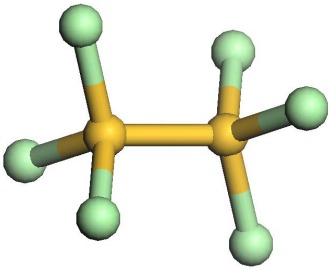


# ALOHA™ CVD/ALD Materials



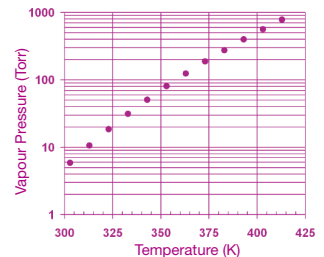
## HCDS

HexaChloroDiSilane  
 $\text{Cl}_3\text{Si-SiCl}_3$  ( $\text{Si}_2\text{Cl}_6$ )  
 CAS n° 13465-77-5

- Hexachlorodisilane is used primarily for deposition of silicon nitride at low temperature (~ 550°C) by LPCVD, along with ammonia, and for the deposition of silicon dioxide by CVD or ALD with pyridine and  $\text{H}_2\text{O}$ .
- HCDS is a corrosive, water reactive colorless liquid, that requires extreme care in handling due to the shock sensitive nature of some partial hydrolysis products ("poppy gels").
- The usual synthetic route to HCDS involves the reaction of chlorine with silicon alloys, which is likely to yield metal contamination. Titanium is notably difficult to separate due to the close boiling points of  $\text{TiCl}_4$  and HCDS.
- ALOHA™'s HCDS is made from world-class semiconductor grade silane disproportionation process, which ensures best purity and lowest level of metallic impurities on the market.
- Backed by strong technical support and proprietary process improvements, ALOHA™'s HCDS is the most widely accepted product at both end users and OEMs.

### Physical & Chemical Properties

Physical Properties	
Molecular weight	268.88 g.mol <sup>-1</sup>
Physical State	Liquid
Color	Colorless
Boiling Point	144-147°C
Melting Point	-1°C
Vapor Pressure	12 Torr @ 40°C
Enthalpy of vaporization	11.1 kcal.mol <sup>-1</sup>
Specific Gravity	1.55-1.567
Decomposition Point	> 250°C
Specific Properties	Deoxygenating agent



## Hazard Rating



### HMIS

Health: 3  
Flammability: 1  
Reactivity: 2  
Incompatibility : Water, O-containing compounds

HCDS should be handled considering that the major volatile by-product in case of air exposure is HCl. Please consult the ALOHA™ MSDS of HCDS for additional data.

All materials in contact with HCDS should be compatible for service in corrosives/acids.

## Special Process Improvement

- Air Liquide and SELETE have jointly developed some process improvements to the SIN LPCVD process with special additives to improve leakage current and etch selectivity at low temperature. The IP rights to exploit this process can be associated with the product purchase.

## Packaging & Dispensing System

- For remote bulk delivery and point of use boiler refilling, HCDS is usually supplied in special 7L canisters with a special five-valve configuration.
- For on-board applications, HCDS is usually supplied in 1200, 1800 or 2500 mL canisters with various valving and dip-tube configurations. ALOHA's on-board canisters have all-metal construction and are cleaned and dried by state of the art techniques. HCDS can also be filled in properly documented customer-supplied canisters.
- Since HCDS has a relatively high vapour pressure at room temperature, the solvent purge option for the Air Liquide CANDI™ system is not required.



## Transport Information

- Proper shipping name: Chlorosilanes, n.o.s. (Hexachlorodisilane)
- CAS n° 13465-77-5
- UN Number: 2987
- Class/division: 8
- Package group: II
- Hazard Labels required (DOT) : Corrosive



Air Liquide's ALOHA™ product line provides advanced precursors for CVD and ALD processes. The ALOHA™ portfolio offers precursors for low k, high k, barrier, metal gate and electrode applications, and may include Air Liquide's proprietary solutions protected via intellectual property rights. No license or other rights to patents or other intellectual property rights is granted herein. AIR LIQUIDE DISCLAIMS ANY EXPRESSED OR IMPLIED WARRANTIES OR LIABILITY WITH RESPECT TO CUSTOMER'S USE OF THE ALOHA™ PRODUCT LINE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT. For more information please contact [aloha@airliquide.com](mailto:aloha@airliquide.com) or your local Air Liquide representative.



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