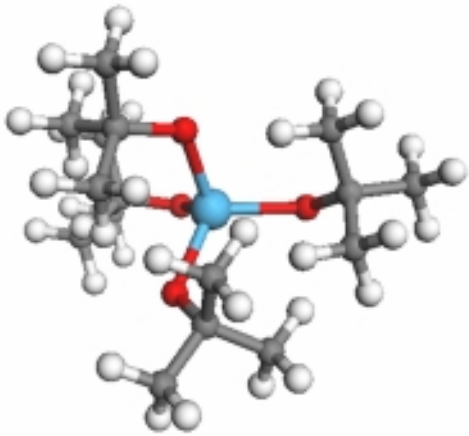


# ALOHA™ CVD/ALD Materials



## HTB

Hafnium Tertiary Butoxide

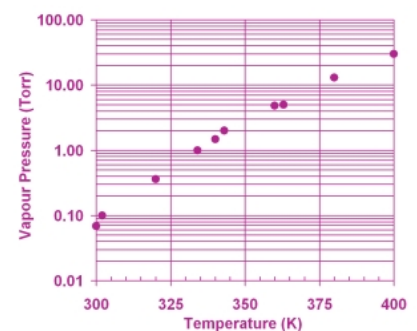
$\text{Hf}[\text{O}-\text{C}(\text{CH}_3)_3]_4$

CAS n°2172-02-3

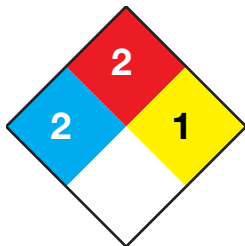
- HTB is used essentially for the CVD of pure  $\text{HfO}_2$  or as a mixed oxide of other elements such as Silicon, Aluminum, Zirconium, Titanium, Tantalum, or others.
- HTB is essentially used in MOCVD mode for the deposition of high k films.
- HTB is a clear liquid that reacts immediately upon contact with water or moisture (white fumes in air), with the evolution of tert-butanol. Except for TDMAH, HTB is the most volatile among the usual Hafnium precursors.
- Like for most of the ALOHA advanced products, each canister of HTB is supplied with a BALAZS CofA ensuring strict compliance with the specifications. Please consult [www.balazs.com](http://www.balazs.com) for more information on Air Liquide's BALAZS analytical services.
- Beside semiconductor application, high purity Hafnium is used in the nuclear industry for control rods. Lower purity material is used for alloying and gettering applications. Hafnium is essentially a "by-product" of Zirconium purification.

### Physical Chemical Properties

Physical Property	
Molecular Weight	470.65 g.mol <sup>-1</sup>
Physical State	Liquid
Colour	Colourless
Melting Point	8°C
Vapour Pressure	1 Torr @ 61°C
Enthalpy of vaporization	15 kcal/mol @ 50°C
Specific Gravity	1.15 g.cm <sup>-3</sup>



## Hazard Rating



### HMIS

Health: 2  
Flammability: 2  
Reactivity: 1

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

## Packaging & Dispensing System

- HTB can be packaged in a variety of canisters depending on the application.
- For on-board applications, HTB 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. HTB can also be filled in properly documented customer-supplied canisters.
- HTB can be conveniently distributed from a liquid dispense system such as the Air Liquide CANDI. In this case, please consult ALOHA for canister configuration.
- Since HTB 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(tertiarybutoxy)Hafnium)
- CAS n° 2172-02-3
- UN Number: 3399
- Class/division: 4.3
- Package group: II
- Hazard Labels required : Class 4.3 (Dangerous When Wet), Class 3 (Flammable)

