

SPEX CATALOG

NOVEMBER 1963

PLEASE CONTACT US FOR CURRENT PRICES

■	PHOTOGRAPHIC PLATES and FILM	P. 1
■	GRAPHITE ELECTRODES and POWDER	PP. 1—3
■	ACCESSORIES	PP. 4—5
■	PELLET PRESS and TORSION BALANCE	PP. 5, 22—23
■	HIGH PURITY CHEMICALS	PP. 6—7
■	MASTER PLATES	P. 8
■	SEMI-QUANTITATIVE STANDARDS	PP. 9—10
NEW ■	MICRO-SPARK and DC ARC UNIT	PP. 11, 16
■	ARC/SPARK STAND and ACCESSORIES	PP. 12—15
■	MIXING and GRINDING EQUIPMENT	PP. 17—20
■	HAND MORTARS and SIEVES	P. 21
■	INFRARED ACCESSORIES	P. 22
■	FLUXING and X-RAY ITEMS	P. 23
■	PREWEIGHED CHEMICALS	P. 24

SPEX INDUSTRIES INC.
METUCHEN, N. J.

■ SPECIALISTS
IN
SPECTROSCOPY

SPECTROSCOPIC PLATES and FILM

DELIVERED PRICES

4" x 10" Plates		Per Case (24 doz.)		Per Package		2" x 10" Plates		Per Case (45 doz.)		Per Package	
		East*	West*	East*	West*			East*	West*	East*	West*
SA #1	3 doz. pkge.	142.50	152.50	19.20	20.70	SA #1	3 doz. pkge.	180.00	190.00	12.85	14.35
	1 doz. pkge.	167.40	177.40	7.75	7.75		1 doz. pkge.	210.60	220.60	5.20	5.20
SA #3	3 doz. pkge.	158.00	168.00	21.20	22.70	SA #3	3 doz. pkge.	198.00	208.00	14.20	15.70
	1 doz. pkge.	198.00	208.00	8.50	8.50		1 doz. pkge.	230.00	240.00	5.70	5.70
Kodak #33						Kodak #33					
	3 doz. pkge.	194.00	204.00	27.00	27.00		3 doz. pkge.	243.00	253.00	18.00	18.00
103-F, 103-O, 1-N**						103-F, 103-O, 1-N**					
	1 doz. pkge.	415.00	425.00	19.55	19.55		1 doz. pkge.	495.00	505.00	12.65	12.65
Q-2 Ilford Plates**						Photographic Chemicals					
	1 doz. pkge.			15.20	15.20	D-19 Developer	one gallon	\$1.20			
SA #1 Film (35mm x 100')						Kodak Fixer	one gallon	.75			
	Daylight			Darkroom		Kodak Rapid Fixer	one gallon	1.60			
	SA 413			SA 421/1		Kodak Rapid Fixer	five gallons	5.65			
Individual Rolls		12.90		12.15		Indicator Stop Bath	16 oz. btl.	1.20			
6 Rolls or more, East*		11.22		10.57		Delivery Schedules					
West*		11.42		10.77		All sizes and emulsions listed above are normally in stock so that most shipments are made within 24 hours. Those requiring dry ice packaging are shipped on Tuesdays and Wednesdays. Additional emulsions and sizes of Kodak Spectroscopic Products, not listed here, are available for 30-60 days delivery.					
SA #3 Film						*East or west of the Mississippi River.					
	Daylight			Darkroom		**Since Eastman Kodak recommends keeping these emulsions at temperatures no higher than 55°F, shipments are normally made via the fastest means and are packaged with dry-ice. The cost of premium transportation plus a \$5.00 packaging charge is additional in such cases.					
	SP 413			SP 421/1							
Individual Rolls		14.00		13.25							
6 Rolls or more, East*		12.18		11.53							
West*		12.38		11.73							
103-O, 103-F, 1-N** Film											
	Daylight			Darkroom							
	SP 702			SP 421							
Individual Rolls		23.30		22.55							
6 Rolls or more, East*		20.25		19.55							
West*		20.45		19.75							

GRAPHITE POWDER and RODS

Two general types of spectroscopic graphite powders are available differing principally in particle shape. These are designated by the final number 1 or 2. Number 1 is used for briquetting and Number 2 for use as a conductor and buffer.

- 4061 National SP-2X—Consists of 90-95% -100 mesh.
- 4062 National SP-1—Consists of 65-75% -200 mesh.
- 4063 National SP-1C—Consists of 90-95% -200 mesh.
- 4064 National SP-2—Consists of 90-95% -200 mesh.

Prices for the above are as follows:

1 oz.	\$ 6.00	1/2 lb.	\$35.00
1/4 lb.	\$20.00	1 lb.	\$60.00

Graphite rods are available in three types. The least expensive are the regular purity National Carbon rods having a maximum ash content of 0.06%. The highest purity rods are AGKSP and SPK with an immeasurably small ash. These high-purity rods are packed individually in cellophane

and an analysis slip accompanies each box. Graphite rods are also available in diameters of 3/8" and 1/2". National Carbon also manufactures high-purity carbon rods and powder. Send for catalog A-4010 for further details.

GRAPHITE RODS 12" LONG

1/8" (.120") diameter		
L-4303 National Regular		\$18.00/100
L-3803 AGKSP or L-3823 SPK		\$49.00/50
3/16" (.180") diameter		
L-4306 National Regular		\$17.00/100
L-3806 AGKSP or L-3826 SPK		\$30.00/25
1/4" (.242") diameter		
L-4309 National Regular		\$20.00/100
L-3809 AGKSP or L-3829 SPK		\$21.30/15
5/16" (.305") diameter		
L-4312 National Regular		\$23.00/100
L-3812 AGKSP or L-3832 SPK		\$14.40/8






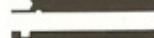


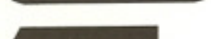
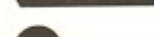





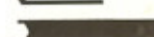



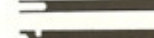
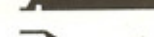










(MINIMUM ORDER — \$10.00)

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • 201-549-7144

SPECTROSCOPIC PREFORMED ELECTRODES

















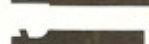

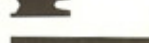









HIGH PURITY GRAPHITE

Spex	Dia."	Description		National		Price per 100
				AGKSP	SPK	
4000	1/4	necked crater, 5/32" dp.		L-3912*	L-3712	\$22.00
4001	3/16	necked crater, 3/16" dp.		L-3903	L-4261	22.00
4002	1/4	crater, 3/16" dp.		L-3900	L-3700	20.00
4003	1/4	angular platform, center post		L-3948	L-3748	28.00
4004	3/16	necked crater, 3/32" dp.		L-3906*	L-3706	19.00
4005	3/16	necked crater, 3/16" dp.		L-3909	L-3709	19.00
4007	1/4	flat necked upper		L-3960	L-3760	20.00
4008	1/4	undercut, center post upper		L-3963	L-3763	22.00
4009	3/16	double-ended, 1/16" r., 2" l.		L-3955	L-3755	24.00
4010	1/4	pointed upper, 120°		L-3966	L-3766	20.00
4011	1/2	solution disc, 1/8" thick		L-4075	L-4275	14.00
4012*	1/2	platrode, extruded		L-4078	L-4278	18.00
4013	1/4	porous cup, chamfered floor, 1-1/2" l.		L-3936		29.00
4014	1/4	porous cup, .025" floor, 1-1/2" l.		L-3927		24.00
4015	1/4	porous cup, chamfered floor, 7/8" l.		L-3933		23.00
4016	1/4	crater, 1/16" dp.		L-3982	L-3782	21.00
4017	1/8	pedestal, 1-1/2" l.		L-3919	L-3719	16.00
4018	1/4	anode cap, 9/32" dp., thin wall		L-3918	L-3718	16.00
4019	1/8	pointed upper		L-4036	L-4236	16.00
4020	1/8	crater, 1/4" dp.		L-3979	L-3779	16.00
4021	1/4	necked crater, 1/16" dp.		L-4012	L-4212	22.00
4022	1/4	boiler cap		L-3915	L-3715	26.00
4023	3/16	boiler cap		L-3916	L-3716	26.00
4024	1/4	flat rod		L-3921	L-3721	18.00
4025	1/4	center post crater, 3/16" dp., 1-1/4" l.		L-3939	L-3739	21.00
4026	1/4	mandrel for rotating electrode, 2" l.		L-3970	L-3770	23.00
4027	1/2	solution disc, .200" thick		L-4072	L-4272	16.00
4028*	1/2	platrode, molded		L-4081		18.00
4029	3/16	necked crater, 3/16" dp.		L-4000	L-4200	19.00
4030	3/16	necked crater, 3/32" dp.		L-4006	L-4206	19.00
4031	1/4	porous cup, .040" floor		L-4048		24.00

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

We maintain a large stock of preformed electrodes in AGKSP grade and SPK grade graphite. When requested we can frequently locate a batch free of a particular element such as boron, silicon, or copper. Preforms are also available in carbon at approximately 30% higher price. Please advise us of your requirements so that we may be of the best possible service to your laboratory.

Spex	Dia."	Description		National		Price per 100
				AGKSP	SPK	
4032	1/4	mandrel for Combination Analyzer		SP-1003		22.00
4033	1/8	necked crater, 1/8" dp.		L-3905	L-3705	19.00
4034	1/8	crater, .059" dp.		L-3975	L-3775	16.00
4035	1/8	crater, 3/16" dp.		L-3977	L-3777	16.00
4036	1/4	crater, 1/2" dp.		L-3985	L-3785	23.00
4037	1/4	porous cup, .025" floor		L-3928		24.00
4038	1/4	anode cap, 9/32" dp.		L-4024	L-4224	16.00
4039	3/16	rounded upper, 1/16" r.		L-3951	L-3751	17.00
4040	3/16	rounded upper, 1/16" r., 2" l.		L-3954	L-3754	18.00
4041	1/4	rounded upper, 1/16" r.		L-3957	L-3757	20.00
4042	1/4	necked crater, 3/16" dp.		L-4018	L-4218	22.00
4043	1/8	pedestal, 1" l.		L-4042	L-4242	12.00
4044	1/4	anode cap, 1/32" dp.		L-4030	L-4230	16.00
4046	1/4	center post crater, 1/4" dp.		L-4054	L-4254	21.00
4047	1/4	porous cup, 0.25" floor, 7/8" l.		L-3924		18.00
4048	1/4	crater, 1/4" dp.		L-3942	L-3742	28.00
4049	1/4	curved platform, center post		L-3945	L-3745	24.00
4070	1/4	anode cap, 1/16" dp.		L-4031	L-4231	16.00
4071	1/8	flat rod		L-3922	L-3722	14.00
4072	3/16	flat rod		L-3923	L-3723	14.50
4073	1/8	rounded upper, 1/32" r.		SP-1009		17.00
4074	1/4	vacuum cup, 3/8" post, 2" l.			L-3790	35.00
4074A	3/4	O.D. Teflon Cup for 4074 or 4075			L-3791	ea. 1.20
4075	1/4	vacuum cup, 5/8" post, 2" l.			L-3789	35.00
4076	1/4	rounded upper, 1/16" r., 2-1/2" l.		SP-1004		30.00
4077†	3/16	carbon necked crater, 1/2" l.				SP-1001 40.00
4078	1/4	tapered mandrel, 1-1/8" l.		L-3967	L-3769	18.00
4079	1/4	micro-cup, .062" dp.			L-4257	22.00

* Spex 4028 is high-density and less porous than 4012.

* Available with small venting hole through crater at \$4.00 additional per 100.

† 4002 Recommended as the supporting element. Reusable.

SPEX INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N. J. • ☎ 201-549-7144

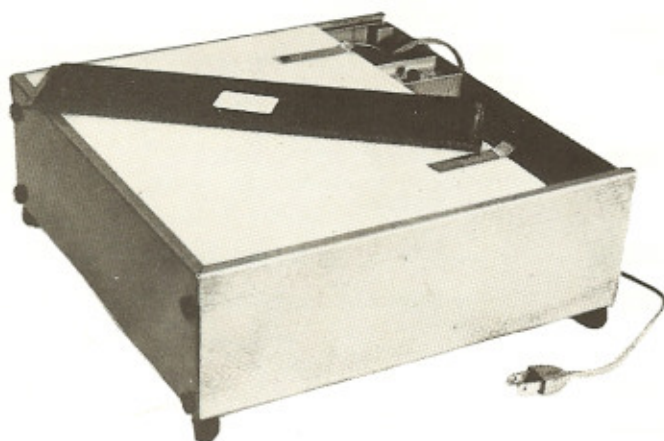
SERIAL MARKER

(SPEX SPEAKER, Vol. VI—No. 1)



- 3702 Serial Marker**, for numbering photographs consecutively. Operates on 115 volts ac; attenuator for adjusting light intensity; size of 5-digit number may be varied from 3 x 15 mm to 4 x 20 mm; fence for aligning plates or films; spare 7.5 watt lamp, 3" x 4" x 4", 4 lbs. Each \$ 78.00

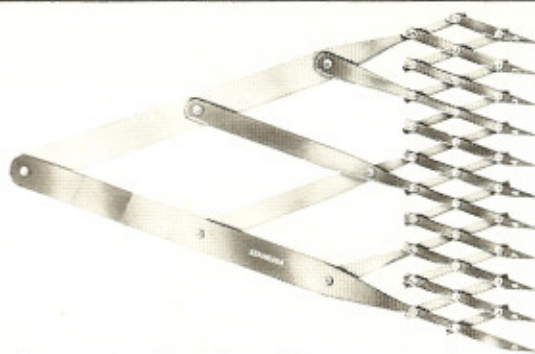
GLOW-BOX



Here's a viewing box that should be evaluated in terms of its versatility and usefulness rather than its low cost. The 11" x 9" viewing surface, of 1/4" thick Plexiglas, is illuminated with a high-intensity, rapid-start, cool, circular fluorescent lamp. The overall dimensions of the box (11-3/4" x 11-3/4" x 4" high) permit it to be stored and used in a desk drawer where it is instantly available yet out of the way when not wanted. Retractable legs permit the box to be flush-mounted or tilted for better viewing. The dimensions of the viewing surface are sufficient for examining two 4" x 10" plates or an 8-1/2" x 11" film. Other suggested uses for the Glow-Box are: 1) illuminating samples as they are being titrated; 2) color comparison; 3) tracing; 4) comparing graphs on different sheets of paper.

