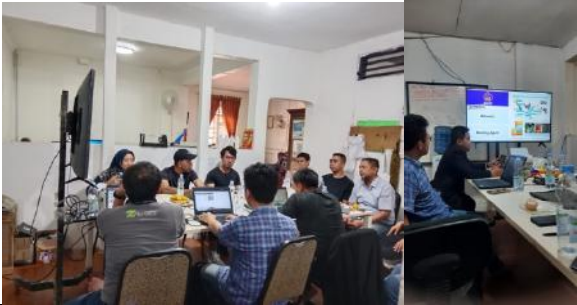


LAPORAN KEGIATAN

PENINGKATAN PENGETAHUAN DAN KAPASITAS KARYAWAN PT MANDIRI INOVASI BERSAMA:
RISET DAN PENGEMBANGAN, DAN PENANGANAN BAHAN-BAHAN KIMIA DI INDUSTRI

Nama Acara	Peningkatan Kapasitas Karyawan PT MIB: Riset dan Pengembangan, dan Penanganan Bahan-bahan Kimia di Industri	
Tanggal	Sabtu, 3 Agustus 2024	
Tempat	PT Mandiri Inovasi Bersama, Cisauk.	
Deskripsi Acara	Kegiatan ini diadakan oleh management PT Mandiri Inovasi Bersama (PT MIB), dengan tujuan untuk meningkatkan pengetahuan dan kapasitas karyawan khususnya management PT MIB	
Peran	Saya diundang pada kegiatan tersebut untuk memberikan kuliah khusus dengan topik Riset dan Pengembangan, dan Penanganan Bahan-bahan Kimia di Industri.	
Foto Kegiatan		
Slide Presentasi	terlampir	

Jakarta,	3 Agustus 2024
 (Ersan Yudhapratama Muslih)	

**PENINGKATAN PENGETAHUAN DAN KAPASITAS KARYAWAN
PT MANDIRI INOVASI BERSAMA:
RISET DAN PENGEMBANGAN, DAN PENANGANAN BAHAN-
BAHAN KIMIA DI INDUSTRI**

Disampaikan oleh: Dr. Eng. Ersan Yudhapratama
Muslih Cisauk
2024

Dr. Eng. Ersan Y. Muslih, M.Sc.Eng.

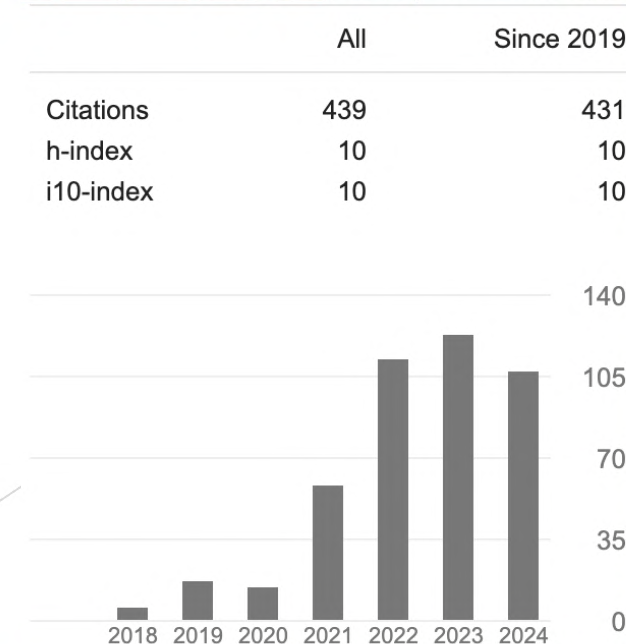
Email: ersanmuslih@gmail.com

Academic:

- Chemistry at Indonesia University of Education (UPI), Bandung (2008 - 2012)
- Materials Science at Yeungnam University, South Korea (2013 - 2015)
- Material Chemistry at Kanazawa University, Japan (2019 - 2022)

Expertise:

- Chemistry
- Material
- Nanotechnology
- Renewable Energy (Photovoltaic - Perovskite Solar Cells)
- Metallurgy



