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**NOAL 0067A** 

Country: SE / Language: EN

# Hydrogen

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

: Hydrogen, Alphagaz 1 Hydrogen, Alphagaz 2 Hydrogen, Hydrogen N50, Hydrogen N56, Trade name

Hydrogen N35, Hydrogen N25 Tubetrailer

SDS no : NOAL\_0067A Other means of identification : Hydrogen

> CAS-No. : 1333-74-0 EC-No. : 215-605-7 EC Index-No. : 001-001-00-9

**REACH** registration No : Listed in Annex IV / V REACH, exempted from registration.

Chemical formula

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : Industrial and professional uses. Perform risk assessment prior to use.

Test gas/Calibration gas.

Laboratory use.

Chemical reaction / Synthesis.

Use as a fuel.

Shield gas for welding processes.

Use for manufacture of electronic/photovoltaic components.

Contact supplier for more information on uses.

Uses advised against : Do not inflate in party balloons because of the risk of explosion.

Consumer use.

Uses other than those listed above are not supported, contact your supplier for more

information on other uses.

### 1.3. Details of the supplier of the safety data sheet

### Company identification

Supplier

AIR LIQUIDE GAS AB Pulpetgatan 20 215 37 Malmö - SWEDEN T +46 40 38 10 00

info.sweden@airliquide.com

E-Mail address (competent person) : eunordic-sds@airliquide.com

### 1.4. Emergency telephone number

Emergency telephone number

Availability (24 / 7)

| Country | Organisation/Company   | Address                              | Emergency number    | Comment |
|---------|--|--------------------------------------|---------------------|---------|
| Germany | Giftnotruf Erfurt<br>Gemeinsames Giftinformationszentrum<br>der Länder Mecklenburg-Vorpommern,<br>Sachsen, Sachsen-Anhalt und Thüringen,<br>c/o HELIOS Klinikum Erfurt | Nordhäuser Straße 74<br>99089 Erfurt | +49 (0) 361 730 730 |         |



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### **SECTION 2: Hazards identification**

### 2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards Flammable gases, Category 1A H220

Gases under pressure : Compressed gas H280

#### 2.2. Label elements

Signal word (CLP)

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :





GHS02

: Danger

Hazard statements (CLP) : H220 - Extremely flammable gas.

H280 - Contains gas under pressure; may explode if heated.

Precautionary statements (CLP)

- Prevention : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.

No smoking.

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.

No smoking.

- Response : P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 - In case of leakage, eliminate all ignition sources. P381 - In case of leakage, eliminate all ignition sources.

- Storage : P403 - Store in a well-ventilated place.

P410+P403 - Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

None.

Not classified as PBT or vPvB.

The substance/mixture has no endocrine disrupting properties.

### **SECTION 3: Composition/information on ingredients**

### 3.1. Substances

| Name     | Product identifier   | Composition [V-%]: | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|----------|--|--------------------|---|
| Hydrogen | CAS-No.: 1333-74-0<br>EC-No.: 215-605-7<br>EC Index-No.: 001-001-00-9<br>REACH registration No: *1 | 100                | Flam. Gas 1A, H220<br>Press. Gas (Comp.), H280                  |

Contains no other components or impurities which will influence the classification of the product.

<sup>\*1:</sup> Listed in Annex IV / V REACH, exempted from registration.

<sup>\*3:</sup> Registration not required: Substance manufactured or imported < 1t/y.



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3.2. Mixtures Not established.

### **SECTION 4: First aid measures**

#### 4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep

victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing

stopped.

Skin contact
 Eye contact
 Adverse effects not expected from this product.
 Adverse effects not expected from this product.

- Ingestion : Ingestion is not considered a potential route of exposure.

#### 4.2. Most important symptoms and effects, both acute and delayed

See section 11.

### 4.3. Indication of any immediate medical attention and special treatment needed

None.

### **SECTION 5: Firefighting measures**

#### 5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.

Dry powder.

- Unsuitable extinguishing media : Carbon dioxide.

Do not use water jet to extinguish.

### 5.2. Special hazards arising from the substance or mixture

Specific hazards : Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products : None.

5.3. Advice for firefighters

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat

radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering

sewers and drainage systems. If possible, stop flow of product.

Use water spray or fog to knock down fire fumes if possible.

Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive

re-ignition may occur. Extinguish any other fire.

Move containers away from the fire area if this can be done without risk.

Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus.

Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire

fighters.

Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full

face mask.

Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves

for firefighters.

### **SECTION 6: Accidental release measures**

### 6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Act in accordance with local emergency plan.

Stay upwind.

