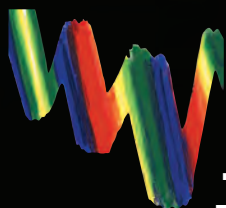
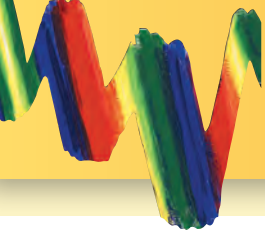


INTERNATIONAL CRYSTAL LABORATORIES

SUPPLIES AND ACCESSORIES FOR SPECTROSCOPY



... *the SOURCE* for all IR, FTIR, XRF, UV/VIS/NIR
Fluorescence & Raman Spectroscopy Requirements

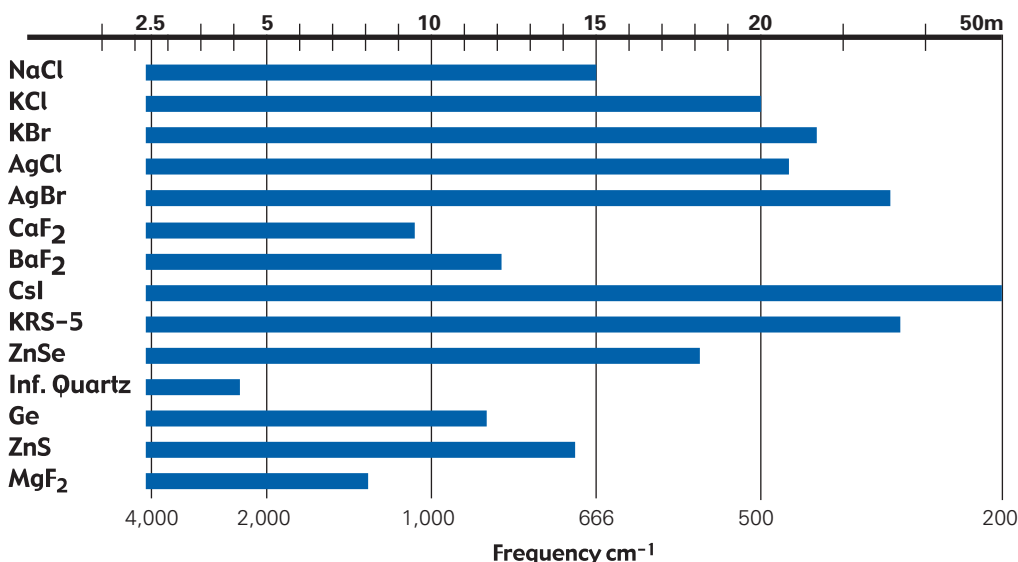


Call for ATR Prisms and Unpolished Blanks

ICL celebrated its 50th anniversary in 2012. We have produced quality crystal optics for spectroscopy and CO₂ lasers since 1962. ICL operates a vertically integrated crystal optics production plant. We grow our own crystals and we are the only U.S. producer of KBr crystals. We welcome the opportunity to quote on custom

sized optics, coated optics, crystal and other optical materials not listed and optical assemblies such as beam splitters. We can produce optics from crystal materials such as CdMnTe, CdMnHgTe, CdZnTe, CdMgTe, CdTe, Si, LiF, CsBr, AgBr, AgCl, MgF₂, as well as from glass and composite materials such as polyethylene, BK-7 and AMTIR.

WAVELENGTH RANGE FOR IR MATERIALS – MICRONS & CM⁻¹



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Polished Crystal Optics

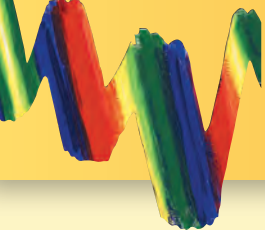


CRYSTAL SIZE	NACL	KCL	KBR	CAF2	BAF2	CSI	KRS-5	Infrasil QTZ	ZNS CLEARTRAN*	ZNSE*	AGCL	AGBR
Discs												
6mm x 1mm	0002A-1003	0002B-1004	0002C-1005	0002D-1006	0002E-1007	0002F-1008	0002G-1009	0002H-1010	0002I-1011	0002J-1821	0002K-1013	0002P-1014
13mm x 1mm	0002A-4549	0002B-4548	0002C-4085	0002D-4488	0002E-4435	0002F-4588	0002G-4589	0002H-4590	0002I-4591	0002J-4464	0002K-4592	0002P-8693
13mm x 2mm	0002A-68	0002B-164	0002C-144	0002D-403	0002E-303	0002F-95	0002G-108	0002H-326	0002I-94	0002J-1822	0002K-1386	0002P-7926
20mm x 2mm	0002A-623	0002B-1424	0002C-1854	0002D-1455	0002E-1449	0002F-1855	0002G-1856	0002H-1857	0002I-1858	0002J-1823	0002K-1374	0002P-4481
22mm x 4mm	0002A-110	0002B-125	0002C-248	0002D-410	0002E-1859	0002F-328	0002G-642	0002H-252	0002I-464	0002J-1826	0002K-1376	0002P-8694
25mm x 2mm	0002A-330	0002B-306	0002C-244	0002D-1457	0002E-340	0002F-565	0002G-245	0002H-4532	0002I-77	0002J-1825	0002K-4458	0002P-4406
25mm x 4mm	0002A-67	0002B-136	0002C-74	0002D-181	0002E-176	0002F-137	0002G-73	0002H-321	0002I-77*	0002J-1825*	0002K-1237	0002P-4984
25.2mm x 5mm	0002A-82	0002B-115	0002C-81	0002D-548	0002E-91	0002F-145	0002G-233	0002H-436	0002I-522	0002J-1827	0002K-1373	0002P-5654
32mm x 3mm	0002A-83	0002B-508	0002C-175	0002D-259	0002E-535	0002F-277	0002G-344	0002H-1427	0002I-151	0002J-1828	0002K-1425	0002P-4476
32mm x 3mm Drilled	0002A-84	0002B-247	0002C-118	0002D-336	0002E-536	0002F-3049	0002G-1861	0002H-1463	0002I-152	0002J-1829	0002K-1860	0002P-4477
37.5mm x 4mm	0002A-170	0002B-317	0002C-155	0002D-262	0002E-384	0002F-271	0002G-143	0002H-664	0002I-1862	0002J-1830	0002K-1863	0002P-8695
38mm x 6mm	0002A-97	0002B-275	0002C-150	0002D-359	0002E-1381	0002F-159	0002G-371	0002H-479	0002I-647	0002J-1831	0002K-1864	0002P-8721
49mm x 6mm	0002A-121	0002B-104	0002C-122	0002D-339	0002E-1445	0002F-130	0002G-357	0002H-441	0002I-1865	0002J-1832	0002K-1866	0002P-8696
50mm x 3mm	0002A-432	0002B-587	0002C-655	0002D-1022	0002E-523	0002F-472	0002G-1023	0002H-1024	0002I-1025	0002J-1833	0002K-1027	0002P-4576
Rectangles												
25mm x 12mm x 2mm	0002A-89	0002B-392	0002C-75	0002D-285	0002E-391	0002F-241	0002G-1879	0002H-573	0002I-286	0002J-1835	0002K-1880	0002P-8697
1" x 1" x 4mm	0002A-106	0002B-334	0002C-389	0002D-559	0002E-1240	0002F-1882	0002G-3051	0002H-1883	0002I-1884	0002J-1837	0002K-1885	0002P-8698
30mm x 15mm x 4mm	0002A-93	0002B-139	0002C-123	0002D-324	0002E-134	0002F-162	0002G-361	0002H-1886	0002I-404	0002J-1838	0002K-1389	0002P-4558
30mm x 15mm x 4mm Drilled	0002A-278	0002B-1405	0002C-183	0002D-1888	0002E-135	0002F-379	0002G-555	0002H-1887	0002I-584	0002J-1839	0002K-1418	0002P-8699
38.5mm x 19.5mm x 4mm	0002A-71	0002B-156	0002C-69	0002D-142	0002E-103	0002F-305	0002G-165	0002H-291	0002I-116	0002J-1840	0002K-615	0002P-4397
38.5mm x 19.5mm x 4mm Drilled	0002A-70	0002B-157	0002C-80	0002D-92	0002E-102	0002F-325	0002G-433	0002H-290	0002I-117	0002J-1841	0002K-654	0002P-4551
41mm x 23mm x 4mm	0002A-507	0002B-7467	0002C-8461	0002D-6037	0002E-8534	0002F-8579	0002G-8580	0002H-8581	0002I-528	0002J-1842	0002K-8582	0002P-8700
41mm x 23mm x 4mm Drilled	0002A-4439	0002B-7468	0002C-6643	0002D-8583	0002E-8535	0002F-8584	0002G-8585	0002H-8586	0002I-529	0002J-1843	0002K-8587	0002P-8701
41mm x 23mm x 6mm	0002A-113	0002B-268	0002C-99	0002D-295	0002E-363	0002F-335	0002G-437	0002H-1889	0002I-528	0002J-1842	0002K-614	0002P-5072
41mm x 23mm x 6mm Drilled	0002A-114	0002B-269	0002C-100	0002D-296	0002E-400	0002F-1890	0002G-1891	0002H-1892	0002I-529	0002J-1843	0002K-1893	0002P-5073
39.5mm x 39.5mm x 6.5mm (Rectangle)	0002A-111R	0002B-537R	0002C-86R	0002D-179R	0002E-322R	0002F-516R	0002G-1906R	0002H-1904R	0002I-1911R	0002J-1847R	0002K-1912R	0002P-8702
39.5mm x 39.5mm x 6.5mm (Hexagon)	0002A-111H	0002B-537H	0002C-86H	0002D-179H	0002E-322H	0002F-516H	0002G-1906H	0002H-1904H	0002I-1911H	0002J-1847H	0002K-1912H	0002P-8705
39.5mm x 39.5mm x 6.5mm (Rectangle), Drilled	0002A-112R	0002B-538R	0002C-87R	0002D-180R	0002E-323R	0002F-3089R	0002G-1907R	0002H-1905R	0002I-1910R	0002J-1848R	0002K-1913R	0002P-8703
39.5mm x 39.5mm x 6.5mm (Hexagon), Drilled	0002A-112H	0002B-538H	0002C-87H	0002D-180H	0002E-323H	0002F-3089H	0002G-1907H	0002H-1905H	0002I-1910H	0002J-1848H	0002K-1913H	0002P-8706
45mm x 20mm x 6mm	0002A-107	0002B-450	0002C-166	0002D-1894	0002E-3052	0002F-1896	0002G-140	0002H-1897	0002I-341	0002J-1845	0002K-1898	0002P-8739
45mm x 20mm x 6mm Drilled	0002A-158	0002B-451	0002C-167	0002D-1895	0002E-1899	0002F-1900	0002G-141	0002H-1901	0002I-1902	0002J-1846	0002K-1903	0002P-8741
50mm x 25mm x 6mm	0002A-109	0002B-352	0002C-168	0002D-1914	0002E-1916	0002F-279	0002G-1919	0002H-1921	0002I-1923	0002J-1849	0002K-1925	0002P-8742
50mm x 25mm x 6mm Drilled**	0002A-96	0002B-364	0002C-169	0002D-1915	0002E-1917	0002F-1918	0002G-1920	0002H-1922	0002I-1924	0002J-1850	0002K-1926	0002P-8743

Call for any size or material not listed.
Call for AMTIR, Sapphire, MgF2, AgBr, CdTe, CdMnTe, CdMnHgTe, CdMgTe, CsBr, Polyethylene, Si and LiF.
Call for unpolished windows, coated optics, beam splitters, ATR prisms & CIR rods.

*All Cleartran, ZnS and ZnSe Crystals are 2mm thick.
**When ordering drilled crystals of this size, please specify whether center or diagonal drilling is required.
Tolerances: length, width and diameter: +0/-0.2mm. Thickness: ±0.5mm

RFP: Request for Price



Real Crystal® IR Sample Cards & PTFE & Polyethylene IR Sample Cards



**UV/VIS/NIR Cuvettes –
See page 30**



**Polyethylene and PTFE
Sample Cards**

**US Patents No. 5,470,757
& 5,764,355 & 5,290,705**



ICL's new Real Crystal® IR sample cards provide a conveniently mounted non-absorbing substrate for qualitative infrared analysis. They are ideal for liquids, mulls, film casting from solutions and pyrolysis samples. The 2" x 4" cards are available with 9.5mm, 15mm and 19mm clear apertures and they will fit in the universal slide mount of any spectrophotometer. Space is provided on the card to write on the card to identify the date of the analysis, the sample identity and the name of the analyst.

Real Crystal® IR cards do not exhibit strong absorbance peaks that limit the utility of PTFE and polyethylene sample cards. The alkali halide sample support substrates (KBr, KCl and NaCl) used in Real Crystal® IR sample cards exhibit very high energy throughput (see www.internationalcrystal.net for spectra).

