

Hydrogen (H₂, R-702)

CAS: 1333-74-0

EC: 215-605-7

UN: 1049 (Compressed); 1966 (Refrigerated liquid)

Hydrogen Baseline 5.0

| | | | | |
|--------------------------|------------------|------------------|----------|--------------------|
| Purity (%) | 99,999 | | | |
| Impurities (ppm) | O ₂ 2 | N ₂ 5 | CnHm 0,5 | H ₂ O 3 |
| Typical Filling Pressure | 20°C: 200 bar(a) | | | |

Characteristics

- Flammable
- Odourless and colourless gas.

Health Risks

- Asphyxiant at high concentrations. Binds itself to the haemoglobin in the blood. A headache is usually the first shown symptom.

Transport

ADR Class 2, 1 F



DOT Class 2,1



| Product Description | Size (kg) | Grade | Material Number | Valve Connection | Recommended Regulator |
|-----------------------|-----------|------------------|-----------------|------------------|-----------------------|
| Hydrogen Baseline 5.0 | 0,74 | Instrument Grade | 510203-SH-C | 5/8" BSP LH Int | W019120 or W019220 |
| Hydrogen Baseline MCP | 11,1 | Instrument Grade | 510203-MH-C | 5/8" BSP LH Int | W019120 or W019220 |
| Hydrogen N4.8 | 0,74 | Process Grade | 510101-SH-C | 5/8" BSP LH Int | W019120 or W019220 |
| Hydrogen MCP N4.8 | 11,1 | Process Grade | 510101-MH-C | 5/8" BSP LH Int | W019120 or W019220 |

Physical Data

| | |
|---|------------|
| Molecular Weight | 2,016 |
| Boiling Point at 1,013 bar [°C] | -252,76 |
| Density at 1,013 bar, 20°C [kg/m ³] | 0,084 |
| Vapour Pressure at 0°C [bar] | - |
| Vapour Pressure at 20°C [bar] | - |
| Flammability Range in Air [% volume] | 4,0 - 74,5 |
| Specific Volume at 1,013 bar, 20°C [m ³ /kg] | 11,90 |

Material Compatibility

| | | | | | | | | | | | | | | |
|-----------|------|-------|--------|-------|--------|-----|-------|----------|-------|-----------|-----|-------|--------|-------|
| Aluminium | Buna | Butyl | Carbon | steel | Copper | Kel | Monel | Neoprene | Nylon | Polythene | PVC | steel | Teflon | Viton |
| ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Legend: ● Good | Fair ■ Avoid

Source

Other sources are electrolysis plants, where the hydrogen

- Hydrogen is most frequently produced for on-site usage by steam reforming of natural gas. Such plants may also be used as sources of hydrogen for the merchant market.

is a by-product of chlorine production, and various waste gas recovery plants, such as at oil refineries or steel plants (coke oven gas). Hydrogen is also produced by electrolysis of water.

Applications

- High purity hydrogen finds widespread usage in the electronics industry as a reducing agent and as a carrier gas.
- High purity hydrogen is used as a carrier gas in gas chromatography.
- Hydrogen finds some usage in the welding and cutting of metals.
- Hydrogen is used in large quantities, (bulk supply or on-site generation) for the hydrogenation of vegetable and animal oils to produce margarine and other fats, hydrotreatment of petroleum products and hydrosulphuration of fuels in order to eliminate sulphur.
- Hydrogen in large quantities is used in petrochemical processes that include hydrodealkylation, hydro-desulphurisation and hydrotreatment.
- Hydrogen is used in leak testing applications.
- Hydrogen is used extensively in the metals industries because of its ability to reduce metal oxides and prevent oxidation of metals during heat treatment. It may be used either pure, as is often the case when heat treating stainless steel, or in a mixture with inert gases, argon or nitrogen. It is used in the production of carbon steels, special metals and semiconductors.
- Hydrogen is used for combustion;
 - In industry, it is used to supply oxygen-hydrogen torches for glass working (quartz, Pyrex®, etc.), in the fabrication of artificial precious stones (ruby, etc.) and for underwater oxy-cutting
 - In the laboratory, it is used in analyser flames, reducing flame photometry detection instruments, flame ionisation detection instruments and fuel cells.
- Extremely pure hydrogen is used in the chemical industry for fine reduction processes.
- Liquefied hydrogen is used as a rocket fuel. In the laboratory, liquid hydrogen is employed for solid physics research.
- In the nuclear industry, para-hydrogen is employed to fill bubble chambers.
- In electrical power plants, hydrogen is used as a coolant gas in turbogenerators.
- Hydrogen is used for synthesis of ammonia.
- Hydrogen is used as a reagent to produce high purity water.
- Hydrogen is used as fuel in fuel cell applications.