Identifikasi Bahan Kimia

Cara Identifikasi Bahan Kimia

- ▶ Merujuk pada *Material Sheet Data Safety* (MSDS) / *Safety Data Sheet* (SDS) / *Technical Data Sheet* (TDS) □
- ▶ Melihat symbol bahan □

Cara Identifikasi Bahan Kimia



Issued: October 2022 | Page 1 of 10
Phone: +61 2 8987 1922 | www.elastotec.com.au

HV BRUSHING CEMENT – MATERIAL SAFETY DATA SHEET

Date prepared	28/10/2022	Reasons for issue	New material
Date last reviewed	28/10/2022	☐ Not reviewed	Next review 28/10/2027
Manufacture/importer Details			
Business name	Elastotec P/L	ABN	65 137 437 239
Telephone	+61 2 8987 1922		
Address	Unit 1 / 61 Somersby Falls Road, Somersby NSW 2250 Australia		
Emergency Contact			
Business name	Elastotec P/L	Telephone	As above or after hours +61 423 200 178
Email	david@elastotec.com.au		

SECTION 1: PRODUCT IDENTIFICATION

Product: **Rubber Lining Brushing Cement for Hot Vulcanising**
Chemical Nature: Solution of rubber in a suitable solvent system.
Uses: Brush or spray-on product to adhere unsulcanised rubber to substrate in for example tyre retreading.

SECTION 2: HAZARDS IDENTIFICATION

Classified as Hazardous according to the criteria of the Australian Safety and Compensation Council ASCC (formerly NCHSC) Approved Criteria for Classifying Hazardous Substances (NCHSC: 1008) 3rd Edition.

GHS Classification

Hazard Categories: Flammable Liquids: Category 2
Aspiration Hazard: Category 1
Skin Corrosion/Irritation: Category 2
Toxic to Reproduction: Category 2
Specific Target Organ Toxicity – Single Exposure: Category 3 Narcotic effects
Specific Target Organ Toxicity – Repeated Exposure: Category 2
Chronic Hazard to the Aquatic Environment: Category 2
Eye Damage: Category 1
Skin Sensitisation: Category 1
Skin Irritation: Category 2
STOT SE 1
STOT SE 2
Aquatic Acute 1
Aquatic chronic 3

GHS Label Elements

Signal Word: **Danger**

Symbol(s):



Technical Data Sheet

Tape & Adhesive

3M ID9007

SEP 2011 (V2)

Product Description	ID9007 is a double coated non woven tapes with modified acrylic adhesive. This product is specially formulated for high bonding performance at moderate temperature applications. This product has very good adhesion to many kind of substrates including metal, painted substrate and many kind of plastics.		
Application Uses	- Plastic parts attachment - Automotive parts attachment - Cushion bonding - General purpose joining and mounting application - Name plates attachment - Decorative attachment - Plastic & Paper bonding		
Product Construction	Adhesive Type	Modified Acrylic Adhesive	
	Tape Thickness	0.16 mm (+/- 0.02 mm)	
	Tape Color	Off White	
	Carrier	Non-woven	
	Release Liner	Poly coated Paper with Light Blue 3M logo printed	
	Liner Thickness	0.15 mm (+/- 0.02mm)	
Typical Physical Properties	Note: The following information and data should be considered representative of typical only and should not be used for specification purposes.		
	Adhesion Strength		(N/inch)
	ASTM D3330	SS	17
	180° Peel Strength	PP	17
	Join Speed: 12 inch/min		
	Dynamic Shear Strength	Initial	(N/inch ²)
	ASTM D-1002	SS	90
	Join Speed: 12.7 mm/min	RT, 72 hrs	
		SS	130
	Relative High Temperature Operating Ranges		
	Long Term (days, weeks)	70°/ 80°C	Dependent on substrate
	Short Term (minutes, hours)	120°C	

SAFETY DATA SHEET

Hydrogen Sulfide

Section 1. Identification

GHS product identifier	: Hydrogen Sulfide
Chemical name	: hydrogen sulphide
Other means of identification	: Hydrogen sulfide; Hydrogen sulfide (H2S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide
Product use	: Synthetic/Analytical chemistry.
Synonym	: Hydrogen sulfide; Hydrogen sulfide (H2S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide
SDS #	: 001029
Supplier's details	:

Emergency telephone number (with hours of operation)

Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas ACUTE TOXICITY (inhalation) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 AQUATIC HAZARD (ACUTE) - Category 1

GHS label elements

Hazard pictograms



Signal word

Hazard statements

: **Danger**
: Extremely flammable gas.
May form explosive mixtures with air.
Contains gas under pressure, may explode if heated.
May cause frostbite.
Fatal if inhaled.
Extended exposure to gas reduces the ability to smell sulfides.
May cause respiratory irritation.
Very toxic to aquatic life.

