

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
Nombor bahan: Material number: 80045
Tarikh diterbitkan: Published 02/02/2006
date:

RISALAH DATA KESELAMATAN BAHAN MATERIAL SAFETY DATA SHEET

1. Pengenalan Produk dan Syarikat *1. Product and Company Identification*

Produk: Product: **37% Formaldehid/7%Metanol, larutan** 37% Formaldehyde/7%Methanol, solution

Nombor MSDS: MSDS number: 45
Nombor bahan: Material number: 80045

Celanese Pte Ltd
501 Orchard Road
Wheelock Place #11-01
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Tel No: (65) 67331767

Nombor telefon kecemasan pengangkutan:
+ (65) 66639259 (Operations Room direct dial)
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or email to
opsroom@semco.psa.com.sg

or Call CHEMTREC 703 527 3887 (USA), collect calls accepted
"+" = International Dialing Access Code

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Kegunaan produk:
Product Use:

Perantara bagi resin urea dan melamina formaldehid; resin fenolik; bahan kimia asetilenik; resin poliasetal.
Intermediate for urea and melamine formaldehyde resins; phenolic resins; acetylenic chemicals; polyacetal resins

2. Komposisi/ Maklumat tentang Ramuan

2. Composition / Information on Ingredients

Komponen Component	No. CAS CAS Number	% Berat Percent %	Status kawalselia OSHA: OSHA hazard category:
Formaldehid FORMALDEHYDE	50-00-0	37 - 37.5	Berbahaya Hazardous
Metanol METHANOL	67-56-1	6.5 - 7.5	Berbahaya Hazardous

Water (CAS 7732-18-5), wt. %: 55 - 56.5

An equilibrium mixture of formaldehyde, methanol, and water with the nominal composition listed above.

3. Pengenalan Bahaya

3. Hazards Identification

Kecemasan pengangkutan:

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Gambaran Menyeluruh Kecemasan:

Emergency Overview:

BAHAYA!

DANGER!

- **Menyebabkan luka terbakar pada kulit, mata dan trek pencernaan.**
Causes skin, eye and digestive tract burns.
- **Jika terkena kulit secara berpanjangan dan berulang kali, boleh menyebabkan kematian atau buta.**
Prolonged and repeated skin contact can cause death or blindness.
- **Boleh membawa maut atau menyebabkan buta jika ditelan.**
May be fatal or cause blindness if swallowed.
- **Menyebabkan kerengsaan trek pernafasan, tekak, kulit dan mata.**
Causes respiratory tract, throat, skin and eye irritation.
- **Memudaratkan jika dihidu.**
Harmful if inhaled.
- **Boleh menyebabkan tindak balas alergi pernafasan dan kulit.**
May cause allergic respiratory and skin reaction.
- **Cecair dan wap mudah terbakar.**
Combustible liquid and vapor.
- **Bahaya kanser. Mengandungi bahan yang boleh menyebabkan kanser. Risiko kanser bergantung pada jangka masa dan aras pendedahan.**
Cancer hazard. Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Perihalan produk

Product Description

Rupa:

Appearance:

Cecair jernih, tak berwarna.

Clear, colorless liquid.

Bau:

Odor:

Strong, pungent, characteristic odor.

Kesan kesihatan yang berpotensi berlaku

Potential health effects

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Laluan pendedahan: **Kulit, mata, dihidu, ditelan.**
Routes of exposure: Skin, eyes, inhalation, ingestion.

Kesan serta merta
Immediate effects:

Kulit: **Menyebabkan luka terbakar pada kulit.**
Skin: Causes skin burns.

Boleh menyebabkan tindak balas alergi kulit.
May cause allergic skin reaction.

Memudaratkan jika terserap melalui kulit.
Harmful if absorbed through skin.

Gejala pendedahan mungkin termasuk: Symptoms of exposure may include:

depresi sistem saraf pusat berserta sakit kepala, stupor, perilaku tak selaras atau ganjil atau tidak sedar.
Central nervous system depression with headache, stupor, uncoordinated or strange behavior or unconsciousness.

kulit menjadi merah atau lebam, bengkak, gatal, terbakar atau repuh.
Redness or discoloration, swelling, itching, burning or blistering of skin.

Sentuhan kulit yang berpanjangan dan/atau berulang kali dengan bahan yang dibasahi metanol menghasilkan kesan-kesan toksik termasuk kesan penglihatan dan kematian.
Prolonged and /or repeated skin contact with methanol-soaked material has produced toxic effects including vision effects and death.

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Mata:
Eyes:

Pendedahan kepada cecair: Exposure to liquid:

menyebabkan luka terbakar yang teruk pada mata, kerosakannya tidak berbalik.

Causes severe eye burns, damage irreversible.

Pendedahan kepada wap: Exposure to vapors:

menyebabkan kerengsaan mata.

Causes eye irritation.

Gejala pendedahan mungkin termasuk: Symptoms of exposure may include:

kerengsaan mata, rasa terbakar atau bisa mata, mata berair, dan/atau perubahan penglihatan

Eye irritation, burning sensation, pain, watering, and/or change of vision.

Dihidu:
Inhalation:

Menyebabkan menyebabkan kerengsaan trek pernafasan.

Causes respiratory tract irritation.

Memudaratkan jika dihidu.

Harmful if inhaled.

Boleh menyebabkan tindak balas alergi pernafasan.

May cause allergic respiratory reaction.

Gejala pendedahan mungkin termasuk: Symptoms of exposure may include:

depresi sistem saraf pusat berserta mual, pening, sakit kepala, stupor, perilaku tak selaras atau ganjil atau tidak sedar.

Central nervous system depression with nausea, dizziness, headache, stupor, uncoordinated or strange behavior or unconsciousness.

lelehan hidung, suara garau, batuk-batuk, sakit dada dan kesukaran bernafas.

Nasal discharge, hoarseness, coughing, chest pain and breathing difficulty.

penumpukan bendalir dalam paru-paru (edema pulmonari); gejala mungkin tertunda selama beberapa jam.

