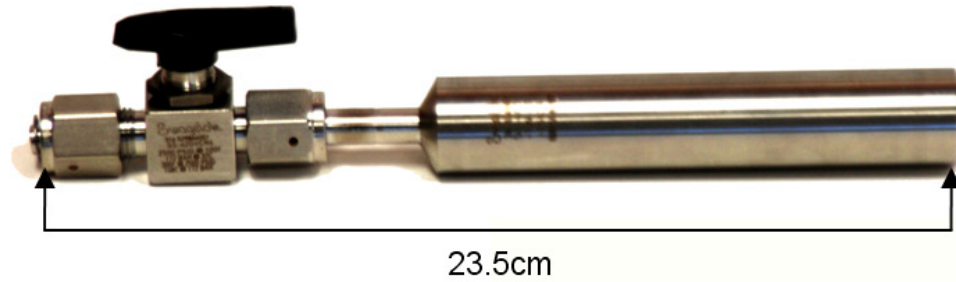


Chemical Vapor Deposition/Atomic Layer Deposition (CVD/ALD) Precursors contained in Swagelok® Cylinders

Element	Symbol	Catalog #	Catalog # of Product Contained	Product Name	CAS#	Quantity in Swagelok® Cylinder
Aluminum	Al	98-4003	93-1360	Trimethylaluminum, min. 98%, 93-1360, contained in 50 ml Swagelok® cylinder for CVD/ALD	75-24-1	10g 25g
Aluminum	Al	98-4004	93-1360	Trimethylaluminum, min. 98%, 93-1360, contained in high-temp. 50 ml Swagelok® cylinder (96-1071) for CVD/ALD	75-24-1	25g
Aluminum	Al	98-4008	98-1955	Trimethylaluminum, elec. gr. (99.999+%-Al) PURATREM, 98-1955, contained in 50 ml Swagelok® cylinder for CVD/ALD	75-24-1	25g
Aluminum	Al	98-4007	98-1955	Trimethylaluminum, elec. gr. (99.999+%-Al) PURATREM, 98-1955, contained in 50 ml electropolished Swagelok® cylinder (96-1077) for CVD/ALD	75-24-1	25g
Gallium	Ga	98-4068	31-2000	Trimethylgallium, 99+%, 31-2000, contained in 50 ml Swagelok® cylinder for CVD/ALD	1445-79-0	10g 25g
Gallium	Ga	98-4047	98-2000	Trimethylgallium, elec. gr. (99.9999%-Ga) PURATREM, 98-2000, contained in 50 ml electropolished Swagelok® cylinder (96-1077) for CVD/ALD	1445-79-0	10g 25g
Hafnium	Hf	98-4021	72-8000	Tetrakis(dimethylamino)hafnium, 98+% (99.99+%-Hf, <0.2%-Zr) TDMAH, PURATREM, 72-8000, contained in 50 ml Swagelok® cylinder for CVD/ALD	19782-68-4	25g
Hafnium	Hf	98-4022	72-8000	Tetrakis(dimethylamino)hafnium, 98+% (99.99+%-Hf, <0.2%-Zr) TDMAH, PURATREM, 72-8000, contained in 50ml Swagelok® cylinder (96-1071) for CVD/ALD	19782-68-4	25g
Hafnium	Hf	98-4048	72-7720	Tetrakis(ethylmethylamino)hafnium, 99% (99.99+%-Hf, <0.15% Zr) TEMA, PURATREM, 72-7720, contained in 50 ml Swagelok® cylinder for CVD/ALD	352535-01-4	10g
Indium	In	98-4057	97-3425	Cyclopentadienylindium (I), elec. gr. (99.99+%-In) PURATREM, 97-3425, contained in 50 ml Swagelok® cylinder for CVD/ALD	34822-89-4	5g
Indium	In	98-4054	97-3425	Cyclopentadienylindium (I), elec. gr. (99.99+%-In) PURATREM, 97-3425, contained in 50 ml electropolished Swagelok® cylinder (96-1077) for CVD/ALD	34822-89-4	5g
Indium	In	98-4056	98-2010	Trimethylindium, elec. gr. (99.999%-In) PURATREM, 98-2010, contained in 50 ml electropolished Swagelok® cylinder (96-1077) for CVD/ALD	3385-78-2	25g
Magnesium	Mg	98-4069	12-0900	Bis(2,2,6,6-tetramethyl-3,5-heptanedionato)magnesium, anhydrous, min. 98% [Mg(TMHD)2], 12-0900, contained in high-temp. 50 ml Swagelok® cylinder (96-1071) for CVD/ALD	21361-35-3	15g
Magnesium	Mg	98-4006	12-0510	Bis(ethylcyclopentadienyl)magnesium, min. 98%, 12-0510, contained in 50 ml Swagelok® cylinder for CVD/ALD	114460-02-5	10g
Magnesium	Mg	98-4010	12-0510	Bis(ethylcyclopentadienyl)magnesium, min. 98%, 12-0510, contained in high-temp. 50 ml Swagelok® cylinder (96-1071) for CVD/ALD	114460-02-5	10g 25g
Manganese	Mn	98-4060	25-0200	Bis(cyclopentadienyl)manganese, 98+%, 25-0200, contained in 50 ml Swagelok® cylinder (96-1070) for CVD/ALD	73138-26-8	10g 25g
Manganese	Mn	98-4065	25-0210	Bis(ethylcyclopentadienyl)manganese, min. 98%, 25-0210, contained in 50 ml Swagelok® cylinder (96-1070) for CVD/ALD	101923-26-6	10g 25g
Oxygen	O	98-8000	98-0295	Water, 99.999% (PURATREM), 98-0295, contained in 50 ml Swagelok® cylinder (96-1070) for CVD/ALD	7732-18-5	25g
Platinum	Pt	98-4024	78-1350	(Trimethyl)methylcyclopentadienylplatinum(IV), 99%, 78-1350, contained in 50 ml Swagelok® cylinder for CVD/ALD	94442-22-5	10g 25g
Platinum	Pt	98-4026	78-1350	(Trimethyl)methylcyclopentadienylplatinum(IV), 99%, 78-1350, contained in 50 ml Swagelok® cylinder high temperature valve (96-1071) for CVD/ALD	94442-22-5	20g

