 1

**California Prop. 65** : WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

### Canada

### **WHMIS (Canada)**

: Class B-2: Flammable liquid  
 Class D-1A: Material causing immediate and serious toxic effects (Very toxic).  
 Class D-2A: Material causing other toxic effects (Very toxic).  
 Class D-2B: Material causing other toxic effects (Toxic).  
 Class E: Corrosive material



**This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.**

### **Canada inventory**

: All components are listed or exempted.

### International regulations

### **International lists**

: **Australia inventory (AICS)**: All components are listed or exempted.  
**China inventory (IECSC)**: All components are listed or exempted.  
**Japan inventory**: All components are listed or exempted.  
**Korea inventory**: All components are listed or exempted.  
**Malaysia Inventory (EHS Register)**: At least one component is not listed.  
**New Zealand Inventory of Chemicals (NZIoC)**: All components are listed or exempted.  
**Philippines inventory (PICCS)**: All components are listed or exempted.  
**Taiwan inventory (CSNN)**: All components are listed or exempted.

## Section 16. Other information

Health	*	2
Flammability		3
Physical hazards		0

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.