Material Safety Data Sheet
Methylenedi-p-phenyl diisocyanate

ACC# 54215

Section 1 - Chemical Product and Company Identification

MSDS Name: Methylenedi-p-phenyl diisocyanate
Catalog Numbers: AC414280000, AC414281000, AC414285000
Synonyms: Diphenylmethane-4,4'-diisocyanate; MDI; 1,1'-Methylenebis[4-isocyanatobenzene]; 4,4'-Methylenediphenyl diisocyanate; Methylene bisphenyl isocyanate.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
101-68-8	Methylenedi-p-phenyl diisocyanate	>97	202-966-0
5873-54-1	Diphenylmethane-2,4'-diisocyanate	<2.5	227-534-9
128-37-0	2,6-Di-tert-butyl-p-cresol	.01	204-881-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to pale yellow flakes.
Danger! May cause severe allergic respiratory reaction. May be fatal if inhaled. Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction.
Target Organs: Lungs, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Lachrymator (substance which increases the flow of tears).
Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Isocyanates, in general, can cause skin discoloration (staining) and hardening of the skin after repeated exposures.
Ingestion: May cause irritation of the digestive tract.
Inhalation: May be fatal if inhaled. Causes respiratory tract irritation. May cause asthmatic attacks due to allergic sensitization of the respiratory tract. Impaired lung functions (decreased ventilatory capacity) has been associated with overexposure to isocyanate. MDI has a very low vapor pressure. Therefore, airborne exposures are unlikely to occur unless MDI is heated or forms an aerosol or mist during pouring, frothing or spraying operations. High aerosol concentrations could cause inflammation of the lung tissue (chemical pneumonitis), chemical bronchitis with severe asthma-like wheezing, severe coughing spasms and accumulation of fluid in the lungs (pulmonary edema), which could prove fatal.
Chronic: Repeated or prolonged exposure may cause allergic reactions in sensitive individuals. Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.
Skin: In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical aid if symptoms occur. Wash clothing before reuse.
Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.
Extinguishing Media: Use foam, dry chemical, or carbon dioxide. Water or water-based foam, if used in very large quantities, may be effective for fighting fires involving methylene bisphenyl isocyanate (MDI). However, care must be taken since the reaction between water or water-based foam and hot MDI can be vigorous.
Flash Point: 196 deg C (384.80 deg F)
Autoignition Temperature: 240 deg C (464.00 deg F)
Explosion Limits, Lower: Not available.

Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Evacuate unnecessary personnel.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Do not breathe dust, vapor, mist, or gas. Keep container tightly closed. Use only with adequate ventilation.
Storage: Store in a cool, dry place. Keep container closed when not in use. Keep refrigerated. (Store below 4°C/39°F.) Store under nitrogen.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methylenedi-p-phenyl diisocyanate	0.005 ppm TWA	0.005 ppm TWA; 0.05 mg/m3 TWA 75 mg/m3 IDLH	0.02 ppm Ceiling; 0.2 mg/m3 Ceiling
Diphenylmethane-2,4'-diisocyanate	none listed	none listed	none listed
2,6-Di-tert-butyl-p-cresol	2 mg/m3 TWA (inhalable fraction and vapor)	10 mg/m3 TWA	none listed

OSHA Vacated PELs: Methylenedi-p-phenyl diisocyanate: No OSHA Vacated PELs are listed for this chemical. Diphenylmethane-2,4'-diisocyanate: No OSHA Vacated PELs are listed for this chemical. 2,6-Di-tert-butyl-p-cresol: 10 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear chemical splash goggles and face shield.
Skin: Wear appropriate gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Flakes
Appearance: white to pale yellow
Odor: slightly musty
pH: Not available.
Vapor Pressure: 0.000005 mm Hg @ 25 deg C
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 392 deg C
Freezing/Melting Point:38-44 deg C
Decomposition Temperature: Not available.
Solubility: 0.2%
Specific Gravity/Density:1.19 @ 70°C
Molecular Formula:C15H10N2O2
Molecular Weight:250.26