Precautionary statements

Material Sheet Data Safety (MSDS) / Safety Data Sheet (SDS) / Technical Data Sheet (TDS)

HV BRUSHING CEMENT – MATERIAL SAFETY DATA SHEET

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Business name	Elastotec P/L	Telephone	As above or after hours +61 423 200 178
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Product:	Rubber Lining Brushing Cement for Hot Vulcanising
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GHS Label Elements

Signal Word: Danger

Symbol(s):



SAFETY DATA SHEET

Hydrogen Sulfide

Section 1. Identification

GHS product identifier	: Hydrogen Sulfide
Chemical name	: hydrogen sulphide
Other means of identification	: Hydrogen sulfide; Hydrogen sulfide (H ₂ S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide
Product use	: Synthetic/Analytical chemistry.
Synonym	: Hydrogen sulfide; Hydrogen sulfide (H ₂ S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide
SDS #	: 001029
Supplier's details	:

Emergency telephone number (with hours of operation) :

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GHS label elements

Hazard pictograms :



Signal word :

Hazard statements :

- : Danger
- : Extremely flammable gas.
- : May form explosive mixtures with air.
- : Contains gas under pressure; may explode if heated.
- : May cause frostbite.
- : Fatal if inhaled.
- : Extended exposure to gas reduces the ability to smell sulfides.
- : May cause respiratory irritation.
- : Very toxic to aquatic life.

Precautionary statements

Symbol Bahan Kimia

Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	Flame  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	Exclamation Mark  • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non Mandatory)
Gas Cylinder  • Gases under Pressure	Corrosion  • Skin Corrosion/ burns • Eye Damage • Corrosive to Metals	Exploding Bomb  • Explosives • Self-<u>Reactives</u> • Organic Peroxides
Flame over Circle  • Oxidizers	Environment *(Non Mandatory)  • Aquatic Toxicity	Skull and Crossbones  • Acute Toxicity (fatal or toxic)

Symbol Bahan Kimia



Symbol Bahan Kimia



Mudah meledak



Zat pengoksidasi



Mudah terbakar



Toksik/ beracun



Bahaya iritasi



Korosif



Bahaya berbahaya
bagi lingkungan



Bahaya radioaktif



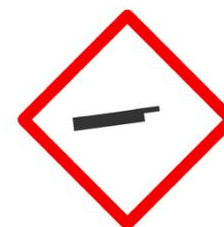
Bahaya biologi



Karsinogenik
teratogenik
dan mutagenik



Peringatan
bahaya



Gas bertekanan

Symbol Bahan Kimia



Dangerous
when wet



Oxidizing agent



Organic peroxide



Toxic



Infectious
substance



Radioactive



Radioactive



Radioactive



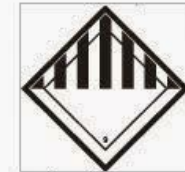
Radioactive



Corrosive



Marine pollutant



Miscellaneous



Explosive



Explosive



Flammable gas



Non-flammable
compressed gas



Toxic gas



Flammable liquid



Flammable solid



Spontaneously
combustible



Dangerous
when wet



Oxidizing agent



Organic peroxide



Toxic

Pengelolaan Bahan Kimia

Langkah-Langkah Pengelolaan Bahan Kimia



Penyusunan



Label dan



Pemisahan

Bahan kimia harus disusun dan ditempatkan sesuai dengan jenisnya untuk memudahkan identifikasi dan mengurangi resiko percampuran yang tidak diinginkan

Penyusunan Bahan Kimia

KELOMPOK PENYIMPANAN

Simpan bahan kimia di perangkat pengaman dan lemari sekunder yang terpisah
Temukan Informasi Kelompok Penyimpanan di Chemtracker
<http://chemtracker.stanford.edu/chemicalsafety>

