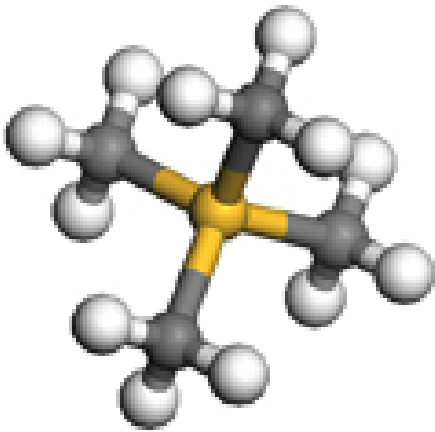


# ALOHA™ CVD/ALD Materials



## 4MS

Tetramethylsilane

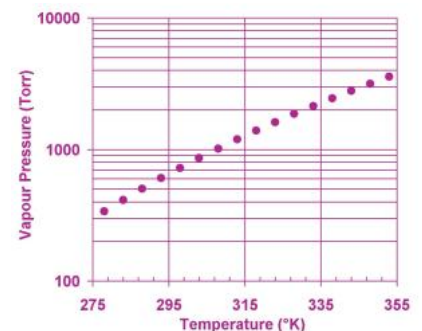
$\text{Si}(\text{CH}_3)_4$

CAS n° 75-76-3

- 4MS or tetramethylsilane is used in the semiconductor industry for Plasma Enhanced Chemical Vapor Deposition (PECVD) of low k dielectric and SiC:H etch stop films on several OEM platforms. It is a colorless highly volatile liquid in normal conditions.
- 4MS is also used as a SiC precursor for optoelectronics, power semiconductors and photosensitive films applications.
- 4MS is widely used in analytical laboratories as NMR standard.
- Air Liquide's ultrahigh purity 4MS is qualified at several semiconductor customers and OEM worldwide.

### Physical Chemical Properties

Physical Property	
Molecular Weight	88.2 g.mol <sup>-1</sup>
Physical State	Liquid
Melting Point	-99°C
Boiling Point	26.5°C
Vapor Pressure	602 Torr at 20°C
Density	0.648 g.cm <sup>-3</sup> at 20°C
Viscosity	2.42N/(s.m <sup>3</sup> ) at 20°C
Flash Point	-27.7°C
Auto Ignition Point	449°C
Conversion Factor / N <sub>2</sub> (MFC)	0.25



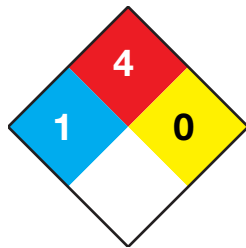
## AL Specifications

Parameter	Unit	Specification
Assay	%	>99,9
Water Content	ppm	<=10
Total Chloride	ppm	<=1
Colour	APHA	< 10

Metals	ppb
Individual Metals	<=1
Total Metals	<=5
List of metals	Consult ALOHA



## Hazard Rating



### HMIS

Health: 1  
Flammability: 4  
Reactivity: 0

### Explosion limits

Lower: 1%  
Upper: 37%

## Handling

- 4MS is intrinsically extremely stable, and does not thermally decompose under an inert atmosphere at room temperature. It is highly flammable but does not spontaneously react with water (not soluble).
- 4MS can be distributed in UHP stainless steel distribution systems, either in liquid phase or in gas phase at subatmospheric pressure. Recommended sealing materials include PCTFE, PTFE, PVDF.
- Because of its high vapor pressure, transportation and storage should be kept below 50°C.

## Packaging & Dispensing System

- 4MS is typically delivered using liquid dispense systems such as CANDI on most OEM platforms. However, due to its relatively high vapor pressure, cylinder-based gas phase delivery (AVP) is also possible at limited flow rates.
- For liquid feed, 4MS is available in SEMIF66-1101 and F 96-0704 compliant canisters of 5 Gallons and 2 Gallons (18,9L and 7,6L) equipped with manually or pneumatically actuated valves. Custom packages are also available on request.
- Special 1,3L on-board canisters can be supplied for qualification purpose, and/or as a point of use refillable buffer container.



## Transport Information

- Proper shipping name: Tetramethylsilane, NOS
- CAS n° 75-76-3
- UN Number: 2749
- ADR Class/division: 3
- ADR Package group: I
- Label ADR: Label 3: Flammable liquid



Air Liquide ALOHA is providing a complete advanced precursor solution. AL ALOHA portfolio covers low k, high k, barrier, metal gate, electrode, including some proprietary solutions for SiN, metals and High k. Manufacturing electronic devices with this material may be claimed in certain patents and seller hereby disclaims any liability as to the use of this material made by buyer.

For more information please contact: [aloha@airliquide.com](mailto:aloha@airliquide.com) or your local Air Liquide representative.

