Page: 1/8

Material Safety Data Sheet



MSDS# 15-0199

Section 1. Chemical Product and Company Identification

Product name ARMOHIB® 28

Material Uses : Surfactant.

Supplier/ AKZO NOBEL SURFACE CHEMISTRY LLC
Manufacturer 525 West Van Buren

Chicago, IL 60607-3823

www.surfactants.akzonobel.com

AKZO NOBEL CHEMICALS LTD. 1 City Centre Drive, Suite 318 Mississauga, Ontario L5B 1M2

Canada

In Case of Emergency

CHEMTREC: 800-424-9300 CANUTEC: 613-996-6666 Medical/Handling: 914-693-6946 Product/Technical: 800-906-9977

Section 2. Hazards Identification

Physical State Liquid.
Color Amber.
Odor Amine like.

Emergency Overview

DANGER!

MAY BE FATAL IF INHALED. CAUSES EYE AND SKIN BURNS.

CANCER HAZARD

CONTAINS MATERIAL WHICH CAN CAUSE CANCER

CONTAINS MATERIAL WHICH CAN CAUSE HERITABLE GENETIC EFFECTS.

VERY TOXIC TO AQUATIC ORGANISMS.

CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, MUCOUS MEMBRANES, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE,

LENS OR CORNEA, TEETH. FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE.

MAY BE HARMFUL IF INHALED, ABSORBED THROUGH SKIN OR SWALLOWED.

CONTAINS MATERIAL WHICH MAY CAUSE DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS,

LIVER.

MAY BE HARMFUL TO ENVIRONMENT IF RELEASED IN LARGE AMOUNTS.

TOXIC TO FISH. TOXIC TO AQUATIC ORGANISIMS. DO NOT RELEASE TO WATER.

Risk of cancer depends on duration and level of exposure. Keep away from heat, sparks and flame. Do not get in eyes, on skin or on clothing. Avoid prolonged contact with eyes, skin, and clothing. Do not ingest. Do not breathe vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Avoid contact of spilled material and runoff with soil and surface

waterways.

Possible Carcinogenic

Effects

proprietary alkoxylated Fatty polyamines: IARC, NTP, OSHA, ACGIH: Not listed.

proprietary Fatty amines: IARC, NTP, OSHA, ACGIH: Not listed.

Propargyl alcohol: IARC, NTP, OSHA, ACGIH: Not listed.

butanol: IARC, NTP, OSHA, ACGIH: Not listed.

formaldehyde: ACGIH A2 (SEN), IARC 1, OSHA+, NTP Reasonably Anticipated To Be Human

Carcinogen.

acetic acid: IARC, NTP, OSHA, ACGIH: Not listed.

Routes of Entry Absorbed through skin. Dermal contact. Eye contact.

See Toxicological Information (section 11)

ARMOHIB® 28 Page: 2/8

Section 3. Composition/Information on Ingredients

Name	CAS#	% by Weight
proprietary alkoxylated Fatty polyamines	proprietary	38
proprietary Fatty amines	proprietary	28
Propargyl alcohol	107-19-7	15
Butanol	71-36-3	8
formaldehyde	50-00-0	6
Acetic acid	64-19-7	5

Section 4. First Aid Measures

Eye Contact Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of

water for at least 30 minutes. Avoid washing contaminated water into unaffected eye. Cold water may

be used. Get medical attention immediately.

Skin Contact In case of contact, immediately flush skin with plenty of water for at least 30 minutes while removing

contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. If breathing has stopped or the heart has stopped, trainned personnel should begin artificial respiration or cardiopulmonary resusitation (CPR) immediately. Get medical

attention immediately.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give

oxygen. Get medical attention. If breathing has stopped or the heart has stopped, trainned personnel

should begin artificial respiration or cardiopulmonary resusitation (CPR) immediately.

Ingestion Do NOT induce vomiting unless directed to do so by medical personnel. If vomiting occurs naturally,

have the victim lean forward to reduce the risk of aspiration. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing has stopped or the heart has stopped, trainned personnel should begin artificial respiration or cardiopulmonary resusitation (CPR)

immediately.

Medical Conditions Aggravated by Overexposure Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may

produce general deterioration of health by an accumulation in one or many human organs.