Element	Symbol	Catalog #	Catalog # of Product Contained	Product Name	CAS#	Quantity in Swagelok® Cylinder
Ruthenium	Ru	98-4009	44-0040	Bis(ethylcyclopentadienyl)ruthenium(II), 98% (99.9%-Ru), 44-0040, contained in 50 ml Swagelok® cylinder for CVD/ALD	32992-96-4	10g
Ruthenium	Ru	98-4067	44-0040	Bis(ethylcyclopentadienyl)ruthenium (II), 98% (99.9%-Ru), 44-0040, contained in high-temp. 50 ml Swagelok® cylinder (96-1071) for CVD/ALD	32992-96-4	10g 20g
Silicon	Si	98-4027	98-0147	Silicon(IV) chloride, fiber optic grade (99.9999%-Si, 50ppm-Fe) PURATREM, 98-0147, contained in a 50 ml electropolished Swagelok® cylinder (96-1077) for CVD/ALD	10026-04-7	50g
Silicon	Si	98-6025	14-7015	Tri-t-butoxysilanol (99.999%-Si) PURATREM 14-7015 contained in 50 ml electropolished Swagelok® cylinder (96-1077) for CVD/ALD	18166-43-3	25g
Silicon	Si	98-4035	14-8750	Tris(dimethylamino)silane, 99+%, 3DMAS (99.999%-Si) PURATREM, 14-8750, contained in 50 ml Swagelok® cylinder (96-1070) for CVD/ALD	15112-89-7	25g
Silicon	Si	98-4036	93-1402	3-Aminopropyltriethoxysilane, 98%, 93-1402, contained in 50 ml Swagelok® cylinder for CVD/ALD	919-30-2	25g
Silicon	Si	98-4037	93-1402	3-Aminopropyltriethoxysilane, 98%, 93-1402, contained in high-temp. 50 ml Swagelok® cylinder (96-1071) for CVD/ALD	919-30-2	25g
Tantalum	Ta	98-4045	73-0700	t-Butylimidotris(dimethylamino)tantalum(V), min. 98%, 73-0700, contained in 50 ml Swagelok® cylinder for CVD/ALD	69039-11-8	10g 25g
Tin	Sn	98-4050	50-1815	Tetrakis(dimethylamino)tin(IV), 99% (99.99%) TDMASn PURATREM, 50-1815, contained in 50 ml Swagelok® cylinder for CVD/ALD	1066-77-9	10g 25g
Tin	Sn	98-4052	50-1150	N,N'-Di-t-butyl-2,3-diamidobutanetin(II), 98%, 50-1150, contained in 50 ml Swagelok® cylinder for CVD/ALD	1268357-44-3	5g
Titanium	Ti	98-4043	22-1050	Tetrakis(diethylamino)titanium(IV), 99%, 22-1050, contained in 50 ml Swagelok® cylinder for CVD/ALD	4419-47-0	10g 25g
Titanium	Ti	98-4015	93-2240	Tetrakis(dimethylamino)titanium(IV), 99% TDMAT, 93-2240, contained in 50 ml Swagelok® cylinder for CVD/ALD	3275-24-9	25g
Titanium	Ti	98-4016	93-2240	Tetrakis(dimethylamino)titanium(IV), 99% TDMAT, 93-2240, contained in high-temp. 50 ml Swagelok™ cylinder (96-1071) for CVD/ALD	3275-24-9	25g