Accumulation of fluid in the lungs (pulmonary edema); symptoms can be delayed for several hours.

kesan buruk pada penglihatan.

Adverse effects on vision.

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Ditelan:
Ingestion:

Menyebabkan luka terbakar pada trek pencernaan.
Causes digestive tract burns.

Memudaratkan jika ditelan.
Harmful if swallowed.

Gejala pendedahan mungkin termasuk: Symptoms of exposure may include:

depresi sistem saraf pusat berserta mual, dizziness, sakit kepala, stupor, perilaku tak selaras atau ganjil, atau tidak sedar.

Central nervous system depression with nausea, dizziness, headache, stupor, uncoordinated or strange behavior, or unconsciousness.

mual, muntah-muntah, hilang selera makan, kerengsaan gastrousus dan/atau diarea.

Nausea, vomiting, loss of appetite, gastrointestinal irritation and/or diarrhea.

severe damage to the mouth, tekak, esofagus dan/atau perut.

Severe damage to the mouth, throat esophagus and/or stomach.

See "Section 11 - Toxicological Information" for studies with experimental animals.

Kesan tertunda/jangka panjang
Delayed / long-term effects:

Pembiakan:
Reproductive:

Boleh menyebabkan kesan buruk pada pembiakan berdasarkan data haiwan.
May cause adverse reproductive effects based on animal data.

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Karsinogenik:
Carcinogenic:

Pendedahan berlebihan kepada formaldehid secara penyedutan berpanjangan atau berulang kali boleh menyebabkan tumor hidung mengikut kajian roden makmal dan data manusia yang terbatas. Kajian pendedahan manusia kepada formaldehid telah menunjukkan hasil berbeza-beza yang mengaitkan pendedahan formaldehid dengan leukemia dan dengan masalah berikut:

Prolonged or repeated inhalation overexposure to formaldehyde may cause nasal tumors based on laboratory rodent studies and limited human data. Studies of human exposure to formaldehyde have shown mixed results associating leukemia with formaldehyde exposure and the following:

Formaldehid adalah:
Formaldehyde is:

Disenaraikan sebagai karsinogen OSHA:
listed as an OSHA Carcinogen

disenaraikan oleh NTP sebagai karsinogen yang dijangka
listed as an anticipated carcinogen by NTP
listed as carcinogenic to humans, IARC Group I, based on sufficient human evidence for nasopharyngeal cancer and sufficient evidence in experimental animals

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Kesan pada organ sasaran:
Target Organ Effects:

- **Pendedahan terlampau (pendadahan berpanjangan atau berulang kali) boleh menyebabkan:**
Overexposure (prolonged or repeated exposure) may cause:

Depresi sistem saraf pusat
Central nervous system depression

Kecederaan kepada mata
Injury to the eyes

Kerosakan trek pencernaan
Digestive tract damage

Kerosakan trek pernafasan
Respiratory tract damage

Tindak balas alergi dan kerengsaan setempat pada kulit
Allergic reaction and local irritation of the skin

Kerosakan kulit
Skin damage

Kerosakan sistem pembiakan

Reproductive system damage

Reaksi alergi pernafasan }par
Allergic respiratory reaction
Nasal tract

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Keadaan perubatan yang umumnya diketahui bertambah buruk oleh pendedahan:
Medical Conditions which may be Aggravated by Exposure:

Pendedahan yang banyak kepada bahan kimia ini boleh memberikan kesan buruk terhadap orang yang menghidap penyakit akut atau kronik pada organ-organ berikut:
Significant exposure to this chemical may adversely affect people with acute or chronic disease of the:

Saluran pernafasan
Respiratory Tract

Kulit
Skin

Mata
Eyes

Sistem saraf pusat
Central nervous system
Reproductive System

Bagi mendapatkan maklumat lanjut, lihat:
For further information, see:

Bahagian 4 - Langkah-Langkah Pertolongan Cemas
Bahagian 5 - Langkah-Langkah Memadam Kebakaran
Bahagian 6 - Langkah-Langkah Pembebasan Tidak Sengaja
Bahagian 8 - Kawalan Pendedahan / Perlindungan Diri
Bahagian 9 - Sifat-Sifat Fizikal dan Kimia
Bahagian 10 - Kestabilan dan Kereaktifan

Section 4 - First Aid Measures
Section 5 - Fire Fighting Measures
Section 6 - Accidental Release Measures
Section 8 - Exposure Controls/Personal Protection
Section 9 - Physical and Chemical Properties
Section 10 - Stability and Reactivity

4. Langkah-Langkah Pertolongan Cemas

4. First Aid Measures

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Kulit:
Skin:

Siram kulit serta merta dengan air yang banyak selama sekurang-kurangnya 15 minit sambil menanggalkan pakaian dan kasut yang tercemar. Dapatkan rawatan perubatan dengan serta merta. Basuh pakaian sebelum menggunakannya semula. Musnahkan kasut yang tercemar.
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Destroy contaminated shoes.

Mata:
Eyes:

Serta merta siram mata dengan air yang banyak selama sekurang-kurangnya 15 minit. Jika mudah, tanggalkan kanta lekap yang dipakai. Dapatkan perhatian perubatan dengan serta merta.
Immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses, if worn. Get medical attention immediately.

Dihidu:
Inhalation:

Pindahkan ke tempat berudara bersih. Jika tidak bernafas, berikan bantuan pernafasan. Jika sukar bernafas, berikan oksigen. Panggil doktor.
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ditelan:
Ingestion:

JANGAN dipaksa muntah. Dapatkan perhatian perubatan dengan serta merta. Jika mangsa sedar sepenuhnya, berikan secawan air. Jangan berikan apa-apa melalui mulut kepada orang yang tidak sedar.
DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Catatan untuk doktor:
Note to physician:

Perhatikan kalau-kalau terjadi edema pulmonari pendam.
Observe for latent pulmonary edema.

Pneumonitis kimia boleh terjadi setelah pendedahan pernafasan.
Chemical pneumonitis could follow respiratory exposure.