See section 8 of the SDS for more information on personal protective equipment

For emergency responders : See section 5.3 of the SDS for more information.

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#### 6.2. Environmental precautions

Try to stop release.

#### 6.3. Methods and material for containment and cleaning up

Ventilate area.

#### 6.4. Reference to other sections

See also sections 8 and 13.

### **SECTION 7: Handling and storage**

### 7.1. Precautions for safe handling

Safe use of the product

: Do not breathe gas.

Avoid release of product into atmosphere.

The product must be handled in accordance with good industrial hygiene and safety procedures.

Only experienced and properly instructed persons should handle gases under pressure.

Consider pressure relief device(s) in gas installations.

Ensure the complete gas system was (or is regularily) checked for leaks before use.

Do not smoke while handling product.

Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.

Avoid suck back of water, acid and alkalis.

Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment.

Purge air from system before introducing gas.

Take precautionary measures against static discharge.

Keep away from ignition sources (including static discharges).

Consider the use of only non-sparking tools.

Ensure equipment is adequately earthed.

: Refer to supplier's container handling instructions.

Do not allow backfeed into the container.

Protect containers from physical damage; do not drag, roll, slide or drop.

When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.

Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.

If user experiences any difficulty operating valve discontinue use and contact supplier.

Never attempt to repair or modify container valves or safety relief devices.

Damaged valves should be reported immediately to the supplier.

Keep container valve outlets clean and free from contaminants particularly oil and water.

Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.

Close container valve after each use and when empty, even if still connected to equipment.

Never attempt to transfer gases from one cylinder/container to another.

Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the content

of the container.

Suck back of water into the container must be prevented.

Open valve slowly to avoid pressure shock.

Safe handling of the gas receptacle



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7.2. Conditions for safe storage, including any incompatibilities

Observe all regulations and local requirements regarding storage of containers.

Containers should not be stored in conditions likely to encourage corrosion.

Container valve guards or caps should be in place.

Containers should be stored in the vertical position and properly secured to prevent them

from falling over.

Stored containers should be periodically checked for general condition and leakage.

Keep container below 50°C in a well ventilated place.

Store containers in location free from fire risk and away from sources of heat and ignition.

Keep away from combustible materials.

Segregate from oxidant gases and other oxidants in store.

All electrical equipment in the storage areas should be compatible with the risk of a

potentially explosive atmosphere.

7.3. Specific end use(s)

None.

### SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

OEL (Occupational Exposure Limits) : None available.

DNEL (Derived-No Effect Level) : None available.

PNEC (Predicted No-Effect Concentration) : None available.

### 8.2. Exposure controls

### 8.2.1. Appropriate engineering controls

Provide adequate general and local exhaust ventilation.

Product to be handled in a closed system.

Systems under pressure should be regularily checked for leakages.

Gas detectors should be used when flammable gases/vapours may be released.

Consider the use of a work permit system e.g. for maintenance activities.

### 8.2.2. Individual protection measures, e.g. personal protective equipment

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.

The following recommendations should be considered:

PPE compliant to the recommended EN/ISO standards should be selected.

• Eye/face protection Wear safety glasses with side shields.

Standard EN 166 - Personal eye-protection - specifications.

Skin protection

- Other

- Hand protection : Wear working gloves when handling gas containers.

Standard EN 388 - Protective gloves against mechanical risk, performance level 1 or higher.

: Consider the use of flame resistant anti-static safety clothing.
Standard EN ISO 14116 - Limited flame spread materials.

Standard EN 1149-5 - Protective clothing: Electrostatic properties.

Wear safety shoes while handling containers.

Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

Respiratory protection
 Self contained breathing apparatus is recommended, where unknown exposure may be

expected, e.g. during maintenance activities on installation systems.

None necessary.

• Thermal hazards : None in addition to the above sections.

### 8.2.3. Environmental exposure controls

Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

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### **SECTION 9: Physical and chemical properties**

### 9.1. Information on basic physical and chemical properties

Appearance

- Physical state at 20°C / 101.3kPa
- Colour
: Gas
: Colourless
Odourless

Odour threshold is subjective and inadequate to warn of overexposure.

pH : Not applicable for gases and gas mixtures.

Melting point / Freezing point

-259 °C -259 °C

Boiling point : -253 °C

Flash point : Not applicable for gases and gas mixtures.

Flammability : Extremely flammable gas

Explosive limits : 4 – 77 vol %

Lower explosion limit : Not available

Upper explosion limit : Not available

Vapour pressure [20°C] : Not applicable.

Vapour pressure [50°C] : Not applicable.