- 3710 Glow-Box**, viewing box as described above; weight 7 lb., complete with 22-watt, circular fluorescent lamp, 115 vac, carrying handle; finished in baked hammertone grey enamel. 12" x 12" x 4", 11 lbs. Each \$ 38.50

SPACING DIVIDERS



- 3506 Spacing Divider, 6" model**, an accurately constructed pantograph-like drafting tool, has eleven teeth so arranged that they always divide the extreme setting into ten equal parts. Each tooth is numbered, left to right on one side, right to left on the other. Constructed of stainless steel, the maximum spread is 23 mm, minimum distance between teeth is 3 mm. This instrument is recommended for most spectrographic measurements Each \$ 36.00
- 3512 Spacing Divider, 12" model**, same as above, but maximum spread 47 mm and minimum distance between teeth 6 mm Each \$ 48.00

PLATE STORAGE CABINET



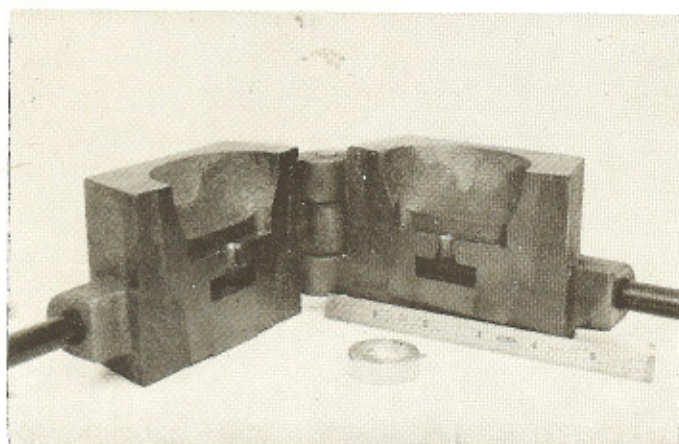
By commercial standards, the ordinary 4" x 10" spectrographic plates are an odd size and do not fit office file cabinets. The pictured unit is ideal for the purpose. It contains 9 drawers, each 11-1/4" x 4-5/8" x 12" deep and equipped with two separators per drawer. About 1000 plates in envelopes can be stored in the unit. The separators as well as the front of the drawers may be labeled for reference.

- 3820 Plate Storage Cabinet**, with nine drawers for 4" x 10" plates. Overall dimensions 19-3/4" high x 34" wide by 12" deep. Steel, welded frame construction, finished in grey, ivory, brown or tan, 74 lbs. Each \$ 60.00

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

1 1/4" DISC BOOK MOLD

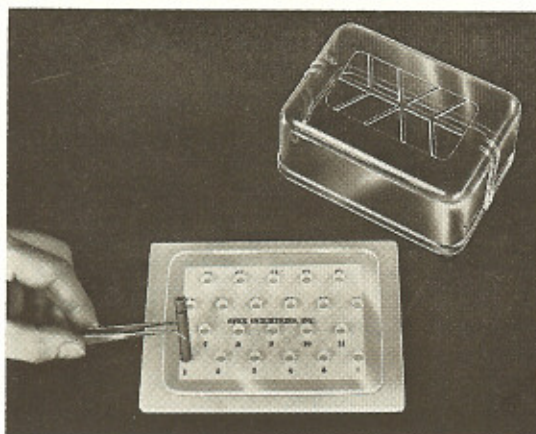


This cast iron book mold for preparing discs of low-melting alloys 1-1/4" dia. by 3/8" thick permits spectrographers to match their samples to standard discs and so facilitates set-ups and increases accuracy.

The large mass of the mold quickly freezes the casting and the sample can be removed almost immediately. The disc is cast horizontally, promoting fast chilling and resulting in small, uniform grain structure on the surface of the sample to be analyzed. A minimum of machining or sanding is required because the faces of the mold are machined quite smoothly.

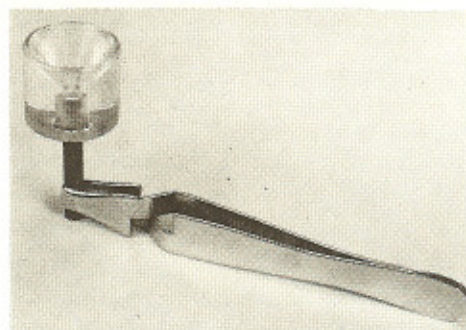
- 3904 **Book Mold** for casting discs about 1-1/4" dia. x 3/8" thick, 16" x 3" x 3", 12 lbs.Each \$ 72.00

PLASTIC ELECTRODE STAND



- 3051 **Plastic Electrode Stand**, for 1/4" electrodes
Each \$ 14.00
- 3052 **Plastic Electrode Stand**, for 3/16" electrodes
Each \$ 14.00
- 3053 **Plastic Electrode Stand**, for 1/8" electrodes
Each \$ 14.00

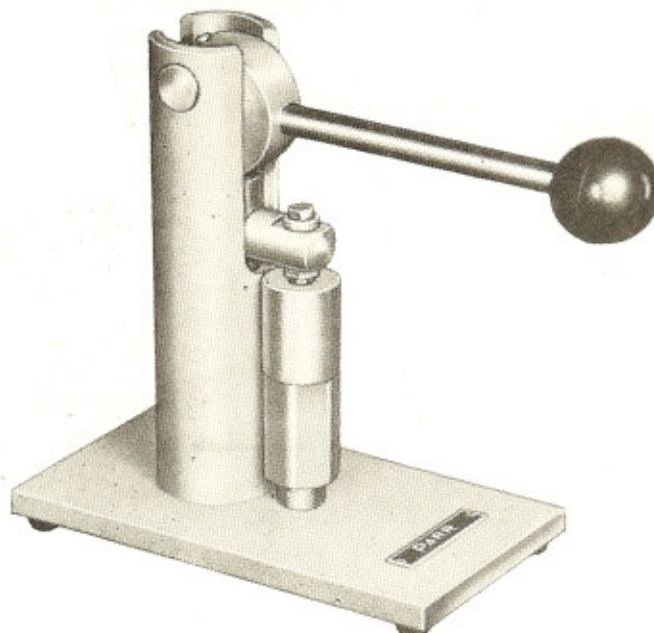
ELECTRODE FUNNEL and TWEEZERS



- | | | |
|------|---|----------------------------------|
| 3001 | Funnel for filling 1/4" electrodes | } Each \$ 3.00
Dozen \$ 25.00 |
| 3002 | Funnel for filling 3/16" electrodes | |
| 3003 | Funnel for filling 1/8" electrodes | |
| 3503 | Tweezers, stainless steel, for handling spectroscopic graphite electrodesPair \$ 3.00 | |

PARR PELLET PRESS

(SPEX SPEAKER, Vol. VIII—No. 1)



This hand operated pellet press provides enough force against a small area to prepare, from powder, a suitable tablet for the cup of an electrode. The plunger and die set of 0.118" diameter produces pellets of the proper size for L-3909, L-4000 and L-4006 Union Carbide preforms and likewise pellets from the 0.178" diameter die set fit L-3900, L-4012 and L-4018 preforms.

- 3625 **Pellet Press**, hand operated, without plunger and die, 9" x 5" x 10", 18 lbs.\$ 72.00
- 3626 **Plunger and Die**, for preparing pellets 0.118" dia., fill height of die 3/4"\$ 60.00
- 3627 **Plunger and Die**, for preparing pellets 0.178" dia., fill height of die 3/4"\$ 46.00

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

PURE MATERIALS

We are now offering individual elements and inorganic compounds of the highest practicable purity, prepared in co-operation with Ledoux and Co., analytical chemists. They are sold with an accompanying certificate of spectrographic analysis covering each batch.

Our policy with respect to these chemicals is as follows:

1. To provide materials of the highest possible purity commensurate with their cost of preparation.
2. To provide a certificate of analysis representing the actual batch of material. The results are obtained using accepted semi-quantitative techniques.
3. To upgrade our stocks constantly as purer materials become available. Prices will also vary accordingly.
4. To provide, on a custom basis, other forms and compounds as required. We invite your inquiries in this regard.

Cat. No.	Material	% Purity*	Form	Price Per Lot as Specified
1112	Aluminum	6-9s	Splatters	8.00/10g 34.75/50g
1212	Aluminum Oxide	4-9s+	Powder	3.50/20g 10.00/100g
1212-6	Aluminum Oxide	6-9s	Powder	6.50/g 52.00/10g
1113	Antimony	6-9s	Chunks	5.75/10g 48.25/100g
1213	Antimony Trioxide	6-9s	Powder	2.50/g 21.00/10g
1114	Arsenic	5-9s	Chunks	13.00/10g 57.25/50g
1214	Arsenic Trioxide	4-9s+	Powder	8.50/10g 37.00/50g
1215	Barium Carbonate	2-9s5	Powder	9.20/5g 41.00/25g
1116	Beryllium	2-9s	Chips	4.50/10g 37.00/100g
1216	Beryllium Oxide	4-9s	Powder	5.50/g 20.50/5g
1117	Bismuth	6-9s	Rods, 1/2" dia.	6.00/50g 15.85/150g
1217	Bismuth Trioxide	6-9s	Powder	2.00/g 18.50/10g
1118	Boron	2-9s+	Powder	2.00/g 8.75/5g
1218	Boric Acid	4-9s	Powder	2.00/100g
1119	Cadmium	5-9s	Splatters	2.00/10g 18.00/100g
1219	Cadmium Oxide	6-9s	Powder	9.70/5g 43.25/25g
1220	Calcium Carbonate	5-9s	Powder	4.00/g 37.00/10g
1265	Cerium Oxide	4-9s	Powder	2.00/10g
1221	Cesium Chloride	3-9s	Powder	6.70/10g 29.75/50g
1331	Cesium Carbonate	3-9s	Powder	6.70/10g
1441	Cesium Chromate	3-9s	Powder	6.70/10g
1122	Chromium	5-9s	Pellets	4.25/10g 38.00/100g
1222	Chromium Oxide	5-9s	Powder	2.45/g 22.55/10g
1123	Cobalt	5-9s	Powder	8.75/10g 40.00/50g
1223	Cobalt Oxide	5-9s	Powder	10.00/10g 44.00/50g
1124	Columbium (see Niobium)			
1125	Copper	5-9s+	Rod, 27g 5x150mm.	3.75 ea.
1225	Copper Oxide (ic)	5-9s	Powder	1.50/g 12.00/10g
1325	Copper (OH) Fluoride	6-9s	Powder	6.00/10g
1266	Dysprosium Oxide	3-9s+	Powder	6.00/10g
1267	Erbium Oxide	3-9s	Powder	6.00/10g
1268	Europium Oxide	3-9s	Powder	11.50/g
1269	Gadolinium Oxide	3-9s+	Powder	6.00/10g
1126	Gallium	6-9s	Chunks	5.50/g 50.00/10g
1226	Gallium Sesqui-Oxide	5-9s	Powder	7.60/g 32.50/5g
1127	Germanium	5-9s	Chunks	9.80/10g 42.50/50g
1227	Germanium Dioxide	5-9s	Powder	5.00/5g 22.00/25g
1128	Gold	5-9s+	Splatters	6.00/g 50.00/10g
1129	Hafnium	3-9s+	Sponge	3.00/g 12.00/5g
1229	Hafnium Oxide	3-9s	Powder	6.20/g 54.50/10g
1270	Holmium Oxide	3-9s	Powder	7.00/10g

* Purity indicated is that of the material or of the base metal from which it was prepared.