Section 5. Fire Fighting Measures

Flammability of the

Product

Flammable.

Auto-ignition Temperature The lowest known value is 342.85°C (649.1°F) (butanol).

Flash Points Closed cup: 32°C (89.6°F). (Pensky-Martens.)

Flammable Limits The greatest known range is LOWER: 5.4% UPPER: 19% (acetic acid)

Products of Combustion These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...).

Fire Fighting Media and Instructions

SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order

to prevent pressure build-up, autoignition or explosion.

Protective Clothing (Fire) Be sure to use an approved/certified respirator or equivalent.

Special Remarks on Fire

Hazards

No sparking tools should be used. Take precautionary measures against static discharges.

ARMOHIB® 28 Page: 3/8

Section 6. Accidental Release Measures

Small Spill and Leak

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: **Use suitable protective equipment (Section 8).**

Large Spill and Leak

Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. **Use suitable protective equipment (Section 8).**

Other Special Considerations

Section 7. Handling and Storage

Handling Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. To

avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and

material handling) equipment.

Storage Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep

container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or

flame).

Other Special Considerations

formaldehyde: This product contains very small amounts of formaldehyde as a preservative, a condition which creates the potential for human exposure. If this product is handled according to the recommendations in the MSDS, the presence of the very small amounts is not expected to result in any short term or long term hazard.

Section 8. Exposure Controls/ Personal Protection

Engineering Controls Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of

vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety

showers are proximal to the work-station location.

Personal Protection

Eyes Face shield.

Body Full suit.

Respiratory Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate

respirator when ventilation is inadequate.

Hands Gloves. Feet Boots.

Protective Clothing (Pictograms)



Personal Protection in Case of a Large Spill

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Ingredient Name

proprietary alkoxylated Fatty polyamines proprietary Fatty amines

Propargyl alcohol

Exposure Limits United States

Not available. Not available.

ACGIH TLV (United States, 2006). Skin Notes: 2000 Adoption.

TWA: 2.3 mg/m³ 8 hour(s). TWA: 1 ppm 8 hour(s).

NIOSH REL (United States, 2000). Skin

TWA: 2 mg/m³ 10 hour(s). TWA: 1 ppm 10 hour(s).

OSHA PEL 1989 (United States, 1989). Skin

TWA: 2 mg/m³ 8 hour(s). TWA: 1 ppm 8 hour(s).

Butanol ACGIH TLV (United States, 2006). Notes: 2002 Adoption.

ARMOHIB® 28 Page: 4/8

TWA: 20 ppm 8 hour(s).

NIOSH REL (United States, 2001). Skin

CEIL: 150 mg/m³ CEIL: 50 ppm

OSHA PEL (United States, 1997).

TWA: 300 mg/m³ 8 hour(s). TWA: 100 ppm 8 hour(s).

OSHA PEL 1989 (United States, 1989). Skin

CEIL: 150 mg/m³ CEIL: 50 ppm

formaldehyde ACGIH TLV (United States, 2006). Sensitizer skin Notes: Substance identified by

other sources as a suspected or confirmed human carcinogen. Refers to

Appendix A -- Carcinogens. 2000 Adoption.

CEIL: 0.37 mg/m³ CEIL: 0.3 ppm

NIOSH REL (United States, 2001). Notes: See Appendix A - NIOSH Potential

Occupational Carcinogen
CEIL: 0.1 ppm 15 minute(s).
TWA: 0.016 ppm 10 hour(s).
OSHA PEL (United States, 1997).

STEL: 2 ppm 15 minute(s). TWA: 0.75 ppm 8 hour(s).

OSHA PEL 1989 (United States, 1989). Notes: See Table Z-2 for operations or sectors excluded from section 1910.1048 or for which limit(s) is(are) stayed. Sec.

1910.1048 Formaldehyde. STEL: 2 ppm 15 minute(s). TWA: 0.75 ppm 8 hour(s).

OSHA PEL Z2 (United States, 1997). Notes: Sec. 1910.1048 Formaldehyde.

STEL: 2 ppm 15 minute(s). TWA: 0.75 ppm 8 hour(s).

Acetic acid ACGIH TLV (United States, 2006).

