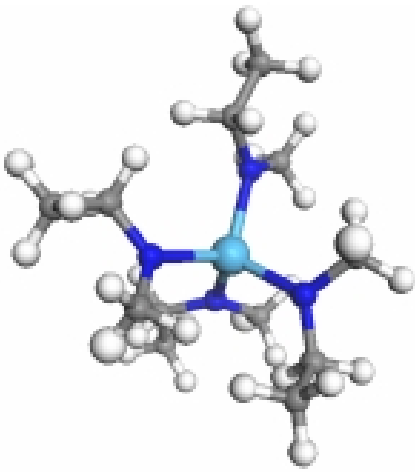


ALOHA™ CVD/ALD Materials



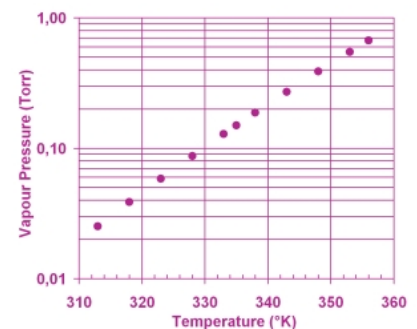
TEMAZ

Tetrakis[EthylMethylAmino]Zirconium
 $Zr[N(CH_3)(C_2H_5)]_4$
 CAS n° 175923-04-3

- TEMAZ is used essentially for the deposition of pure ZrO_2 or as a mixed oxide of other elements such as Silicon, Aluminum, Hafnium, Titanium, Tantalum, or others.
- TEMAZ can be used both in ALD or MOCVD mode for the deposition of high-k films, with O_2 , O_3 and H_2O being the most common co-reactants.
- TEMAZ is a clear liquid that reacts immediately upon contact with water or moisture, with the evolution of ethylmethylamine and zirconium oxide/hydroxide formation. Handling in perfectly dried piping and components is mandatory for high-performance, low particle processing.
- Like for most of the ALOHA advanced products, each canister of TEMAZ is supplied with a BALAZS CofA ensuring strict compliance with the specifications. Please consult www.balazs.com for more information.
- Beside semiconductor application, high purity zirconium is used in the nuclear industry for cladding fuel elements since it has a low absorption cross section for neutrons.

Physical Chemical Properties

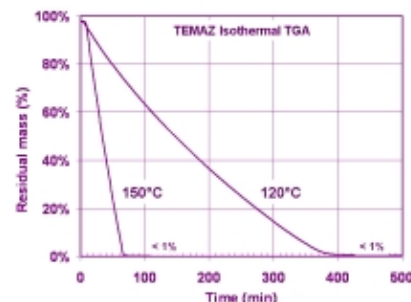
Physical Property	
Molecular Weight	323,6
Physical State	Liquid
Colour	Colourless
Melting Point	< -20°C
Vapour Pressure	~ 0,1 torr @ 70°C
Specific Gravity	1,049 g/cm3



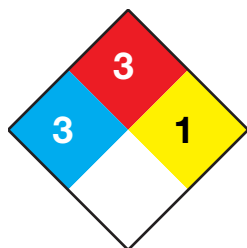
ALOHA Specifications

Parameter	Unit	Specification
Assay	%	>99%
Water Content	ppm	Reacts
Total Chloride	ppm	<=5

Please consult ALOHA™ for detailed metals and additional specifications. This product comes under low volume manufacturing control plan.



Hazard Rating



HMIS

Health: 3
Flammability: 3
Reactivity: 1

The product should be handled considering that the major by-product in case of air exposure is ethylmethanimine. Please consult the ALOHA MSDS of TEMAZ for additional data.

All materials in contact with TEMAZ should be compatible with amines. Please consult ALOHA for detailed materials recommendation.

Packaging & Dispensing System

- TEMAZ can be packaged in a variety of canisters depending on the application.
- For on-board applications, TEMAZ is usually supplied in 1200, 1800 or 2500 ml canisters with various valving and dip-tube configurations. Multipoint or continuous level sensing systems can also be customized to meet each specific requirements. ALOHA's on-board canisters have all-metal construction and are cleaned and dried by state of the art techniques. TEMAZ can also be filled in properly documented customer-supplied canisters.
- Since TEMAZ has a very low vapour pressure at room temperature, the solvent purge option for the Air Liquide CANDI system is mandatory. ALOHA's UHP Hexane or Octane undergo a proprietary drying process for this application. For the cleaning of on-board manifold and direct exhaust to the tool, a new and harmless high volatility solvent can be proposed.



Transport Information

- Proper shipping name: Organometallic substance, water reactive, flammable, n.o.s. (Tetrakis(ethylmethanimino) Zirconium)
- CAS n° 175923-04-3
- UN Number: 3399
- Class/division: 4.3
- Package group: II
- Hazard Labels required : Class 4.3 (Dangerous When Wet), Class 3 (Flammable)



Air Liquide ALOHA is providing a complete advanced precursor solution. 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 or your local Air Liquide representative.