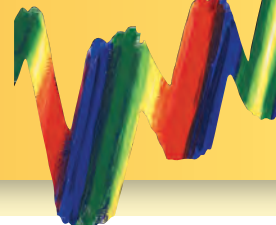
ICL has also brought back the 3M® card, which we manufacture under a license from Minnesota

Mining and Manufacturing Company. PTFE and polyethylene IR sample cards provide inexpensive disposable sample substrates for qualitative analysis. The 2" x 4" cards mount vertically in the universal slide mount in any spectrophotometer. The cards have a clear aperture of 19mm and space is provided to write on the card to identify the date of the analysis, the sample and the name of the analyst. The cards are sold in packages of 10, 25 and 50.

PTFE and Polyethylene cards exhibit absorbance bands in the 4400 to 400 CM⁻¹ spectral range. For absorbance spectra of the substrates in these cards see www.internationalcrystal.net.

Part No.	Description	Price
0000-7095	NaCl-Pack of 25, 9.5mm aperture	
0000-7096	KBr-Pack of 25, 9.5mm aperture	
0000-7097	KCl-Pack of 25, 9.5mm aperture	
0000-7131	NaCl-Pack of 25, 15mm aperture	
0000-7132	KBr-Pack of 25, 15mm aperture	
0000-7133	KCl-Pack of 25, 15mm aperture	
0000-7087	NaCl-Pack of 25, 19mm aperture	
0000-7090	KBr-Pack of 25, 19mm aperture	
0000-7091	KCl-Pack of 25, 19mm aperture	
0000-7361	Pack of 10 PTFE IR Sample Cards	
0000-7362	Pack of 25 PTFE IR Sample Cards	
0000-7363	Pack of 50 PTFE IR Sample Cards	
0000-7364	Pack of 10 Polyethylene IR Sample Cards	
0000-7365	Pack of 25 Polyethylene IR Sample Cards	
0000-7366	Pack of 50 Polyethylene IR Sample Cards	

Precision Demountable Cells, SL-2 Demountable Cell Kit & Pres-N-Lok Demountable Cell



Demountable Cells

Sandwich cells available

Demountable Cells are ideal for mulls, capillary films, cast films and thin films of finely powdered solids in slurry form. The Precision Demountable Cell ("PDC") can also be used for liquid analysis with its luer syringe fittings. The PDC is constructed of stainless steel and is designed for easy assembly and disassembly for cleaning and changing the pathlength. The inside surfaces of the PDC are lapped optically flat to ensure leak free seals. It can be completely disassembled for cleaning simply by unscrewing the convenient thumb screws on the front plate of the cell. The pathlength can be changed simply by using a spacer with a different thickness between the windows or by using sandwich cells. The window size is 38.5mm x 19.5mm x 4mm.

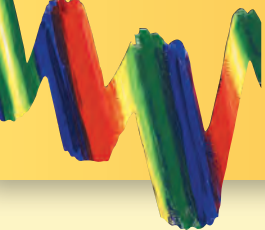
ICL's Pres-N-Lok Cell enables the user to analyze mulls and smears without the use of clumsy springs, nuts, and bolts. The cell is assembled by placing the sample on one (1) of two (2) 25mm x 4mm crystal windows separated by a PTFE spacer, dropping them into the bore of the inner barrel, and pressing in the outer barrel.

The Demountable SL-2 is the same as the SL-2 sealed precision liquid cell (see page 5), except that the amalgam seal has been replaced by a demountable PTFE spacer, and gasket. The window size is 32mm x 3mm. The Demountable SL-2 Cell Kit comes complete with the cell and cell holder assembly for FTIR or dispersive, one PTFE O-ring, two gaskets, one aluminum needle/pin plate with luer lock syringe ports, two PTFE plugs, one space compensator for use with 2mm thick optical windows and assorted 32mm spacers, but without windows. The cell holder and mounting plate can also be used with sealed sandwich cells if precision pathlengths are required.

The Micro Quik Cell kit comes with 6 pressed AgCl 13 x 1mm windows, which could flow for good seals and can be used with wet samples. AgCl transmits through the full spectral range of most FTIR spectrophotometers. Each window has a 0.025mm circular depression in the middle, allowing windows to be positioned face to face for a 0.05mm pathlength, back to face for a 0.025mm pathlength and back to back for making mulls. The windows have flat rims with a bevel to assure sealing in the mount provided with the kit.

Micro-Quik Cell
AgCl Windows

0006-497	Dispersive (rectangular aperture) Precision Demountable Cell, without windows
0006-604	FTIR (circular aperture) Precision Demountable Cell, without windows
0006-5064	Thumbscrews (1pk/4) for 2mm thick windows
0006-2467	Pres-N-Lok Cell complete with assorted spacers, but without windows
0006-2090	Micro Quik Cell Kit with cell, 6 AgCl windows and slide holder
0006-4153	Demountable SL-2 Cell Kit for Dispersive Instrument, without windows
0006-4154	Demountable SL-2 Cell Kit for FTIR Instrument, without windows
0006-4122	Cell Holder for Dispersive Instrument without needle/pin plate
0006-4124	Cell Holder for FTIR Instrument without needle/pin plate



Sealed IR Liquid Cells



Pathlength – Rectangular Aperture – SL-2 Dispersive								
MATERIAL	.015mm	.025mm	.05mm	0.1mm	0.2mm	0.5mm	1mm	PRICE
NaCl	0005A-2899	0005A-2900	0005A-2901	0005A-2902	0005A-2903	0005A-2904	0005A-2905	
KCl	0005B-2906	0005B-2907	0005B-2908	0005B-2909	0005B-2910	0005B-2911	0005B-2912	
KBr	0005C-2913	0005C-2914	0005C-2915	0005C-2916	0005C-2917	0005C-2918	0005C-2919	
CaF2	0005D-2920	0005D-2921	0005D-2922	0005D-2923	0005D-2924	0005D-2925	0005D-2926	
BaF2	0005E-2927	0005E-2928	0005E-2929	0005E-2930	0005E-2931	0005E-2932	0005E-2933	
CSi	0005F-2941	0005F-2942	0005F-2943	0005F-2944	0005F-2945	0005F-2946	0005F-2947	
KRS-5	0005G-2934	0005G-2935	0005G-2936	0005G-2937	0005G-2938	0005G-2939	0005G-2940	
INFRASIL QTZ.	0005H-4136	0005H-4137	0005H-4138	0005H-4139	0005H-4140	0005H-4141	0005H-4142	
CLEARTRAN/ZnS	0005I-2948	0005I-2949	0005I-2950	0005I-2951	0005I-2952	0005I-2953	0005I-2954	
ZnSe	0005J-2955	0005J-2956	0005J-2957	0005J-2958	0005J-2959	0005J-2960	0005J-2961	
AgCl	0005K-2962	0005K-2963	0005K-2964	0005K-2965	0005K-2966	0005K-2967	0005K-2968	

Pathlength – Circular Aperture – SL-2 FTIR								
MATERIAL	.015mm	.025mm	.05mm	0.1mm	0.2mm	0.5mm	1mm	PRICE
NaCl	0005A-2969	0005A-2970	0005A-2971	0005A-2972	0005A-2973	0005A-2974	0005A-2975	
KCl	0005B-2976	0005B-2977	0005B-2978	0005B-2979	0005B-2980	0005B-2981	0005B-2982	
KBr	0005C-2986	0005C-2987	0005C-2988	0005C-2989	0005C-2990	0005C-2991	0005C-2992	
CaF2	0005D-2993	0005D-2994	0005D-2995	0005D-2996	0005D-2997	0005D-2998	0005D-2999	
BaF2	0005E-3000	0005E-3001	0005E-3002	0005E-3003	0005E-3004	0005E-3005	0005E-3006	
CSi	0005F-3014	0005F-3015	0005F-3016	0005F-3017	0005F-3018	0005F-3019	0005F-3020	
KRS-5	0005G-3007	0005G-3008	0005G-3009	0005G-3010	0005G-3011	0005G-3012	0005G-3013	
INFRASIL QTZ.	0005H-4143	0005H-4144	0005H-4145	0005H-4146	0005H-4147	0005H-4148	0005H-4149	
CLEARTRAN/ZnS	0005I-3021	0005I-3022	0005I-3023	0005I-3024	0005I-3025	0005I-3026	0005I-3027	
ZnSe	0005J-3028	0005J-3029	0005J-3030	0005J-3031	0005J-4059	0005J-3032	0005J-3033	
AgCl	0005K-3034	0005K-3035	0005K-3036	0005K-3037	0005K-3038	0005K-3039	0005K-3040	

*Note: Cells with pathlength of 2-4mm add \$35.00 to above prices. Pathlengths 5-10mm add \$69 to above prices.
Add \$16.00 for cell calibration, \$36.00 each for cell matching and \$56.00 each for all matching of .015/.025/.03/.075 mm cells.

Pathlength – Rectangular Aperture – SL-3 Dispersive Pathlength – Spacer Thickness								
MATERIAL	.015mm	.025mm	.05mm	0.1mm	0.2mm	0.5mm	1mm	PRICE
NaCl	0005A-590	0005A-591	0005A-592	0005A-593	0005A-594	0005A-595	0005A-596	
KCl	0005B-783	0005B-784	0005B-785	0005B-786	0005B-787	0005B-788	0005B-789	
KBr	0005C-2096	0005C-777	0005C-778	0005C-779	0005C-780	0005C-1448	0005C-782	
CaF2	0005D-790	0005D-791	0005D-792	0005D-793	0005D-794	0005D-795	0005D-796	
BaF2	0005E-797	0005E-798	0005E-799	0005E-800	0005E-801	0005E-802	0005E-803	
CSi	0005F-804	0005F-805	0005F-806	0005F-807	0005F-808	0005F-809	0005F-810	
KRS-5	0005G-811	0005G-812	0005G-813	0005G-814	0005G-815	0005G-816	0005G-817	
INFRASIL QTZ.	0005H-824	0005H-826	0005H-827	0005H-828	0005H-829	0005H-830	0005H-831	
CLEARTRAN/ZnS	0005I-818	0005I-819	0005I-820	0005I-821	0005I-822	0005I-1080	0005I-823	
ZnSe	0005J-839	0005J-840	0005J-841	0005J-842	0005J-843	0005J-844	0005J-845	
AgCl	0005K-832	0005K-833	0005K-834	0005K-835	0005K-836	0005K-837	0005K-838	

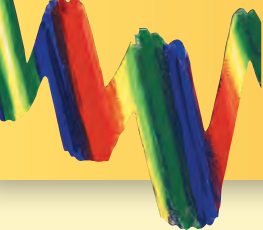
Pathlength – Circular Aperture – SL-3 FTIR								
MATERIAL	.015mm	.025mm	.05mm	0.1mm	0.2mm	0.5mm	1mm	PRICE
NaCl	0005A-853	0005A-854	0005A-855	0005A-856	0005A-857	0005A-858	0005A-859	
KCl	0005B-860	0005B-861	0005B-862	0005B-863	0005B-864	0005B-865	0005B-866	
KBr	0005C-867	0005C-868	0005C-869	0005C-870	0005C-871	0005C-872	0005C-873	
CaF2	0005D-1082	0005D-874	0005D-875	0005D-876	0005D-877	0005D-878	0005D-879	
BaF2	0005E-880	0005E-881	0005E-882	0005E-883	0005E-884	0005E-885	0005E-886	
CSi	0005F-887	0005F-888	0005F-889	0005F-890	0005F-891	0005F-892	0005F-893	
KRS-5	0005G-894	0005G-895	0005G-1081	0005G-896	0005G-897	0005G-898	0005G-899	
INFRASIL QTZ.	0005H-907	0005H-908	0005H-909	0005H-910	0005H-911	0005H-912	0005H-913	
CLEARTRAN/ZnS	0005I-900	0005I-901	0005I-902	0005I-903	0005I-904	0005I-905	0005I-906	
ZnSe	0005J-930	0005J-931	0005J-932	0005J-933	0005J-934	0005J-935	0005J-936	
AgCl	0005K-923	0005K-924	0005K-925	0005K-926	0005K-927	0005K-928	0005K-929	

*Note: Cells with pathlength of 2-4mm add \$35.00 to above prices. Pathlengths 5-10mm add \$69.00 to above prices.
Add \$16.00 for cell calibration, \$36.00 each for cell matching and \$49.00 each for all matching of .015/.025/.03/.075 mm cells.