STEL: 37 mg/m³ 15 minute(s). STEL: 15 ppm 15 minute(s). TWA: 25 mg/m³ 8 hour(s). TWA: 10 ppm 8 hour(s).

NIOSH REL (United States, 2001).

STEL: 37 mg/m³ 15 minute(s). STEL: 15 ppm 15 minute(s). TWA: 25 mg/m³ 10 hour(s). TWA: 10 ppm 10 hour(s).

OSHA PEL (United States, 1997).

TWA: 25 mg/m³ 8 hour(s). TWA: 10 ppm 8 hour(s).

OSHA PEL 1989 (United States, 1989).

TWA: 25 mg/m³ 8 hour(s). TWA: 10 ppm 8 hour(s).

Section 9. Physical and Chemical Properties

Physical State Liquid.

Color Amber.

Odor Amine like.

pH Not determined.

Boiling/Condensation 115°C (239°F)

Point

Melting/Freezing Point -58°C (-72.4°F)

Pour Point 11°C

Density 0.925 g/cm³ (25°C / 77°F) **Vapor Pressure** 1.3 kPa (10 mmHg) (at 20°C)

Vapor Density 1.96 (Air = 1)

Evaporation Rate <1 compared to Butyl acetate. **Ionicity (in Water)** Cationic. (proprietary Fatty amines).

ARMOHIB® 28 Page: 5/8

Solubility Easily soluble in acetone.

Soluble in cold water, hot water, methanol.

Dispersion Properties Partially dispersed in diethyl ether.

See solubility in water, methanol, acetone.

viscosity = 7SSU @ 38C; 6SSU @ 54C; 5SSU @ 65C; 4SSU @ 75C; 3SSU @ 85C. (proprietary

Comments Fatty amines)

Section 10. Stability and Reactivity

Stability and Reactivity

The product is stable.

Conditions of Instability

proprietary Fatty amines: Not sensitive to Static Discharge. Not sensitive to Mechanical Impact.

Incompatibility with Various Substances

Physical Chemical

Reactive with OXIDIZING AGENTS, acids.

Slightly reactive to reactive with metals, alkalis. Incompatible with phosphorous pentoxide.

Hazardous Polymerization

Will not occur.

Section 11. Toxicological Information

Toxicity to Animals				
Ingredient Name or Product	Test	Result	Route	Species
name				
ARMOHIB® 28 (whmis)	LD50	950 mg/kg	Oral	Rat
	LD50	705 mg/kg	Dermal	Rabbit
Propargyl alcohol	LC50	1040 ppm (1 hour(s))	Inhalation	Rat (female)
formaldehyde	LC50	203 mg/m³ (1 hour(s))	Inhalation	Rat
Acetic acid	LC50	5620 ppm (1 hour(s))	Inhalation	Mouse

Special Remarks on Toxicity to Animals

proprietary alkoxylated Fatty polyamines: Slight to moderate dermal irritation @ 7.72 mg/kg/day for 28 days. based on data for: (similar material)

proprietary Fatty amines: INHALATION > 0.033 mg/L 1 hour(s) Rat based on data for: (similar material). The NOEL in dogs dosed with a mixture of oleylamine and hexadecylamine hydrofluoride salts was 12 mg/kg/day (highest dose tested).

Administration of a mixture of oleylamine and hexadecylamine hydrofluoride salts the diet of rats resulted in enlarged lymphnodes and gastrointestinal discoloration at doses of 1.2 mg/kg/day and above.

formaldehyde: Formaldehyde has produced dermal sensitization in animals.

Chronic Effects on Humans

CARCINOGENIC EFFECTS: Classified None. by NIOSH [Propargyl alcohol]. Classified None. by NIOSH [butanol]. Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA, + (Proven.) by NIOSH [formaldehyde]. Classified A2 (Suspected for human.) by ACGIH, 2 (Reasonably Anticipated To Be Human Carcinogens.) by NTP [formaldehyde].

MUTAGENIC EFFECTS: Classified None. for human [proprietary Fatty amines]. Non-mutagenic for bacteria and/or yeast. [proprietary Fatty amines]. Non-mutagenic for bacteria and/or yeast. [butanol]. Classified PROVEN for human [formaldehyde]. Mutagenic for mammalian germ and somatic cells based on *in vitro* studies. [formaldehyde].