5. Langkah-Langkah Memadam Kebakaran

5. Fire Fighting Measures

NFPA: Health: 3 Flammability: 2 Reactivity: 0

Sifat-sifat mudah menyala
Flammable properties

Takat kilat (kaedah ujian): 69 C (156 F)
Flash point (test method):

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Had mudah menyala, Dalam udara, % mengikut isipadu

Flammable limits in air, % by volume:

Atas:	73% (Formaldehyde)
Upper:	36.5% (Methanol at 25 deg C)
	Not Applicable (Water)
	7% (Formaldehyde)
Bawah:	5.5% (Methanol at 25 deg C)
Lower:	Not Applicable (Water)

Suhu swapencucuhan:	300 C (572 F) (Formaldehyde)
Autoignition temperature:	385 C (725 F) (Methanol)

Hasil Pembakaran:	Karbon Monoksida.
Products of combustion:	Carbon Monoxide.

Media pemadam:	Gunakan busa pembentuk selaput akueus jenis alkohol bagi kebakaran besar.
Extinguishing Media:	Use alcohol type aqueous film forming foam for large fires.

	Gunakan CO₂ atau kimia kering bagi kebakaran kecil.
	Use CO ₂ or dry chemical for small fires.

Petunjuk Memadam Kebakaran
Fire Fighting Instructions

Semburan air patut digunakan bagi menyejukkan struktur dan wadah yang terdedah kepada api. Semburan air boleh digunakan bagi mengurangkan keamatan api dan mencairkan tumpahan menjadi campuran tidak mudah menyala.

Water spray should be used to cool fire-exposed structures and vessels. Water spray can be used to reduce the intensity of flames and to dilute spills to a non-flammable mixture.

Kakitangan hendaklah dipindahkan dan dipastikan berada di atas arah tiupan angin ke api. Jika ada kemungkinan pendedahan kepada wap atau produk pembakaran, pakai pakaian bomba yang lengkap serta alat pernafasan swalengkap yang diluluskan NIOSH. Bahan kimia yang mengoksida mungkin mencepatkan kadar pembakaran dalam keadaan kebakaran.

Keep personnel removed from and upwind of fire. If potential for exposure to vapors or products of combustion exists, wear full fire fighting turnout gear and NIOSH approved self-contained breathing apparatus. Oxidizing chemicals may accelerate the burning rate in a fire situation.

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Persoalan Alam Sekitar Semasa**Memadam Kebakaran**

Fire Fighting Environmental Concerns

Penyaliran air dan kepulan wap boleh mengakis. Benteng dan kumpulkan air yang digunakan untuk memadam kebakaran supaya dapat dineutralkan sebelum dibebaskan.

Water run-off and vapor cloud may be corrosive. Dike and collect water used to fight fire for neutralization before release.

Wap dan gas pembakaran boleh dikawal dengan menggunakan aliran kabut air.

Vapors and combustion gases can be controlled using a water fog stream.

Kelengkapan pakaian bunker dan peralatan memadam kebakaran yang lain hendaklah dibersihkan daripada pencemaran sebelum digunakan semula.

Thoroughly decontaminate bunker gear and other fire-fighting equipment before re-use.

6. Langkah-Langkah Pembebasan Tidak Sengaja

6. Accidental Release Measures

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Petunjuk Tumpahan atau Kebocoran
Spill or Leak Instructions

Hapuskan punca-punca pencucuhan.
Eliminate ignition sources.

Lihat peralatan perlindungan diri di Bahagian 8. Tumpahan hendaklah ditampung dengan benteng tanah atau bahan penyerap yang tidak mudah menyala bagi mengurangkan kawasan yang tercemar.

See Section 8 for appropriate personal protective equipment. Contain spill with dikes of soil or nonflammable absorbent to minimize contaminated area.

Aliran kabut air boleh mengurangkan wap.
Water fog stream may reduce vapors.

Jika ada potensi kebakaran, selimutkan tumpahan dengan busa pembentuk selaput akueus jenis alkohol atau gunakan aliran kabut air untuk menyebarkan wap.

If fire potential exists, blanket spill with alcohol type aqueous film-forming foam or use water fog stream to disperse vapors.

Hindarkan pengaliran ke dalam pementang dan parit yang membawa ke saluran air. Jika dikehendaki, maklumkan pihak berkuasa negeri dan tempatan. Letakkan bekas yang bocor di kawasan yang sempurna pengudaraannya.

Avoid run-off into storm sewers and ditches leading to waterways. If required, notify state and local authorities. Place leaking containers in well-ventilated area.

Neutralkan dengan asid sulfamik atau natrium bisulfit.
Neutralize with sulfamic acid or sodium bisulfite.

Bersihkan tumpahan kecil dengan menggunakan bahan penyerap tidak mudah menyala atau dengan menyiram sedikit-sedikit dengan air. Tampung tumpahan besar dengan benteng atau bahan penyerap tidak mudah menyala. Bersihkan dengan vakum atau menyapu.

Clean up small spills by using a nonflammable absorbent or flushing sparingly with water. Contain larger spills with nonflammable dikeing or absorbent. Clean up by vacuuming or sweeping.

Di Amerika Syarikat, hubungi Pusat Gerak Balas Nasional (800-424-8802) dan pihak berkuasa negeri dan tempatan jika kuantiti yang dibebaskan selama 24 jam sama dengan atau melebihi kuantiti wajib lapor yang disenaraikan di bawah:

Within the United States, call the National Response Center (800-424-8802) and appropriate state and local authorities if the quantity released over 24 hours is equal to or greater than the reportable quantity listed below:

270 lbs. of the material as is; based on a Reportable Quantity of 100 lbs. for formaldehyde.

Orang yang tidak perlu jangan dibiarkan dekat; pencilkan kawasan bahaya dan

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jangan benarkan masuk. Pastikan berada di atas arah tiupan angin; jauhi kawasan rendah.

Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas.

Pencilkan sejauh 800 meter atau 0.5 batu di semua arah jika tangki, gerabak, atau lori tangki terbabit dalam kebakaran.