Density : Not applicable

Vapour density : Not applicable for gases and gas mixtures.

Relative density, liquid (water=1) : 0.07
Relative density, gas (air=1) : 0.07
Water solubility : 1.6 mg/l

Partition coefficient n-octanol/water (Log Kow) : Not applicable for inorganic products.

Auto-ignition temperature : 560 °C

Decomposition temperature : Not applicable.

Viscosity, kinematic : No reliable data available.

Particle characteristics : Not applicable for gases and gas mixtures.

### 9.2. Other information

### 9.2.1. Information with regard to physical hazard classes

Explosive properties : Not applicable.

Oxidising properties : Not applicable.

Tci : 5.5 %

Critical temperature [°C] : -240 °C

9.2.2. Other safety characteristics

Molar mass : 2 g/mol

Evaporation rate : Not applicable for gases and gas mixtures.

Gas group : Compressed gas

Other data : Burns with an invisible flame.

### **SECTION 10: Stability and reactivity**

### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None.

Can form explosive mixture with air. May react violently with oxidants.



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Reactivity

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10.4. Conditions to avoid

This mixture contains components with the following reactivity: Can form explosive mixture with air. May react violently with oxidants.

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No

smoking.

Avoid moisture in installation systems.

10.5. Incompatible materials

Air, Oxidisers.

For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not

be produced.

### **SECTION 11: Toxicological information**

### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity : No known toxicological effects from this product.

: No known effects from this product. Skin corrosion/irritation : No known effects from this product. Serious eye damage/irritation No known effects from this product. Respiratory or skin sensitisation : No known effects from this product. Germ cell mutagenicity No known effects from this product. Carcinogenicity : No known effects from this product. Toxic for reproduction: Fertility : No known effects from this product. Toxic for reproduction: unborn child : No known effects from this product. STOT-single exposure No known effects from this product. STOT-repeated exposure

Aspiration hazard : Not applicable for gases and gas mixtures.

11.2. Information on other hazards

Other information : The substance/mixture has no endocrine disrupting properties.

### **SECTION 12: Ecological information**

### 12.1. Toxicity

Assessment : No ecological damage caused by this product.

EC50 48h - Daphnia magna [mg/l] : No data available.

EC50 72h - Algae [mg/l] : No data available.

LC50 96 h - Fish [mg/l] : No data available.

12.2. Persistence and degradability

Assessment : No ecological damage caused by this product.

12.3. Bioaccumulative potential

Assessment : No data available.

12.4. Mobility in soil

Assessment : Because of its high volatility, the product is unlikely to cause ground or water pollution.

Partition into soil is unlikely.



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12.5. Results of PBT and vPvB assessment

Assessment : No data available.

Not classified as PBT or vPvB.

12.6. Endocrine disrupting properties

The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

Other adverse effects : No known effects from this product.

Effect on the ozone layer : None Global warming potential [CO2=1] : 6

Effect on global warming : Contains greenhouse gas(es).

When discharged in large quantities may contribute to the greenhouse effect.

### **SECTION 13: Disposal considerations**

### 13.1. Waste treatment methods

Contact supplier if guidance is required.

Do not discharge into areas where there is a risk of forming an explosive mixture with air.

Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not

exceeded.

Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at

http://www.eiga.org for more guidance on suitable disposal methods.

Return unused product in original container to supplier.

List of hazardous waste codes (from Commission

Decision 2000/532/EC as amended)

16 05 04 \*: Gases in pressure containers (including halons) containing hazardous

substances.

### 13.2. Additional information

External treatment and disposal of waste should comply with applicable local and/or national regulations.

### **SECTION 14: Transport information**

### 14.1. UN number or ID number

In accordance with ADR / RID / IMDG / IATA / ADN

UN-No. : 1049

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : HYDROGEN, COMPRESSED

Transport by air (ICAO-TI / IATA-DGR) : Hydrogen, compressed

Transport by sea (IMDG) : HYDROGEN, COMPRESSED

14.3. Transport hazard class(es)

Labelling

2.1: Flammable gases.

Transport by road/rail (ADR/RID)

Class : 2 Classification code : 1F Hazard identification number : 23



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Tunnel Restriction

B/D - Tank carriage: Passage forbidden through tunnels of category B, C, D and E. Other carriage: Passage forbidden through tunnels of category D and E

Transport by air (ICAO-TI / IATA-DGR)

Class / Div. (Sub. risk(s)) : 2.1

Transport by sea (IMDG)

Class / Div. (Sub. risk(s)) : 2.1
Emergency Schedule (EmS) - Fire : F-D
Emergency Schedule (EmS) - Spillage : S-U

14.4. Packing group

Transport by road/rail (ADR/RID) : Not established.