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Polymerizes if heated above 204°C / 399°F. MDI is readily dimerized and trimerized by heat. Reacts vigorously with water above 50°C (122°F). MDI may undergo uncontrolled exothermic polymerization upon contact with incompatible materials, especially strong bases, such as triethylamine and sodium hydroxide, trialkyl phosphines, potassium acetate, & many metal compounds soluble in organic media.
Conditions to Avoid: High temperatures, dust generation, moisture, At room temperature, MDI reacts slowly with water forming carbon dioxide and inert material comprised of non-toxic polyureas which could rupture closed containers. 4,4'-Methylene dianiline is formed as an intermediate product in this reaction..
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, strong bases, alcohols, amines, organotin catalysts.
Hazardous Decomposition Products: Hydrogen cyanide, nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 101-68-8: NQ9350000
CAS# 5873-54-1 unlisted.
CAS# 128-37-0: GO7875000
LD50/LC50:
CAS# 101-68-8:
Draize test, rabbit, eye: 100 mg Moderate;
Draize test, rabbit, skin: 500 mg/24H;
Inhalation, rat: LC50 = 178 mg/m3;
Oral, mouse: LD50 = 2200 mg/kg;
Oral, rat: LD50 = 9200 mg/kg;
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CAS# 5873-54-1:
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CAS# 128-37-0:
Draize test, rabbit, eye: 100 mg/24H Moderate;
Draize test, rabbit, skin: 500 mg/48H Moderate;
Oral, mouse: LD50 = 650 mg/kg;
Oral, mouse: LD50 = 1040 mg/kg;
Oral, rabbit: LD50 = 2100 mg/kg;
Oral, rat: LD50 = 890 mg/kg;
.
Inhalation LC50 rat: 369-380 mg/m3/4H. (ACGIH documentation)
Carcinogenicity:
CAS# 101-68-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 5873-54-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 128-37-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: In laboratory animals, MDI/polymeric MDI did not produce birth defects. Other fetal effects occurred only at high doses which were toxic to the mother.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Daphnia: Daphnia: 0.35 mg/l; 24H; EC50Fish: Zebrafish: >100 mg/l; 96H; LC50 No data available.
Environmental: Aquatic: Rapidly hydrolyzes to form an insoluble crust. Terrestrial: Will bind with moist soil and no leaching will occur. Atmospheric: Remains in the vapor phase and is degreaded by photochemically produced hydroxyl radicals, half life 32 hours. Will not bioconcentrate or biodegrade.
Physical: No information available.
Other: Not readily biodegradable.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLIDS, ORGANIC, N.O.S.
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 101-68-8 is listed on the TSCA inventory.
CAS# 5873-54-1 is listed on the TSCA inventory.
CAS# 128-37-0 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 101-68-8: Effective 6/1/87, Sunset 6/1/97 CAS# 5873-54-1: Effective 6/1/87, Sunset 11/9/93
Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 101-68-8: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 101-68-8: immediate, delayed, reactive.
CAS # 128-37-0: immediate.

Section 313

This material contains Methylenedi-p-phenyl diisocyan (CAS# 101-68-8, >97%),which is subject to the reporting requirements of Section 313 of SARA Title

Clean Air Act:

CAS# 101-68-8 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 101-68-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 5873-54-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 128-37-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.
R 42/43 May cause sensitization by inhalation and skin contact.
R 20 Harmful by inhalation.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.
S 36/37 Wear suitable protective clothing and gloves.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 101-68-8: 1
CAS# 5873-54-1: No information available.
CAS# 128-37-0: 1

Canada - DSL/NDSL

CAS# 101-68-8 is listed on Canada's DSL List.
CAS# 5873-54-1 is listed on Canada's DSL List.
CAS# 128-37-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A, D1A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 101-68-8 is listed on the Canadian Ingredient Disclosure List.
CAS# 128-37-0 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 3/13/1998
Revision #5 Date: 3/22/2006