Titanium	Ti	98-4033	22-1150	Titanium(IV) chloride, 99.8+%, 22-1150, contained in 50 ml Swagelok® cylinder for CVD/ALD	7550-45-0	25g
Titanium	Ti	98-4030	93-2216	Titanium(IV) i-propoxide, min. 98%, 93-2216, contained in 50 ml Swagelok® cylinder for CVD/ALD	546-68-9	25g
Yttrium	Y	98-4018	39-1500	Tris[N,N-bis(trimethylsilyl)amide]yttrium(III), min. 98% (99.9%-Y) (REO), 39-1500, contained in 50 ml Swagelok® cylinder (96-1070) for CVD/ALD	41836-28-6	10g
Zinc	Zn	98-4002	97-5060	Dimethylzinc, elec. gr. (99.999%-Zn) PURATREM, 97-5060, contained in 50 ml electropolished Swagelok® cylinder (96-1077) for CVD/ALD	544-97-8	10g
Zinc	Zn	98-4000	93-3030	Diethylzinc, min. 95%, 93-3030, contained in 50 ml Swagelok® cylinder for CVD/ALD	557-20-0	25g
Zinc	Zn	98-4005	93-3030	Diethylzinc, min. 95%, 93-3030, contained in high-temp. 50 ml Swagelok® cylinder (96-1071) for CVD/ALD	557-20-0	25g
Zinc	Zn	98-4001	97-5061	Dimethylzinc, 99%, 97-5061, contained in 50 ml Swagelok® cylinder for CVD/ALD	544-97-8	25g
Zirconium	Zr	98-4012	40-4100	Tetrakis(dimethylamino)zirconium(IV), 99% TDMAZ, 40-4100, contained in 50 ml Swagelok® cylinder for CVD/ALD	19756-04-8	25g
Zirconium	Zr	98-4042	40-4115	Tetrakis(dimethylamino)zirconium(IV), 98% (99.99%-Zr) TDMAZ, 40-4115, contained in 50ml Swagelok® cylinder (96-1070) for CVD/ALD	19756-04-8	25g
Zirconium	Zr	98-4039	40-1710	Tetrakis(ethylmethylamino)zirconium(IV) 99% TEMAZ, 40-1710, contained in 50 ml Swagelok® cylinder for CVD/ALD	175923-04-3	10g 25g

96-1070 Swagelok® Cylinder Assembly, 50ml with ¼" VCR Male Ball Valve and Female Nut for CVD/ALD



Standard Ball Valve



High Temp Bellows Sealed Valve



Female Nut



Silverplated Gasket Assembly



Cylinder Body

*High Temperature Swagelok® cylinder assembly 96-1071 available at extra cost.

96-1077 Swagelok® Cylinder Assembly, 50ml with ¼" VCR Male DP Valve (Ultra High Purity) and Female Nut, **electropolished** for CVD/ALD



EP Male DP high pressure Diaphragm Valve



EP Female Nut



EP Unplated Gasket Assembly



EP Cylinder Body

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