(Minimum Order \$10.00)

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • 201-549-7144

Cat. No.	Material	% Purity*	Form	Price Per Lot as Specified	Cat. No.	Material	% Purity*	Form	Price Per Lot as Specified
1130	Indium	6-9s+	Splatters	7.00/5g 30.25/25g	1244	Potassium Carbonate	4-9s+	Powder	5.00/10g
1230	Indium Oxide	5-9s	Powder	5.20/10g 45.50/100g	1245	Ammonium Perrhenate	4-9s	Powder	3.00/g 28.00/10g
1131	Iridium	3-9s+	-325 Powder	8.30/g 37.00/5g	1274	Praseodymium Oxide	3-9s+	Powder	5.50/10g
1132	Iron	4-9s	Rod, 5x150mm	7.00/ea.	1145	Rhenium	4-9s+	Powder	4.20/g 36.50/10g
1232	Iron Oxide Fe ₂ O ₃	5-9s	Powder	3.00/5g 26.50/50g	1146	Rhodium	3-9s+	Powder	15.00/g 68.00/5g
1271	Lanthanum Oxide	4-9s+	Powder	3.50/20g	1247	Rubidium Chloride	3-9s+	Powder	6.80/10g 57.70/100g
1133	Lead	6-9s	Splatters	6.00/50g 15.85/150g	1148	Ruthenium	3-9s	Powder	7.30/g 33.50/5g
1233	Lead Oxide, PbO	6-9s	Powder	2.00/g 18.50/10g	1275	Samarium Oxide	3-9s+	Powder	3.30/10g
1333	Lead Sulfide	4-9s+	Powder	18.50/10g	1276	Scandium Oxide	3-9s	Powder	20.10/g
1234	Lithium Carbonate (formerly Cat. No. 1005)	5-9s	Powder	6.00/10g 30.00/1/4 lb.	1149	Selenium	5-9s	Pellets	3.00/25g 10.00/100g
1134	Lithium Fluoride	4-9s+	Powder	20.25/10g	1249	Selenium Oxide	5-9s	Powder	2.10/g 17.60/10g
1272	Lutetium Oxide	3-9s+	Powder	12.00/g	1150	Silicon	6-9s	Needles	8.00/5g
1135	Magnesium	4-9s+	Rods	4.00/10g	1250	Silicon Dioxide	6-9s	Powder	4.00/10g 38.50/100g
1235	Magnesium Oxide	4-9s+	Powder	21.50/10g	1151	Silver	6-9s	Splatters	3.00/5g 11.75/25g
1136	Manganese	3-9s+	Powder	3.50/100g	1251	Silver Chloride	5-9s	Powder	2.45/g 20.75/10g
1236	Manganese Dioxide	3-9s	Powder	2.00/2g 8.50/10g	1252	Sodium Carbonate	4-9s+	Powder	4.00/g 37.00/10g
1137	Mercury	7-9s	Liquid	4.60/100g	1153	Strontium Fluoride	5-9s	Powder	6.00/g
1237	Mercuric Oxide	5-9s+	Powder	2.00/g 9.00/5g	1253	Strontium Carbonate	5-9s	Powder	3.00/g 12.50/5g
1138	Molybdenum	4-9s+	-325 Powder	2.50/10g	1353	Strontium Chloride	3-9s+	Powder	16.25/10g
1238	Molybdenum Trioxide	4-9s	Powder	4.10/2g 44.60/25g	1154	Tantalum	3-9s+	Pellets	3.50/10g 28.00/100g
1273	Neodymium Oxide	3-9s+	Powder	4.25/10g	1254	Tantalum Pentoxide	3-9s+	Powder	2.25/g 19.00/10g
1139	Nickel	3-9s	-325 Powder	3.00/100g	1155	Tellurium	5-9s	Chunks	3.90/20g 16.30/100g
1239	Nickel Oxide	5-9s+	Powder	10.00/20g	1255	Tellurium Oxide	5-9s	Powder	2.20/g 19.00/10g
1124	Niobium	3-9s	-325 Powder	2.50/10g 22.00/100g	1277	Terbium Oxide	3-9s	Powder	3.60/g
1224	Niobium Oxide	3-9s+	Powder	4.50/2g 19.85/10g	1156	Thallium	5-9s	Rods, 3/8" dia.	3.50/10g 28.00/100g
1141	Palladium	3-9s+	Powder	3.30/g 28.50/10g	1256	Thallium Oxide	5-9s	Powder	2.25/g 19.50/10g
1242	Ammonium Phosphate	5-9s	Powder	9.85/g 43.70/5g	1157	Thorium	2-9s5	Powder	3.20/20g 13.60/100g
1143	Platinum	4-9s	Powder	9.40/g 43.00/5g					

* Purity indicated is that of the material or of the base metal from which it was prepared.

(Minimum Order \$10.00)

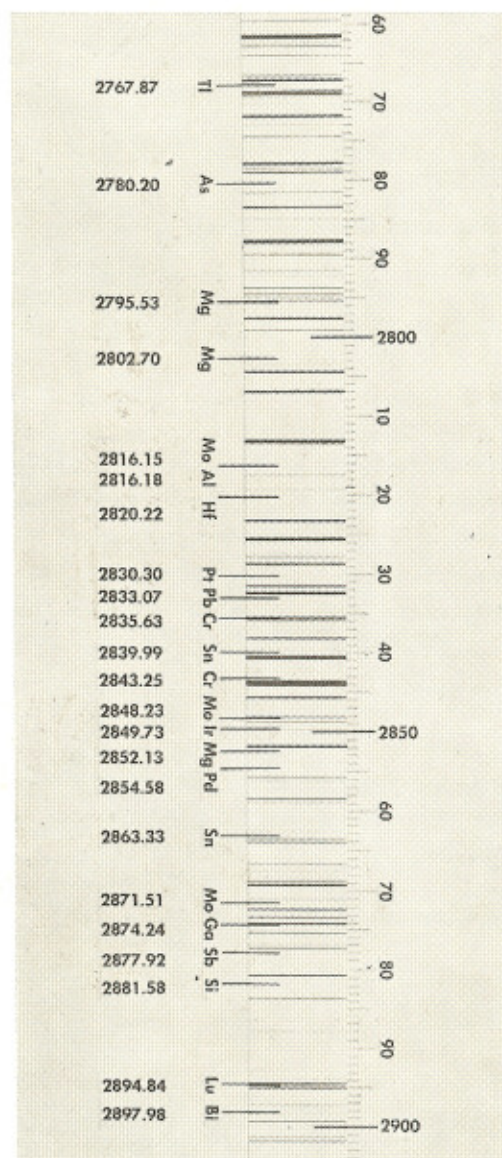
SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

MASTER PLATES

(SPEX SPEAKER, Vol. V—No. 1)

COLOR CODED AND MATCHED
TO YOUR SPECTROGRAPH



1103 Master Plates, covering any wavelength interval from 1950 to 4600Å, individually matched to any linear dispersion spectrograph. Persistent lines of about 70 elements are given with color coded labeling for ease in identification. To order please send us an iron spectrum covering the region of interest and made under conditions normally used. Also specify 2" x 10" or 4" x 10" plate size for mounting.

10 inches of spectrum \$ 90.00
40 inches of spectrum \$324.00

Cat. No.	Material	% Purity*	Form	Price Per Lot as Specified
1257	Thorium Oxide	3-9s+	Powder	2.80/2g 12.20/10g
1278	Thulium Oxide	3-9s	Powder	10.00/g
1158	Tin	6-9s	Pellets	10.00/20g
1258	Tin Oxide	5-9s	Powder	2.20/g 19.00/10g
1159	Titanium	3-9s+	Sponge	10.00/50g
1259	Titanium Dioxide	4-9s	Powder	2.20/10g 16.30/100g
1160	Tungsten	3-9s5	-325 Powder	4.00/100g
1260	Tungsten Oxide	4-9s+	Powder	4.00/100g
1161	Uranium	3-9s+	Chunks	5.50/10g 46.00/100g
1261	Uranium Oxide (UO ₂)	3-9s+	Powder	2.70/g 23.00/10g
1162	Vanadium	2-9s5	Pellets	3.80/10g 31.00/100g
1262	Vanadium Pentoxide	3-9s+	Powder	2.30/g 19.40/10g
1279	Yttrium Oxide	4-9s	Powder	2.50/g
1280	Ytterbium Oxide	3-9s	Powder	12.50/5g
1163	Zinc	5-9s	Splatters	3.00/20g 13.60/100g
1263	Zinc Oxide	4-9s+	Powder	8.00/1/4#
1164	Zirconium	3-9s+	Sponge	9.50/10g 42.00/50g
1264	Zirconium Oxide	3-9s+	Powder	7.00/10g 50.00/100g

* Purity indicated is that of the material or of the base metal from which it was prepared.

(Minimum Order \$10.00)

ENCYCLOPEDIA of SPECTROSCOPY

Edited by **GEORGE L. CLARK**

This unique reference offers a complete survey of the field of spectroscopy. One hundred sixty contributors, each a recognized authority, cover theory, instrumentation of the most modern design, experimental techniques and measurements, interpretations and applications. The material is presented in such a way as to be easily understood by readers unfamiliar with the subject, yet is sound and comprehensive enough to be useful to the expert.

Each \$25.00

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • 201-549-7144

POWDER STANDARDS

(SPEX SPEAKER, Vol. VII—No. 4)

COMMON ELEMENT STANDARDS

- 1000 **Spex Mix.** 49 elements, 1.28% each element. Ag Al As B Ba Be Bi Br Ca Cd Ce Cl Co Cr Cs Cu F Fe Ga Ge Hg I In K Li Mg Mn Mo Na Nb Ni P Pb Rb Sb Se Si Sn Sr Ta Te Th Ti Tl U V W Zn Zr2g \$ 36.00
- 1001 **Z Standards.** 0.1%, 0.01%, 0.001% of 49 above elements in zinc oxide base (for analysis of organic materials).set \$ 33.00
- 1002 **G Standards.** 0.1%, 0.01%, 0.001%, 0.0001% of 49 above elements in graphite base (for analysis of inorganic substances).set \$ 44.00
- 4061 **Graphite Powder,** highest purity, -100 mesh. For use with G Standards.1 oz. \$ 6.00
- 1263 **Zinc Oxide,** spectrographic grade.1/4 lb. \$ 8.00
- 1004 **L Standards.** 0.1%, 0.01%, 0.001% of 49 elements in lithium carbonate base (for analysis of organic materials, particularly petroleum products).set \$ 36.00
- 1234 **Lithium Carbonate,** spectrographic grade ...10g \$ 6.00
- 1006 **Si Standards.** 0.1%, 0.01%, 0.001%, 0.0001% of 49 elements in SiO₂ base (for analysis of minerals).set \$ 48.00
- 1250 **SiO₂,** 5-9s pure.10g \$ 4.00
- 1007 **Al Standards.** 0.1%, 0.01%, 0.001%, 0.0001% of 49 elements in Al₂O₃ base (for analysis of minerals).set \$ 56.00
- 1212-6 **Al₂O₃,** 6-9s pure.g \$ 6.50
- 1008 **Ge Standards.** 0.1%, 0.01%, 0.001% of 49 elements in GeO₂ base (for analysis of high purity germanium).set \$ 36.00
- 1227 **GeO₂,** 5-9s pure.5g \$ 5.00
- 1009 **Ga Standards.** 0.1%, 0.01%, 0.001% of 49 elements in GaO₂ base (for analysis of high purity gallium).set \$ 42.00
- 1226 **GaO₂,** 5-9s pure.1g \$ 7.60
- 1012 **In Standards.** 0.1%, 0.01%, 0.001% of 49 elements in In₂O₃ base (for analysis of high purity indium).set \$ 33.00
- 1230 **In₂O₃,** 5-9s pure.10g \$ 5.20
- 1013 **Ni Standards.** 0.1%, 0.01%, 0.001% of 49 elements in NiO base (for analysis of nickel and its oxides in electronic tubes).set \$ 33.00
- 1239 **NiO,** 5-9s pure.20g \$ 10.00
- 1014 **Ca Standards.** 0.1%, 0.01%, 0.001% of 49 elements in CaCO₃ base (for analysis of minerals, particularly water deposits).set \$ 36.00
- 1220 **CaCO₃,** 5-9s pure.g \$ 4.00
- 1010 **Element Kit,** individual compounds of 49 elements present in Spex Mix.kit \$ 55.00
- 1020 **Qual Mix.** Proprietary mixture for qualitative spectrochemical analysis, 43 elements in a readily arced base, so blended that about three lines of each element will appear on the spectrographic plate in the region 2100 to 4700A.2g \$ 20.00
- 1025 **Qual Mix Atlas.** Comprises 20 charts with spectra of Qual Mix, Fe arc and spark, taken with Hartmann diaphragm.each \$ 24.75

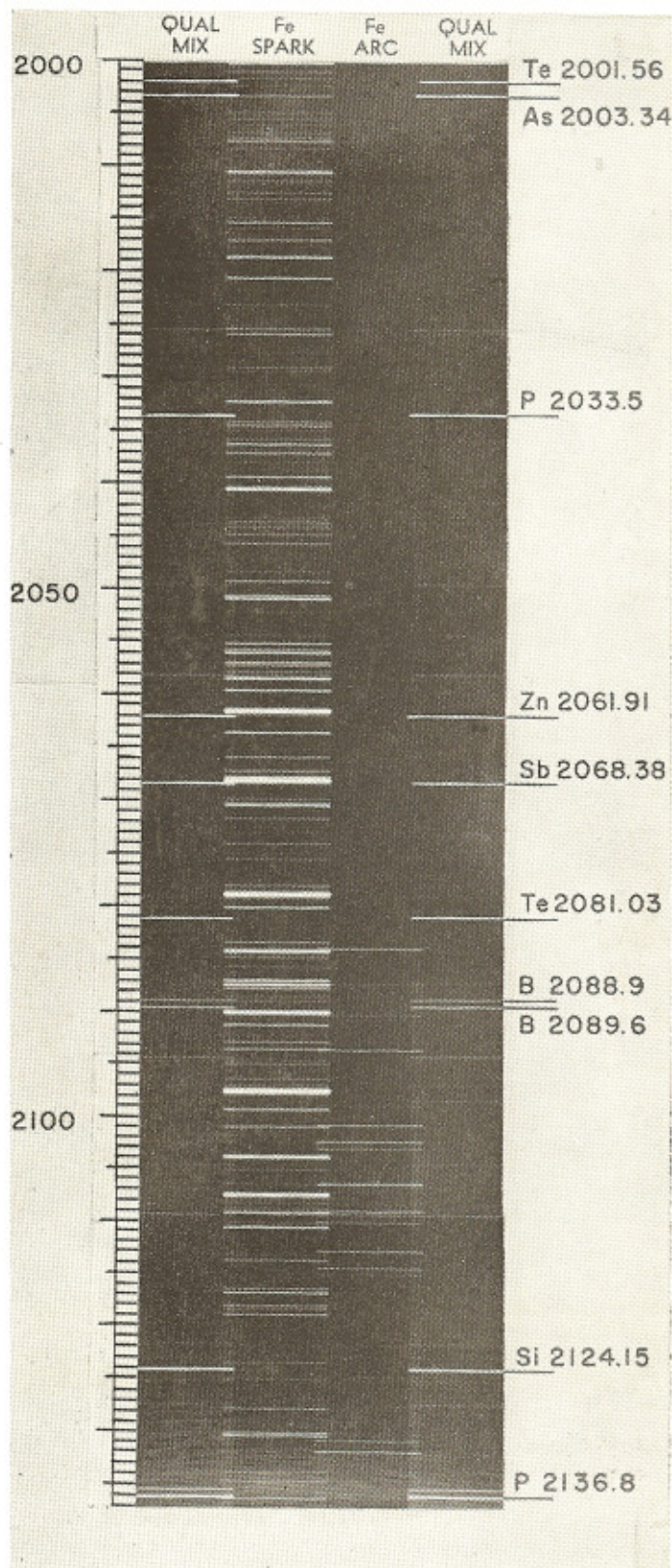


Chart from Qual Mix Atlas taken on Q-2 plate in region below 2300A. Note crisp lines and high contrast.

