

Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 09/21/2009

1 Identification of substance

· **Product details**

· **Trade name:** *Double Bubble Urethane High Shear Strength D85 Part A (04023)*

· **Manufacturer/Supplier:**
Royal Adhesives And Sealants, LLC
2001 W. Washington Street
South Bend IN 46628-2023

· **Information department:** *Environment protection department.*

· **Emergency information:** *ChemTrec: UNITED STATES 1(800)424-9300 INTERNATIONAL 202-483-7616*

2 Composition/Data on components

· **Chemical characterization**

· **Description:**

Job-Size Double-Bubble® Packages
Urethane Adhesive (Blue-Beige Package)
Mixture of the substances listed below with nonhazardous and Trade Secret addition(s).

· **Dangerous components:**

For Trade Secret information refer to 29 CFR 1910.120.

101-68-8	4,4'-methylenediphenyl diisocyanate	Danger:  3.4.R/1, 3.2/2, 3.3/2A, 3.4.S/1	25-50%
		Warning:  3.1.1/4, 3.8/3	

· **Additional information:** *For the wording of the listed risk phrases refer to section 15.*

3 Hazards identification

· **Hazard description:**

Harmful

· **Information pertaining to particular dangers for man and environment:**

Harmful by inhalation.
Irritating to eyes, respiratory system and skin.
Limited evidence of a carcinogenic effect.
May cause sensitisation by inhalation and skin contact.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.
Contains isocyanates. See information supplied by the manufacturer.

· **Classification system:**

The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 1
Reactivity = 1

· **HMIS-ratings (scale 0 - 4)**

HEALTH	2
FIRE	1
PHYSICAL HAZARD	1

*Health = *2*
Fire = 1
Physical Hazard = 1

(Contd. on page 2)

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 09/21/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part A (04023)

(Contd. of page 1)

- **GHS label elements**

- Health hazard **Danger**

- 3.4/1 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.

- 3.2/2 - Causes skin irritation.

- 3.3/2A - Causes serious eye irritation.

- 3.4/1 - May cause an allergic skin reaction.

- Exclamation mark **Warning**

- 3.1/4 - Harmful if inhaled.

- 3.8/3 - May cause respiratory irritation. May cause drowsiness or dizziness.

- Warning**

- 3.1/5 - May be harmful if swallowed.

- **Prevention:**

- In case of inadequate ventilation wear respiratory protection.

- Avoid breathing dust/fume/gas/mist/vapours/spray.

- **Response:**

- IF IN EYES:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

- Continue rinsing.

- Specific treatment (see on this label).

- **Storage:**

- Store locked up.

- **Disposal:**

- Dispose of contents/container in accordance with local/regional/national/international regulations.

* 4 First aid measures

- **After inhalation:**

- Remove to fresh air. If not breathing, administer artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

- **After eye contact:**

- Rinse opened eye for 15 minutes under running water. If eye becomes irritated, obtain medical treatment.

- **After swallowing:** Seek medical treatment.

* 5 Fire fighting measures

- **Suitable extinguishing agents:**

- Use water fog, dry chemical, foam, Carbon Dioxide.

- Use fire fighting measures that suit the environment.

- **Protective equipment:** Protective clothing and respiratory protective device.

* 6 Accidental release measures

- **Person-related safety precautions:**

- Ensure adequate ventilation

- Wear protective clothing.

- **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.

- **Measures for cleaning/collecting:**

- Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

USA

(Contd. on page 3)

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 09/21/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part A (04023)

(Contd. of page 2)

7 Handling and storage

- **Handling:**
- **Information for safe handling:**
Ensure good ventilation/exhaustion at the workplace.
Use only in well ventilated areas.
- **Information about protection against explosions and fires:**
Product reacts with water. Reaction may produce heat and/or gases.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store in a cool location away from direct heat.
Protect from moisture. Keep packages dry.
- **Information about storage in one common storage facility:** Keep away from open flames and high temperatures.
- **Further information about storage conditions:** Store in a cool place.

8 Exposure controls and personal protection

- **Additional information about design of technical systems:** No further data.