Isolate for 800 meters or 0.5 miles in all directions if tank, rail car, or tank truck in involved in fire.

Pindahkan orang dari kawasan di bawah arah tiupan angin jika wajar mengikut keadaannya bagi mencegah pendedahan dan membolehkan wap atau wasap lesap. Tumpahan boleh mendedahkan kawasan di bawah tiupan angin kepada kepekatan yang toksik atau mudah menyala pada jarak yang jauh dalam hal-hal tertentu.

Evacuate downwind areas as conditions warrant to prevent exposure and to allow vapors or fumes to dissipate. Spills may expose downwind areas to toxic or flammable concentrations over considerable distances in some cases.

7. Penanganan dan Penyimpanan

7. Handling and Storage

Penanganan:
Handling:

Gunakan dengan pengudaraan memadai. Bekas hendaklah sentiasa ditutup apabila tidak digunakan. Bekas hendaklah dibuka perlahan-lahan bagi melepaskan lebih tekanan. Jangan menghidu wapnya. Hindarkan daripada terkena mata, kulit atau pakaian. Basuh tubuh bersih-bersih dengan sabun dan air setelah menanganinya. Pakaian kotor hendaklah dibersihkan daripada pencemaran sebelum digunakan semula. Pakaian daripada kulit hendaklah dimusnahkan jika tercemar.

Use with adequate ventilation. Keep containers closed when not in use. Always open containers slowly to allow any excess pressure to vent. Avoid breathing vapor. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Decontaminate soiled clothing thoroughly before re-use. Destroy contaminated leather clothing.

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Produ ini mungkin membangkitkan cas statik. Bumikan/ikat peralatan peralatan apabila memindahkan bahan bagi mencegah penumpukan statik. Di AS, peralatan elektrik dan litar dalam semua situasi penyimpanan dan penanganan mesti mematuhi Kod Elektrik Nasion (Perkara 500 dan 501) bagi lokasi berbahaya.

This product may generate a static charge. Ground/bond equipment when transferring material to prevent static accumulation. Electrical equipment and circuits in all storage and handling must conform to requirements of National Electric Code (Article 500 and 501) for hazardous location.

Penyimpanan:
Storage:

Semua bekas hendaklah sentiasa ditutup ketat apabila tidak digunakan. Simpan secara terlindung daripada sinaran matahari langsung dan di lantai yang tidak telus.

Keep all containers tightly closed when not in use. Store out of direct sunlight and on an impermeable floor.

Janga simpan bersama bahan yang tidak serasi. Lihat Bahagian 10. Kestabilan dan Kereaktifan.

Do not store with incompatible materials. See Section 10. Stability and Reactivity.

8. Kawalan Pendedahan / Perlindungan Diri *8. Exposure Controls / Personal Protection*

Kawalan kejuruteraan
Engineering Controls:

Pengudaraan umum atau sebaran sering kali tidak mencukupi sebagai satu-satunya cara mengawal pendedahan pekerja. Biasanya pendedahan setempat lebih diutamakan.

General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred.

Peralatan pelindung diri
Protective Equipment

Tempat mandi keselamatan dan tempat membasuh mata harus disediakan di tempat mudah didapatkan.

A safety shower and eyebath should be readily available.

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Perlindungan kulit:
Skin Protection:

Pakai pakaian dan sarung tangan tidak telus bagi menghindari sentuhan. Disarankan supaya menggunakan getah butil. Bahan pelindung yang lain boleh digunakan, mengikut keadaan, sekiranya ada data yang memadai tentang degradasi dan penelapan. Jika bahan kimia lain digunakan bersama bahan kimia ini, pemilihan bahan harus berdasarkan perlindungan terhadap semua bahan kimia yang hadir.

Wear impervious clothing and gloves to prevent contact. Butyl rubber is recommended. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Perlindungan mata/muka:
Eye/face protection:

Pakai gogal kimia jika ada kemungkinan munasabah akan terkena mata.

Wear chemical goggles when there is a reasonable chance of eye contact.

Selain gogal, pakai perisai muka jika ada kemungkinan munasabah akan terpercik ke muka.

In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Kecemasan pengangkutan:

Transportation emergency: 703 527 3887 (USA) CHEMTREC, collect calls accepted, 24 hrs/day

Nama produk:	Product name:	Formaldehide 37%/Methanol 7%, solution
Nombor MSDS:	MSDS number:	45
Nombor bahan:	Material number:	80045
Tarikh diterbitkan:	Published date:	02/02/2006

Perlindungan pernafasan:
Respiratory Protection:

Berdasarkan aras pencemaran dan had bekerja alat pernafasan, gunakan alat pernafasan yang diluluskan oleh NIOSH. Berikut adalah peralatan minimum disarankan bagi aras pendedahan pekerjaan. Bagi menganggarkan pendedahan pekerjaan lihat Bahagian 3, Bahagian 8 dan Bahagian 11.
Based on workplace contaminant level and working limits of the respirator, use a respirator approved by NIOSH. The following is the minimum recommended equipment for an occupational exposure level. To estimate an occupational exposure level see Section 3, Section 8 and Section 11.

Bagi kadar kepekatan formaldehid > 1 dan <10 kali aras pendedahan pekerjaan: Gunakan alat pernafasan pemurni udara dengan pelindung muka penuh dilengkapi kartrij atau bejana yang khusus diluluskan bagi perlindungan terhadap formaldehid, atau alat pernafasan pemurni udara kuasa berpelindung muka penuh dilengkapi kartrij atau bejana yang khusus diluluskan bagi perlindungan terhadap formaldehid. Elemen pemurni udara harus dilengkapi penunjuk tamat hayat perkhidmatan, atau harus disahkan dengan dokumentasi jika ada perubahan tidak mengikut jadual. Jika tidak, gunakan bekalan udara.
For formaldehyde concentrations > 1 and < 10 times the occupational exposure level: Use air-purifying respirator with full facepiece fitted with either cartridge(s) or canister specifically approved for protection against formaldehyde, or a full facepiece powered air-purifying respirator fitted with either cartridge(s) or canister specifically approved for protection against formaldehyde. The air purifying element must have an end of service life indicator, or a documented change out schedule must be established. Otherwise, use supplied air.