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N. J. • 201-549-7144

RARE EARTH STANDARDS

- 1030 Rare Earth Element Kit**, for spectrochemical quantitative, semi-quantitative and qualitative analysis. Contains quantities ranging from 100mg to 2g of 16 high-purity compounds of the following elements: Ce Dy Er Eu Gd Ho La Lu Nd Pr Sc Sm Tb Tm Y YbKit \$ **50.00**
- 1031 Rare Earth Spex Mix**, contains the same elements as 1030, each element at exactly 5.28% concentration2 grams \$ **36.00**
- 1032 Rare Earth L Standards**, semi-quantitative standards for the determination of rare earth elements in unknown materials. One standard contains 0.50% of the 16 elements listed under 1030; the others 0.050%, 0.0050% and 0.00050%.
4 standards, 2 grams eachSet \$ **49.00**
- 1033 Rare Earth Qual Mix**, preparation for the qualitative determination of rare earth elements.
2 grams \$ **20.00**

NOBLE METAL STANDARDS

- 1040 Noble Metal Element Kit**. Contains small quantities of the following elements, some in solution, others as salts or powdered metals: Au Ga Hf In Ir Pd Pt Re Rh and RuKit \$ **50.00**
- 1041 Noble Metal Spex Mix**. Contains the same elements as 1040, all at exactly 9.32% concentration. For the analysis of "pure" unknowns.
2 grams \$ **38.00**
- 1042 Noble Metal G Standards**. Semi-quantitative standards for determining the same elements as in 1040 in unknowns that are relatively impure. One standard contains 0.50%, the others 0.050%, 0.0050%, 0.00050% of each of the 10 elements. 4 standards, 2 grams each.....Set \$ **48.00**
- 1043 Noble Metal Qual Mix**, preparation for the qualitative determination of the same elements as in 10402 grams \$ **20.00**

STEEL and CAST IRON STANDARDS

We maintain a stock of most of the British Bureau of Analysed Samples standards, only the most popular of which are listed here. If you are interested, please write for the complete listing.

- 1200 Low Alloy Steel Standards**, blocks 1" x 1" x 1-1/2" for use both in x-ray and optical spectroscopy. Elements vary in such a fashion that the iron remainder is kept constant at around 94% to minimize matrix effects. Element ranges are Si 0.10-0.96; Mn 0.16-1.54; Ni 0.19-4.98; Cr 0.19-2.97; Mo 0.17-1.51; V 0.12-0.65; Cu 0.13-0.55 percentsset of 8 \$ **124.00**
- 1202 Low Alloy Steel Standards**, same as above but granules for photometric and solution analysis.
set of 8, 100g each \$ **104.00**

- BSS 21-24 Low Tungsten Steel Standards**, rods, 3/4" dia. x 3" long; Tungsten 0.70%, 1.29%, 2.16%, 3.41%. Each contains about 0.02% C, 0.13% Si, 0.036% S, 0.014% P, 0.07% Mn, 0.02% Mo and 0.01% VSet of 4 \$ **67.00**
- BCS 281-284 Low Tungsten Steel Standards**, granules, 100g each, analysis as above.....Set of 4 \$ **45.00**
- BSS 31-35 Carbon Steel Standards**, discs 1/2" thick x 1-3/4" dia.; .07-.47% C, .06-.55% Si, .01-.08% S, .004-.067% P, .14-.72% Mn, .003-.11% As.Set of 5 \$ **82.00**
- BSS 41-46 Cast Iron Standards**, rods, 1-3/16" dia. x 1-1/2" long; 0.012-0.128% Mg, 0.32-1.42% Ni, 0.01% S, 3.3% C, 0.02% PSet of 6 \$ **115.00**

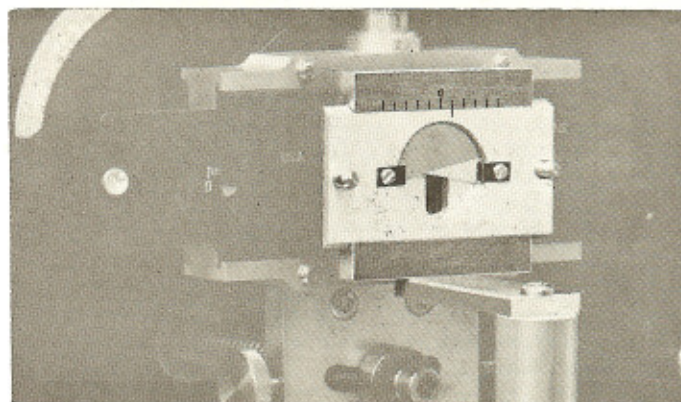
THREE-STEP NEUTRAL FILTER

(SPEX SPEAKER, Vol. VI—No. 2)

The three-step neutral filter is constructed with wedges of evaporated metal and is so mounted in a slide that it can be pushed horizontally across the center of the optical path, reducing the density of intense lines to readable values.

When placed at the focus position (the slit in stigmatic spectrographs, Sirk's focus in astigmatic instruments), the height of the steps can be made to vary up to about 5mm, when used in conjunction with the fishtail of the spectrograph. Furthermore, it is possible to utilize either the 20% filter alone or the 5% and 100% as a two-step filter simply by sliding it in place. An engraved scale is provided to permit resetting positions.

The No. 1090 filter is mounted on an offset post to fit standard riders and still be placed as close as possible to the position of vertical focus.



- 1090 Three-Step Neutral Filter Assembly**, on offset post. Please specify the diameter of the post necessary to fit the rider of your spectrograph (normally 1/2", 5/8" or 3/4") 4" x 2" x 8", 4 lbs.Each \$ **145.00**

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

STABILIZED DC ARC UNIT

A new spectrochemical source unit designed especially for use with the Plasma Jet has a number of features making it equally attractive as a general dc arc source. Most of these are not found in older instrumentation:

- 1) Current is controlled through a potentiometer instead of the usual motor-driven reactor core. Amperage is adjusted swiftly, without vibration and overshooting.
- 2) Current is stabilized to the extent that normal burn-out of volatiles or separation of electrodes does not materially alter the amperage.
- 3) An impedance-matching selector switch permits full 30-amp power with the plasma jet or dc arc.
- 4) Open circuit 300 volts and high inductance choke permit sustained current down to 3.0 amperes for Pfund arc or where inherently narrow lines are desired.
- 5) Utilizing solid state circuitry, the instrument requires no warmup period and no periodic replacement of tubes.
- 6) Electrostatic shielding of transformer reduces interference with other instrumentation especially while arc is being ignited.
- 7) Either negative or positive terminal may be grounded.
- 8) The main timer normally begins to operate only after the arc is struck, not during the ignition period.
- 9) The spark igniter will strike an arc with electrodes separated by up to 10 mm.
- 10) A low-voltage safety circuit interlocks with the door of the arc stand.
- 11) Power signal for timed operations of exposure shutter is available.

Input 480, 240, 208, 120 volts, single phase, 60 cycle (specify); maximum wattage about 2000

Output 3.0-30 amperes
300 volts open circuit
RF spark ignition
Isolated output permitting negative or positive ground
Continuous current control by potentiometer adjustment with negative feedback of an arc-current derived signal to stabilize the amperage

Controls Start-Stop
Impedance Matching Selector
Current level continuous adjustment
Pre-exposure timer (0-30 seconds), On-Off
Exposure timer (0-150 seconds), On-Off
Igniter, On-Off

Indication Arc Current level, 4-1/2" meter
Time settings
Pilot Lamp for Main
Pilot Lamp for arc voltage



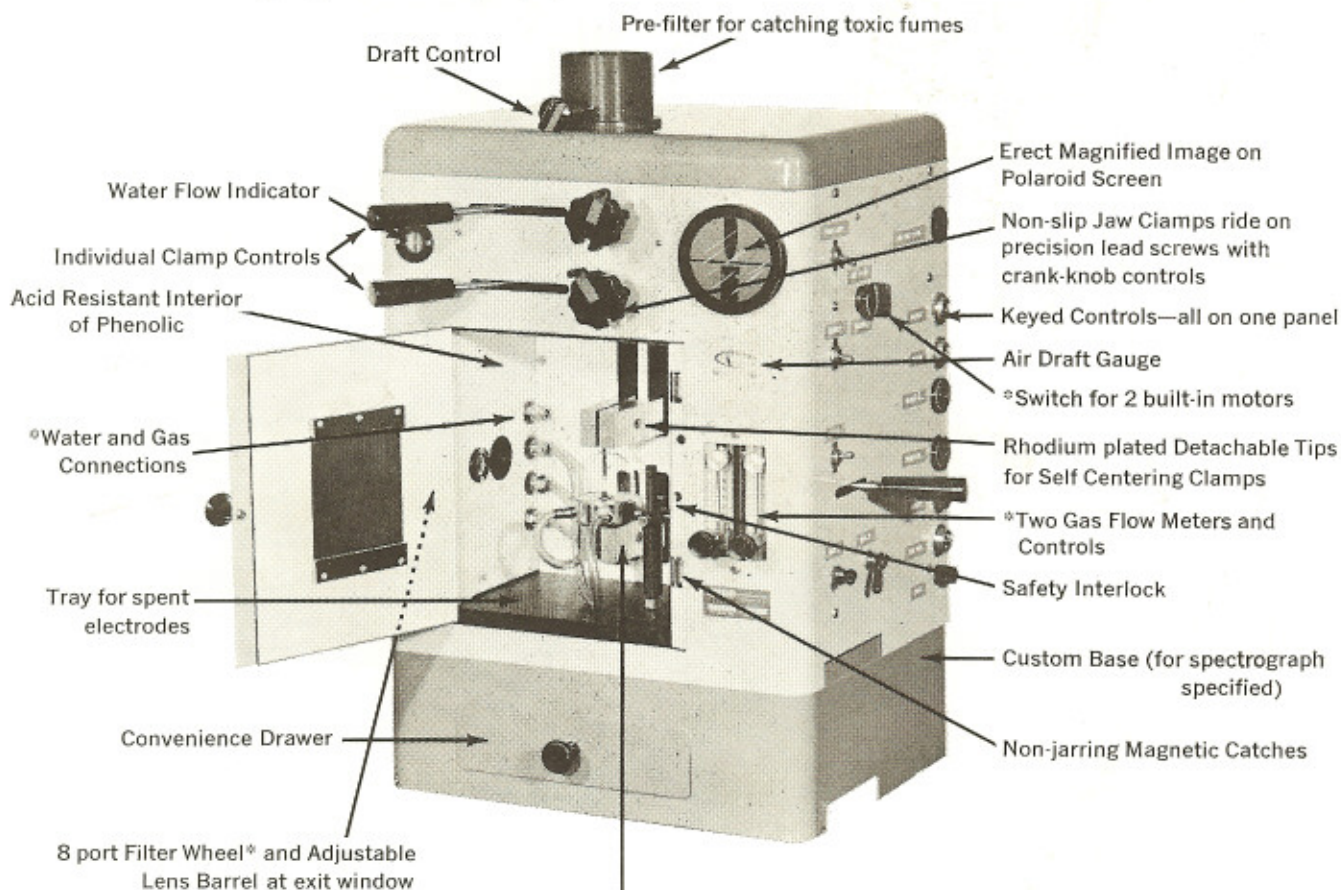
9040 Stabilized DC Arc Unit, as described; 480, 240, 208, 120 volts, single phase (specify); dimensions 24" wide x 22" deep x 42" high on casters, output cables with PS50 socket plugs; gross weight 400 pounds\$2,350.00

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • 201-549-7144

check all these features before specifying the ARC/SPARK STAND for your laboratory

Left or right hand models adapt to most new spectrographs or will modernize your existing equipment.