- **Components with limit values that require monitoring at the workplace:**

101-68-8 4,4'-methylenediphenyl diisocyanate (25-50%)

PEL	Short-term value: C 0.2 mg/m ³ , C 0.02 ppm
REL	Short-term value: C 0.2* mg/m ³ , C 0.02* ppm Long-term value: 0.05 mg/m ³ , 0.005 ppm *10-min
TLV	0.051 mg/m ³ , 0.005 ppm

- **Additional information:**
MDI products have poor warning properties, since recognition of an odor is far above the TLV. Observe OSHA regulations for respirator use (29 CFR 1910.134).
The lists that were valid during the creation were used as basis.
- **Personal protective equipment (see listings below)**
- **General protective and hygienic measures:**
The usual precautionary measures for handling chemicals should be followed.
- **Breathing equipment:**
Not necessary if room is well-ventilated.
In the absence of adequate ventilation, use NIOSH-certified respiratory protection when chemical exposure is excessive or above an established exposure limit. Comply with OSHA 29 CFR 1910.134.
- **Protection of hands:**
Protective gloves
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
- **Material of gloves**
Chloroprene rubber, CR
Nitrile rubber, NBR
- **Eye protection:** Safety glasses with side shields.
- **Body protection:** Protective work clothing

USA

(Contd. on page 4)

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 09/21/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part A (04023)

(Contd. of page 3)

9 Physical and chemical properties

· General Information

Form: Liquid
Color: Light yellow
Odor: Characteristic

· Change in condition

Melting point: Undetermined.
Boiling point: Undetermined.

· Flash point: 218°C (424°F)

· Ignition temperature: 520°C (968°F)

· Auto igniting: Product is not selfigniting.

· Danger of explosion: Product does not present an explosion hazard.

· Flammable limits:

Lower: 0.4 Vol %

· Specific gravity at 20°C (68°F): 1.11 g/cm³

· Solubility in / Miscibility with

Water: Insoluble.

· Solvent content:

Organic solvents: 0.0 %
VOC (Per EPA 24) 42.22 GMS/L

Solids content: 100.0 %

10 Stability and reactivity

· Thermal decomposition / conditions to be avoided:

Contact with moisture, other materials that react with isocyanates, or temperatures above 350F (177C), may cause polymerization.

· Materials to be avoided:

Reacts with amines, caustic alkali solutions, alcohols, ammonia, oxidizers, acids, polyols.
 Reacts with water forming carbon dioxide-may rupture sealed containers if contaminated with water.
 May produce violent reactions with bases and numerous organic substances including alcohols and amines.

· Dangerous reactions

MDI reacts slowly with water to form Carbon Dioxide gas. Reaction with water at high temperatures may be more severe. Avoid contact with bases, alcohols and amines.

· Dangerous products of decomposition:

Carbon dioxide, carbon monoxide, oxides of nitrogen, dense black smoke, hydrogen cyanide, isocyanic acid, other undetermined compounds.

11 Toxicological information

· Acute toxicity:

· LD/LC50 values that are relevant for classification:

101-68-8 4,4'-methylenediphenyl diisocyanate

Oral	LD50	2200 mg/kg (mouse)
------	------	--------------------

(Contd. on page 5)

USA

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 09/21/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part A (04023)

(Contd. of page 4)

- **Primary irritant effect:**
- **on the skin:** May irritate the skin.
- **on the eye:** May irritate the eye.
- **Sensitization:**
Inhalation - Sensitization possible through inhalation.
Skin Contact - Sensitization possible through skin contact.
- **Additional toxicological information:**
May cause allergic respiratory reaction. Respiratory sensitization is possible by skin contact. Use skin protection.
Preexisting eye, skin and respiratory disorders may be aggravated by exposure to this product.
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

* 12 Ecological information

- **Additional ecological information:**
- **General notes:**
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

* 13 Disposal considerations

- **Product:**
- **Recommendation:** Disposal must be made according Federal, State and local regulations.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

* 14 Transport information

- **DOT regulations:** non-hazardous via all transport modes.
- **Hazard class:** -

- **Land transport ADR/RID (cross-border):**
- **ADR/RID class:** -
Not Regulated

- **Maritime transport IMDG:**
- **IMDG Class:** -
Not Regulated

- **Air transport ICAO-TI and IATA-DGR:**
- **ICAO/IATA Class:** -
Not Regulated

- **UN "Model Regulation":** -

USA

(Contd. on page 6)

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 09/21/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part A (04023)

(Contd. of page 5)

15 Regulations

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

All ingredients are listed.

· TSCA (Toxic Substances Control Act):

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity:

None of the ingredients is listed.

· (DSL) Canada Domestic Substance List

All components of this product are on the DSL(Canada Domestic Substance list) or are exempt from DSL requirements.

· Cancerogenity categories

· EPA (Environmental Protection Agency)

101-68-8	4,4'-methylenediphenyl diisocyanate	CBD
----------	-------------------------------------	-----

· IARC (International Agency for Research on Cancer)

101-68-8	4,4'-methylenediphenyl diisocyanate	3
----------	-------------------------------------	---

· NTP (National Toxicology Program)

None of the ingredients is listed.