- A** Basa Organik yang Sesuai
- B** Bahan Piroforik dan Reaktif Air yang Sesuai
- C** Basa Anorganik yang Sesuai
- D** Asam Organik yang Sesuai
- E** Pengoksidasi yang Sesuai, Termasuk Peroksida
- F** Asam Anorganik yang Sesuai tidak Termasuk Pengoksidasi atau Bahan Mudah Menyala
- G** Tidak Intrinsik Reaktif atau Mudah Terbakar atau Mudah Menyala
- J*** Gas Mampat yang Beracun
- K*** Bahan Peledak atau Bahan yang Sangat Tidak Stabil Lainnya yang Sesuai
- L** Bahan Mudah Terbakar dan Mudah Menyala Non-reaktif, Termasuk Pelarut
- X*** Tidak sesuai dengan SEMUA Kelompok Penyimpanan Lain

Kelompok Penyimpanan J, K dan X: Hubungi EH&S @3-C448
Untuk penyimpanan spesifik – baca MSD pabrikan

Jika ruang tidak memungkinkan sehingga Kelompok Penyimpanan tidak disimpan di lemari terpisah, skema berikut ini dapat digunakan dengan kewaspadaan ekstra untuk memberikan kondisi yang stabil, tidak ramal, dan dipantau secara cermat.