SNAP-IN ACCESSORIES INCLUDE:

- *Stallwood Jet (shown) for cleaning up background and stabilizing arc
- *Plasma Jet for trace analysis of liquids
- *Petrey Stand for point-to-plane work
- *Atmosphere Chamber for Petrey Stand
- *Combination Analyzer (Rotrode and Platrode)

*OPTIONAL ACCESSORIES

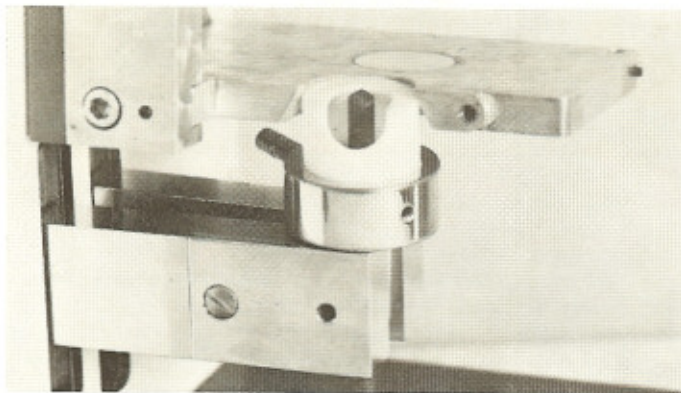
SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N. J. • ☎ 201-549-7144

ATMOSPHERE CHAMBER FOR PETREY STAND

(SPEX SPEAKER, Vol. VIII—No. 3)

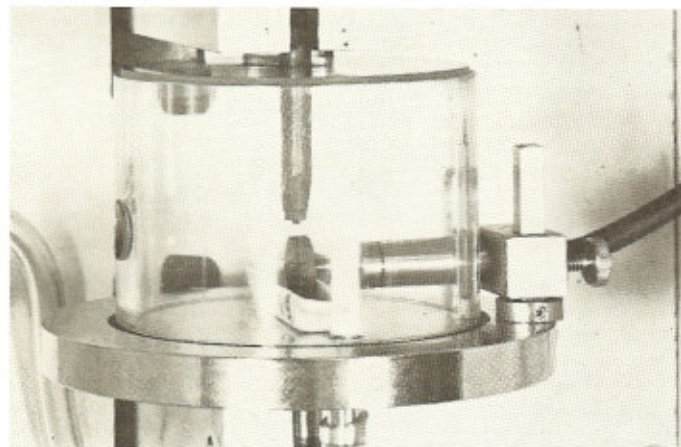
So that it may be mounted in any attitude on almost any Petrey Stand, this chamber is contrived principally for dispelling matrix effects, especially in ferrous alloys. By sparking in an argon atmosphere, using the Arrak method, one set of standards (such as our No. 1200 Low Alloy Steels) serves for the accurate determination of all elements standardized, whether the unknown is carbon, low alloy, high temperature or tool steel.



ENCLOSED COMBINATION ANALYZER

(SPEX SPEAKER, Vol. VI—No. 1)

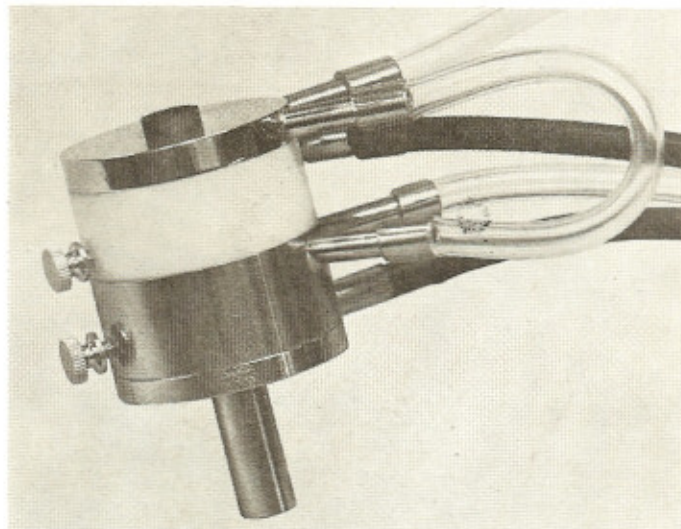
One of the oldest, still one of the best methods for analyzing solutions is with the rotating graphite disc. Powered by a 10 rpm, built-in motor, through an insulated flexible shaft, our rotrode is mounted in the lower electrode jaws. A Pyrex cover may be placed over the sample to permit sparking in inert gases, a feature permitting the analysis of flammables. The accessory may also be used vertically as a platrode for the analysis of briquets or dried salts.



PLASMA JET SOLUTION ANALYZER

(SPEX SPEAKER, Vol. VIII—No. 1)

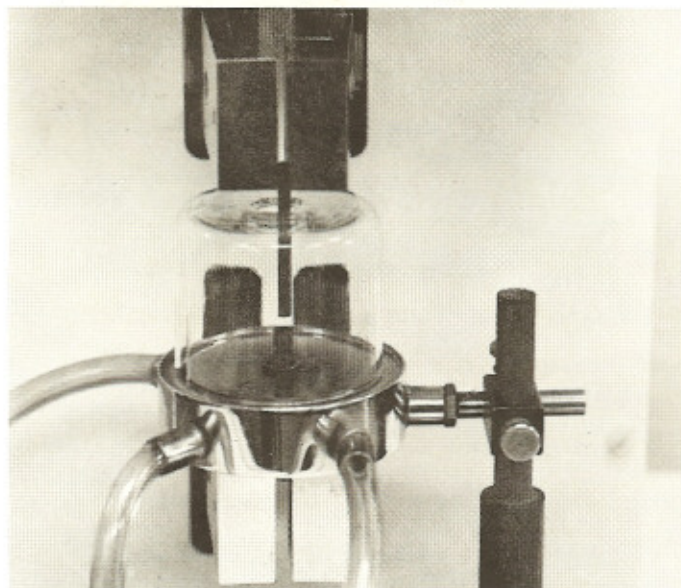
This accessory permits the direct analysis of almost any liquid, flammable or not, with the greatest precision and sensitivity of any liquid technique. Utilizing a 10-20 ampere dc arc, the Plasma Jet requires no sample preparation, only a short flush-out time between samples.



ENCLOSED STALLWOOD JET

(SPEX SPEAKER, Vol. VII—No. 3)

Jacketed in a sheath of gas, the arc is constrained from wandering and the result is far greater stability and sensitivity. By using an argon:oxygen mixture, cyanogen bands virtually disappear, opening up hundreds of angstroms where the persistent lines of many elements appear.



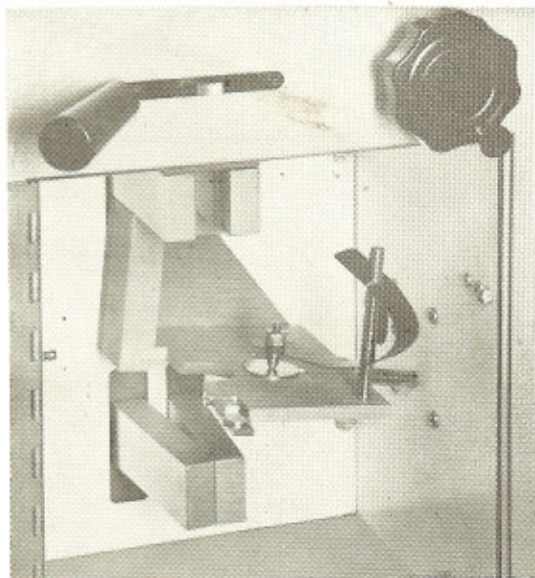
SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

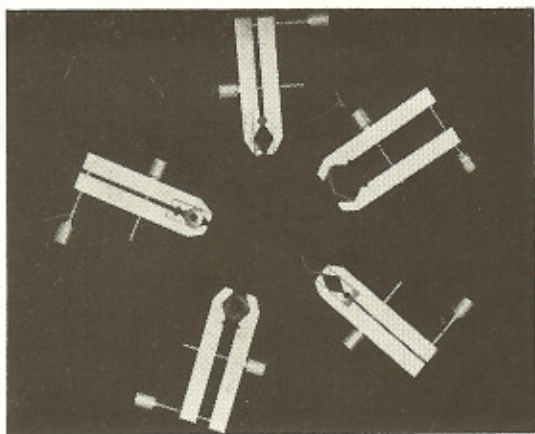
PETREY STAND

(SPEX SPEAKER, Vol. IV—No. 2)

Petrey Stand has removable, motorized turntable for sampling a large area to minimize segregation effects. A jet of gas may be directed at the gap to reduce matrix effects. Alignment of sample is simplified with use of viewing mirror. Capable of supporting up to 20 pounds, the Petrey Stand is snapped in and out of the upper electrode jaws in seconds.



THE PETREY STAND SAMPLE CLAMP (3300)

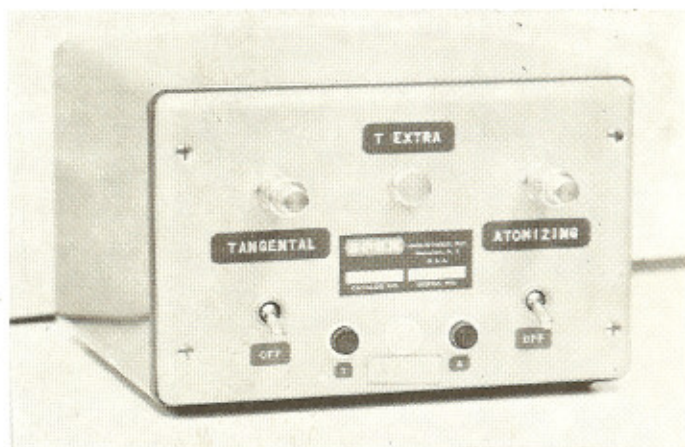


ARC/SPARK STAND AND ACCESSORY PRICES

- 9010 Arc/Spark Stand**, 115 v., 50-60 cy., specify type of spectrograph and the direction light must emerge as operator views stand, 15" x 12" x 21", 129 lbs.Each \$1330.00
- *9010A Skirt** (not required on B&L spectrographs or others where the vertical distance from the top of the bar to the center of the optical path is less than 6"). Contains drawer for electrodes, tweezers, brush, etc.Each \$ 30.00

SPEX-OWEN MANIFOLD

(SPEX SPEAKER, Vol. VIII—No. 1)



This compact control package accurately regulates the flow of either two separate gases or a single gas to the tangential and atomizing sections of the Spex Plasma Jet Solution Analyzer. Micrometer verniers and pressure regulators on both gas lines assure reproducible settings and gas flow. A relay valve prevents the flow of atomizing gas until the tangential gas valve is opened thus protecting the capillary tip of the burner when the jet is ignited. The unit is complete with pressure tubing and connectors and requires only standard regulators on the cylinders of helium and argon.

- 3200 Circulating Pump Assembly**, includes pump, 7 gal. polyethylene container, 20 feet of Tygon tubing, 115 vac., 14 lbs.Each \$ 80.00
- 3300 Petrey Stand Sample Clamp**, used for gripping small and/or irregular samples on Petrey StandEach \$ 33.00
- 3310 Atmosphere Chamber for Petrey Stand**, complete with 2 and 3 mm spacer and length of Tygon tubing. Takes standard 0.242" dia. graphite counter electrode; also requires No. 9024A Flow Meter Assembly or equivalent for controlling argon flow\$ 65.00
- 3400 Combination Analyzer**, for the analysis of solutions by either the rotrode or platrode techniques. A Pyrex cover may be used and the device may be flushed with an inert gas during sparking; includes one 3401 porcelain boat and one 3402 aluminum boat, 4 lbs.Each \$199.50
- 3401 Porcelain Boat**, spareDozen \$ 12.00
- 3402 Platform**, for the analysis of 1/4" or 1" dia. pelletsEach \$ 13.00
- 3403 Aluminum Boat**Each \$ 6.00
- 3404 Pyrex Cover**, spareEach \$ 13.00