Bagi kadar kepekatan lebih daripada 10 kali aras pendedahan pekerjaan dan kurang daripada 100 kali aras pendedahan pekerjaan atau IDLH, mana yang lebih rendah: Gunakan alat pernafasan bekalan udara berpelindung muka penuh Jenis C dikendalikan dalam cara permintaan tekanan atau aliran terus menerus.

For concentrations more than 10 times the occupational exposure level and less than the lower of either 100 times the occupational exposure level or the IDLH: Use Type C full facepiece supplied-air respirator operated in positive-pressure or continuous-flow mode.

Bagi kadar kepekatan > aras IDLH atau kepekatan tidak diketahui (misalnya dalam kecemasan): Gunakan alat pernafasan swalengkap dengan pelindung muka penuh dalam cara tekanan positif atau alat pernafasan bekalan udara tekanan positif berpelindung muka penuh Jenis C dengan sistem lolos alat pernafasan swalengkap tekanan positif bantu.

For concentrations > the IDLH level or unknown concentration (such as in emergencies): Use self-contained breathing apparatus with full facepiece in positive-pressure mode or Type C positive-pressure full facepiece supplied-air respirator with an auxiliary positive-pressure self-contained breathing apparatus escape system.

Untuk lolos: Gunakan alat pernafasan swalengkap tekanan positif dengan pelindung muka penuh atau topeng pelindung muka penuh dengan bejana saiz

Kecemasan pengangkutan:

Transportation emergency: 703 527 3887 (USA) CHEMTREC, collect calls accepted, 24 hrs/day

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
Nombor bahan: Material number: 80045
Tarikh diterbitkan: Published 02/02/2006
 date:

industri jenis dagu atau yang dipasang di depan atau belakang yang khusus diluluskan bagi perlindungan terhadap formaldehid.

For escape: Use positive-pressure self-contained breathing apparatus with full facepiece or full facepiece mask with chin style or front or back mounted type industrial size canister specifically approved for protection against formaldehyde.

Garis panduan pendedahan

Exposure guidelines

Komponen Component	No. CAS CAS Number	% Berat Percent %	ACGIH TWA	ACGIH STEL	ACGIH CEILING	OSHA TWA	OSHA STEL	OSHA CEILING	WEL (Had Pendedahan Tempat Kerja) Celanese Celanese WEL (Workplace Exposure Limit)	Mexico TWA	Mexico STEL	Mexico CEILING
Formaldehid FORMALDEHYDE	50-00-0	37 - 37.5	-	-	0.3 ppm	0.75 ppm	2 ppm	-	0.75 ppm (TWA); 2 ppm (STEL)	-	-	2 ppm
Metanol METHANOL	67-56-1	6.5 - 7.5	200 ppm	250 ppm	-	200 ppm	-	-	-	200 ppm	250 ppm	-

Komponen Component	No. CAS CAS Number	% Berat Percent %	1990 NIOSH IDLH (Recognized by OSHA)	1994 NIOSH IDLH
Formaldehid FORMALDEHYDE	50-00-0	37 - 37.5	30 ppm	20 ppm
Metanol METHANOL	67-56-1	6.5 - 7.5	25,000 PPM	6000 ppm

Comments:

Celanese telah mengambil keputusan tidak menerapkan nilai Had Maksimum ACGIH bagi Formaldehid, berdasarkan penilaian saintifik semua data yang tersedia.

Celanese telah menerapkan ACGIH TLV bagi metanol.

Celanese has decided not to adopt the ACGIH Ceiling value for Formaldehyde based on a scientific evaluation of all the available data.

Celanese has adopted the ACGIH TLV for methanol.

Kecemasan pengangkutan:

Transportation emergency: 703 527 3887 (USA) CHEMTREC, collect calls accepted, 24 hrs/day

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
Nombor bahan: Material number: 80045
Tarikh diterbitkan: Published date: 02/02/2006

9. Sifat-Sifat Fizikal dan Kimia *9. Physical and Chemical Properties*

Rupa:
Appearance: **Cecair jernih, tak berwarna.**
Clear, colorless liquid.

Bau:
Odor: Strong, pungent, characteristic odor.

3 - 6

pH (larutan 1% dalam air pada 25 °C):
pH (1% soln in water @ 25 °C):

Tekanan Wap:
Vapor Pressure: 23 mmHg @ 25 deg C (calculated)

Ketumpatan wap (udara = 1 pada 20° C):
Vapor Density (Air=1 @ 20 C):
Formaldehyde: 1.04 (calculated)
Water: 0.62 (calculated)
Methanol: 1.11 (calculated)

Takat didih (760 mmHgA):
Boiling Point (760 mmHgA): 97 C (207 F)

Freezing Point:
Pada suhu di bawah 16°C (61°F), polimer formaldehid pejal secara beransur-ansur akan terbentuk. Hablur ais akan kelihatan pada suhu di bawah 0° C (32°F).
Below 16°C (61°F), solid formaldehyde polymer gradually forms. Ice crystals appear below 0°C (32°F).

Keterlarutan dalam air pada 20° C:
Solubility in Water @ 20 C: complete

Graviti tentu:
Specific Gravity: 1.092 @ 25 deg C

Nama produk:	Product name:	Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS:	MSDS number:	45
Nombor bahan:	Material number:	80045
Tarikh diterbitkan:	Published date:	02/02/2006

Berat molekul:
Molecular Weight:

Formaldehyde: 30.0
Water: 18
Methanol: 32.0

10. Kestabilan dan Kereaktifan

10. Stability and Reactivity

Kestabilan:
Stability:

Stabil.
Stable.

Keadaan yang harus dihindarkan: Produk ini higroskopik. Satu kaedah bagi mengeluarkan lembapan mesti disediakan bagi mencegah pencemaran dan kemungkinan terbentuknya polimer.

