

# AYERS INTERNATIONAL CORP.

## MATERIAL SAFETY DATA SHEET

### SECTION I - PRODUCT IDENTIFICATION

#### PRODUCT IDENTIFICATION:

**Product Name:** XL-300 NMA Monomer  
**Type Product:** Post crosslinking monomer  
**Chemical Family:** Amide  
**Molecular Formula:** C<sub>4</sub>H<sub>7</sub>O<sub>2</sub>N  
**Latest revision:** 12/11/96

### SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

#### OSHA REGULATED COMPONENTS

Components	CAS. No.	%	TWA/Ceiling	REF.
Acrylamide	000079-06-1	<5.00	.03 mg/M3 (skin)	OSHA
			.03 mg/M3 (skin)	ACGIH
Formaldehyde	000050-00-0	<2.00	.75 ppm	OSHA
			.3 ppm (ceiling) ACGIH	
			2 ppm (STEL)	OSHA
N-methylol acrylamide	000924-42-5	40-44	1 mg/M3	Cytec

#### Product Classification under Section 311 of SARA

Acute (Y) Chronic (Y) Fire (N) Reactive (N) Pressure (N)

#### NFPA Hazard Rating

Fire: Substances must be preheated before ignition can occur.

Health: Materials which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.

Reactivity: Materials which in themselves are stable, but which can become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently.

### SECTION III - HAZARD IDENTIFICATION

#### Emergency Overview

Appearance and odor : Clear, pale yellow to pink aqueous solution; slight formaldehyde odor

#### Statements of hazard:

**Warning!** May cause allergic skin reaction  
Causes eye irritation  
Polymerization may occur from excessive heat or contamination.

#### CHRONIC HAZARD WARNING:

which may cause nervous system damage. Potential Cancer hazard - contains formaldehyde and other materials which caused cancer in laboratory animal tests. Acrylamide caused male reproductive disorders in laboratory test animals.

## POTENTIAL HEALTH AFFECTS

### Effects of overexposure:

Acute oral (rat) and acute dermal (rabbit) LD50 values are estimated to be greater than 500 mg/kg and 1830 mg/kg, respectively. The acute 4-hour inhalation LC50 (rat) is estimated to be greater than 5 mg/kg. Direct contact with this material may cause moderate eye and skin irritation. Repeated or prolonged dermal contact with this material may cause allergic skin reactions.

## SECTION IV - EXPOSURE CONTROL/PERSONEL PROTECTION

### Engineering controls and personal protective equipment (PPE)

Utilize a closed system process where feasible. Where a closed system is no used, good enclosure and local exhaust ventilation should be provided to minimize exposure. After Acrylamide is in solution, exposure to liquid and mist must be controlled. Food, beverages and tobacco products should not be carried, stored or consumed where this chemical is in use. Before eating, drinking or smoking, wash face and hands with soap and water. Shower after completion of workshift. Launder clothes at end of workshift prior to reuse. Store street clothing separately form work clothing and protective equipment. Work clothing and shoes must not be taken home. Where adequate engineering controls are in effect, and measurements confirm airborne concentrations are below Permissible Exposure Level, no respiratory protection is required. NIOSH does not approve a cartridge respirator for use with Acrylamide. However, tests conducted show that organic vapor cartridges provide protection from airborne levels up to 2.5 mg/M3. **The cartridges must be changed at the beginning of each shift.** Full facepiece, positive pressure, supplied air respirators or self-contained breathing apparatus must be u sed for higher or for unknown concentrations. Full facepiece respirators provide additional eye protection where handling makes it desirable. Note that Acrylamide exhibits no warning properties at concentrations at o below, the Permissible Exposure Level. Wear the following to prevent skin contact: impervious rubber or plastic gloves, rubber shoes and long sleeved coveralls, which are provided clean daily. For operations where eye and face contact with Acrylamide solution can occur, wear chemical splash goggles, a faceshield and head covering. **WASH GLOVES THOROUGHLY BEFORE REMOVING AND DISCARD GLOVES THAT ARE CONTAMINATED ON THE INSIDE.** When solutions are used, provide eyewash fountain and safety shower in close proximity to points of potential exposure.

## SECTION V - PHYSICAL AND CHEMICAL PROPERTIES

<b>Boiling point:</b>	212 F, 100 C degrees
<b>Vapor pressure:</b>	23.76 mm Hg @ 25 degrees C
<b>Vapor Density (air = 1):</b>	1
<b>Solubility in Water:</b>	Soluble
<b>Appearance/odor:</b>	Clear to pale yellow or pink aqueous solution/ slight formaldehyde odor.
<b>Specific Gravity (water = 1):</b>	1.1 @ 25 degrees C
<b>Percent Volatile by Weight:</b>	52 %
<b>Evaporation Rate :</b>	.33; (butyl acetate = 1)

pH: 5.0-7.0

Melting Point: 14 degrees F; -10 degrees C; (crystallization point)

Saturation in Air (% by Vol.): Not available

## SECTION VI - STABILITY AND REACTIVITY

Stability: Stable

Conditions to avoid: Unstable if not maintained under recommended conditions. See Section VII (Handling and Storage). Avoid temperatures above 85 degrees F, oxidizing agents, reducing agents, peroxides, acids and bases and direct sunlight. Prevent loss of dissolved oxygen.