Pathlength – Spacer Thickness – SL4								
MATERIAL	.015mm	.025mm	.05mm	0.1mm	0.2mm	0.5mm	1mm	PRICE
NaCl	0005A-1965	0005A-1966	0005A-1967	0005A-1968	0005A-1969	0005A-1970	0005A-1971	
KCl	0005B-1972	0005B-1973	0005B-1974	0005B-1975	0005B-1976	0005B-1977	0005B-1978	
KBr	0005C-1979	0005C-1980	0005C-1981	0005C-1982	0005C-1983	0005C-1984	0005C-1985	
CaF2	0005D-1986	0005D-1987	0005D-1988	0005D-1989	0005D-1990	0005D-1991	0005D-1992	
BaF2	0005E-1993	0005E-1994	0005E-1995	0005E-1996	0005E-1997	0005E-1998	0005E-1999	
ZnSe	0005J-7435	0005J-7436	0005J-7437	0005J-7438	0005J-7439	0005J-7440	0005J-7441	

*Note: Cells with pathlength of 2-4mm add \$35.00 to above prices. Pathlengths 5-10mm add \$69.00 to above prices.

Calibration & Matching	
0010-186	Calibration of cells
0010-185	Calibration & matching of cells
0010-4170	Calibration & matching of .015/.025/.03/.075 mm cells, except SL-2
0010-7901	Calibration & matching of 015/.025/.03/.075 mm SL-2 cells
0010-4169	Calibration of variable pathlength cell
0005B-2064	KCl
0005C-2065	KBr



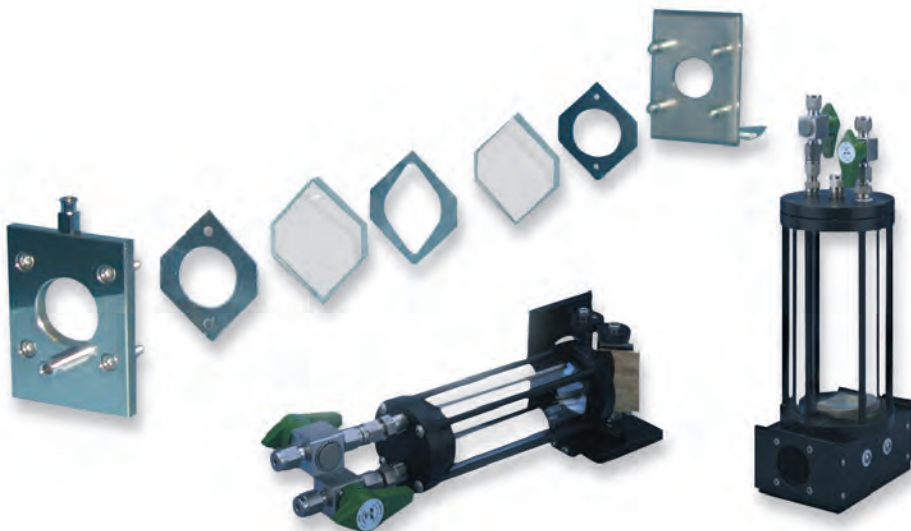
Cell Reconditioning



Varian, Digilab
& Bio-Rad



Thermo Nicolet

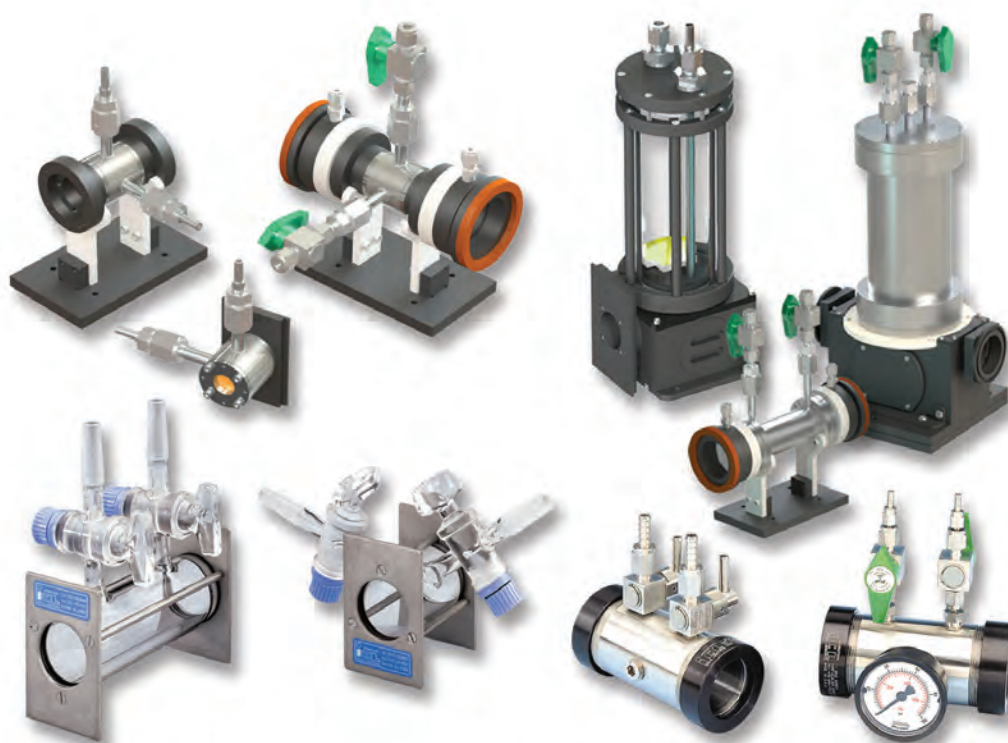
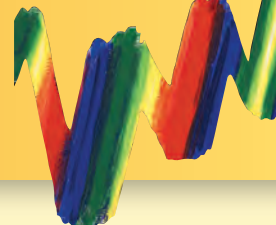


Infrared Liquid & Gas Cell Reconditioning

Part No.	Description	Price
0010-76	Disassembly and reassembly of liquid cell	
0010-4167	Disassembly and reassembly of gas cell	
0010-4528	Disassembly and reassembly of variable path mini gas cell and permanently aligned cell	
0010-4168	Disassembly and reassembly of variable path liquid cell	
0010-4169	Calibration of variable path liquid cell	
0010-186	Calibration of cell	
0010-185	Calibration and matching of cell	
0010-4170	Calibration and matching of .015/.025/.03/.075 mm cells, except SL-2	
0010-7901	Calibration and matching of .015/.025/.03/.075 mm SL-2 cells	
0010-4297	Soldering of fitting	
0010-XXXX	Recondition Long Path Gas Cell	



ICL reconditions oil flow cells for the Thermo Nicolet Avatar 360, the Varian FT-IR Oil Analyser, the Bio-Rad Oil Analyzer and the Digilab Oil Analyzer. All reconditioned cells are calibrated and tested under pressure. If requested by customer, windows can be wedged to limit fringing. Contact ICL for pricing guidelines.



ICL's Gemini™ Gas Cells comprise an entire system of gas cell configurations suited for FTIR and laser spectroscopy. Gemini™ Gas Cells are available in numerous standard configurations; and cells can be configured with virtually any custom path length, sample compartment material, seal composition, mirror or optic coating and inlet or outlet style. In summary, the Gemini™ Gas Cell solar system includes:

Mercury™ Gas Cells: **short path length single pass** Gemini™ Gas Cells with low volumes (100cc to 0.5 liter) from nickel plated stainless steel. Pathlengths range from 10cm to 2.5 meters. Vacuum rating 1×10^{-9} Torr.

Venus™ Gas Cells: **low volume** (0.5 to 1 liter) borosilicate glass and aluminum bodied long path gas cells with fixed and variable path lengths (1 to 6.5 meters), including our popular long path mini cells.

Earth™ Gas Cells: **moderate volume** (2 to 8 liter) borosilicate glass long path gas cells with fixed and variable path lengths (10 to 20 meters).

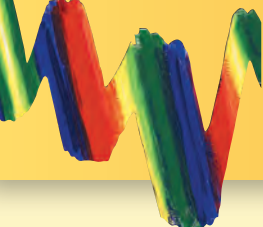
Mars™ Gas Cells: **rugged and robust** moderate volume (1 to 5 liter) **all metal** long path gas cells comprised of stainless steel (passivated or electropolished) or nickel plated aluminum bodies **for demanding or corrosive applications** requiring durability. Path lengths range from 1 to 20 meters and pressures range from vacuum (1×10^{-10} Torr) to 125 psi.

Saturn™ Gas Cells: **research grade ultra long path** gas cells (50 to 100 meters) with borosilicate or fused silica bodies with laser alignment.

The Gemini™ solar system combined with ICL's Basics Gas Cells offers a solution to every sample analysis problem and for every budget.

Gas Cell Selection Guide Applications & Configurations

	Heatable	Corrosive Sample	Glass Body	Metal Body	PTFE Body	Variable Path Length	Laser Alignment	Modest Cost	Short Path Length	Special Gases	Pure Gases	Sub PPM Gas	Vacuum Test
Cell Models	Mercury Mars ICL	Mercury Mars	Venus Earth Saturn ICL	Mercury Mars	ICL	Venus Earth Mars Saturn	Saturn	Venus ICL	Mercury ICL	Mercury Mars	Mercury Mars	Saturn Venus Mars Earth	Mercury Mars



Gas Cells



**Demountable
Beta Gas Cell**

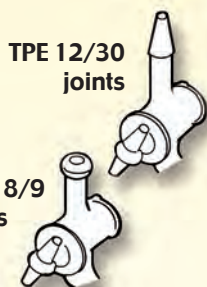


Figure 1.



The G-2 Gas Cell is for analysis of pure gases or gas mixtures in which component gases are present at concentrations of 5 percent or more. The G-2 Gas Cell has a fixed pathlength of either 5cm or 10cm. The windows of the cell are easy to remove for cleaning, making the G-2 ideal for working with wet or reactive gases that have a tendency to fog or attack the window material.

The G-2 cell comes completely assembled in a stainless steel universal 2" x 3" mount. It includes a Pyrex® glass body, silicon rubber or Viton® gaskets and a choice of optical materials.

The window size is 38mm x 6mm. The clear aperture of the cell is 32mm.

The G-2 is available in a variety of optical window materials, two pathlengths and a choice of ground tapered endings with 12/30 joints (**TPE**), plain endings joints (**PTE**) or ground semi-ball joints with 18/9 joints (**SBJ**). (See notes beneath chart and Figure 1).

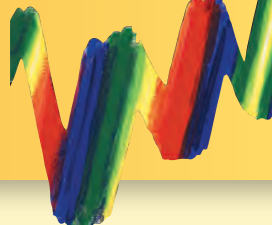
The Beta Gas Cell is an inexpensive demountable gas cell that uses 25 x 4mm windows and is available in 5 or 10cm versions.

Material		Catalog Number		Price
Gas Connection		5 cm	10 cm	
NaCl				
PTE		0008A-715	0008A-711	
SBJ		0008A-716	0008A-712	
TPE		0008A-714	0008A-710	
KCl				
PTE		0008B-720	0008B-717	
SBJ		0008B-721	0008B-718	
TPE		0008B-719	0008B-713	
KBr				
PTE		0008C-726	0008C-723	
SBJ		0008C-727	0008C-724	
TPE		0008C-725	0008C-722	
CaF₂				
PTE		0008D-732	0008D-729	
SBJ		0008D-733	0008D-730	
TPE		0008D-731	0008D-728	
BaF₂				
PTE		0008E-739	0008E-735	
SBJ		0008E-740	0008E-736	
TPE		0008E-737	0008E-734	
INFRASIL QTZ				
PTE		0008H-5030	0008H-5031	
SBJ		0008H-5032	0008H-5033	
TPE		0008H-5034	0008H-5035	
AgCl				
PTE		0008K-763	0008K-760	
SBJ		0008K-764	0008K-761	
TPE		0008K-762	0008K-759	
BETA GAS CELL		0008-505	0008-504	

* PTE = Plain tubular endings. This is a straight tube, not ground.

SBJ = Semi ball ending with 18/9 joints. This is a ground joint, 18mm diameter at widest with 9mm hole.

TPE = Tapered ending with 12/30 joints. This is a ground joint, 12mm diameter at widest, 30mm in length.



Model G-2SS
10cm Stainless
Steel Gas Cell



The G-2SS stainless steel gas cell is useful for qualitative analysis of pure gases and mixtures where one or more of the constituent gases are present in concentrations of at least 5 percent. It can be used in situations that make use of a glass cell impractical, such as applications involving high pressure or gases that etch a glass cell body. The only functional constraint on the pressure that can be applied to this cell is the window material selected. The clear aperture of the cell is 39mm and it uses 47mm x 6mm windows. Like the G-2, this cell uses a universal

2" x 3" slide mount that fits all spectrophotometers. There are inlet and outlet ports equipped with vacuum valves and hose barbs that are configured to also allow flowing gas through the cell. A 1/4 NPT port in the side of the cell allows the addition of a pressure gauge, a thermocouple and other probes. The cell comes with an assortment of silicon, nitrile, PTFE and viton "O" rings and gaskets. KBr and NaCl are the basic window material, but other materials are available upon request. Can be heated.