TERATOGENIC EFFECTS: Classified None. for human [proprietary Fatty amines].

Contains material which causes damage to the following organs: lungs, mucous membranes, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea, teeth.

Contains material which may cause damage to the following organs: kidneys, liver.

Special Remarks on Chronic Effects on Humans

proprietary alkoxylated Fatty polyamines: Embryotoxic at maternally toxic doses but not teratogenic @ >45 mg/kg (based on a similar substance).

proprietary Fatty amines: Chromosomal (DNA) abnormalities will not occur in CHO mammalian cell assay, the In Vivo Cytogenetics Assay in mice, the CHO/HGPRT mammalian cell assay and the Mouse Lymphoma Assay.

formaldehyde: Inhaling the product ingredient formaldehyde induced fetotoxicity in experimental animals at doses which did not produce maternal toxicity.

Acute Effects Skin

Corrosive to the skin. Harmful in contact with skin.

ARMOHIB® 28 Page: 6/8

Acute Effects Eyes Corrosive to the eyes.

Special Remarks on

Other Toxic Effects on

Humans

proprietary alkoxylated Fatty polyamines: Skin and Eyes based on data for: (similar material)

formaldehyde: Formaldehyde has produced respiratory sensitization in humans

Section 12. Ecological Information

Ecotoxicity			
Ingredient Name or Product name	Species	Period	Result
proprietary alkoxylated Fatty polyamines	based on data for: (similar material) (LC50)	96 hour(s)	0.1 to 0.15 mg/l
proprietary Fatty amines	Fathead Minnow (LC50)	96 hour(s)	0.11 mg/l
	Daphnia (EC50)	48 hour(s)	0.011 mg/l
	Algae (EC50)	96 hour(s)	0.03 mg/l
Propargyl alcohol	Pimephales promelas (LC50)	96 hour(s)	1.53 mg/l
Butanol	Daphnia magna (EC50)	48 hour(s)	1983 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	100 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1730 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1910 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1940 mg/l
formaldehyde	Daphnia pulex (EC50)	48 hour(s)	5.8 mg/l
	Daphnia magna (EC50)	48 hour(s)	14 mg/l
	Daphnia magna (EC50)	48 hour(s)	14.6 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	1.41 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	1.51 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	1.79 mg/l
Acetic acid	Daphnia magna (EC50)	48 hour(s)	65 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	75 mg/l
	Pimephales promelas (LC50)	96 hour(s)	79 mg/l
	Pimephales promelas (LC50)	96 hour(s)	88 mg/l

Biodegradability and 48% @ 28 day(s); 38% @ 162 day(s) CBT

Ecotoxicity Remarks

Biodegradable/OECD Not readily biodegradable.

Products of Degradation These products are carbon oxides (CO, CO₂) and water, nitrogen oxides (NO, NO_{2...}).

Section 13. Disposal Considerations

Waste Information Waste must be disposed of in accordance with federal, state and local environmental control

regulations.

RCRA Classification Code: D001 Ignitable Waste

Consult your local or regional authorities.

Section 14. Transport Information

Regulatory Information	UN number	Proper shipping name	Class	Packing Group	Label	Additional information
DOT Classification	UN2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Propargyl alcohol, formaldehyde). Marine pollutant (Oleylamine)	8	III	MARINE POLLUTANT	Marine pollutant Marine pollutant (P)

ARMOHIB® 28					Page: 7/8	
TDG Classification	UN2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Propargyl alcohol, formaldehyde)	3	III		-
			8			
IMDG Class	UN2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Propargyl alcohol, formaldehyde). Marine pollutant (Oleylamine)	3	III		Marine pollutant Marine pollutant (P)
			8		MARINE POLLUTANT	
IATA-DGR Class	UN2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Propargyl alcohol, formaldehyde)	3	III		-
			8			

Section 15. Regulatory Information

HCS Classification Highly toxic

> Flammable liquid Target organ effects Corrosive Material

U.S. Federal Regulations

TSCA: All intentionally present components are listed on the TSCA inventory.