· TLV (Threshold Limit Value established by ACGIH)

None of the ingredients listed.

· MAK (German Maximum Workplace Concentration)

101-68-8	4,4'-methylenediphenyl diisocyanate	4
----------	-------------------------------------	---

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

· OSHA-Ca (Occupational Safety & Health Administration)

None of the ingredients is listed.

· Product related hazard informations:

Observe the general safety regulations when handling chemicals.

The product has been classified and marked in accordance with directives on hazardous materials.

· Hazard-determining components of labelling:

4,4'-methylenediphenyl diisocyanate

· Risk phrases:

Harmful by inhalation.

Irritating to eyes, respiratory system and skin.

Limited evidence of a carcinogenic effect.

May cause sensitisation by inhalation and skin contact.

Harmful: danger of serious damage to health by prolonged exposure through inhalation.

(Contd. on page 7)

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 09/21/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part A (04023)

(Contd. of page 6)

- **Special labeling of certain preparations:**
Contains isocyanates. See information supplied by the manufacturer.
- **National regulations:**
- **Water hazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.

16 Other information

Although the information and recommendations set forth in this MSDS are presented in good faith and are believed to be correct as of the date of this MSDS, Royal Adhesives & Sealants makes no representations as to the completeness or accuracy thereof. Information is supplied on the condition that the persons receiving and using it will make their own determination as to the suitability for their purpose prior to use. In no event will Royal Adhesives & Sealants or any affiliate thereof be responsible for damages of any nature whatsoever resulting from the use or reliance on the information set forth in the MSDS.

- **Department issuing MSDS:** Environment protection department.
- **Abbreviations and acronyms:**
 ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
 RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
 IMDG: International Maritime Code for Dangerous Goods
 DOT: US Department of Transportation
 IATA: International Air Transport Association
 IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
 ICAO: International Civil Aviation Organization
 ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
 GHS: Globally Harmonized System of Classification and Labelling of Chemicals
 ACGIH: American Conference of Governmental Industrial Hygienists
 NFPA: National Fire Protection Association (USA)
 HMIS: Hazardous Materials Identification System (USA)
 LC50: Lethal concentration, 50 percent
 LD50: Lethal dose, 50 percent

USA

Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 10/01/2009

1 Identification of substance

- **Product details**
- **Trade name:** Double Bubble Urethane High Shear Strength D85 Part B (04023)
- **Manufacturer/Supplier:**
Royal Adhesives And Sealants, LLC
2001 W. Washington Street
South Bend IN 46628-2023
- **Information department:** Environment protection department.
- **Emergency information:** ChemTrec: UNITED STATES 1(800)424-9300 INTERNATIONAL 202-483-7616

2 Composition/Data on components

- **Chemical characterization**
- **Description:**
Job-Size Double-Bubble® Packages
Urethane Adhesive (Blue-Beige Package)
Mixture of the substances listed below with nonhazardous and Trade Secret addition(s).

· **Dangerous components:**

1332-58-7	Kaolin	10-25%
-----------	--------	--------

- **Additional information:** For the wording of the listed risk phrases refer to section 15.

3 Hazards identification

- **Hazard description:** Not applicable.
- **Information pertaining to particular dangers for man and environment:**
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU/US" in the latest valid version.
- **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.
- **NFPA ratings (scale 0 - 4)**



- **HMIS-ratings (scale 0 - 4)**

HEALTH	1	Health = 1
FIRE	1	Fire = 1
PHYSICAL HAZARD	0	Physical Hazard = 0

- **GHS label elements** Void

4 First aid measures

- **After inhalation:**
Remove to fresh air. If not breathing, administer artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

(Contd. on page 2)

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 10/01/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part B (04023)

(Contd. of page 1)

- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:**
Rinse opened eye for 15 minutes under running water. If eye becomes irritated, obtain medical treatment.
- **After swallowing:** Seek medical treatment.

* 5 Fire fighting measures

- **Suitable extinguishing agents:**
Use water fog, dry chemical, foam, Carbon Dioxide.
Use fire fighting measures that suit the environment.
- **Protective equipment:** Protective clothing and respiratory protective device.

* 6 Accidental release measures

- **Person-related safety precautions:**
Ensure adequate ventilation
Wear protective clothing.
- **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
- **Measures for cleaning/collecting:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

* 7 Handling and storage

- **Handling:**
- **Information for safe handling:**
Ensure good ventilation/exhaustion at the workplace.
Use only in well ventilated areas.
- **Information about protection against explosions and fires:** No special measures required.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store in a cool location away from direct heat.
Protect from moisture. Keep packages dry.
- **Information about storage in one common storage facility:** Keep away from open flames and high temperatures.
- **Further information about storage conditions:** Store in a cool place.