Part No.	Description	Price
0008-5160	G-2SS, NaCl windows	
0008-5161	G-2SS, KBr windows	
0008-5162	Cylindrical Cell Holder	
0008-5584	Optional Pressure Gauge	
0008-5804	PTFE Gaskets (1pk/4)	
0008-5321	Nitrile "O" Rings (1pk/4)	
0008-5805	PTFE "O" Rings (1pk/4)	
0008-XXXX	Replacement 47 x 6mm windows, all materials	
0008-7329	Heater Jacket and accessories	

G-3PTFE 10cm
PTFE Gas Cell



All components of the G-3PTFE 10cm gas cell that contact the sample can be made entirely of PTFE, making the cell useful for any gas sample that might attack, or be contaminated by, glass or stainless steel gas cell components. The G-3PTFE is useful for analysis of pure gases and mixtures in which

the constituent gases are present in concentrations of 5% or more. The G-3PTFE has a clear aperture of 39mm and uses 47 x 6mm windows. Swagelok® SS valves are standard, but PFA valves are optional. A heated version is available. Requires a cell mount (Part No. 0008-5162).

Gas Cells



Heated gas cell
See page 11



Long Path Mini Gas Cell
Variable 1 to 5 meters
See page 14

Gas Cells



Figure 2
Gas cell configuration
with Swagelok® valves



High stability
temperature controller
www.internationalcrystal.net

Heated Vapor Gas Multi-Sampler



This heated cell can be configured as a gas cell (Fig. 2) or for vaporizing samples that are normally solids or liquids at room temperature. Configured for gas sampling, the cell incorporates 2 valves, an inlet and an outlet, that enable flowing gas samples through the cell. In its solid and liquid vaporization configuration, the cell has an outlet needle valve from which a vacuum can be pulled and two (2) sample inlets.

One inlet is a needle septa injection port on the top of the cell which is similar to the type used in gas chromatography. There is a second inlet in the form of a side port for inserting solid samples, which also doubles as the thermocouple port. Using the side port eliminates the need to recheck vacuum seals whenever the cell is opened to insert solid samples. The heating jacket extends over the end of the cell so that both the cell body and the optics are heated, and allows operation at temperatures up to 200°C.

Condensation on the optics is minimized by heating them to the same temperature as the sample chamber. A type J iron constantan thermocouple is provided with plugs which are compatible with the optional temperature controller. The cell body is type 304 stainless steel and an assortment of seals is provided – silicon, viton PTFE and nitrile.

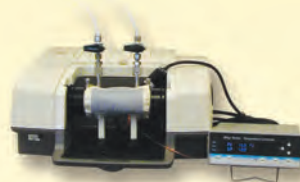
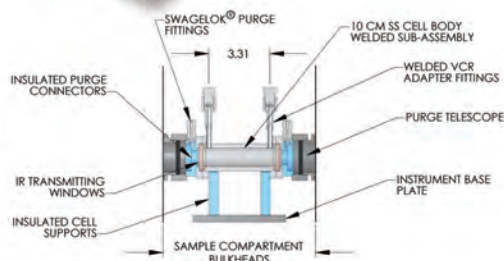
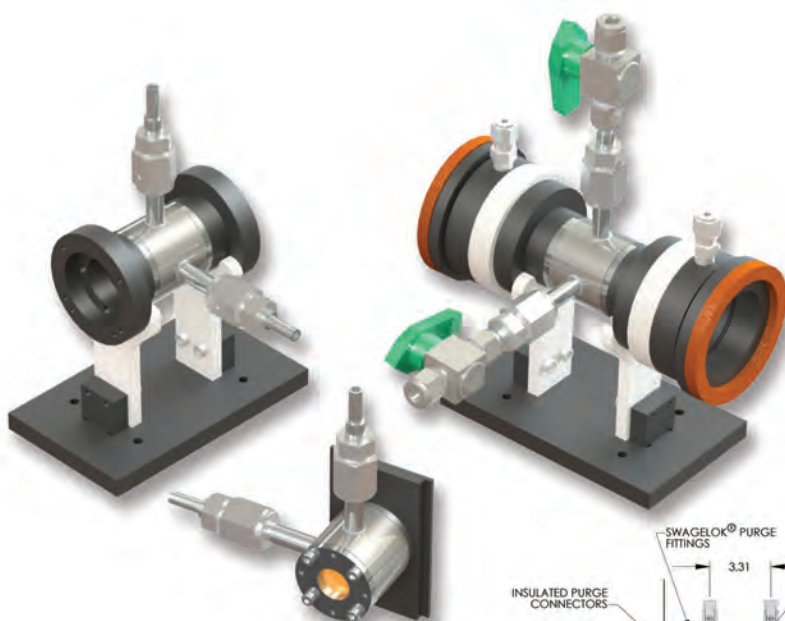
Cells are factory pretested for vacuum leaks using dummy windows and then new windows are shipped with the cell. The cell comes standard with 47 x 6mm KCl windows. The clear aperture is 39mm. Other window materials are available. An optional high stability temperature controller with RS-232 computer interface and Windows® compatible software is available. The temperature controller has ramp and soak cycles that can be programmed either on the keypad or from a PC using the provided software and the RS232 interface.

Part No.	Description	Price
0007-5546	10cm vapor gas multi-sampler with sheathed Iron Constantan 304SS type J thermocouple, 115v, 250w heater system, Swagelok® vacuum valve, thermocouple port, injection port heatable to 200 degrees C, heated windows to prevent fogging, KCl windows, 303SS body.	
0007-5547	Same as 0007-5546 with KBr windows.	
0017-5548	High Stability PID Temperature Controller for 0007-5546, 110v, RS-232 interface and Windows® based software for PC control, digital readout, keypad or PC programmable for ramp up, ramp down, set point, and soak (dwell) time as well as for temperature settings, digital readouts of all parameters. See www.internationalcrystal.net for more details.	
0017-4804	Same as 0017-5548 but 230 volts	
0008-5162	Cylindrical Cell Holder for 0007-5546 and 0007-5547	
0007-7405	10cm heated gas cell, KCl windows, two Swagelok® valves, type J Iron Constantan thermocouple, 115v, 250w heater jacket. Requires temperature controller (Part no. 0017-5548) and cell mount (Part No. 0008-5162).	
0007-7406	Same as 0007-7405 with KBr windows	
0008-7329	Replacement Heater Jacket	

Mercury™ Single Pass Short Path Length Stainless Steel Specialty Gas Cells



Gas Cells



Heated 10cm Mercury™ cell with valve kit and temperature controller

Short Path Gas cells are useful for pure gases and, generally speaking, for concentrations of not less than 100 ppm. Cell utility for various ppm concentrations is dependent not only on path length, but also on the absorbance characteristics of the sample. Feel free to consult with us on these and any other issues concerning selection of an appropriate gas cell.

ICL's Gemini™ gas cell line begins with our Mercury™ short path length single pass gas cells constructed of electropolished 316 Stainless Steel, available in standard path lengths of 1cm, 2cm, 3cm, 5cm, 10cm and 15cm. Custom path length cells for a variety of applications are also available.

These robustly constructed gas cells are ideal for specialty gas analysis, because they are leak tight and capable of high vacuum performance exceeding 1×10^{-8} Torr, and they also can be made pressure-safe with appropriate window material and thickness selection. Each Mercury™ cell is individually helium leak tested or hydrostatically tested and a test certificate can be supplied with any cell for \$299.00 (Part No. 0009-9281).

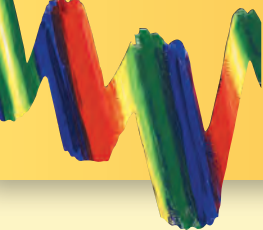
Mercury™ cell configurations include base plate mounted, slide mounted and heated versions with temperature controllers. Purge maintaining connectors or couplers extending from the cell body to the sample compartment walls are standard on many base plate mounted models and purge gas connections are an available option. A wide variety of window materials can be used. Wedged windows are available to limit fringing. Instrument specific spectrophotometer interfaces are available.

Mercury™ cells feature high-vacuum welded gas fittings without valves comprising the sample inlet and outlet to maintain the leak-free integrity of the cell and assure high vacuum performance. Inlets and outlets comprise a Swagelok® VCR gland, a VCR female nut, a male VCR nut and a 1/4" Swagelok® adapter. Valve kits are available.

Several common Mercury™ cell configurations are shown, but custom configurations are available upon request. Prices do not include windows, which can be selected from our transmission window price list. RFQ for wedged windows. Cell mounting and other hardware, exclusive of the cell body material and valves, is black anodized aluminum. See www.internationalcrystal.net for more information.

Part Number	Cell Body Material	Pathlength	Vol.	Temp. Range	Temp. Controller	Heater	Spectrophotometer-Specific Interface	Pressure Range	Window Size	Price w/o windows
0008-9272	316 SS electropolished	15cm	0.15L	ambient–200°C	Optional 0017-XXXX	Optional 0008-9278	Optional 0008-9279	Vacuum – 45psi*	37.5 x 4	
0008-9273	316 SS electropolished	10cm	0.1L	ambient–200°C	Optional 0017-XXXX	Optional 0008-9278	Optional 0008-9279	Vacuum – 45psi*	37.5 x 4	
0008-9274	316 SS electropolished	5cm	0.05L	ambient–200°C	Optional 0017-XXXX	Optional 0008-9278	Optional 0008-9279	Vacuum – 45psi*	37.5 x 4	
0008-9275	316 SS electropolished	1cm	0.01L	ambient–200°C	Optional 0017-XXXX	Optional 0008-9278	Optional 0008-9279	Vacuum – 45psi*	25 x 4	
0008-9276	316 SS electropolished slide mounted	1cm	0.01L	ambient–200°C	Optional 0017-XXXX	Optional 0008-9278	Optional 0008-9279	Vacuum – 45psi*	25 x 4	
0008-9277	316 SS electropolished slide mounted	5cm	0.05L	ambient–200°C	Optional 0017-XXXX	Optional 0008-9278	Optional 0008-9279	Vacuum – 45psi*	25 x 4	
0008-9278	Heater Jacket									
0017-5548	Temp. Controller, 115v									
0017-4804	Temp. Controller, 230v									
0008-9279	Spectrophotometer Interface									
0008-9280	Valve Kit									

*Window-dependent: KBr should be used only to 15psi.

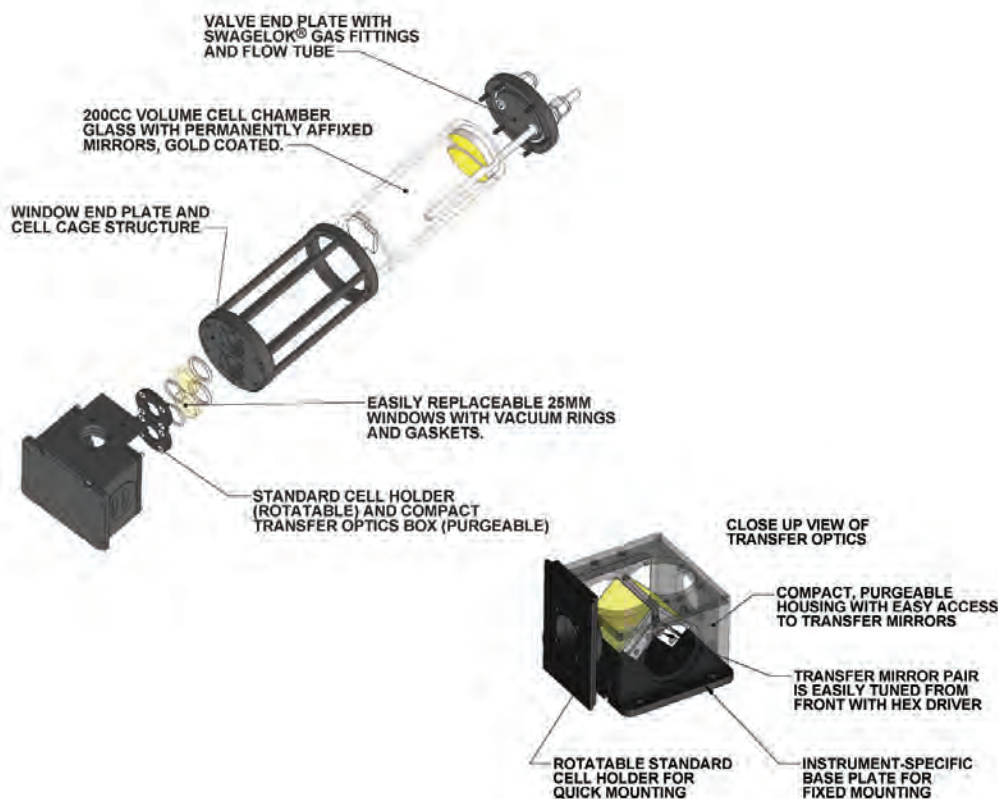


Venus™ Glass Bodied Long Path Gas Cells

Gas Cells



Venus 6.4M



Gemini™ Venus™ Glass bodied long path gas cells are classic Hanst cells, first made commercially available by Dr. Phil Hanst, who started producing them after a long career at NASA and the EPA. Hanst cells are in our bloodline at ICL, since we were Phil's first outlet for his product and Phil's son Steve, who worked with Phil designing gas cells for 20 years, is now a major shareholder in ICL as well as its Executive Vice President.