Conditions to Avoid:

Avoid heat, flames, sparks, and other sources of ignition.

Bahan yang harus dihindarkan:
Incompatibility:

Jauhkan dari soda kaustik, kapur dan alkali keras yang lain, natrium, kalium dan logam alkali lain, asid hidroklorik, asid sulfurik dan asid tak organik keras yang lain, oksida nitrogen, amina dan agen pengoksidaan seperti peroksida, asid nitrik, asid perklorik, kromium trioksida, fenol atau urea.

Keep away from caustic soda, lime and other strong alkalis, sodium, potassium and other alkali metals, hydrochloric, sulfuric and other strong inorganic acids, nitrogen oxides, amines and oxidizing agents such as peroxides, nitric acid, perchloric acid, chromium trioxide, phenols or urea.

Hasil Pembakaran atau Penguraian Berbahaya:
Hazardous combustion or decomposition products:

Hasil penguraian terma boleh termasuk oksida karbon.
Thermal decomposition products may include oxides of carbon.

Pempolimeran berbahaya:
Hazardous Polymerization:

Pempolimeran berbahaya tidak akan terjadi.
Hazardous polymerization will not occur.

Kecemasan pengangkutan:

Transportation emergency: 703 527 3887 (USA) CHEMTREC, collect calls accepted, 24 hrs/day

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
Nombor bahan: Material number: 80045
Tarikh diterbitkan: Published 02/02/2006
date:

11. Maklumat Toksikologi

11. Toxicological Information

Component Toxicological Information

Komponen Component	Formaldehid FORMALDEHYDE
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Acute Exposure: Toxicity information on the solution is generally not available. Information on the solution components is listed next.

Oral LD50: 800mg/kg (rats); slightly toxic to animals.

Inhalation LC50: 474ppm (rats,4 hrs.); moderately toxic to animals.

Skin: Severely irritating/corrosive to rabbit skin depending on exposure duration and concentration; moderately toxic to animals (LD50, rabbits: 270mg/kg); causes skin sensitization in humans and guinea pigs.

Eye: Severely irritating to rabbit eyes.

Kecemasan pengangkutan:

Transportation emergency: 703 527 3887 (USA) CHEMTREC, collect calls accepted, 24 hrs/day

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
Nombor bahan: Material number: 80045
Tarikh diterbitkan: Published date: 02/02/2006

Mutagenicity: Genotoxic potential was noted in a variety of in vitro systems. Results in vivo have been mixed probably due to the presence of metabolic processes for detoxifying.

Carcinogenicity: Oral-Formaldehyde was not carcinogenic in several well-conducted rodent lifetime drinking water studies. Repeated dermal-topical application on mice has not indicated carcinogenic potential. Inhalation-Rats and mice were exposed to 2.0, 5.6, or 14.3 ppm formaldehyde for 6hrs/day, 5 days/week for 24 months. In rats no treatment-related tumors were seen at 2 ppm while at 5.6 ppm 1% had nasal tumors and at 14.3 ppm 43% had nasal tumors. In mice no treatment-related tumors were observed at 2 ppm or 5.6 ppm while 1% had nasal tumors at 14.3 ppm. IARC: Group I, Carcinogenic to Humans, based on sufficient human (nasopharyngeal cancer) and experimental animal data. Formaldehyde is listed as an OSHA carcinogen. Formaldehyde is listed as an anticipated carcinogen by the NTP.

Hauptmann, et. al. (2004) have reported a statistically significant dose-related increase in the incidence of nasopharyngeal tumors in a large cohort of formaldehyde exposed workers. In another study by Hauptmann, et. al. (2003) based upon the same cohort, a statistically significant dose-related increase of leukemia mortality was observed. However, this increase was seen only for a peak exposure metric and the rate of leukemia mortality was less than that of the unexposed general population. In addition, the Hauptmann et. al. (2003) results are not consistent with the findings of Coggon et. al. (2003). Coggon et. al. found no association between formaldehyde exposure and leukemia incidence in a large cohort of U.K. workers with estimated formaldehyde exposures higher than the Hauptmann et. al. (2003) study. A recent NIOSH study (Pinkerton, et. al. 2004) based on a cohort of formaldehyde exposed garment workers reported only a marginal association with leukemia incidence. Experimental data linking formaldehyde exposure with toxicity in organs, including the bone marrow, remote from the portal of entry is lacking. Also, an established mechanism for induction of leukemia by formaldehyde is not available. Furthermore, formaldehyde inhalation by rats in several well-conducted cancer bioassays did not induce leukemia.

Reproductive/Developmental Effects: In a developmental toxicity study with mice dosed orally by gavage at 74, 148 or 185 mg/kg/day, no fetotoxic or teratogenic effects were seen. In a developmental toxicity study with rats exposed via inhalation to 2, 5 or 10ppm formaldehyde, treat-related developmental effects were not observed. In a reproduction study, dogs received the equivalent of 9.4 mg/kg/day of formaldehyde in feed during days 4-56 after mating without adverse reproductive effects.

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
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Repeated Exposure: Inhalation exposure (6hrs./day;5 days/week;13 weeks) of rats resulted in nasal tissue irritation at 10 or 20ppm, but not at 2ppm. Monkeys exposed for 26 weeks (22hrs./day;7 days/week) had nasal irritation at 3ppm but not at 1ppm. Oral exposure of rats to formaldehyde in the drinking water at a dose equivalent to 82-109 mg/kg/day over a lifetime resulted in stomach tissue irritation while a dose of 15-21 mg/kg/day was without effect.

Komponen Component	Metanol METHANOL
-----------------------	---------------------

Acute Exposure: Toxicity information on the solution is generally not available. Information on the solution components is listed next.

Oral LD50: 6.2-12.9g/kg (rats); practically nontoxic to animals. However, based on human exposure reports, a small amount (usually two or more ounces) can cause mental sluggishness, nausea and vomiting leading to severe illness, and may produce adverse effects on vision with possible blindness or death if treatment is not received.