Kelompok Penyimpanan X harus dipisahkan dari bahan kimia lain



Kelompok Penyimpanan B tidak sesuai dengan kelompok penyimpanan lain



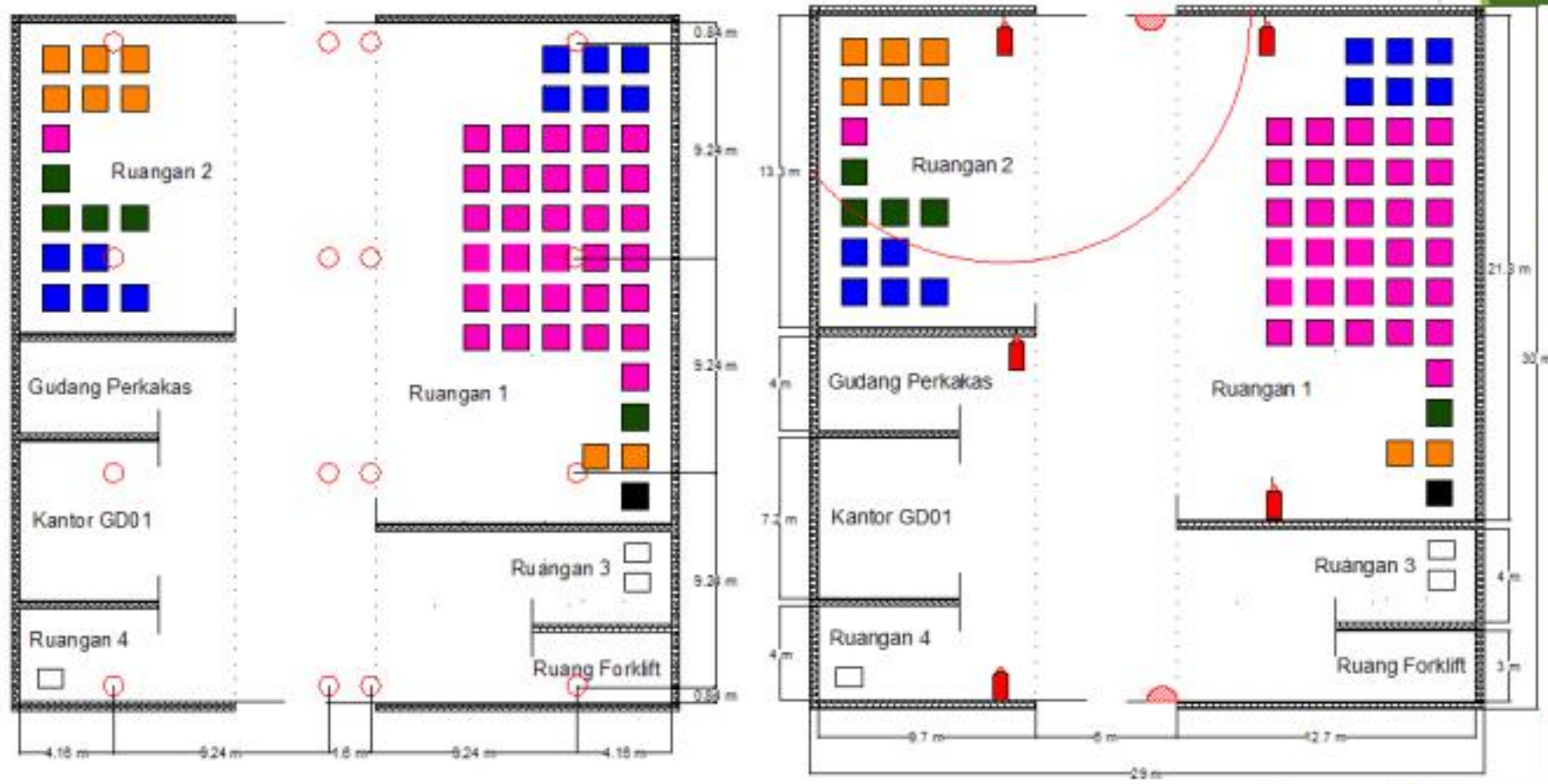
Kategori Penyimpanan Bahan Kimia

Penyusunan Bahan Kimia

Daftar Kelompok Bahan Kimia

<u>Klas</u>	<u>Kelompok</u>
1	Bahan mudah atau mudah terbakar tetapi tidak amat toksik, dapat dioksidasi, asal semuanya kompatibel dengan air
2	Seperti klas 1, tetapi tidak kompatibel dengan air
3	Zat oksidator, tidak mudah terbakar, tidak amat beracun, tetapi kompatibel dengan air
4	Seperti klas 3, tetapi tidak kompatibel dengan air
5	Sensitif terhadap udara, tidak amat beracun/beracun
6	Zat beracun yang memerlukan penyimpanan pada suhu dingin
7	Gas bertekanan atau silinder gas lain. Dipisahkan dalam empat jenis: oksidator, reduktor, korosif dan amat beracun. Dipisahkan pula silinder yang kosong dan silinder yang berisi.

Penyusunan Bahan Kimia



Contoh Tata Ruang Penyimpanan Bahan Kimia pada Manufaktur Alutsista

Source: Hajaningsih, E. I. K (2018, December). *Conference on Safety Engineering and Its Application*

Langkah-Langkah Pengelolaan Bahan Kimia



Penyusunan



Label dan



Pemisahan

Setiap wadah bahan kimia harus dilengkapi dengan label yang jelas berisi informasi tentang nama bahan, sifat, dan bahaya yang terkandung

Label dan Identifikasi

Epichlorohydrin

Epichlorohydrin
1-Chloro-2, 3-epoxypropane
CAS No. 106-89-8
UN No. 2023



DANGER

- Flammable liquid
- Toxic if contact with skin
- Fatal if inhaled
- May cause genetic defects
- May cause cancer
- Cause severe skin burns
- May cause an allergic skin reaction
- Cause eye damage

Precautions:

Avoid exposure – obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately.

Supplier: SATO Asia Pacific Pte. Ltd. Sales: (65) 6271 5300 Fax: (65) 6273 6011
Address: 11 Ubi Road 1, Meiban Industrial Building, #03-01, Singapore 408723

For more information, please refer to SDS

Label dan Identifikasi



Langkah-Langkah Pengelolaan Bahan Kimia



Penyusunan



Label dan



Pemisahan

Bahan kimia yang tidak kompatibel harus disimpan terpisah untuk mencegah reaksi yang berbahaya