Venus™ cells are small to moderate volume long path gas cells designed for all purpose use in industrial and research applications. The cell design has improved significantly over the years with such advances as multilayer proprietary gold mirror coatings, improved purgeable transfer optics, and instrument specific base plate mountings. All Venus cells are fitted with Swagelok® 1/4" or 1/8" tube fittings to which valves, hose barbs or compression fittings can be attached. SS Swagelok® Valves are standard on the models listed.

Venus™ cell configurations include ICL's popular Ultra Mini Cell which measures 3" x 3" x 8" (3 meters fixed path length, 200cc volume), the Long Path Mini Cell (variable path length to 5 meters, 0.5L volume) and fixed and variable path length cells ranging from 4.8 to 8 meters. Heatable, laser aligned, base plate mounted and other custom configurations of Venus™ cells are available. Instrument specific interfaces are available for base plate mounted cell configurations.

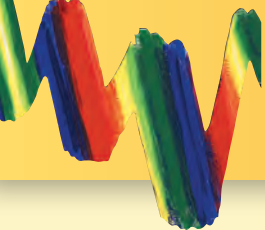
Several common Venus™ cell configurations are shown, but custom configurations are available upon request. Prices do include KBr windows, but optional windows can be selected from our transmission window price list. RFQ for wedged windows to limit fringing a/k/a channeling. Cell mounting and other hardware, exclusive of the cell body material and valves, is black anodized aluminum. Fittings and Valves are SS Swagelok®. All cell bodies are borosilicate glass. Mirrors are GemGold™ multi-layer gold coated, removable and easily serviced. See www.internationalcrystal.net for more information.

Venus™ Glass Bodied Long Path Gas Cells



3 Meter Ultra Mini Cell (1/2 scale)

Part Number	Mounting	Pathlength	Vol.	Temp. Range	Temp. Controller	Heater	Spectrophotometer-Specific Interface	Pressure Range	Window Size	Price w/ KBr windows
0008-9292	Slide Mounted	3.0 M	200cc	ambient	N/A	N/A	N/A	vacuum-ambient	25 x 4	
0008-9293	Slide Mounted	variable 1 to 5M	0.5L	ambient – 100°C	Optional 0017-XXXX	Optional 0008-9278	N/A	vacuum-ambient	25 x 4	
0008-9294	Slide Mounted	4.8M	0.5L	ambient – 100°C	Optional 0017-XXXX	Optional 0008-9278	Base Mounted	vacuum-ambient	25 x 4	
0008-9295	Slide Mounted	6.4M	0.5L	ambient – 100°C	Optional 0017-XXXX	Optional 0008-9278	Available Base Mounted	vacuum-ambient	25 x 4	
0008-9296	Slide Mounted	variable 1.6 to 8M	0.75L	ambient – 100°C	Optional	Optional	Available Base Mounted	vacuum-ambient	25 x 4	
0008-9278	Heater Jacket									
0017-5548	Temp. Controller 115v									
0017-4804	Temp. Controller 230v									
0008-9279	Spectrophotometer Specific Interface									
0008-9280	Replacement Valve Kit									



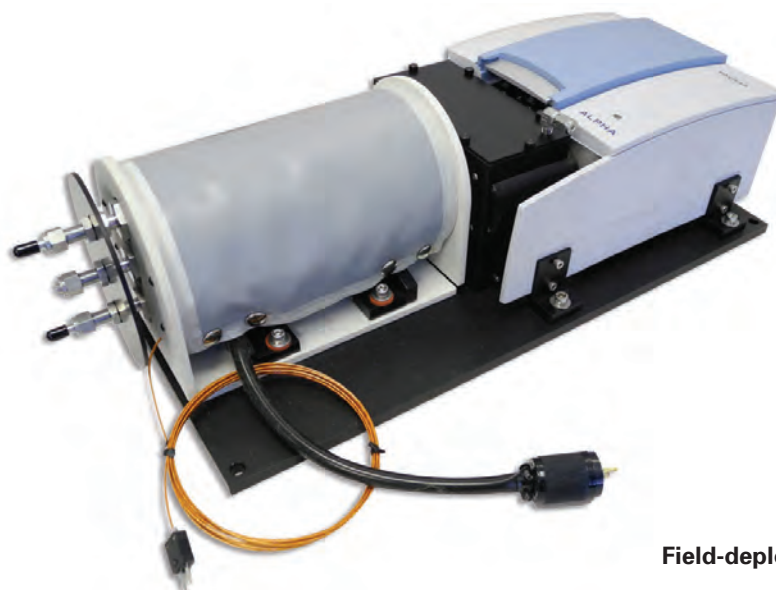
Gas Cells



Heated 3 Meter Mars™ Cell



Mars™ Long Path Gas Cells



Field-deployed Gas Analysis System

Part Number	Cell Body Hardware Material/Plating	Pathlength	Vol.	Temp. Range	Temp. Controller	Heater	Instrument Interface	Pressure Specific Range	Price w/ KBr windows
0008-9282	Aluminum Electroless Nickel	2M	0.2L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-9283	316 SS electropolished	2M	0.2L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-7681	Aluminum Electroless Nickel	3M	0.375L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-9284	316 SS electropolished	3M	0.375L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-9285	316 SS electropolished	4.8M	0.5L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-7682	Aluminum Electroless Nickel	6.4M	0.75L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-7679	316 SS electropolished	6.4M	0.75L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-9287	Aluminum Electroless Nickel	1.6 to 6.4M variable	0.75L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-9288	316 SS electropolished	1.6 to 6.4M variable	0.75L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-9289	Aluminum Electroless Nickel	10M	2L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-9290	316 SS electropolished	10M	2L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-9291	316 SS electropolished	12 to 48M variable	8L	ambient – 200°C	Optional 0017-XXXX	Optional 0008-7684	Optional 0008-9279	Vacuum – 45psi*	
0008-7684	Heater Jacket								
0017-5548	Temp. Controller 115v								
0017-4804	Temp. Controller 230v								
0008-9279	Spectrophotometer Specific Interface								
0008-9280	Valve Kit								

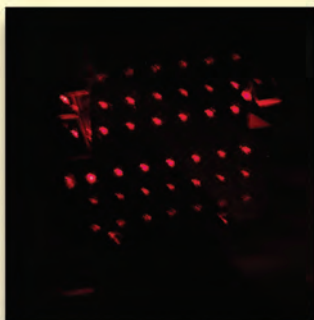
Specify spectrophotometer manufacturer and model when ordering.

*Window-dependent: KBr should be used only to 15psi.

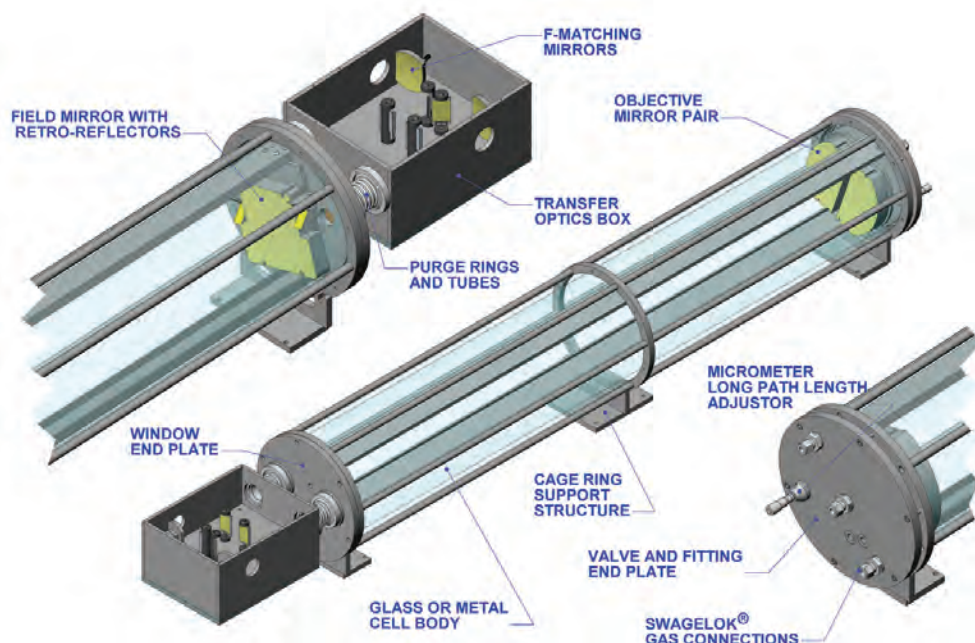


Earth™ and Saturn™ Glass Bodied Long Path Gas Cells

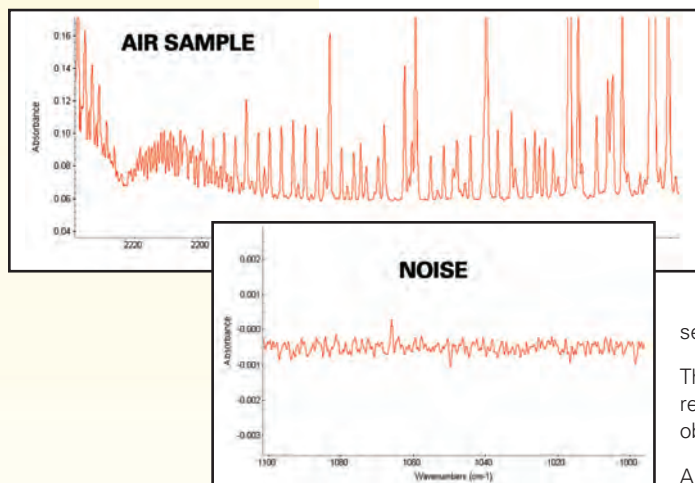
Gas Cells



632nm Laser alignment footprint on Saturn™ cell mirrors



Features of Saturn 50L/200V



Gemini™ Earth™ glass bodied long path gas cells are, like Venus™ cells, classic Hanst cells, but with larger volumes and longer path lengths. Pathlengths range from 10 to 20 meters and volumes range from 2 to 8 liters.

For applications requiring ultra long path lengths we offer our Saturn™ series multi-pass gas cells that range from 80 to 200 meters. These cells employ an innovative advancement in White cell configuration that effectively triples the operational range of the cell within a moderate size cell volume, thereby providing path lengths in excess of 100 meters that still produce strong signal throughput to enable part per billion (ppb) trace level detection sensitivity in ambient conditions and when sampling gas mixtures.

The spectra show excellent signal to noise performance at 0.5cm^{-1} resolution in a 160 meter path length cell in a few minutes of elapsed observation time.

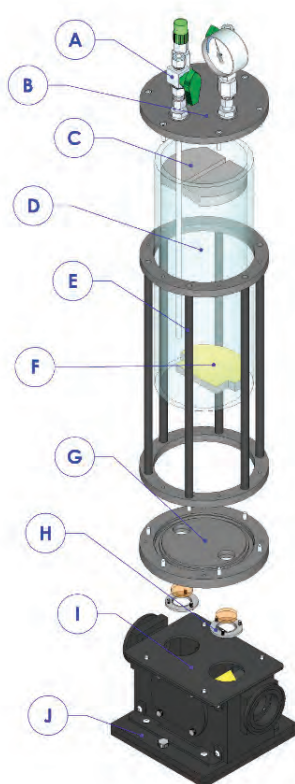
All Earth and Saturn cells feature SS Swagelok® valves, multilayer gold coated mirrors, borosilicate glass bodies, transfer optics and base plate configurations to fit most spectrophotometers, and black anodized aluminum hardware. Earth™ cells use $1/4"$ SS flow tubes and Swagelok® connections and Saturn cells use $3/8"$ SS flow tubes and Swagelok® connections. All variable path length cells incorporate a laser alignment device with a 6 volt DC power supply for path length verification based on the number of passes made through the cell.

Several typical Earth™ and Saturn™ cell configurations are shown, but custom configurations are available upon request. Prices do include KBr windows, but optional windows can be selected from our transmission window price list. RFQ for wedged windows to limit fringing a/k/a channeling. Cell mounting and other hardware, exclusive of the cell body material and valves, is black anodized aluminum. Fittings and Valves are SS Swagelok®. All cell bodies are borosilicate glass. Mirrors are removable and easily serviced. See www.internationalcrystal.net for more information.