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • 201-549-7144

- *9011 Petrey Stand**, complete with 2, 3 or 4 mm spacer (specify); mirror; turntable; hold-down spring, 2 rpm motor. Fits in upper jaws of 9010, 5 lbs.Each \$156.00
- *9012 Motor**, 2 rpm or 10 rpm (specify). Note: The 2 rpm motor is included with and recommended for the 9011 Petrey Stand; the 10 rpm motor is included with the 3400 Combination Analyzer. If it is desired to add either the Petrey Stand or the Combination Analyzer at a later date, it is necessary to order one or both motors with the basic arc/spark standEach \$ 20.00
- 9013 Blower-filter Assembly**, includes 6' length of 3" dia. Flexhaust, pre-filter, blower 115 v., 60 cy.Each \$150.00
- 9017 Projection Lamp**, replacementEach \$ 2.50
- 9018 Quartz Window**, replacement, protects condensing lensEach \$ 14.80
- *9019 Toggle Valve and Flow Meter**, 2-18 CFH (Required for 9025 and 9027 Stallwood Jets and 9030 Plasma Jet)Each \$ 52.00
- 9020 Jaw Tips**, rhodium plated brass, replacement set of 4Set \$ 86.00
- 9020-S Jaw Tips**, for short (to 1/2") electrodes, set of 4\$130.00
- 9021 Filter Wheel**, mounts on 9010, indexes at each of 8 portsEach \$ 70.00
- 9022 Neutral Filter**, quartz, specify 50%, 20%, 12%, or 6% transmittanceEach \$ 18.00
- 9023-C Filter**, clear glass, cuts off below 3200A to eliminate overlapping 3rd order when photographing 2nd order 3200-4700AEach \$ 6.00
- 9023-R Filter**, red glass, cuts off below 6000A to eliminate overlapping orders when photographing red and infrared spectraEach \$ 6.00
- 9023-Y Filter**, yellow glass, cuts off below 4500A to reduce overlapping orders when photographing visible spectrumEach \$ 6.00
- 9023-UV Filter**, ultraviolet transmitting for photographing 2nd order 2250-3500A on emulsions sensitive above 4500AEach \$ 14.00
- 9024-A Flow-meter Assembly** (not for Spex 9010), including regulator and toggle valve which mounts directly on cylinder of argon or argon-oxygen (required with 9025, 9027 or 9030 when used with other arc stands)Each \$ 65.00
- 9024-He Flow-meter Assembly**, similar to above but for helium cylindersEach \$ 97.00
- 9025 Enclosed Stallwood Jet**, air-cooled, fits most arc stands, may be used with 1/8", 3/16" or 1/4" dia. electrodes, with one 9026 quartz domeEach \$108.00
- 9026 Quartz Dome**, for use with 9025 and 9027, spare (it is suggested that several be purchased as they should be cleaned before a sample is arced)Each \$ 19.00
For 10 \$150.00
- 9027 Enclosed Stallwood Jet**, like 9025 but water-cooled, 4 lbs.Each \$152.00
- *9028 Water-cooling connection**, (required for use with 9027 or 9030)Each \$ 30.00
- *9029 Toggle Valve and Flow Meter**, 5-40 CFH (required for use with 9030)Each \$ 52.00
- 9030 Plasma Jet Solution Analyzer**, fits in most arc/spark stands. Includes water-cooled jet assembly with atomizer (medium bore unless otherwise specified), and graphite upper control rings, graphite lower anode rings, Teflon sample holder, 4 lbs.\$249.00
- 9032 Spex-Owen Manifold**, micrometer-controlled gas system for using single gas in both atomizer and control sections of Plasma Jet, 8" x 6" x 5", 10 lbs.\$250.00
- 9033 Spex-Owen Manifold**, micrometer-controlled gas system for using 1 or 2 gases in atomizer and control systems of the Plasma Jet, 8" x 6" x 5", 10 lbs.Each \$375.00
- 9030-4131 Atomizer, small-bore**, useful for gas analysis.\$ 40.00
- 9030-4038 Atomizer, medium-bore**, useful for general analysis of liquids.\$ 40.00
- 9030-4140 Atomizer, large-bore**, useful for analyzing slurries and suspensions, gas oils and other viscous petroleum products\$ 40.00
- 9030-6 Thoriated Tungsten Rod**, 1/8" dia. x 7" long....\$ 4.50
- 9030-5U Upper control ring**, graphite\$ 16.00/C
- 9030-5L Lower anode ring**, graphite\$ 19.00/C
- 9030-7 Heated solution container, aluminum**, 115v., 50-60 cy., useful for analyzing substances which dissolve at elevated temperatures, or to reduce viscosity of some liquids, or melt materials such as waxes\$ 55.00
- 9030-8 Sample holder**, Teflon with polyethylene cover, 4 ml capacitySpare, each \$ 5.00
10 \$ 40.00

(*) These accessories for factory installation only in Spex No. 9010 Arc/Spark Stand.

(Minimum order \$10.00)

SPEX

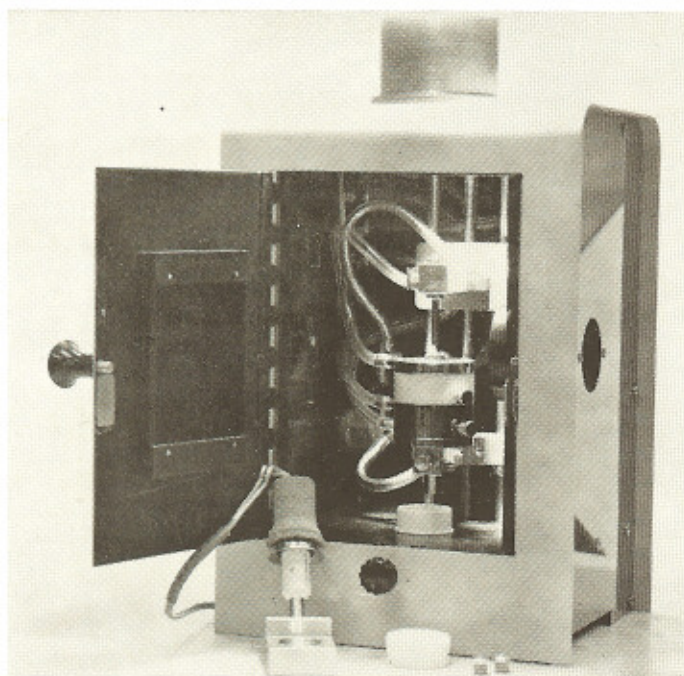
INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N. J. • ☎ 201-549-7144

PLASMA JET STAND

(SPEX SPEAKER, Vol. VIII—No. 1)

This complete excitation unit was designed to house a 9030 Plasma Jet Analyzer Assembly; it contains many of the same convenience features found in our No. 9010 Arc/Spark Stand.

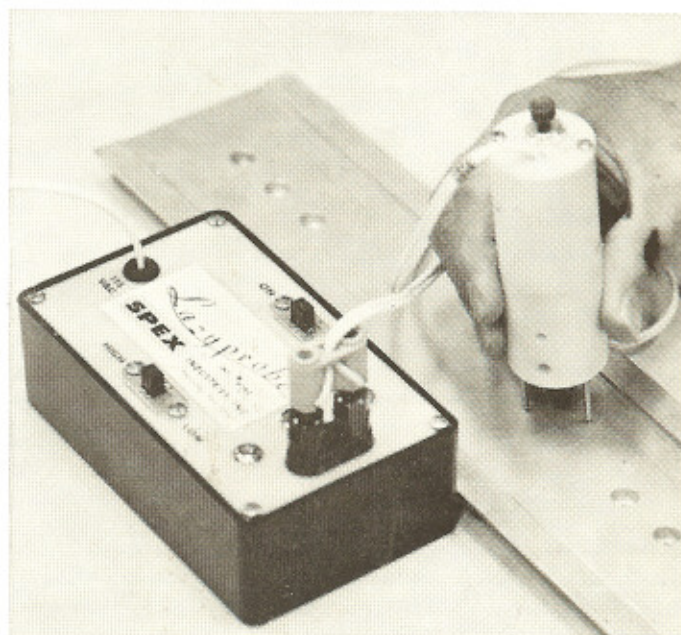
- 1) Available for right or left hand operation and adaptable to most optical benches.
- 2) Water-cooled upper jaws are mounted on a precision lead screw for vertical adjustment, and take 1/8" or 3/16" electrodes.
- 3) Operator viewing is through a variable Polaroid window.
- 4) Interlocking door switch ensures safety.



9031 Plasma Jet Unit in Stand. Complete excitation unit including 9030 atomizer assembly; vertically adjustable, water-cooled upper electrode holder; interlocking door switch; neutral filter on viewing window (specify spectrograph), 9" x 8" x 20", 45 lbs.\$880.00

For control of argon only the 9032 Manifold is recommended. For control of argon or argon and helium, the 9033 is recommended. Other Plasma Jet accessories will be found listed under 9030 on page 15.

LAZYPROBE



The analysis of heavy or hard-to-move objects is facilitated with this small device. Weighing about two pounds, it can be brought to the sample rather than *vice versa*. In many instances the procedure is non-destructive. In others only an easily sanded-off shallow sparking scar appears.

Plugged into a 115 vac outlet, the Lazyprobe® discharges polarized sparks, transferring sufficient sample material to a 120° pointed graphite electrode so that, subsequently, it can be arced or sparked to obtain the analysis of the sample. The method is suitable for typing aluminum or ferrous alloys. Being able to pinpoint the discharge, the operator can also use the Lazyprobe for the analysis of inclusions.

Convenient for use on flat objects, the probe is removable from the handpiece to allow almost any size or shape object to be sparked. It is necessary only that the sample be electrically conductive.

In operation, after the 1/4" electrode is placed in the probe, it is positioned over the spot to be sampled. Exact placement is facilitated by the spring-loaded tripod legs. The momentary switch on top of the probe is then depressed, energizing the probe and causing a spark to jump. After about ten such sparks, the electrode is removed, placed in a convenient tray attached to the main unit, and later sparked or arced in the normal spectrograph.

9050 Lazyprobe®, spark sampler, 115 vac, 6-1/4" x 3-3/4" x 2", 5 lbs.Each \$155.00

4010 Graphite Electrode, 1/4" upper, high purity, 120° point100 \$ 20.00

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

THE SHATTERBOX

An extremely fast, efficient grinder, the Shatterbox spins a heavy, hardened concentric puck and ring around the inside of a closed, removable dish at 900 rpm. Although ball-bearing steel is the most popular material for a grinding container, tungsten carbide and high-alumina ceramic have their place, too. Typically, 10 ml of a sample may be ground in 3 minutes to —325 mesh. With reasonable precautions, the particle size distribution from sample to sample may be maintained remarkably constant.

A quick scan of the material listed below will reveal how universal the Shatterbox is turning out as a tool for grinding production samples quickly and reproducibly prior to x-ray and emission spectrochemical analysis. From the standpoint of sale, probably the most interesting, if unexpected, use of the instrument is in grinding Portland cements and intermediate raw mixes. Scattered throughout the country, many Shatterboxes are now whirling away on a 24-hour-a-day, 7-day-a-week basis busily engaged in the control of uniform, high-quality concrete.

In the metals industries, the Shatterbox is helping to stabilize the composition of slags, raw materials and master alloys. Other users are manufacturers of welding fluxes, fertilizer, pesticides, inorganic chemicals as well as research laboratories in the geological and mining fields.

May we test grind some of your samples? No obligation, naturally.

(SPEX SPEAKER, Vol. VIII—No. 2)

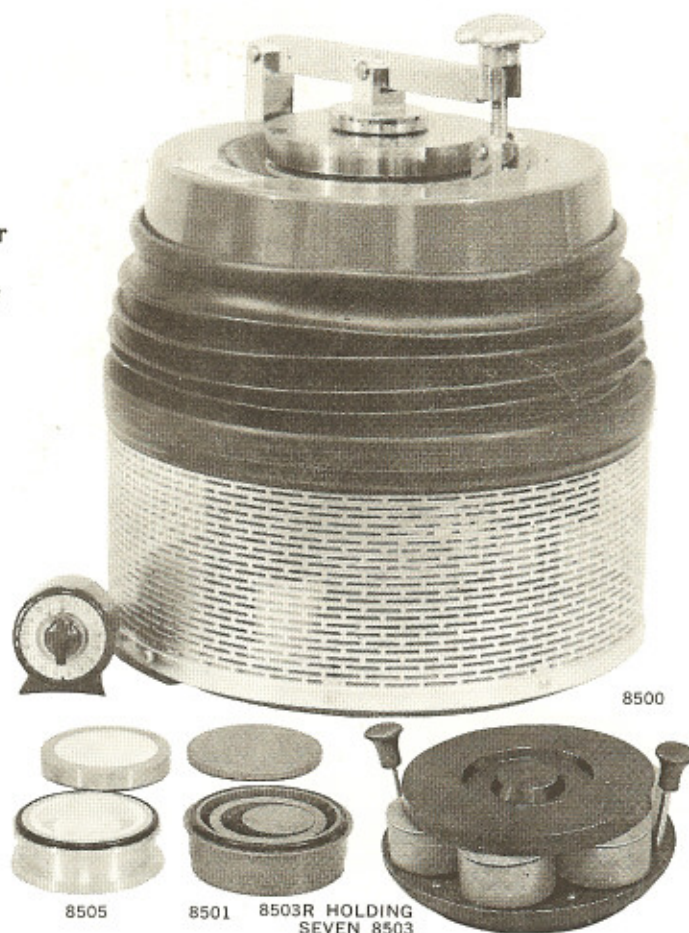
Grinding Tests Using 8501 Hardened Steel Container

Material	Form as received	Time, min.	Amount grams	% Passing 325 mesh
Asbestos	Fibrous	12	20	100
Cement, Portland				
raw mix	+60 mesh	2½	40*	100
Ferro-chromium	+100 mesh	5	25	100
Ferro-manganese	+200 mesh	3	25	100
Ferro-molybdenum	—80 mesh	4	25	100
Ferro-niobium	—80 mesh	3	25	100
Ferro-silicon	—80 mesh	4	25	100
Ferro-titanium	—80 mesh	6	25	100
Ferro-vanadium	—80 mesh	7	25	100
Fiberglass	thin sheets	2	10	100
Fluorspar	+100 mesh	3	50	100
Pesticide	—100 mesh	15	50	100
Phosphate, raw mix	+60	2½	40	100
Iron powder	—80	6	5	68
Sand	—10	10	100	100
Slag, blast furnace	chunks	1	10**	100
Slag, open hearth	chunks	1	20	76
Transite	chunks	10	35	100

* sodium alkylarylsulfonate added, 5%

** Household detergent (Tide) added, 10%

- 8500 Shatterbox®, grinder and blender, 1/3 hp motor 50-60 cy., 115v or 230v (specify), 0-15 min. timer, 13" dia. x 20" high, 160 lbs.Each \$925.00
- 8501 Grinding Container, hardened steel, 100 ml capacity, 6" dia. x 3" high, 19 lbs.Each \$200.00
- 8502 Grinding Container, hardened steel, with provision for filling with inert gas; gasketed and held closed with 4 thumb screws, 100 ml capacityEach \$245.00
- 8503 Grinding Vial, hardened steel, for multiple sample handling, 15 ml capacity, the Shatterbox will hold 7 of these vials (requires 8503R rack)Each \$ 42.00
Set of 7 \$275.00
- 8503R Rack, for holding up to 7 8503 vialsEach \$ 55.00
- 8504 Tungsten Carbide Grinding Container, 100 ml capacity, 6" dia. x 3" high, 42 lbs.Each \$950.00
- 8505 Alumina Ceramic Grinding Container, 100 ml capacity, 6" dia. x 3" high, 9 lbs.Each \$310.00

