



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

**METALS • INORGANICS • ORGANOMETALLICS • CATALYSTS • LIGANDS • NANOMATERIALS • CUSTOM SYNTHESIS • cGMP FACILITIES**

| 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<br>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 <b>electropolished Swagelok® cylinder (96-1077)</b> 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<br>25g                     |
| Gallium   | Ga     | 98-4047   | 98-2000                        | Trimethylgallium, elec. gr. (99.9999%-Ga) PURATREM, 98-2000, contained in 50 ml <b>electropolished Swagelok® cylinder (96-1077)</b> for CVD/ALD                        | 1445-79-0   | 10g<br>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 <b>electropolished Swagelok® cylinder (96-1077)</b> 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 <b>electropolished Swagelok® cylinder (96-1077)</b> 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<br>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<br>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<br>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<br>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                            |

Visit [www.strem.com](http://www.strem.com) for new product information and a searchable catalog.

**Strem Chemicals, Inc.**  
7 Mulliken Way  
Newburyport, MA 01950  
U.S.A  
Tel: 978.499.1600  
Fax: 978.465.3104  
Email: [info@strem.com](mailto:info@strem.com)

**Strem Chemicals, Inc.**  
15, rue de l'Atome  
Zone Industrielle  
67800 BIRSCHHEIM France  
Tel: (33) 03 88 62 52 60  
Fax: (33) 03 88 62 26 81  
Email: [info.europe@strem.com](mailto:info.europe@strem.com)

**Strem Chemicals, Inc.**  
Postfach 1215  
77672 KEHL  
Germany  
Tel: 0 78 51/ 7 58 79  
Email: [info.europe@strem.com](mailto:info.europe@strem.com)

**Strem Chemicals UK Ltd.**  
An Independent Distributor of Strem Chemicals Products  
Newton Hall, Town Street  
Newton, Cambridge  
England CB22 7ZE  
Tel: 0845 643 7263  
Fax: 0845 643 7362  
Email: [enquiries@strem.co.uk](mailto:enquiries@strem.co.uk)

| 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<br>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 <b>electropolished Swagelok® cylinder (96-1077)</b> 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 <b>electropolished Swagelok® cylinder (96-1077)</b> 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<br>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<br>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<br>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 <b>electropolished Swagelok® cylinder (96-1077)</b> 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), 99% (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<br>25g                     |

Visit [www.strem.com](http://www.strem.com) for new product information and a searchable catalog.

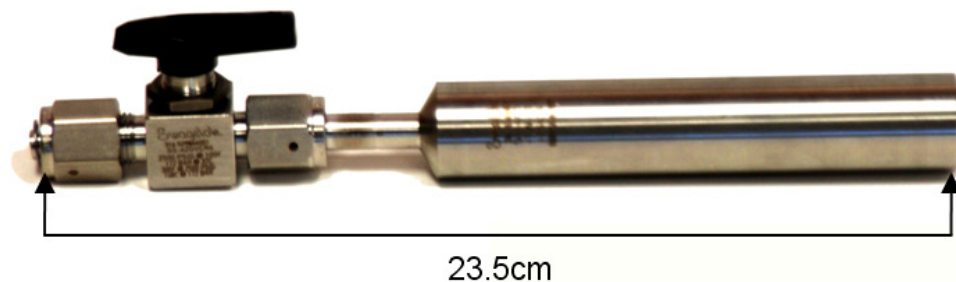
**Strem Chemicals, Inc.**  
7 Mulliken Way  
Newburyport, MA 01950  
U.S.A  
Tel: 978.499.1600  
Fax: 978.465.3104  
Email: [info@strem.com](mailto:info@strem.com)

**Strem Chemicals, Inc.**  
15, rue de l'Atome  
Zone Industrielle  
67800 BISCHHEIM France  
Tel: (33) 03 88 62 52 60  
Fax: (33) 03 88 62 26 81  
Email: [info.europe@strem.com](mailto:info.europe@strem.com)

**Strem Chemicals, Inc.**  
Postfach 1215  
77672 KEHL  
Germany  
Tel: 0 78 51/ 7 58 79  
Email: [info.europe@strem.com](mailto:info.europe@strem.com)

**Strem Chemicals UK Ltd.**  
An Independent Distributor of Strem Chemicals Products  
Newton Hall, Town Street  
Newton, Cambridge  
England CB22 7ZE  
Tel: 0845 643 7263  
Fax: 0845 643 7362  
Email: [enquiries@strem.co.uk](mailto:enquiries@strem.co.uk)

**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

Swagelok® Trademark owned by Swagelok. Registered user in Canada, SWAGELOK Canada, Ltd.  
SWAGELOK AG is an authorized user in Switzerland of the SWAGELOK trademark.

Visit [www.strem.com](http://www.strem.com) for new product information and a searchable catalog.

**Strem Chemicals, Inc.**  
7 Mulliken Way  
Newburyport, MA 01950  
U.S.A  
Tel: 978.499.1600  
Fax: 978.465.3104  
Email: [info@strem.com](mailto:info@strem.com)

**Strem Chemicals, Inc.**  
15, rue de l'Atome  
Zone Industrielle  
67800 BIRSCHHEIM France  
Tel: (33) 03 88 62 52 60  
Fax: (33) 03 88 62 26 81  
Email: [info.europe@strem.com](mailto:info.europe@strem.com)

**Strem Chemicals, Inc.**  
Postfach 1215  
77672 KEHL  
Germany  
Tel: 0 78 51/ 7 58 79  
Email: [info.europe@strem.com](mailto:info.europe@strem.com)

**Strem Chemicals UK Ltd.**  
An Independent Distributor of Strem Chemicals Products  
Newton Hall, Town Street  
Newton, Cambridge  
England CB22 7ZE  
Tel: 0845 643 7263  
Fax: 0845 643 7362  
Email: [enquiries@strem.co.uk](mailto:enquiries@strem.co.uk)