## SECTION VII - ECOLOGICAL INFORMATION

LC50

Trout 96 Hour: 890 mg/L

BOD

28 Day: 51.9%

OCTANOL/H2O PARTITION COEF: NOT AVAILABLE

## SECTION VIII - DISPOSAL CONSIDERATIONS

DISPOSAL MUST BE MADE IN ACCORDANCE WITH APPLICABLE GOVERNMENTAL REGULATION

## SECTION XIV - TRANSPORT INFORMATION

SHIPPING NAME	D.O.T. SHIPPING INFORMATION OTHER REGULATED SUBSTANCE LIQUID, N.O.S.	IMO SHIPPING INFORMATION NOT APPLICABLE/NOT REGULATED
HAZARD CLASS/ PACKING GROUP:	9 III	NOT APPLICABLE
UN NUMBER	MA3082	NOT APPLICABLE
IMDG NUMBER	NOT APPLICABLE	NOT APPLICABLE
D.O.T. HAZARDOUS SUBSTANCES:	(PRODUCT REPORTABLE QUANTITY) FORMALDEHYDE 5000 LBS.	NOT APPLICABLE
TRANSPORT LABEL REQUIRED	MISCELLANEOUS	NONE REQUIRED

SHIPPING NAME	ICAL/IATA OTHER REGULATED SUBSTANCE	TRANSPORT CANADA NOT APPLICABLE/NOT REGULATED
HAZARD CLASS	9	NOT APPLICABLE
UN / ID NUMBER	8,027	NOT APPLICABLE
SUBSIDIARY CLASS:	--	NOT APPLICABLE
PACKING GROUP	--	NOT APPLICABLE
TRANSPORT LABEL REQUIRED	MISCELLANEOUS	NONE REQUIRED

## SECTION IX - FIRE AND EXPLOSION HAZARD DATA

**Flash Point:** NOT AVAILABLE

**Extinguishing Media:** NOT AVAILABLE, OR APPLICABLE

**Unusual Fire and Explosion Hazards:** Not applicable

**Fire Fighting Measures** Use water spray, carbon dioxide, or dry chemical to extinguish fires  
Use water to keep containers cool. Wear self contained positive  
breathing apparatus and full time fire-fighting protective clothing.  
See Section IV for special protective clothing.

## SECTION X - FIRST AID

**EYE CONTACT:** Immediately irrigate with plenty of water for 15 minutes. Obtain medical attention if irritation persists.

**SKIN CONTACT:** Remove contaminated clothing as soon as possible. Wear impervious gloves. Wash skin thoroughly with soap and water. Do not omit cleaning hair, under fingernails. Do not reuse clothing without laundering, and throw away contaminated leather. Obtain medical attention if irritation persists.

**INGESTION:** Induce vomiting by giving 2 glasses of water and stimulating the back of the throat with a finger, or giving syrup of ipecac, 1 oz. Never give anything by mouth or induce vomiting in an unconscious person.

**INHALATION:** Remove from exposure to fresh air immediately. Administer oxygen if there is difficulty in breathing. Obtain medical attention.

### **NOTE TO PHYSICIAN:**

Either acute or chronic exposure may lead to weak or absent reflexes, positive Rombergs sign, loss of vibration and position senses and numbness and tingling of the limbs. An early sign of overexposure is peeling of the skin of the fingertips. Weekly examinations (by plant medical staff or supervisor) for peeling skin is recommended. Evidence of peeling requires removal from possible exposure to acrylamide. Once the skin has returned to normal, the employee may be returned to normal duties. If the peeling should occur a second time, permanent removal is required.

## SECTION XI - ACCIDENTAL RELEASE MEASURES

### STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition, to the protective clothing/equipment in section IV, wear impervious boots. Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.

## SECTION XII- HANDLING AND STORAGE

Do not get in eyes, on skin, on clothing. Buildup of heat and pressure in closed containers may result if polymerization occurs. Avoid contamination with iron, copper, aluminum, brass bronze, acids, bases, oxidizing, reducing, and chelating agents, precipitant for copper and known initiators for vinyl polymerization. Wash thoroughly after handling. Keep container close. Wear clean work clothing daily.

This product is stabilized with dissolved oxygen, cupric ion (Cu<sup>2+</sup>) and MEHQ (monomethyl ether of Hydroquinone). Maintain air sparge at .2-.4 cfm per 1000 gallons. Maintain temperature between 32-85 degrees F. Maintain pH between 5.5 and 7.0 To prevent loss of dissolved oxygen: do not heat, do not use an inert blanket, and do not sparge with inert gas. Avoid temperatures above 85 degrees F, initiators such as bisulfites, peroxides, reducing agents, oxidizing and redox systems.