Inhalation LC50: 64000ppm (rats,4 hrs.); practically nontoxic to animals. Based on human exposure reports, levels substantially above the TLV cause stupor, headache, nausea, dizziness, unconsciousness and may produce adverse effects on vision.

Skin: Irritating to rabbit skin. Severity depends on the quantity administered and exposure period and is related to the defatting properties of methanol; slightly toxic to animals (minimum lethal dose, monkeys: 1.6g/kg; LD50, rabbits:16g/kg). Based on human exposure reports, prolonged and repeated skin contact with methanol-soaked material has produced toxic effects including vision effects and death.

Eye: Severely irritating to rabbit eyes.

Nama produk:	Product name:	Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS:	MSDS number:	45
Nombor bahan:	Material number:	80045
Tarikh diterbitkan:	Published date:	02/02/2006

Mutagenicity: Methanol - Not genotoxic in most in vitro assays. Not genotoxic in vivo in mice exposed via inhalation up to 4000ppm (6hrs./day for 5 days) and subsequently examined for cytogenetic effects.

Carcinogenicity: Methanol - Inhalation-Not carcinogenic in lifetime inhalation studies (reported in limited detail) in rats and mice at concentrations of 10-1000ppm. Dermal-Not carcinogenic in mice exposed dermally to 0.02ml/day, 2 days/week over a lifetime in a study of limited quality.

Reproductive/Developmental Effects: Methanol - In an inhalation developmental toxicity study, rats were exposed 6hrs./day to 5000, 10000 or 20000ppm vapors. A significant teratogenic response was seen at 20000ppm. Fetotoxicity was noted at 10000ppm, but not at 5000ppm. In an inhalation developmental toxicity study, mice were exposed 7hrs./day to 2000, 5000 or 10000ppm vapors. Methanol caused developmental toxicity at all levels. Oral administration of methanol via gavage at 1.3, 2.6 or 5.2 ml/kg to rats resulted in developmental toxicity at all levels.

Repeated Exposure: Methanol - Inhalation exposure (6hrs./day; 5days/week) of monkeys to vapor concentrations of 500, 2000 or 5000ppm for 4 weeks did not result in any treatment-related effects. Monkeys exposed to methanol vapors of 10, 100 or 1000ppm for 22hrs./day for up to 2.5yrs. showed changes in the liver, kidney and nervous system at 1000ppm (limited details reported). Rats exposed by oral gavage to 100, 500 or 2500mg/kg/day methanol for 90days exhibited only effects on organ weight (brain) and serum enzymes (SGPT,AP) at the high dose.

12. Maklumat Ekologi 12. Ecological Information

Component Ecological Information

Komponen Component	Formaldehid FORMALDEHYDE
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Kecemasan pengangkutan:

Transportation emergency: 703 527 3887 (USA) CHEMTREC, collect calls accepted, 24 hrs/day

Nama produk:	Product name:	Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS:	MSDS number:	45
Nombor bahan:	Material number:	80045
Tarikh diterbitkan:	Published date:	02/02/2006

Ecotoxicity: Formaldehyde exhibits slight acute toxicity to various fish species. The 24-, 48- and 96-hr. LC50 values (bluegill sunfish, trout, bass, salmon, catfish, carp, golden orfe) are in the range 10-1000ppm. Algae and some invertebrates appear more susceptible e.g., acute toxicity occurs in green algae at 0.3-0.5ppm and in the water flea (daphnids) at 2-52ppm (24/48-hr. EC50). Formaldehyde has bactericidal properties at low levels (EC50, E. coli=1ppm).

Environmental Fate: The short atmospheric half-life, the low n-octanol/water partition coefficient and the ability of animals & microorganisms to rapidly biodegrade formaldehyde are expected to lead to its ready removal if released into the environment.

Degradation: Formaldehyde in aqueous effluent is degraded by activated sludge and sewage in 48-72 hr. In a die-away test with lake water, degradation was complete in 30 hrs. under aerobic conditions and 48 hrs. under anaerobic conditions. Atmospheric photochemical degradation is rapid with estimated half-lives of 19hrs. or less.

Bioaccumulation: The log n-octanol/water partition coefficient is 0.35. This suggests that formaldehyde has relatively low potential to bioaccumulate.

Komponen Component	Metanol METHANOL
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Ecotoxicity: Toxicity information on the solution is generally not available. Information on solution components is listed next.

Methanol exhibits low acute toxicity to aquatic species. The 24-, 48- and 96-hr. LC50 values for various fish species (bluegill sunfish, fathead minnows, rainbow trout, goldfish, carp, bleak, creek chub) are in the range 1700-28100ppm. The 18-, 24- and 48-hr. EC50 values for the water flea (daphnids) are in the range 10000-24500ppm. The 18-hr. LC50 for grass shrimp is 21900ppm and the 24-hr. LC50 for brine shrimp is >10000ppm. Cell multiplication was inhibited after 8 days exposure to 8000ppm and 530ppm in the green algae (*Scenedesmus quadricauda*) and blue-green algae (*Anacystis aeruginosa*), respectively.

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
Nombor bahan: Material number: 80045
Tarikh diterbitkan: Published date: 02/02/2006

Environmental Fate: The ability of animals and microorganisms to rapidly biodegrade methanol coupled with its low n-octanol/water partition coefficient is expected to lead to its rapid removal if released into the environment.

Degradation: Under aerobic conditions methanol is readily biodegradable. The 5-Day BOD values are 48-83% of COD. Biodegradation also occurs under anaerobic conditions, e.g. 83-91% degradation in a marine water/sediment system after 3 days. Atmospheric photochemical degradation (half-life) is estimated to be 17.8 days. Volatilization half-lives of 4.8 days and 51.7 days have been estimated for a model river and a model pond, respectively.

Bioaccumulation: The log n-octanol/water partition coefficient for methanol is -0.77. This suggests that methanol has low potential to bioaccumulate.