Earth™ and Saturn™ Glass Bodied Long Path Gas Cells



- A. Swagelok® and Nupro Valves and Fittings
- B. Valve and Fitting Bulkhead
- C. Precision Aligned Objective Mirror Pair
- D. "Cell Rack"
- E. Cell Body
- F. Field Mirror
- G. Windows Endplate
- H. Window Retaining Rings
- I. Transfer Optics Box
- J. Base Plate



Part Number	Cell	Pathlength	Vol.	Temp. Range	Controller	Temp. Heater	Laser Alignment	Pressure Range	Window Size	Price w/ KBr windows
0008-9298	Earth	10M	2L	ambient – 100°C	Optional 0017-XXXX	Optional 0008-7684		vacuum-ambient	25 x 4	
0008-9299	Earth	variable 1 to 10M	2L	ambient – 100°C	Optional 0017-XXXX	Optional 0008-7684	Yes	vacuum-ambient	25 x 4	
0008-9300	Earth	20M	8L	ambient – 100°C	Optional 0017-XXXX	Optional 0008-7684		vacuum-ambient	25 x 4	
0008-9301	Earth	variable 2 to 20M	8L	ambient – 100°C	Optional 0017-XXXX	Optional 0008-7684	Yes	vacuum-ambient	25 x 4	
0008-9302	Saturn	variable 8 to 80M	18L	ambient			Yes	vacuum-ambient	37.5 x 4	
0008-9303	Saturn	variable 10 to 100M	25L	ambient			Yes	vacuum-ambient	37.5 x 4	
0008-9304	Saturn	variable 20 to 200M	50L	ambient			Yes	vacuum-ambient	37.5 x 4	
0008-7684	Heater Jacket									
0017-5548	Temp. Controller 115v									
0017-4804	Temp. Controller 230v									
0008-9279	Spectrophotometer specific Interface									
0008-9280	Replacement Valve Kit									



Presses



Little Press™ KBr Pellet Die Kit



Evacuatable Little Press™

Quick Press KBr Pellet Kit & Port-A-Press™ KBr Pellet Kit



ICL's Port-A-Press™ and QuickPress are the most economical, full-scale, KBr pellet presses on the market, and each produces pellets that are as transparent as those made with a 12 ton hydraulic press. The Port-A-Press™ uses a torque wrench to permit the user to apply the same amount of pressure from pellet to pellet thereby facilitating reproducibility of results. The square frame of the Port-A-Press™ can either be inserted in a bench mounted vise or in the channel shaped holder provided with the press (shown in photo) which can be mounted to a work bench. The torque wrench easily generates 20 foot pounds of torque without the use of excessive strength, which is sufficient to

produce 16,000 lbs/in² of pressure on the die set. This is the equivalent of 8 tons of pressure and forms a very clear pellet.

The Quick Press is a hand press for making transparent KBr pellets (discs) with diameters of 7mm, 4mm or 2mm. The Quick Press uses the principle of toggle action to apply very high pressure with minimal force. The KBr pellet is formed using only the pressure of a firm handshake applied steadily to the handle. The anvils of the 7mm die sets are hardened with optically polished faces and use aerospace grade of nickel based alloy. The die sets are interchangeable for both the Port-A-Press™ and the Quick Press.

Part No.	Description	Price
0012-188	KBr Port-A- Press™ Kit, complete with 7mm die set, torque wrench, channel holder and pellet press	
0012-189	Die Set—7mm	
0012-191	Die Set—4mm	
0012-190	Die Set—2mm	
0012-4706	10 pack of 7mm collars/KBr pellet mounts	
0012-4607	Sample Holder to mount collars containing pellets in spectrophotometer	
0012-4586	KBr Quick Press Kit, complete with 7mm die set and holder	
0012-4977	KBr Quick Press Handle Only w/o Die Set	
0012-193	Little-Press™ Kit, including press body, two type 316 stainless steel bolt style anvils and sample holder	
0012-6680	Evacuatable Little-Press™ Kit, same as 0012-193 but evacuatable	
0012-624	Assortment of ten Little-Press bodies (Nuts) with twenty bolt style 316SS anvils	
0009-489	35mm OD Agate Mortar & Pestle (See page 27 for other sizes)	

Solid Sampling & KBr Presses



The E-Z™ Quick Table Top Press operates on the same toggle action principle as our Quick Press. By mounting the press vertically and providing a table top mounting platform, we have made it easier to compress a KBr pellet and easier to open the press and remove the pellet. Vertical mounting enables the use of body weight and shoulder muscles, so the E-Z™ Quick requires minimal strength to operate. When the base is attached to a bench it is easier to open

then a hand press, and pushing a small lever ejects the die set. There is a dial indicator to enable reproduction of force settings from pellet to pellet. The press is constructed from Stainless Steel, chrome plated steel and anodized aluminum for long corrosion-free service. The E-Z™ Quick Press uses the same 7mm, 4mm and 2mm die sets that are used in ICL's Quick Press and Port-A-Press™.

Presses

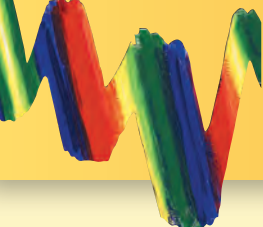


**KBr powder
& random cuttings**
See page 26



Quick Press
See page 19

0012-8076	E-Z™ Quick Table Top Press, w/o die set
0012-8211	E-Z™ Quick Table Top Press, w/ 7mm die set
0012-8212	E-Z™ Quick Table Top Press, w/ 2mm, 4mm and 7mm die sets
0012-189	7mm die set
0012-191	Die Set—4mm
0012-190	Die Set—2mm
0012-4706	10 Pack of 7mm collars/KBr pellet mounts
0012-6678	20 Pack of 7mm collars/KBr pellet mounts
0012-6679	30 Pack of 7mm collars/KBr pellet mounts
0012-4607	Sample Holder to mount collars containing pellets in 2" x 3" slide mount of spectrophotometer
0011-8966	Premium Grade FTIR SpectroGrade™ KBr Powder, 100 grams
0011-4541	KBr XL Ultra Pure SpectroGrade™ Powder 99.999% pure, 100 grams
0009-489	35mm OD Agate Mortar & Pestle



Presses



**KBr powder
& random cuttings**
See page 26



Agate mortars & pestles
See page 27

E-Z Press™ 12, 15, 20, 30 & 40 Ton Hydraulic Presses

U.S. Patents No. 5,701,814 & 5,787,564



**12, 15 & 20 Ton
E-Z Press™**



**30 & 40 Ton
High Profile
E-Z Press™**

ICL's new patented E-Z Press™ hydraulic lab presses feature a unique lightweight ergonomic design. All E-Z Press™ models weigh less than 155 pounds due to ICL's patented unibody construction. **The 12 ton E-Z Press™ weighs a mere 51 pounds!** The E-Z Press™ will handle a variety of lab applications, including pressing KBr pellets for FTIR spectroscopy and briquetting samples for XRF spectroscopy.

Ports in the walls of the press frame allow access for vacuum lines and electrical cords, enabling use of the press with evacuable dies and heated platens. The 15 and 20 ton E-Z Press™ can also be used for making thin films with ICL's Precision Thickness Film Maker.

All E-Z Presses™ feature built in polycarbonate safety shields with solid brass hardware. There are die centering depressions in the round bottom platens. Each press comes with a standard

stainless steel filling disc to flatten the platen. The bottom platen of the 12 ton E-Z Press™ automatically centers ICL's 13mm Macro-Micro die. The bottom platen of the 15 and 20 ton E-Z Press™ has a 4" diameter depression and optional donut shaped inserts are available to automatically center ICL's 13mm, 20mm, 32mm, 35mm and 40mm die sets. Optional extra long handles are also available for all presses for extra leverage.

Features

- Built in Polycarbonate Safety Shields
- Adjustable Overhead Lead Screw
- Access Ports for Vacuum and Electrical Lines
- Lightweight
- Unibody Construction
- Ergonomic Design
- Automatic Die Centering

Part No.	Description	Price*
0012-5859	12 ton E-Z Press™, with safety shields shipping weight approx. 57 pounds, CE marked	
0012-7418	15 ton E-Z Press™, with safety shields shipping weight approx. 90 pounds, CE marked	
0012-6306	20 ton E-Z Press™, with safety shields shipping weight approx. 90 pounds, CE marked	
0012-4608	Precision Thickness Film Maker with 15, 25, 50 100, 250 & 500 micron spacers, cooling jacket and foil inserts	
0012-5908	KBr Pellet Kit with 13mm die set (0012-2477) & 12 ton E-Z Press™ (0012-5859)	
0012-6549	30 ton E-Z Press™, with safety shields, high profile with 8 1/4" daylight, weight 151 pounds, CE marked	
0012-6630	40 ton E-Z Press™, with safety shields, high profile with 8 1/4" daylight, weight 153 pounds, CE marked	
0012-2477	13mm KBr die set (See page 27)	
0012-6633	32mm die set with 2 SS anvils	
0012-6664	Water cooled 4" dia. Heated Platens (See page 25)	
0012-6636	Die Centering Disc with 3.65" (92.7mm) aperture and 4" OD, centers ICL 20-40mm die sets	

*Handling charges are additional.



Presses



0012-7417	2 Ton E-Z™ Press with safety shields. Daylight opening 2.5", Shipping weight approximately 60 pounds.
0012-7760	1 Ton E-Z™ Press with safety shields. Daylight opening 2.5", Shipping weight approximately 60 pounds.
0012-7825	Intrinsic dissolution die sets with 6 dies and 6 flat bottom beakers
0012-8092	Intrinsic dissolution die sets with 2 dies and 2 flat bottom beakers
0012-8093	Die centering insert for 2mm, 4mm and 7mm die sets
0012-191	Die Set—4mm
0012-189	Die Set—7mm

*Handling charges are additional.



Presses

Air-EZ™ 15, 20, 30 & 40 Ton Automated Presses

U.S. Patents No. 5,701,814 & 5,787,564

Precision
Thickness Film Maker



15 & 20 Ton
AIR-EZ™ Press



30 & 40 Ton
High Profile
AIR-EZ™ Press

Pellet and
Briquetting Die Sets
See page 27

The Air-EZ™ Press adds automation to the patented unibody design that enables ICL to make the E-Z Press™ so light and ergonomic. The press is driven by an elegant and quiet pneumatic motor that runs off of your lab's compressed air supply or most commercially available air compressors. **No physical effort whatsoever is required.** The press jacks up to its rated capacity of 15, 20, 30 or 40 tons in a mere 5 seconds. Ports in the walls of the press frame allow access for vacuum lines and electrical cords to the area between the platens, which enables use of the press with evacuable dies or heated platens. The Air-EZ™ Press is suitable for many lab applications, including KBr pellets and XRF briquettes. It has a small footprint and weighs between 130 pounds and 155 pounds. **If you dread pumping up a manual press or crave lab space, this is the solution.** The press is available with heated platens and our PrecisionThickness Film Maker as a Film Maker Kit.

Air-EZ™ Presses feature built in polycarbonate safety shields with polished brass hardware and a die centering depression in the round stainless steel bottom platen. The press comes with a standard 4" diameter stainless steel filling disc to flatten the platen. Optional donut shaped inserts are available to automatically center die sets with a variety of base diameters.

Features

- Automated – propelled by lab compressed air
- No strength required
- Lightweight
- Built-in Polycarbonate Safety Shields
- Small Footprint
- Ergonomic Design
- Unibody Construction
- Access Ports for Vacuum and Electrical Lines
- Adjustable Overhead Lead Screw
- CE Marked

Part No.	Description	Price*
0012-7419	15 ton Air-EZ™ Press, with safety shields, shipping weight approx. 130 pounds, requires 100–115 psi, 7cfm, compressed air supply	
0012-6486	20 ton Air-EZ™ Press, with safety shields, shipping weight approx. 130 pounds, requires 100–115 psi, 7cfm, compressed air supply	
0012-4608	Precision Thickness Film Maker with 15, 25, 50 100, 250 & 500 micron spacers, cooling jacket and foil inserts	
0012-6906	KBr Pellet Kit with 13mm die set (0012-2477) & 20 ton Air-EZ™	
0012-2477	13mm KBr die set (See page 27)	
0012-6633	32mm die set (See page 27)	
0012-6625	30 ton Air-EZ™, with safety shields, high profile with 8 1/4" daylight, weight approx. 152 pounds, CE marked	
0012-6628	40 ton Air-EZ™, with safety shields, high profile with 8 1/4" daylight, weight approx. 155 pounds, CE marked	
0012-6664	Water cooled 4" dia. Heated Platens (See page 25)	

*Handling charges are additional.