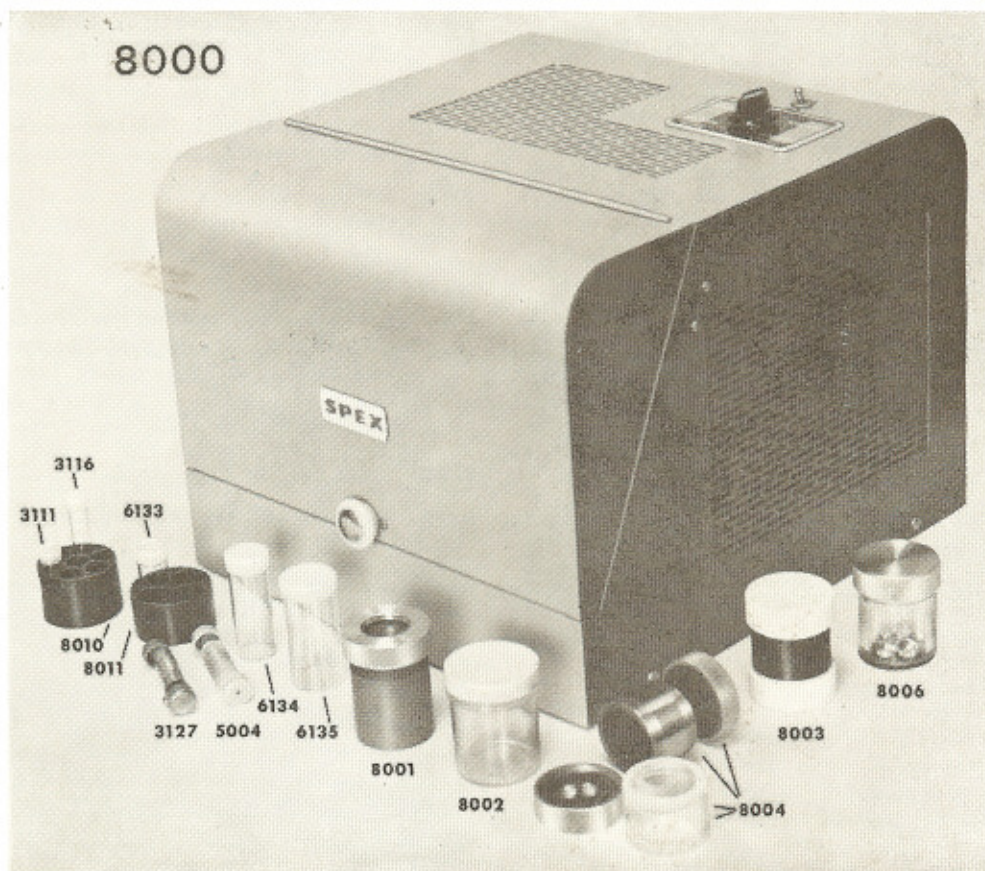


SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

No. 8000 MIXER/MILL

DESIGNED FOR SAFE ENDURING PERFORMANCE



The **MIXER/MILL** is a high-speed impact shaker already widely acclaimed in laboratories from Atomic Energy to X-ray Spectroscopy. This versatile instrument is ideal for mixing and grinding laboratory size samples quickly, conveniently, uniformly and without undesirable contamination.

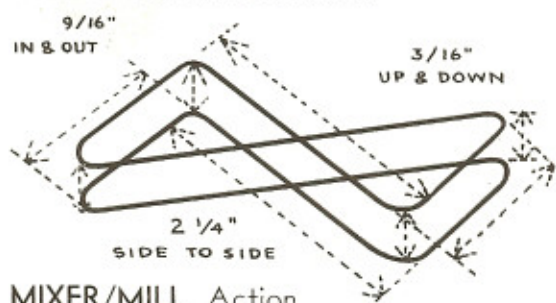
The entire mechanism is enclosed in an attractive sheet metal case with a hinged door which controls a safety switch. A timer automatically turns the **MIXER/MILL** off after any pre-set time up to one hour. A parallel switch permits operation for longer periods. Although the impact is very vigorous, adequate shock mounting permits the instrument to be placed on a table with very little vibration. Not only is the effort of mortar and pestle labor eliminated but results are made more reproducible as consistency in particle size is attained every time.

For mixing, plastic balls and vials are provided so that metallic contamination is completely avoided. Up to 100 ml of sample can be thoroughly mixed in 2 minutes or less.

The **MIXER/MILL** is capable of pulverizing 10-25 ml in a single load. The actual grinding time depends on many factors such as the hardness of the material and before and after particle size. As an example, 5g of coarse sand may be ground to 97% -300 mesh within 15 minutes.

The action of the **MIXER/MILL** is illustrated in the accompanying diagram. Violent and complex, the agitation may be

represented by components in three mutually perpendicular directions. The main component is a swing through about 2-1/4" at the end of a 3-1/2" arm—an arc of approximately 40°. Within a single cycle, there is an additional vertical component of 3/16" and horizontal of 9/16". This movement is repeated some 1200 times per minute.



MIXER/MILL Action

The dimensions of our vials are calculated to take full advantage of these large displacements. Thus the ball-pestles in the No. 6135 vial have a chance to travel along its entire length during each 1/2 cycle. On the return swing, the vial is displaced laterally and vertically to allow other portions of the substance to be struck by the pestles. Smaller displacements would, by contrast, cause the pestles to jiggle inefficiently in the center of the vial, discouraging rapid mixing or grinding.

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • 201-549-7144

GRINDING TESTS USING 8000 MIXER/MILL

Material	Form	Method	Time min.	Amount grams	% Passing 325 mesh
Antimony	Pieces	L-D	5	26	97
Asbestos	Fluff	WC-D	10	*	*
Bauxite	60 mesh	TS-W	30	3	*
Bismuth	Chunks	PJ-D	20	5	75
Bone	Chunk	AC-D	10	*	55
Boron Carbide	Chunk	WC-D	15	7	100
Brake Linings	Chunk	WC-D	*	*	*
Carbon (activated)	Pieces	TS-D	10	10	90
Carnauba Wax	Piece	PJ-D	2	5	20
Cement (portland)	Powder	AC-W	30	20	100
Chrome Ore	Chunk	WC-D	10	15	39
Chromium	Chunk	WC-W	20	10	50
Cobalt		WC-W	10	10	91
Copper Shot		WC-D	15	2	95
Ferro Cr	100 mesh	WC-W	20	5	94
Ferro Nb		WC-W	60	5	10
Floor Tile	Chunk	WC-D	**	**	**
Germanium	Pieces	L-D	5	5	38
Ilmenite	Grains	WC-D	10	5	98
Limonite Ore	Grains	TS-W	30	3	100
Porcelain	Chunk	WC-D	15	6	83
Potassium Pyrosulfate	Fused Button	PV-D	10	5	100
Reforming Catalyst	Beads, 1/8"	AC-D	5	5	*
Sand	Grains	WC-D	2	12	86
Silica	Chips	L-D	30	15	*
Silica	Chips	AC-D	20	5	97
Silicon	Chunks	WC-D	15	10	92
Silicon	Lumps, 1/4"	L-D	10	5	30
Slag (blast furnace)		TS-W	20	3	100
Slag (copper)	100 mesh	WC-W	10	5	84
Slag (open hearth)		TS-W	20	3	100
Straw		TS-D	10	5	**
Ti-diborate		WC-D	15	5	100
Tomato Stems		TS-D	10	5	**
Transite	Chunks	WC-D	*	*	*
Tungsten Carbide		WC-W	15	10	100
Tungsten	Lumps	WC-D	10	25	50
Welding Flux		WC-W	30	5	82
Wood	Pieces	AC-D	10	1	50
Zirconium Carbide		AC-W	30	15	100

TS—No. 8001 Tool Steel Vial

AC—No. 8003 Ceramic Vial

WC—No. 8004 Tungsten Carbide Vial

PV—No. 6133 Polystyrene Vial

PJ—No. 8002 Polystyrene Jar

L—No. 8006 Lucite Vial

-D—Dry ground

-W—Wet ground (water or 1, 1, 1-trichloroethylene slurry)

* Suitable for X-ray or Emission Spectroscopy

** Satisfactory for Extractions

(Minimum order \$10.00)

8000 Mixer/Mill®, 115v, 60 cy. for mixing quantities of 10-100 ml, grinding 3-25 ml, 1 hour timer, continuously variable jaws holding vials up to 2-1/8" dia. x 3-1/4" long, rugged construction and housing, shock mounted, 15" x 16" x 12", 75 lbs. Each **\$370.00**
220v, 50 cy. model Each **\$380.00**

8001 Grinding Vial, hardened steel, 2" dia. x 2-7/8" long with O-ring sealed lid, four 1/4" dia. and two 1/2" dia. steel balls included, grinding capacity about 25 ml. Each **\$ 49.00**

8002 Mixing Jar, polystyrene with screw-on plastic cap, 2-1/8" dia. x 2-1/2" long, 100 ml mixing capacity 100 **\$ 20.00**

8003 Ceramic Vial, made of 96% alumina-ceramic with a 1/2" dia. ball of the same material, grinding capacity about 15 ml Each **\$ 42.00**

8003A Ceramic Ball, made of 99% alumina-ceramic 1/2" dia., spare (one furnished with 8003) Each **\$ 2.25**

8004 Tungsten Carbide Grinding Vial, 2-1/8" dia. x 2-3/8" long, with two WC balls and an alternate Lucite cylinder, grinding capacity about 20 ml Each **\$145.00**

8004A Tungsten Carbide Ball, 7/16" dia. (spare) Each **\$ 1.00**

8006 Lucite Grinding vial, with 1/2" dia. Lucite balls; grinding capacity about 20 ml. **\$ 20.00**

8010 Vial Adapter, for holding seven 3111 (1/2" x 1" plastic); or seven 3116 (1/2" x 2" plastic); or seven 3114 (1/2" x 1" stainless); or seven 3117 (1/2" x 1" hardened tool steel) Each **\$ 15.00**

8011 Vial Adapter, for holding four 3127 (3/4" x 2" hardened steel) or four 6133 (3/4" x 2" plastic) or four 5004 tungsten carbide vials. Each **\$ 15.00**

3112 Ball, clear Plexiglas, 3/8" dia.
100 **\$ 1.80**
1000 **\$ 12.00**
1000 (in lots of 5000 or more) **\$ 10.00**

3116 Vial, 1/2" dia. x 2" long, polystyrene with polyethylene cap, 5 ml capacity
100 **\$ 5.00**
1000 **\$ 40.00**
1000 (in lots of 5000 or more) **\$ 30.00**

6133 Vial, 3/4" dia. x 2" long, polystyrene with polyethylene cap, 10 ml capacity
100 **\$ 6.50**
1000 **\$ 53.00**

6134 Vial, 1" dia. x 3" long, polystyrene with polyethylene cap, 30 ml capacity
100 **\$ 11.00**
1000 **\$ 85.00**

6135 Vial, 1-1/4" dia. x 3" long, polystyrene with polyethylene cap, 60 ml capacity
100 **\$ 12.00**
1000 **\$ 95.00**

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N. J. • ☎ 201-549-7144

Like the larger No. 8000 Mixer/Mill, the high grinding and mixing efficiency of the No. 5000 is a result of its three-dimensional action. Along the axis of the vial there is a component 1" long; at right angles 3/16" wide and up and down the oscillation is about 1/4". The resulting action is consistent with the general shape and size of the vials. That is, at every stroke there is an impact at the end of the vial—over 100 per second—to crush the material rapidly and reproducibly. Among its advantages over other small mixers are:

- 1) The Mixer/Mill jaws are continuously adjustable accommodating any size vial from 1" to 2-1/2" long and up to 3/4" dia. with no special adapters required.
- 2) Two vials may be shaken simultaneously.
- 3) It is extremely rugged with a strong enough motor to oscillate at 3200 rpm with a full load, assuring rapid grinding.
- 4) A unique timer switch runs the instrument for periods up to 6 minutes or, at another setting, up to one hour.
- 5) A protective and attractive housing encloses the entire mechanism including the vials during operation of the instrument.
- 6) Its motion along all three axes exceeds that of any other instrument its size affording more vigorous and therefore faster grinding action.