13. *Pertimbangan Pelupusan* 13. *Disposal Considerations*

Lupuskan bahan tumpah sejajar dengan peraturan negeri dan tempatan bagi bahan buangan berbahaya. Kaedah yang disarankan adalah penunuan atau pengolakan biologi di kemudahan pelupusan yang diizinkan oleh pihak berkuasa negeri atau Persekutuan. Harap ingat bahawa maklumat ini adalah bagi bahan sebagaimana dibuat; pemprosesan, penggunaan, atau pencemaran mungkin menjadikan maklumat ini tidak wajar, tidak tepat atau tidak lengkap.

Dispose of spilled material in accordance with state and local regulations for hazardous waste. Recommended methods are incineration or biological treatment at a federally or state-permitted disposal facility. Note that this information applies to the material as manufactured; processing, use, or contamination may make this information inappropriate, inaccurate, or incomplete.

Harap ingat bahawa maklumat penanganan dan pelupusan ini juga mungkin terpakai bagi bekas kosong, pelapik dan bahan bilasannya. Peraturan atau sekatan peringkat negeri atau tempatan adalah kompleks dan mungkin berbeza dengan peraturan persekutuan. Maklumat ini dimaksudkan sebagai bantuan bagi penanganan dan pelupusan yang wajar; tanggung jawab muktamad bagi penanganan dan pelupusan terletak di tangan pemilik bahan buangan berkenaan. Lihat Bahagian 9 Sifat-Sifat Fizikal dan Kimia.

Note that this handling and disposal information may also apply to empty containers, liners and rinsate. State or local regulations or restrictions are complex and may differ from federal regulations. This information is intended as an aid to proper handling and disposal; the final responsibility for handling and disposal is with the owner of the waste. See Section 9 - Physical and Chemical Properties.

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
Nombor bahan: Material number: 80045
Tarikh diterbitkan: Published date: 02/02/2006

14. Maklumat Pengangkutan

14. Transport Information

US Department of Transportation:

UN/NA Number:	UN 2209
Shipping name:	FORMALDEHYDE SOLUTIONS
Hazard class:	8
Packing Group:	PG III
DOT Reportable Quantity (RQ):	100 lb/45.4 kg (FORMALDEHYDE)
Emergency Response Guide:	132

ICAO/IATA:

IATA UN Number:	UN 2209
Proper Shipping Name:	FORMALDEHYDE SOLUTIONS
Hazard Classification:	8
Packing group:	III
Label:	Corrosive

IMDG:

International Marine UN Number:	UN 2209
Proper Shipping Name:	FORMALDEHYDE SOLUTIONS
Hazard Class:	8
Packing Group:	III
Takat kilat (kaedah ujian):	69 C (156 F)
Flash point (test method):	

Transport Canada

Trade Information

Schedule B Code (export):	2912.11.0000
Harmonization Code (import):	29121100

15. Maklumat Kawalselia

15. Regulatory Information

Kecemasan pengangkutan:

Transportation emergency: 703 527 3887 (USA) CHEMTREC, collect calls accepted, 24 hrs/day

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
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INTERNATIONAL REGULATIONS

Inventori kimia

International chemical inventories:

Disenaraikan dalam inventori kimia negara-negara berikut atau layak dikecualikan:

Listed on the chemical inventories of the following countries or qualifies for an exemption:

AUSTRALIA, CHINA, CANADA, EUROPE, KOREA, PHILIPPINES, JAPAN

16. Maklumat Lain 16. Other Information

Disiapkan oleh:

Prepared by:

Jabatan Penyeliaan Produk

Celanese Ltd.

Product Stewardship Department

Celanese Ltd.

Pentarafan bahaya

Hazard ratings

Maklumat ini dimaksudkan untuk digunakan hanya oleh mereka yang terlatih dalam sistem NFPA dan/atau HMIS.

This information is intended solely for the use of individuals trained in the NFPA and/or HMIS systems.

NFPA:

Health: 3 Flammability: 2 Reactivity: 0

HMIS:

Health: 3* Flammability: 2 Reactivity: 0

The following sections have been revised since the last issue of this MSDS.

Maklumat berikut telah disemak sejak versi terakhir MSDS ini:

The following has been revised since the last issue of this MSDS:

1. Pengenalan Produk dan Syarikat

Kecemasan pengangkutan:

Transportation emergency: 703 527 3887 (USA) CHEMTREC, collect calls accepted, 24 hrs/day

Nama produk: Product name: Formaldehyde 37%/Methanol 7%, solution
Nombor MSDS: MSDS number: 45
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date:

Maklumat yang terkandung di sini adalah tepat sejauh pengetahuan kami. Kami tidak menyatakan atau menjamin bahawa mana-mana bahaya yang disenaraikan di sini adalah satu-satunya yang wujud. Celanese Ltd. tidak memberi jaminan dalam apa jua bentuk, secara nyata atau tersirat, tentang penggunaan bahan ini yang selamat dalam proses anda atau secara bergabung dengan zat lain. Kesan-kesannya boleh diburukkan oleh bahan lain dan/atau bahan ini pula boleh memburukkan atau menambah kesan-kesan bahan lain. Bahan ini boleh dibebaskan daripada bahan gas, cecair, atau pepejal yang dibuat secara langsung atau tidak langsung daripadanya. Pengguna memikul tanggungjawab tunggal untuk menentukan kesesuaian bahan-bahan bagi apa jua kegunaan dan cara penggunaan yang dirancangkan. Pengguna mesti memenuhi semua piawai keselamatan dan kesihatan yang berkenaan. Lembaran data keselamatan bahan disediakan di Internet oleh Celanese, Ltd. sebagai satu perkhidmatan untuk pelanggannya. Memiliki MSDS Internet tidak menandakan bahawa pemilik MSDS itu adalah pembeli atau pengguna produk yang berkenaan.

Note: For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Celanese Ltd. makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. This material may be released from gas, liquid, or solid materials made directly or indirectly from it. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards. Material safety data sheets are provided on the Internet by Celanese, Ltd. as a service to its customers. Possession of an Internet MSDS does not indicate that the possessor of the MSDS was a purchaser or user of the subject product.