The ICL Precision Thickness Film Maker is available with several film making kits and as a stand alone accessory for use with other lab presses. It is designed to hot press polymer films to precise thicknesses of 15, 25, 50, 100, 250 & 500 microns. It can be used in conjunction with either ICL's 6" x 6" thermostat controlled heated platens (0012-4612; see www.internationalcrystal.net) or the temperature controlled, water cooled heated platens with digital temperature controller (0012-6664). The Precision Thickness Film Maker and the heated platens can be combined as complete kits with the 20 ton E-Z Press™, the 20 ton Air-EZ™ and the 12 ton Mini "C" Column press.

The Precision Thickness Film Maker produces thin films which are highly reproducible from

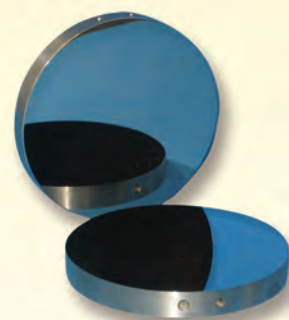
sample to sample using hardened steel spacers to separate the two (2) mirror finish optically polished surfaces of the special anvils. The entire assembly and the sample are placed between heated platens, heated to close to the softening point and pressed with a hydraulic press to form the film. By using matte finished foil inserts between the anvils, interference fringes can be avoided. Excess sample runs off into a trough to prevent interference with the formation of the film. A water cooled chamber is provided into which the entire assembly with the film can be inserted for cooling after the film has been pressed.

For those making films from soluble polymers, we urge you to take a look at the Roto-Film™ (see page 25).

Presses



Heated platens
See page 25



Mirror Finish
Polished Plates

0012-4608	Precision Thickness Film Maker with 15, 25, 50, 100, 250 & 500 micron spacers, cooling jacket and 200 foil inserts
0012-4611	Replacement foil discs, pk/200
0009-610	Magnetic Film Holder for mounting films in a spectrophotometer
0012-4609	Replacement Polished Top Platen
0012-4610	Replacement Polished Bottom Platen
0012-8486	Mirror Finish Polished 4" dia. 316 SS plates for making polymer films, threaded for optional handle with drilled thermocouple port, set of 2
0012-8803	PTFE 4" Diameter Platens for quick release of thin films made with heated platens; set of 2 with matte finish for diminished fringing. 3/8" thick.
0012-8806	PTFE 30mm Diameter Platens for quick release of thin films made with heated platens; pack of 4 with matte finish for diminished fringing. 1/8" thick.
0012-6664	Heated Platens, 4" dia. water cooled aluminum with digital PID temperature controller
0012-6631	Film Maker Kit, with film maker (0012-4608) 20 ton E-Z press™ (0012-6306), digital temperature controller and water cooled 4" dia. aluminum heated platens (0012-6664)
0012-6681	Auto Film Maker Kit, with film maker (0012-4608) 20 ton Air E-Z™ press (0012-6486), digital temperature controller and water cooled 4" dia. aluminum heated platens (0012-6664)
0014-6031	Roto-Film™ Film Maker (See page 25)

Presses

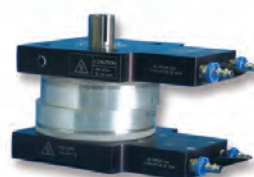


Precision Thickness film maker for polymers
See page 24



Heated Platens with 20 ton E-Z Press™

Heated Platens with Temperature Controller



The water cooled heated platens have a 4" (100mm) diameter aluminum pressing surface that will heat a sample from ambient to 400°C in less than 15 minutes. The heated platens are controlled by a stable ($\pm 1^\circ\text{C}$) CE marked digital PID temperature controller. The integral water cooling facility reduces cooling times. A removable thermocouple monitors temperature close to the surface of the platens. This accessory is compatible with ICL's 20 ton E-Z Press™ and

20 ton Air-EZ™ and is available as part of polymer film maker kits with those presses (0012-6631 and 0012-6681), and the Precision Thickness Film Maker (0012-4608). The heated platens can also be used with ICL's 2 ton High Profile E-Z Press™ (0012-8393) and the 5000 pound load cell E-Z Press™ (0012-8379). When ordering for use with an existing ICL Press, order a special lead screw assembly (0012-6665) for raising and lowering the top platen.

Part No.	Description	Price
0012-6664	Water Cooled 4" dia. Heated Platens with CE marked Digital Temperature Controller, (Specify 120 v, 60Hz; or 220v, 50Hz, CE marked, European RoHS Power Cord)	
0012-6665	Lead Screw assembly for attaching the heated platens (0012-6664) to the lead screw of an ICL 20 ton E-Z Press™ or an ICL 20 ton Air-EZ™ lab press for raising and lowering the top platen with the hand wheel	
0012-8486	Mirror finish polished 4" dia. 316SS plates for making polymer films, threaded for optional handle with drilled thermocouple port, set of 2 (See photo on page 24)	
0012-8803	PTFE 4" Diameter Platens for quick release of thin films made with heated platens; set of 2 with matte finish for diminished fringing. $\frac{3}{8}$ " thick.	

Roto-Film™ Rotational Casting™ Polymer Film Maker

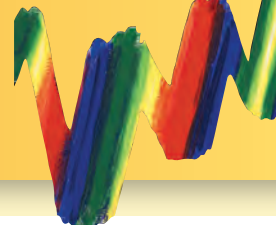


For making thin films from polymers that can be dissolved into solutions, the Roto-Film™ is an excellent alternative. Films are spin cast on a rapidly turning polished platen, Real Crystal® IR Cards or on a KBr window. The film is complete within 60 seconds. If the film is cast on a KBr window, the window is simply mounted in a spectrophotometer for analysis. The Roto-Film™ is also designed to allow films to be cast on standard aluminum weighing dishes, which are disposable. The Roto-Film™ produces films which are extraordinarily consistent from film to film. The accessory employs a programmable positive feedback micro-processor controlled motion controller and a programmable timer to precisely

reproduce cycle time, rotation speed and ramp up and ramp down from run to run.

Films cast by rotational casting on KBr windows or Real Crystal® IR Cards are free of interference fringes. Rotational casting produces films with radial symmetry, which means that the film molecules radiate from a central point like spokes on a wheel rather than exhibiting the monodirectional orientation typical of extruded films. Extruded films will exhibit different absorbance peak intensities depending upon how the film is oriented when it is placed in a spectrophotometer, but radially symmetric films cast on the Roto-Film™ will exhibit the same peak intensities regardless of orientation.

Part No.	Description	Price
0014-6031	Roto-Film™ film maker with disposable film casting platens, crystal casting platen, digital microprocessor motion controller, programmable cycle timer, 110 v, 60Hz	
0014-6909	Roto-Film™ for use in countries with 220v, 50 Hz power, same as above unit with CE marked transformer & country specific power cord & plug set	
0014-6273	Concave platen	
0014-6276	Microscope slide platen	
0014-7451	Real Crystal® IR Card platen	



Chemicals & Solvents

Random Cuttings & Spectroscopic Powders



KBr powder is graded solely by purity standards that are relevant to infrared spectroscopy. In the industry, the highest specification for transmission optics is beam splitter grade material which is generally specified by FTIR spectrophotometer OEMs as material having absorption bands due to impurities of less than 1% measured at 4 wave resolution between 4400cm⁻¹ and 450cm⁻¹. The cut off for commercial grade KBr crystal optics at ICL is material having absorption bands due to impurities of less than 2% at 4 cm⁻¹ resolution.

Most of the KBr now produced by ICL has absorption bands due to impurities of less than 1.5% at 4cm⁻¹ resolution. Accordingly, lower grade KBr powder may not be available.

FTIR Grade SpectroGrade™ KBr powder is made from KBr crystal boules that are not quite beam

splitter grade material and is defined as material that does not have any absorbance peaks in excess of 1.5%. FTIR Premium SpectroGrade™ is the equivalent of beam splitter grade material, and it is made from a blend of KBr crystal boules in which peaks range from 0.9% to 1.1%. XL Ultrapure SpectroGrade™ is a blend of material from rare boules that exhibit absorbance bands under 0.8% and the impurity range goes down to 0.2%. Please call ICL for current availability.

KBr and KCl sold as random cuttings can be ground finely immediately prior to being mixed with the sample for either diffuse reflection or transmission pellets. Random cuttings ground into powder a short time before being mixed with a sample will contain less water than pre-made powders.

**Fluorolube® and Nujol®
for mull samples**

Part No.	Description	Price
0011-5078	XL Ultra Pure SpectroGrade™ KBr Powder 99.999% pure 25gms	
0011-4541	XL Ultra Pure Spectrograde™ KBr Powder 100gms	
0011-8966	Premium Grade FTIR SpectroGrade™ KBr Powder 100gms	
0011-8967	Premium Grade FTIR SpectroGrade™ KBr Powder 25gms	
0002-2498	KBr Random Cuttings—one pound	
0002-2499	KCl Random Cuttings—one pound	
0002-4539	KBr Random Cuttings—100 grams	
0002-4538	KCl Random Cuttings—100 grams	

Paper Inserts, Econo Cards & Magnetic Pellet Holders

Part No.	Description	Price
0009-4450	13mm Magnetic pellet holder holds 13mm diameter pellets & pellets in paper inserts	
0012-2478	Econo Cards, 9.5mm aperture, for mounting 13mm pellets and micro pellets pressed into paper inserts, fits standard 3" x 2" (76.2mm x 50.8mm) spectrophotometer slide mount (1pk/100)	
0012-6903	Econo Cards, 19mm aperture (1pk/100)	
0012-2479	Paper inserts for 13mm die set 1.5mm dia hole (1 pk/200)	
0012-2480	Paper inserts for 13mm die set 3.0mm dia hole (1pk/200)	
0012-2481	Paper inserts for 13mm die set 5.0mm dia hole (1pk/200)	
0012-2482	Paper inserts for 13mm die set 11.0mm dia hole (1pk/200)	
0012-2483	Paper inserts for 13mm die set 1.5 x 9mm hole (1pk/200)	

**Econo cards
for KBr pellets**

Part No.	Description	Price
0011-2474	Fluorolube® 30ml	
0011-2475	Nujol® 60ml	

Presses



Water Jacketed Dies For Heating and Cooling See

www.internationalcrystal.net



Agate Mortar & Pestle Sets

Evacuatable KBr & Briquetting Pellet Dies



13mm Die Set



32mm Die Set

Hardened aerospace grade stainless steel is used to produce all of ICL's die sets. The 3mm to 19mm dies are used primarily for KBr pellets for transmission analysis by IR spectroscopy, while the larger dies are most commonly used for producing briquettes for XRF spectroscopy. The 13mm Macro-Micro die is chosen by most spectroscopists for KBr pellets, and it is available with paper inserts with a variety of small apertures (1.5, 3, 5, & 11mm) that enable the user to make micro-pellets with a 13mm die set and also provide a useful frame for mounting and storing the pellets.

All ICL dies have an upper and lower stainless steel section for ease of disassembly and they are sealed with viton seals. For ease of use, the weight was reduced in all die sets in the 10mm to 45mm range by adding an outer shield of aluminum. This feature makes them much easier to handle than 2 piece dies made completely from stainless steel due to their lighter weight, but without sacrificing strength or durability. The dies

can be evacuated with a vacuum pump to reduce the moisture in the sample. 13mm and 20mm dies are typically used with 12 to 20 ton presses, while the larger size dies are used with 20 to 40 ton presses and are most commonly used for briquetting samples for XRF analysis.

To enable preparation of the finest quality pellets and briquettes, anvils are optically polished to a mirror finish and are free from scratches or digs. All die sets in the 13mm to 45mm size range are available with optional extremely hard tungsten carbide polished anvils for use with abrasive samples.

Die sets with water jackets that allow heating and cooling of solid samples while under pressure are now available in 20mm, 25mm, 32mm, 35mm and 40mm. Please visit www.internationalcrystal.net for more information.

Features

- Aerospace Grade Hardened Stainless Steel
- Optically Polished Anvils
- Evacuatable

Evacuatable KBr & Briquetting Pellet Dies

Part No.	Description	Price
0012-6646	3mm KBr die set	
0012-6647	5mm KBr die set	
0012-6648	10mm KBr die set	
0012-2477	13mm KBr die set with 2 SS anvils & assorted paper inserts for micro samples	
0012-6649	16mm KBr die Set with 2 SS anvils	
0012-8777	19mm die Set with 2 SS anvils	
0012-5223	20mm die set with 2 SS anvils	
0012-6653	25mm die set with 2 SS anvils	
0012-6633	32mm die set with 2 SS anvils	
0012-6634	35mm die set with 2 SS anvils	
0012-6635	40mm die set with 2 SS anvils	
0012-8990	45mm die set with 2 SS anvils	

Agate Mortars and Pestles

ICL's agate mortars and pestles are the ideal tool for grinding a matrix of a solid sample with KBr powder in preparation for making a transparent pellet free from spurious absorption peaks.