Langkah-Langkah Pengelolaan Bahan Kimia

Daftar Bahan Inkompatibel

Bahan	Inkompatibel dengan :
Amonium nitrat	Asam klorat, asam nitrat, pelarut organik, mudah terbakar dan bubuk logam.
Asam asetat	Asam kromat, asam nitrat, perklorat, peroksida dan permanganat
Karbon aktif	Bahan oksidator seperti klorat, perklorat dan hipoklorit
Asam kromat	Asam asetat, gliserin, alkohol dan bahan organik mudah terbakar
Cairan mudah terbakar	Amonium nitrat, asam kromat, hidrogen peroksida dan asam nitrat
Hidrokarbon	Fluor, klor, asam kromat dan peroksida
Kalium permanganat	Gliserin, etilen, glikol dan asam sulfat
Asam sulfat	Klorat, perklorat, permanganat dan air
Amonia	Klor, brom dan yodium, kalsium hipoklorit dan air raksa
Natrium nitrat atau nitrit	Amonium nitrat
Oksigen	Lemak, minyak, hidrogen dan bahan mudah terbakar

Langkah-Langkah Pengelolaan Bahan Kimia

Daftar Bahan Campuran Penghasil Gas Beracun

<u>Senyawa A</u>	<u>Senyawa B</u>	<u>Produk gas beracun</u>
<u>Sianida</u>	<u>Asam</u>	<u>Asam sianida</u>
<u>Sulfida</u>	<u>Asam</u>	<u>Hidrogen sulfida</u>
<u>Hipoklorit</u>	<u>Asam</u>	<u>Klor, asam hipoklorit</u>
<u>Nitrat</u>	<u>Asam sulfat</u>	<u>Nitrogen dioksida</u>
<u>Asam nitrat</u>	<u>Logam</u>	<u>Nitrogen dioksida</u>
<u>Nitrit</u>	<u>Asam</u>	<u>Nitrogen dioksida</u>
<u>Arsenik</u>	<u>Reduktor</u>	<u>Arsen</u>

Prosedur Keselamatan dalam Penanganan Bahan Kimia

Prosedur Keselamatan dalam Penanganan Bahan Kimia

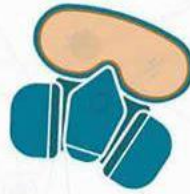
- ▶ There are many ways in which to work with chemicals to reduce the probability of an accident and to reduce the consequences of such an accident to minimal levels. □
□
□
- ▶ Risk minimization depends upon **safe practices, appropriate engineering controls**, the proper use of **Personal Protective** Equipment, the use of the least **quantity of chemicals necessary**, and when possible, the **substitution of less hazardous chemicals**. Essentially, chemical safety is inherently linked to other safety issues. □

Prosedur Keselamatan dalam Penanganan Bahan Kimia

8 ALAT KESELAMATAN KERJA DI LABORATORIUM KIMIA



Lab Coat



Gas Mask



Safety Shoes



Safety Google



Safety Glove



First Aid Kit



Fire Extinguisher



Emergency Exit

Prosedur Keselamatan dalam Penanganan Bahan Kimia

- Patuhi **Manual Prosedur**, **Petunjuk** atau **prosedur kerja**

- **Manual Prosedur** adalah Tahapan kegiatan tertentu yang bertujuan untuk memberi petunjuk bagi personel untuk bekerja melaksanakan suatu proses atau prosedur pada fungsi manajemen (laboratorium / *ware house*)

- **Prosedur Kerja** adalah petunjuk yang detail atau rinci tentang bagaimana suatu proses atau prosedur dilaksanakan



Referensi

- ▶ Undang-undang nomor 1 tahun 1970 tentang keselamatan kerja
- ▶ Undang-undang nomor 13 tahun 2003 tentang ketenagakerjaan
- ▶ Kepmen 187 Tahun 1999 tentang pengendalian bahan kimia
- ▶ Undang-Undang Nomor 32 tahun 2009 Tentang Perlindungan Dan Pengelolaan Lingkungan Hidup
- ▶ PP 101 tahun 2014 tentang Pengelolaan Limbah B3
- ▶ PP 74 tahun 2001 tentang Pengelolaan Bahan Berbahaya Dan Beracun
- ▶ Permen LHK 55 tahun 2015 tentang Uji Karakteristik Limbah B3
- ▶ Permen LH Nomor 3 tahun 2008 tentang Simbol Dan Label_Combine
- ▶ Undang - Undang No 10 tahun 2013 Tentang Konvensi Rotterdam, Prosedur Persetujuan Atas Dasar Informasi Awal Untuk Bahan Kimia Dan Pestisida Berbahaya Tertentu Dalam Perdagangan Internasional