5000 Mixer/Mill®, 115v, 60 cy. or 230v, 50 cy. (specify), for quantities under 10 ml, dual timer permits mixing up to 6 or 60 min., built for heavy duty use with continuously variable jaws holding vials up to 3/4" dia. x 2-3/8" long, safety enclosure, 12" x 8" x 8", 22 lbs. ...Each \$150.00

3111 Vial, 1/2" dia. x 1" long, polystyrene with polyethylene cap, 2 ml capacity
 100 \$ 3.80
 1000 \$ 30.00
 1000 (in lots of 5000 or more) \$ 24.00

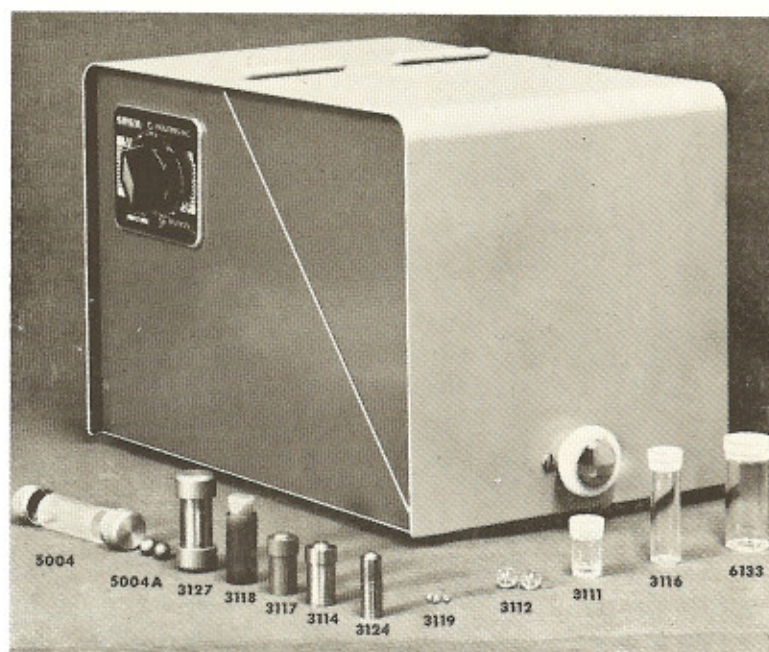
3112 Ball, clear Plexiglas, 3/8" dia.
 100 \$ 1.80
 1000 \$ 12.00
 1000 (in lots of 5000 or more) \$ 10.00

3114 Vial, stainless steel, 1/2" dia. x 1" long, 1 ml grinding capacity with stainless steel ball 1/4" dia.Each \$ 7.50

3116 Vial, 1/2" dia. x 2" long, polystyrene with polyethylene cap, 5 ml capacity
 100 \$ 5.00
 1000 \$ 40.00
 1000 (in lots of 5000 or more) \$ 30.00

(Minimum order \$10.00)

No. 5000 MIXER/MILL



3117 Vial, tool steel (hardened), 1/2" dia. x 1" long, 1 ml grinding capacity, with hardened steel ball 1/4" dia.Each \$ 7.50

3118 Vial, agate, 9/16" dia. x 1-5/16" long, 1 ml grinding capacity, with agate ball 1/4" dia.Each \$ 43.00

3119 Ball, clear Plexiglas, 1/8" dia. (for small samples).
 100 \$ 1.20
 1000 \$ 8.00
 1000 (in lots of 5000 or more) \$ 6.00

3120 Vial, high purity graphite, 1/2" dia. x 1" long, for ashing samples up to 500°C and grinding without transfer48 \$ 24.00

3124 Micro-vial, stainless steel, with three 1/8" dia. ball, 1/2 ml grinding capacityEach \$ 7.50

3127 Vial, hardened alloy steel, 3/4" dia. x 2" long, 3 ml grinding capacity, with stainless steel ball 1/4" dia.Each \$ 14.00

5004 Tungsten Carbide grinding vial, consisting of two tungsten carbide lined end caps, 12 replaceable center sections of Lucite, two 1/4" dia. tungsten carbide ballsEach \$ 30.00

5004A Tungsten Carbide ball, 1/4" dia., (spare) four \$ 2.00

5004C Lucite Center Sections, (spare)20 \$ 10.00
 100 \$ 36.00

5004W Tungsten Carbide Lined End Caps (spare) two \$ 20.00

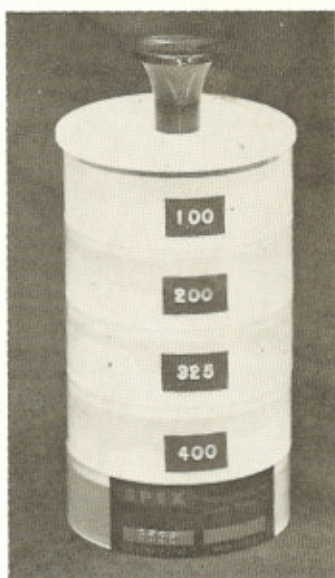
6133 Vial, 3/4" dia. x 2" long, polystyrene with polyethylene cap, 10 ml capacity
 100 \$ 6.50
 1000 \$ 53.00

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • 201-549-7144

NYLON SIEVES

Every step in the handling of high purity materials is a potential source of contamination. Our nylon sieves were designed to eliminate one such source of metallic impurities. Each sieve consists of a sheet of monofilament nylon cloth stretched in an "embroidery" frame consisting of two telescoping Lucite rings. The cloth, available in four mesh sizes, meets ASTM specification E11-58T for size and uniformity of mesh.



- 3536 Sieve Set**, consisting of 4 frames and 1 tray with 1 each of the screens listed belowSet \$ **36.00**
- 3530 Sieve frame**, consisting of two telescoping Lucite rings, 70 mm dia. x 25 mm high, specify for 100, 200, 325 or 400 meshEach \$ **9.00**
- Screen, nylon monofilament cloth, 3-1/2" dia.:
- 3531 100 mesh** (each opening 149 microns).....twelve \$ **6.00**
- 3532 200 mesh** (each opening 74 microns).....twelve \$ **8.00**
- 3533 325 mesh** (each opening 44 microns).....six \$ **6.00**
- 3534 400 mesh** (each opening 37 microns)three \$ **7.50**
- 3535 Tray, plastic**, 70 mm dia. x 25 mm high, with coverEach \$ **4.00**

STATICMASTER BRUSHES

- 3900 Staticmaster Brush**, 1" wide. Model 1C50 (50 microcurie polonium element). Cleans surfaces of dust, lint or any substance held by static attractionEach \$ **5.25**
- 3901 Staticmaster Brush**, 3" wide. Model 3T500 (500 microcurie polonium element)Each \$ **15.25**
- 3902 Staticmaster Brush**, 1" wide. Model 1C200 (200 microcurie polonium element)Each \$ **8.25**

BORON CARBIDE MORTARS and PESTLES



Boron carbide is one of the best materials for hand grinding. Possessing a hardness close to diamond, it is also extremely inert, resisting attack by most acids and alkalis. In addition, boron carbide is unbonded so that the only possible metallic contaminating element is boron itself. Here it differs from, say, tungsten carbide which is usually bonded with cobalt. The material from which the mortars are produced is made by the Norton Company. Compressed under great pressure, its density approaches the theoretical value.

The 1/2" and 1" mortars are mounted in removable plastic bases for ease in handling; 2" d. and larger are encased in stainless steel. Pestles are attached to an aluminum handle.

We can supply mortar and pestle combinations with cavities ranging from 1/2" to 3" in diameter. Also available are double cavity mortars—a crater on both ends of a cylinder. Please write us for price and delivery information on these special sets.

- 3201 Mortar and pestle, boron carbide.** Mortar cavity 1/2" d. by 5/32" deep, highly polished. Pestle 1/4" d.Set \$ **50.00**
- 3202 Mortar and pestle, boron carbide.** Mortar cavity 1" d. by 1/4" deep, highly polished. Pestle 9/16" d.Set \$ **98.00**
- 3205 Mortar and pestle, boron carbide.** Mortar cavity 1-1/2" d. by 3/4" deep, highly polished. Pestle 9/16" d.Set \$ **268.00**
- 3203 Mortar and pestle, boron carbide.** Mortar cavity 2" d. by 1" deep, highly polished. Pestle 9/16" d.Set \$ **405.00**
- 3204 Mortar and pestle, boron carbide.** Mortar cavity 3" d. by 1-1/2" deep, highly polished. Pestle 1" d.Set \$ **500.00**
- 3206 Mortar and pestle, boron carbide** for grinding under a microscope. Mortar cavity 1/4" d., highly polished. Pestle, 1/8" d. cemented to 60° offset aluminum handleSet \$ **50.00**

(Minimum order \$10.00)

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

PRE-WEIGHED CHEMICALS

In many laboratories, spectroscopy is a production operation and the director is expected to turn out analytical results like any other product, at the lowest cost. Toward this end, we at Spex Industries have tried over the years to introduce time-saving ideas, instruments and standards. With pre-weighed powders, which are ordinarily weighed out in the laboratory one portion for each analysis, we can save you money and free your technicians for more important work than repetitive weighings.

Typically, a weighing in a spectrographic lab takes at least one minute including the transfer to the container. At a cost of \$10.00 per hour—a figure often quoted to us by laboratory managers who include salary plus overhead—this means that each weighing costs 17 cents. On a large scale, using an expensive automatic balance, we can weigh with equal accuracy, at a fraction of that cost and pass the savings on to you.

Further to reduce costs, we package the chemicals in containers ready for the addition of a sample and either blending or fluxing depending on the application. For the emission laboratory, you can purchase 100 mg units of graphite powder already packaged in plastic vials with a ball included, at a price per 100 of \$16.60. You merely add your weighed sample and shake it in a Mixer/Mill or Wig-L-Bug. For the infrared laboratory, you can have high-purity KBr, of the proper particle size and sealed to prevent moisture pickup. It is in a glass container into which you not only mix the sample but can finally store the 13 mm pellet. For fluxing techniques in both X-ray and emission laboratories, you can choose the convenience of having weighed amounts of lithium tetraborate packaged in polyethylene bags. Drop the sample into the bag, knead the two together for a few seconds, then drop the contents (or even the bag as well) into the graphite fluxing crucible.

PLEASE CONSIDER THE PRICE LIST WHICH FOLLOWS AS A GUIDE. IF YOU REQUIRE SPECIAL MIXTURES OR WEIGHTS WE SHALL GLADLY QUOTE. WE CAN WORK EITHER WITH OUR MATERIALS OR YOURS.

PRICE LIST

SPECIFY ACTUAL WEIGHT REQUIRED

Graphite Powder, highest purity specify SP-2 (-100 mesh) SP-2 (-200 mesh) or SP-1 (for briquetting); in 3111 vial (polystyrene 1/2" dia. x 1" long) with 3112 ball (Lucite, 3/8" dia.)

	100	1000	5000
30-100 mg)	\$16.60	\$125.00	\$535.00
101-150 mg) ± 1.5 mg	17.60	136.00	570.00
151-200 mg)	18.60	143.00	600.00

Lithium Carbonate, spectrographic grade in 3111 vial with 3112 ball

	100	1000	5000
30-100 mg)	\$19.80	\$142.00	\$603.00
101-150 mg) ± 1.5 mg	22.40	160.00	665.00
151-200 mg)	25.00	177.00	730.00

Lithium Carbonate, mixed with SP-2 (-100) powder 1:1 by weight

	100	1000	5000
30-100 mg)	\$18.80	\$137.00	\$572.00
101-150 mg) ± 1.5 mg	20.90	152.00	620.00
151-200 mg)	23.00	167.00	665.00

Potassium Bromide, infrared grade, in glass vial (3/4" dia. x 1" long) with stainless steel ball*

	100	1000	5000
100-200 mg)	\$18.80	\$147.00	\$615.00
201-250 mg)	19.30	152.00	640.00
251-300 mg) ± 2 mg	19.90	157.00	660.00
301-350 mg)	20.40	162.00	685.00
351-400 mg)	21.00	167.00	705.00

*These vials are sealed in containers together with silica gel to maintain extreme dryness of the KBr. They may be shaken in our No. 5000 Mixer/Mill directly. In the Wig-L-Bug a special adapter (3113K at \$6.00) is required.

FLUXING CHEMICALS

Lithium Tetraborate, spectrographic grade, in sealed polyethylene bag. (Sample may be kneaded with lithium borate right in plastic bag, then transferred to graphite fusion crucible No. 7152)

	100	1000	5000
100 mg)	\$13.60	\$78.00	\$420.00
1500 mg) ± 2 mg	15.60	91.00	465.00
1800 mg)	16.80	99.00	490.00

Graphite Powder—SP-1 for pelletizing, in 1/2" dia. x 2" long plastic vial (3116) with 3/8" dia. Lucite ball (3112)

	100	1000	5000
400 mg)	\$23.80	\$188.00	\$765.00
900 mg) ± 2 mg	33.80	277.00	1095.00

(Prices on request for Lithium Tetraborate packaged in vials.)

SPEX

INDUSTRIES, INC. • 3880 PARK AVENUE • METUCHEN, N.J. • ☎ 201-549-7144

ORDERING INFORMATION

Terms are net 30 days to rated firms. To avoid delays purchasers who have not transacted any previous business with Spex Industries should include commercial references or remittance with the initial order.

Shipments will be made F.O.B. Destination anywhere within the continental United States via our choice of surface transportation. Any premium transportation, packaging or invoicing requested will be additionally invoiced.

Authorized dealers in foreign countries are listed below. In the United States and countries not listed, orders should be sent directly to Spex Industries, Inc., 3880 Park Avenue, Metuchen, N. J.

Foreign orders will be accepted subject to U.S.A. regulations and shipped F.O.B. Metuchen, N. J.

Where feasible, dimensions of the article and shipping weights are given adjacent to price information. Reference is also made to any **SPEX SPEAKER** in which more detailed information may be found.

A minimum order of \$10.00 is required.

Belgium	MBLE, 80 Rue Des Deux-Gares, Brussels 7
England	Glen Creston Ltd., The Red House, 37 The Broadway, Stanmore, Middlesex
France	Bureau de Liaison, 113 Rue de L'Universite, Paris VII ^E
Japan	Nissho Company, Ltd., 2,1-Chome, Otemachi Chiyoda-Ku, Tokyo
	Seishin Trading, 59 Naniwa-Machi, Ikuta-Ku, Kobe
West Germany	Dipl.-Met. Gerhard Winopal, Postfach 40, Isernhagen NB-Sud, Hannover

GUARANTEE

Our products are guaranteed:

- (1) to conform to the specifications of the most recent model of the item.
- (2) against defects of workmanship and parts for one year from the date of the original shipment.

Although catalog information is as representative of the product as possible, we must reserve the right to make changes in specifications or prices, and also to delete and add items.