Pure agate is non-absorbing in an infrared spectrophotometer. Mortar and pestle sets are available in custom sizes ranging from 25mm to 200mm diameter as well as standard 35mm, 50mm, 65mm and 95mm diameters.

Part No.	Description	Price
0009-489	35mm OD Agate Mortar & Pestle	
0009-7339	50mm OD Agate Mortar & Pestle	
0009-501	65mm OD Agate Mortar & Pestle	
0009-491	95mm OD Agate Mortar & Pestle	



Wig-L-Bug Grinding Mill



Digital Wig-L-Bug

The Wig-L-Bug is an invaluable accessory for the spectroscopy laboratory. It is ideal for mixing and pulverizing samples for use in a KBr matrix that will be pressed into a pellet and for mulling and diffuse reflection (DRIFT) techniques. Sample preparation is reproducible

from sample to sample by replicating the cycle time, which is controlled by a 60 second timer. Most samples can be prepared in 10 seconds. Agate, metal and plastic sample vials are available.

Part No.	Description	Price
0013-2485	Wig-L-Bug™ grinding mill with vial adapter and 60 second timer	
0013-7357	Digital Wig-L-Bug™, 120 v, 60 Hz with polymer vial and ball pestle	

Wig-L-Bug Accessories*

0013-2487	Adapter for 1" x 1/2" diameter vials, 1.0ml capacity
0013-2489	Stainless Steel Vial (1" h. x 1/2" dia.) with stainless steel ball pestle (1/4" dia)
0013-2495	Agate Vial Assembly comprised of a 2-part white Delrin® outer shell and a 3-part inner liner consisting of an agate vial, agate cap and a 6mm ball pestle. Capacity of inner liner is 1ml.
0013-5506	Agate Ball Pestle 1/4" diameter
0013-5531	PTFE Vial Assembly with Agate ball pestle (6mm dia)
0013-2488	Polystyrene Vial with polyethylene slip-on cap (1" h. x 1/2 dia.), pk/100
0013-2490	Ball Pestle, polycarbonate, 3/8" dia., pk/100
0013-2492	Adapter for 2" h. x 1/2" dia. vials (2.5 ml capacity)
0013-2494	Ball Pestle, polycarbonate, 1/8" dia, pk/100
0013-8005	Wig-L-Bug Arm Assembly with Spoon Arms and Braces
0013-5022	Bearing Strap



* Most accessories listed above are not compatible with the Digital Wig-L-Bug. See www.internationalcrystal.net for Digital Wig-L-Bug accessories.

Grinding Mills



Films



Square Cuvette Holder
See page 30



Cylindrical Cell Holders
See page 30

Polystyrene Calibration Films

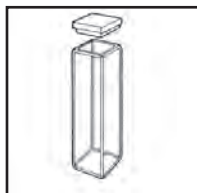


ICL produces calibration films for IR and FTIR spectrophotometers that are certified to be traceable to NIST 1921b Standard Reference Material (SRM), European Pharmacopeia 2.2.24-1 (PhEur 2.2.24-1) and Japan Pharmacopeia 2.25 (PhJap 2.25). In addition, ICL produces polystyrene calibration films cast on KBr substrates, Boron doped KBr and calibration films of various thickness useful for ordinate calibrations. These calibration materials are described in detail at www.internationalcrystal.net. Summary descriptions of all available calibration materials appear below in the part number list.

Part No.	Description	Price
0009-2500	Polystyrene Test Film—38 microns thick	
0009-8181	Polystyrene Test Film—76 microns thick	
0009-8182	Pair of polystyrene calibration films of different thickness. One film is 38 microns and is provided with certification of traceability to five (5) NIST 1921b frequencies. The second film is 76 microns and is provided without certification. Both films are mounted on 2" x 3" card stock holder with a 19mm aperture for mounting in the universal slide holder in all instruments. Includes instructions for two (2) film ordinate calibration and storage case.	
0009-8487	Same as 0009-8182 but with PhEur 2.2.24 certification	
0009-7676	NIST traceable Polystyrene Test film, certificate of traceability to five (5) NIST 1921b frequencies, set of 2 films each mounted to 2" x 4" card stock holder	
0009-7393	Pair of polystyrene films of different thickness, both with NIST traceability certification. Kit also includes a pair of standard polystyrene films, but without NIST traceability certification. One NIST traceable film is mounted on 2" x 4" card stock, which enables mounting in the standard universal slide mount found in all spectrophotometers, and is the same thickness as an NIST 1921 standard film (38 microns). The second thinner NIST traceable film is cast on KBr and includes holder and mounting device. Kit includes certification of traceability to five (5) NIST 1921 frequencies, radial symmetry certification for film cast on KBr and storage cases for all films.	
0009-7394	Pair of polystyrene calibration films of different thickness cast on KBr, radial symmetry certification, summary of NIST standard 1921 with frequency locations, certification of traceability to five (5) NIST 1921 frequencies, instructions for two (2) film ordinate calibration, slide mount holder. Kit also includes a pair of standard polystyrene films, without NIST traceability certification, mounted on 2" x 4" card stock which enables mounting in the standard universal slide mount found in all spectrophotometers. Storage case provided.	
0009-7395	Single Boron doped KBr Crystal calibration standard with slide mount holder and storage case. (U.S. Patent No. 6,594,008)	
0009-7396	Pair of matched Boron doped KBr windows. (U.S. Patent No. 6,594,008)	
0009-8157	Polystyrene calibration film for PhEur 2.2.24 calibration of IR and FTIR instruments, certified to 7 wave numbers and certified as to absorption minima and maxima differentials at 2870 cm ⁻¹ and 2849.5cm ⁻¹ and at 1589 cm ⁻¹ and 1583 cm ⁻¹	
0009-8158	Pair of PhEur 2.2.24 certified polystyrene calibration films, same as 0009-8157 but with 2 certified films	
0009-8559	Polystyrene Calibration film for PhJap 2.25 calibration of IR and FTIR instruments, certified to 7 wave numbers, mounted on 2" x 4" card stock	
0009-8558	Pair of PhJap 2.25 certified polystyrene calibration films, same as 0009-8559 but with 2 certified Films	
0009-8560	Polystyrene calibration film, certificate of traceability to 7 NIST frequencies (wave numbers) and certified as to absorption minima and maxima differentials at 2870cm ⁻¹ and 2849.5cm ⁻¹ and 1589cm ⁻¹ and 1583cm ⁻¹ as required by PhEur 2.2.24	
0009-8448	Same as 0009-8560 but also certified to PhJap 2.25	
0009-8437	Pair of films same as 0009-8448	



Standard Cell



TYPE 1

Cell with fitted PTFE cover.
Satin finish on two sides.
Lightpaths: 1, 2, 5, 10, 20, 40,
50 and 100 mm.
Outside dimensions:
45 mm high, 12.5 mm wide.

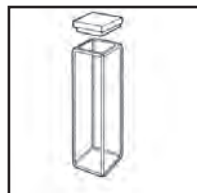
Standard Cell Screw Cap



TYPE 1SC

Same as Type 1 but with
screw cap.
Lightpath 10 mm only.

Standard Fluorimeter Cell



TYPE 3

Cell with fitted PTFE cover
for fluorimetry. All 4 sides
and bottom polished.
Lightpaths: 2, 5, 10, 20, 40
and 50 mm.
Outside dimensions:
45 mm high x 12.5 mm wide.

Semi-Micro Cell



TYPE 9

Semi-micro cell with fitted
PTFE cover.
Satin finish on two sides.
Inside width 4mm.
Lightpaths: 5, 10, 20 and
40 mm.
Outside Dimensions:
45 mm high x 12.5 mm wide.

Adjustable Cuvette Holder



UV-VIS, NEAR IR, RAMAN & FLUORIMETER CELLS

CELL TYPE	LIGHTPATH in mm	O SILICA UV GRADE	I SILICA IR GRADE	OG FUSED SILICA	G OPTICAL GLASS	VOLUME ml
Type 1 Standard Cell	1mm	0023Q-289	0023R-401	0023S-572	0023T-571	.4
	2mm	0023Q-413	0023R-353	N/A	0023T-2314	.7
	5mm	0023Q-284	0023R-243	N/A	0023T-2315	1.7
	10mm	0023Q-236	0023R-355	N/A	0023T-256	3.5
	20mm	0023Q-2316	0023R-2317	N/A	0023T-2319	7.0
	30mm	0023Q-5010	0023R-7488	N/A	0023T-7490	10.5
	40mm	0023Q-273	0023R-2320	N/A	0023T-288	14.0
	50mm	0023Q-412	0023R-429	N/A	0023T-2985	17.5
	100mm	0023Q-440	0023R-545	0023S-2321	0023T-2322	35.0
Type 1 SC Screw Top Standard Cell	10mm	0023Q-7491	0023R-7492	N/A	N/A	3.5
Type 3 Fluorimeter Cell	10mm	0023Q-274	0023R-2327	0023S-2332	0023T-382	3.5
	20mm	0023Q-2324	0023R-2328	0023S-2333	0023T-2337	7.0
	40mm	0023Q-663	0023R-2329	N/A	0023T-2338	14.0
	50mm	0023Q-7497	0023R-7498	N/A	0023T-7500	14.0
Type 9 Semi Micro Cell	5mm	0023Q-2339	0023R-2342	N/A	0023T-2348	.7
	10mm	0023Q-301	0023R-566	0023S-1382	0023T-251	1.4
	20mm	0023Q-2340	0023R-2343	0023S-2346	0023T-2349	2.8
	40mm	0023Q-2341	0023R-2344	0023S-2347	0023T-2350	5.6
Type 21 Standard Cell	1mm	0023Q-319	0023R-367	0023S-586	0023T-570	1.4
	2mm	0023Q-579	0023R-368	N/A	0023T-2370	.7
	5mm	0023Q-349	0023R-2365	0023S-627	0023T-2371	1.7
	10mm	0023Q-261	0023R-414	N/A	0023T-307	3.5
	20mm	0023Q-2364	0023R-2366	0023S-2368	0023T-581	7.0
	40mm	0023Q-580	0023R-2367	0023S-2369	0023T-2372	14.0
	50mm	0023Q-7513	0023R-7514		0023T-7516	17
Type 32 Cylindrical Cell	2mm	0023Q-452	0023R-454	N/A	N/A	.7
	5mm	0023Q-439	0023R-2409	0023S-2410	N/A	1.5
	10mm	0023Q-302	0023R-360	N/A	0023T-583	3.1
	20mm	0023Q-260	0023R-417	0023S-2411	0023T-541	6.3
Type 34 Cylindrical Cell	50mm	0023Q-331	0023R-281	0023S-356	0023T-557	15.7
	100mm	0023Q-292	0023R-461	0023S-409	0023T-530	31.4
Type 34 Screw Top Cylindrical Cell	50mm	0023Q-7612	0023R-7613	0023S-7614	N/A	14.1
	100mm	0023Q-7616	0023R-7617	0023S-7618	N/A	28.2

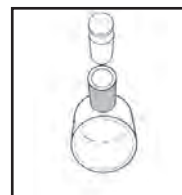
Standard Cell



TYPE 21

Same as Type 1, but
with tapered PTFE
stopper.

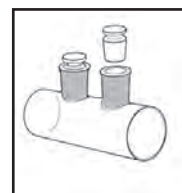
Cylindrical Cell



TYPE 32

Cylindrical cell with one
PTFE stopper.
Lightpaths: 2, 5, 10 and
20mm.
Outside diameter: 22 mm.
Use IR Grade for
hydrocarbon analysis.

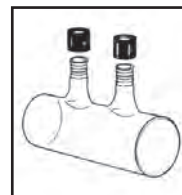
Cylindrical Cell



TYPE 34

Cylindrical cell with two
PTFE stoppers.
Lightpaths: 50 and 100 mm.
Outside diameter: 22 mm.
Use IR Grade for
hydrocarbon analysis.

Cylindrical Cell Screw Cap



TYPE 34 SC

Cylindrical cell with
screw caps.
Lightpaths: 50 and 100 mm.
Outside-diameter: 22 mm.
Use IR Grade for
hydrocarbon analysis.

Part No.	Description	Price
0023-503	Square Cuvette Holder — see photo on page 29	
0023-4607	Cylindrical Cell Holder (10mm) — see photo on page 29	
0023-2984	Cylindrical Cell Holder (50mm) — see photo on page 29	
0023-502	Cylindrical Cell Holder (100mm) — see photo on page 29	
0023-2466	Adjustable Cuvette Holder	

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