Transport by air (ICAO-TI / IATA-DGR) : Not established.

Transport by sea (IMDG) : Not established.

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : None.
Transport by air (ICAO-TI / IATA-DGR) : None.
Transport by sea (IMDG) : None.

### 14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail (ADR/RID) : P200

Transport by air (ICAO-TI / IATA-DGR)

Passenger and Cargo Aircraft : Forbidden.
Cargo Aircraft only : 200.
Transport by sea (IMDG) : P200

Special transport precautions

: Avoid transport on vehicles where the load space is not separated from the driver's

compartment.

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in

the event of an accident or an emergency.
Before transporting product containers:
- Ensure there is adequate ventilation.
- Ensure that containers are firmly secured.
- Ensure valve is closed and not leaking.

- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.

- Ensure valve protection device (where provided) is correctly fitted.

### 14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

### **SECTION 15: Regulatory information**

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

### **EU-Regulations**

Restrictions on use : None.

National legislation : Ensure all national/local regulations are observed.

Seveso Directive : 2012/18/EU (Seveso III) : Listed.

Covered.

### National regulations

Ensure all national/local regulations are observed.

Germany

Water hazard class (WGK) : WGK nwg, Non-hazardous to water (Classification according to AwSV)

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National Rules and Recommendations

[German regulations] BetriebssicherheitsV mit TRBSen insbesondere TRBS 3145 / TRGS 725 Ortsbewegliche Druckgasbehälter", TRBS 2141, BGRegel 500 Teil 2.33: "Umgang mit Gasen", GefahrstoffV mit Technischen Regeln Gefährliche Stoffe TRGS insbesondere TRGS 407 "Tätigkeiten mit Gasen - Gefährdungsbeurteilung", TRGS 400, 500, 510, 900." BGR 104, TRBS 2152.

#### Netherlands

SZW-lijst van kankerverwekkende stoffen

SZW-lijst van mutagene stoffen SZW-lijst van reprotoxische stoffen – Borstvoeding

SZW-lijst van reprotoxische stoffen -

Vruchtbaarheid

SZW-lijst van reprotoxische stoffen - Ontwikkeling

Denmark

**Danish National Regulations** 

The substance is not listed The substance is not listed : The substance is not listed

The substance is not listed

The substance is not listed

: Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

### **SECTION 16: Other information**

Indication of changes

: Safety data sheet in accordance with commission regulation (EU) No 2020/878.

| Section | Changed item | Change | Comments   |
|---------|--------------|--------|--|
| 1.3     | Company      |        | Version 7.0. New address in Sweden. (This change only applies to the Swedish (SE) version of this SDS) |

Abbreviations and acronyms

: ATE - Acute Toxicity Estimate

CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008

REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation

(EC) No 1907/2006

EINECS - European Inventory of Existing Commercial Chemical Substances

CAS# - Chemical Abstract Service number

PPE - Personal Protection Equipment

LC50 - Lethal Concentration to 50 % of a test population

RMM - Risk Management Measures

PBT - Persistent, Bioaccumulative and Toxic

vPvB - Very Persistent and Very Bioaccumulative

STOT- SE: Specific Target Organ Toxicity - Single Exposure

CSA - Chemical Safety Assessment

EN - European Standard

**UN - United Nations** 

ADR - European Agreement concerning the International Carriage of Dangerous Goods by

Road

IATA - International Air Transport Association

IMDG code - International Maritime Dangerous Goods

RID - Regulations concerning the International Carriage of Dangerous Goods by Rail

WGK - Water Hazard Class

STOT - RE: Specific Target Organ Toxicity - Repeated Exposure

UFI: Unique Formula Identifier

: Ensure operators understand the flammability hazard.

Classification in accordance with the procedures and calculation methods of Regulation

(EC) 1272/2008 (CLP).

Key literature references and sources of data are maintained in EIGA doc 169: 'Classification and Labelling Guide', downloadable at http://www.Eiga.eu .

Further information

Training advice

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## Hydrogen NOAL\_0067A

| Full text of H- and EUH-statements |   |  |
|------------------------------------|---|--|
| Flam. Gas 1A                       | Flammable gases, Category 1A                        |  |
| H220                               | Extremely flammable gas.                            |  |
| H280                               | Contains gas under pressure; may explode if heated. |  |
| Press. Gas (Comp.)                 | Gases under pressure : Compressed gas               |  |

DISCLAIMER OF LIABILITY

 Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
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 Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

**End of document**