* 8 Exposure controls and personal protection

- **Additional information about design of technical systems:** No further data.
- **Components with limit values that require monitoring at the workplace:**

1332-58-7 Kaolin (10-25%)

PEL	15* 5** mg/m ³ *total dust **respirable fraction
REL	10* 5** mg/m ³ *total dust **respirable fraction
TLV	2* mg/m ³ E; as respirable fraction

- **Additional information:** The lists that were valid during the creation were used as basis.

(Contd. on page 3)

USA

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 10/01/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part B (04023)

(Contd. of page 2)

- **Personal protective equipment (see listings below)**
- **General protective and hygienic measures:**
The usual precautionary measures for handling chemicals should be followed.
- **Breathing equipment:**
Not necessary if room is well-ventilated.
In the absence of adequate ventilation, use NIOSH-certified respiratory protection when chemical exposure is excessive or above an established exposure limit. Comply with OSHA 29 CFR 1910.134.
- **Protection of hands:**
Protective gloves
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
- **Material of gloves**
Nitrile rubber, NBR
Chloroprene rubber, CR
- **Eye protection:** Safety glasses with side shields.
- **Body protection:** Protective work clothing

* 9 Physical and chemical properties

· General Information

Form:	Liquid
Color:	Off White
Odor:	Characteristic

· Change in condition

Melting point:	Undetermined.
Boiling point:	Undetermined.

· **Flash point:** > 96°C (> 205°F)

· **Auto igniting:** Product is not selfigniting.

· **Danger of explosion:** Product does not present an explosion hazard.

· **Specific gravity at 20°C (68°F):** 1.47 g/cm³

· Solubility in / Miscibility with

Water: Not miscible or difficult to mix.

· Solvent content:

Organic solvents:	0.0 %
VOC (Per EPA 24)	61.04 GMS/L

Solids content: 100.0 %

* 10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Materials to be avoided:**
- **Dangerous reactions** Strong oxidizing agents.
- **Dangerous products of decomposition:** Carbon monoxide and carbon dioxide

USA

(Contd. on page 4)

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 10/01/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part B (04023)

(Contd. of page 3)

11 Toxicological information

- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** May irritate the skin.
- **on the eye:** May irritate the eye.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**
The product is not subject to classification according to internally approved calculation methods for preparations:

12 Ecological information

- **Additional ecological information:**
- **General notes:** Water hazard class 1 (Self-assessment): slightly hazardous for water

13 Disposal considerations

- **Product:**
- **Recommendation:** Disposal must be made according Federal, State and local regulations.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- **DOT regulations:** Non-Regulated
- **Hazard class:** -
- **Land transport ADR/RID (cross-border):**
- **ADR/RID class:** -
Not Regulated
- **Maritime transport IMDG:**
- **IMDG Class:** -
Not Regulated
- **Air transport ICAO-TI and IATA-DGR:**
- **ICAO/IATA Class:** -
Not Regulated
- **UN "Model Regulation":** -

15 Regulations

- **Sara**
- **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.
- **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.

(Contd. on page 5)

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 10/01/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part B (04023)

(Contd. of page 4)

· **TSCA (Toxic Substances Control Act):**

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

· **Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity:**

None of the ingredients is listed.

· **(DSL) Canada Domestic Substance List**

All components of this product are on the DSL (Canada Domestic Substance list) or are exempt from DSL requirements.

· **Carcinogenicity categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

· **IARC (International Agency for Research on Cancer)**

None of the ingredients listed.

· **NTP (National Toxicology Program)**

None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**

1332-58-7 Kaolin

A4

· **MAK (German Maximum Workplace Concentration)**

None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

· **Product related hazard informations:**

Observe the general safety regulations when handling chemicals.

The product is not subject to identification regulations according to directives on hazardous materials.

· **National regulations:**

· **Water hazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.

16 Other information

Although the information and recommendations set forth in this MSDS are presented in good faith and are believed to be correct as of the date of this MSDS, Royal Adhesives & Sealants makes no representations as to the completeness or accuracy thereof. Information is supplied on the condition that the persons receiving and using it will make their own determination as to the suitability for their purpose prior to use. In no event will Royal Adhesives & Sealants or any affiliate thereof be responsible for damages of any nature whatsoever resulting from the use or reliance on the information set forth in the MSDS.

· **Department issuing MSDS:** Environment protection department.

· **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

(Contd. on page 6)

USA

Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing Date 03/31/2010

Revision Number 1

Reviewed on 10/01/2009

Trade name: Double Bubble Urethane High Shear Strength D85 Part B (04023)

(Contd. of page 5)

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

USA