DSL: All intentionally present components are listed on the DSL.

CERCLA: Hazardous substances.: Proparayl alcohol: 1000 lbs. (453.6 kg): butanol: 5000 lbs. (2268

kg); formaldehyde: 100 lbs. (45.36 kg); acetic acid: 5000 lbs. (2268 kg);

SARA 302/304/311/312 extremely hazardous substances: formaldehyde

SARA 302/304 emergency planning and notification: formaldehyde SARA 302/304/311/312 hazardous chemicals: ARMOHIB® 28 (whmis)

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: ARMOHIB® 28 (whmis):

Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

SARA 313 Form R Reporting Requirements

No products were found.

SARA 313 Supplier Notification

No products were found.

State Regulations

Pennsylvania RTK: Propargyl alcohol: (environmental hazard, generic environmental hazard); Butan-1-ol: (environmental hazard, generic environmental hazard); Formaldehyde: (special hazard, environmental hazard, generic environmental hazard); Acetic acid: (environmental hazard, generic

environmental hazard)

Massachusetts RTK: Propargyl alcohol; Butan-1-ol; Formaldehyde; Acetic acid

New Jersey: Propargyl alcohol; Butan-1-ol; Formaldehyde; Acetic acid

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Formaldehyde

California prop. 65 (no significant risk level): Formaldehyde

California prop. 65: This product contains the following ingredients for which the State of California

has found to cause cancer which would require a warning under the statute: Formaldehyde

ARMOHIB® 28 Page: 8/8

WHMIS (Canada)

Class B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).

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 liquid.

CEPA DSL: proprietary alkoxylated Fatty polyamines; proprietary Fatty amines; Propargyl alcohol;

butanol; formaldehyde; acetic acid

European Union

Component	EC Number	EC Status	EC Annex
proprietary alkoxylated Fatty	proprietary	proprietary	proprietary
polyamines			
proprietary Fatty amines	proprietary	proprietary	proprietary
Propargyl alcohol	203-471-2	Not available.	603-078-00-X
Butanol	200-751-6	Not available.	603-004-00-6
formaldehyde	200-001-8	Not available.	Not available.
Acetic acid	200-580-7	Not available.	607-002-00-6

Other International Lists

Australia (NICNAS): proprietary alkoxylated Fatty polyamines; proprietary Fatty amines; Propargyl alcohol; butanol; formaldehyde; acetic acid

China: proprietary alkoxylated Fatty polyamines; proprietary Fatty amines; Propargyl alcohol; butanol; formaldehyde; acetic acid

Germany water class: Propargyl alcohol; butanol; formaldehyde; acetic acid

Japan (MITI): proprietary alkoxylated Fatty polyamines; proprietary Fatty amines; Propargyl alcohol; butanol; formaldehyde; acetic acid

Japan (MOL): butanol; formaldehyde

Korea (TCCL): proprietary alkoxylated Fatty polyamines; proprietary Fatty amines; Propargyl alcohol; butanol; formaldehyde; acetic acid

Philippines (RA6969): proprietary alkoxylated Fatty polyamines; proprietary Fatty amines; Propargyl alcohol; butanol; formaldehyde; acetic acid

Section 16. Other Information

Hazardous Material Information System (U.S.A.)

Health	3
Fire Hazard	3
Reactivity	0
Personal Protection	

National Fire Protection Association (U.S.A.)



Other Information Armohib® is a registered trademark of Akzo Nobel or affiliated companies and is registered in one or more countries including the United States.

Validation Date 4/4/2008. Validated by Product Safety Specialist

 Previous Validation Date
 5/14/2007.
 Print Date
 4/4/2008.

 Phone Number
 312-544-7038

Notice to Reader

The information in the material safety data sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. All information concerning this product and/or suggestions for handling and use contained herein are offered in good faith and are believed to be reliable as of the date of publication. However, no warranty is made as to the accuracy of and/or sufficiency of such information and/or suggestions or as to the product's merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. Nothing contained herein shall be construed as granting or extending any license under any patent. Buyer must determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes, including mixing with other products. The information contained herein supersedes all previously issued bulletins on the subject matter covered. If the date on this document is more than three years old, call to make certain that this sheet is current.