

## Technical Data Sheet

Starfire® CVD-742 (1,1,3,3-tetramethyl-1,3-disilacyclobutane) is a single source, liquid precursor for chemical vapor desposition (CVD) of high purity silicon carbide (SiC) and is also useful as a monomer for producing dimethyl poly(silylenemethylene). In initial trials, CVD-742 has shown promising results for SiC films which exhibit high density, adherence and crystallinity at deposition temperatures of 750-900°C.

CVD-742 contains carbon and silicon in a ratio of 3:1 but does not incorporate excess carbon into the coatings when proper conditions are used. Vapor delivery is conveniently done by a bubbler or heated mass flow controller. As compared with methyltrichlorosilane (MTS) and silane, CVD-742 has important safety advantages owing to its lack of oxygen and moisture sensitivity. Storage and transfer between containers are relatively simple and the precursor forms no corrosive byproducts in the CVD process, resulting in a process with low environmental impact.

The table below compares chemistry and deposition conditions for CVD-742 with those of another Starfire® precursor for CVD SiC, CVD-189 (Dimethylisopropylsilane):

Precursor Characteristics and Deposition Conditions	Units	CVD-189	CVD-742
Formula		C <sub>5</sub> H <sub>14</sub> Si	C <sub>6</sub> H <sub>16</sub> Si <sub>2</sub>
Molecular Weight		102	144
Boiling Point	(deg. C)	68	120
Deposition Temperature	(deg. C)	825 – 875	750 - 900
Reactor Pressure	(torr)	1 – 760	1 - 760
Reactor Size		15 cm diam X 40 cm long	15 cm diam X 40 cm long
Precursor Input Method		Gas Bubbler	Gas Bubbler
Deposition Rate	(micron/hr)	10 – 30	5 - 20
Carrier Gas for Precursor Vapor		Hydrogen	Hydrogen
Carrier Gas Flow Rate	(sccm)	10:1 - 100:1	10:1 - 100:1
Coating Crystallinity		Sharp alpha SiC peaks, small beta SiC peak	
Adherence to Substrate		Excellent	Excellent
Precursor Input Rate	(g/min.) (mols/min.)	0.001 0.00001	0.001 0.00001
Flammable		Yes	Yes

### Warranty

No analysis of this product is permitted. The data provided relates only to the material identified above, as supplied by Starfire Systems®, Inc. (SSI). Because conditions and methods of use of our products are beyond our control, this information should not be used as a substitution for customer's tests to ensure that SSI's products are safe, effective, and fully satisfactory for the intended end use. SSI's sole warranty is that the product will meet sales specifications in effect at the time of shipment.