Drums that have contained the material should be stored separately and not used for any other purpose. These drums should be incinerated. It is important that surfaces subject to acrylamide contamination be thoroughly cleaned on a routine basis. This is to prevent inadvertent skin contact and reduce airborne limits since concentration of vapor up to 120 mg/M3 can be reached in an enclosed area at 40 C.

## SECTION XIII- TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section III. Toxicological information on the OSHA regulated components of this product is as follows:

Acrylamide has acute oral (rat) and acute dermal (rabbit) LD50 values of 295 mg/kg and 252 mg/kg, respectively. Direct contact with acrylamide will cause moderate skin and eye irritation. Neurotoxicity from acrylamide can result from a single ingestion but is more likely to occur over a period of several days or weeks. Signs and symptoms of exposure include increased sweating of the hands and feet, numbness, tingling and weakness in the extremities, unsteady gait and decreased reflexes. Acrylamide is readily absorbed through unbroken skin. If the exposure route is dermal, the signs and symptoms described above may be preceded by peeling and redness of skin on the areas of exposure, normally the hands and feet. Eye contact with acrylamide may produce conjunctival irritation and may lead to systematic toxicity if contact is prolonged and /or repeated. Airborne acrylamide is readily absorbed through the lungs and overexposure will produce signs and symptoms of neurotoxicity as described above. An initial two year study in rats where acrylamide was administered in the drinking water indicated that a variety of tumors could be produced at doses of 2 mg/kg/day. A lifetime study has been conducted in which male Fisher rates received 0.1, 0.5, and 2 mg/kg/day and female Fisher rats received 1 and 3 mg/kg/day acrylamide in their drinking water. The only malignant tumor significantly increased in this second study was testicular mesothelioma, which is peculiar to rats. Non-malignant tumors of the thyroid were increased at doses above .5 mg/kg/day. Mammary tumors were statistically increased by were not above the historical average and thus of questionable toxicological significance. Other effects identified in the first study were not repeatable in the second study. Acrylamide was negative in the Ames assay both with and without metabolic activation. Acrylamide is a chemical known to the State of California to cause cancer.

Formaldehyde has oral (rat) and dermal (rabbit) LD50 values of 100 mg/kg and 270 mg/kg, respectively. The LC50 following a 4-hour inhalation exposure to rats is 250-478 ppm. Irritation of the nose and throat has been observed in people exposed to formaldehyde vapor levels in 1 ppm. Normal breathing may be seriously impaired at levels above 10 ppm and serious lung damage can occur at levels exceeding 50 ppm. No pulmonary sensitization has been demonstrated in laboratory animal studies. Formaldehyde solutions can cause severe eye and moderate skin irritation. Repeated skin exposure to solutions of 2% or more formaldehyde has caused allergic skin reactions. Formaldehyde was found to be weakly mutagenic in a number of in vitro genotoxicity tests, but inactive in vivo. Formaldehyde did not cause birth defects in rats inhaling concentrations up to 10 ppm. Lifetime inhalation of formaldehyde vapor at concentrations above 5 ppm for 6 hours per day, caused nasal tumors in laboratory animals. Epidemiology studies have failed to link cancer in humans with occupational exposure to formaldehyde.

The acute oral (mouse), acute oral (rat) and acute dermal (rabbit) LD50 value for N-methylolacrylamide are 400 mg/kg, 474 mg/kg and 16,000 mg/kg, respectively. Moderate skin irritation was produced furring testing in rabbits at dermal doses of 2-16 g/kg. Mild eye irritation was produced furring primary eye irritation testing in rabbits. Neurotoxicity can result after a single ingestion of N-methylolacrylamide, but is more likely ingestion of small amounts over a period of several days or weeks. Signs and symptoms include increasing sweating of the hands and feet, numbness, tingling and weakness in the extremities, unsteady gait and decreased reflexes. N-Methylolacrylamide is readily absorbed through the unbroken skin. Prolonged or repeated dermal exposure may cause signs and symptoms of neurotoxicity as described above but is preceded by peeling and redness of the skin of the hands and feet, the usual areas of exposure. Airborne N-methylolacrylamide is absorbed through the lungs and upon overexposure causes neurotoxicity. The National Toxicology Program (NTP) has completed lifetime carcinogenicity studies on N-methylolacrylamide in rats and mice. Doses of up to 12 mg/kg/day in rats produced no evidence of carcinogenic activity. Doses of up to 50 mg/kg/day in mice produced increased incidences of tumors of the lung, liver, ovary, and the harderian gland, an accessory gland of the eye. N-Methylolacrylamide is a chemical known to the State of California to cause cancer.

## **SECTION XIV - REGULATORY INFORMATION**

### **INVENTORY INFORMATION**

US TSCA: This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U. S. C. 2601 et. seq.

CANADA DSL: Components of this product have been reported to the Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.

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