APS's commitment to clients extends beyond the initial supply of labware, as it can offer a complete service with metal exchange, refining and technical support to help make the purchasing of platinum products as easy and cost effective as possible.

Whatever your platinum requirements are, APS offers QUALITY, VALUE, SERVICE AND COMMITMENT.

AGR has traditionally been and still is Australia's largest refiner of gold. A refiner that generates international consumer demand for the Australian Precious Metal Industry by manufacturing and marketing value added products.

At its Melbourne plant, AGR manufactures a comprehensive range of precious metal products including coin blanks, jewellery alloys and products, silver brazing alloys, chemicals and platinum laboratory ware.

To better service the Platinum Labware Market, AGR has joined forces with Automated Fusion Technology Pty Ltd to form a marketing outlet for all platinum related labware products. This new company APS (Analytical Platinum Supplies Pty Ltd) will service the labware market on a global basis. With AGR's manufacturing skills developed in over 100 years experience with precious metals together with a focused and dedicated marketing arm in APS it will be able to offer an exceptional service on a wide range of Platinum based labware products.

APS • Good Ideas • Good People • Good Products

Products

APS supplies an extensive range of Platinum Alloy related labware. Many of the items available are quite standard in nature, however APS have the capability to assist in the design of specialised items. APS takes great pride in the fact that it can meet your needs from the most basic item through to the most intricate of individual designs.

Service

Our experienced sales department is focused on giving you its full support in achieving your needs. We are delighted to show competence, knowledge and integrity. For our established customers we can provide an **advanced order** system. This system allows for the minimum amount of down time when replacing a larger quantity of items. As a standard function APS will put an **identifying mark or number** on all its product, or if you prefer your own identifying system.

Refining

APS is a division of Australia's largest precious metal refiner, this parentage enables APS to access world best practice in refining and services to ensure your scrap metal is treated with the care it deserves.

Repair and Reshaping

If for some reason your Platinum Labware is damaged or needs to be cleaned and polished APS offers a refurbishment service at a fraction of the price of a new product. We are also able to make and supply steel or wooden reshapers to help you keep your labware in good condition. Please call your nearest APS office for more information on this service.

The analytical laboratory is a vital part of all industrial plants and research establishments. The techniques employed therein have developed rapidly in recent years, but the fundamentals upon which many of these techniques are based have remained constant and the majority demand the use of high-purity inert materials. In this category platinum has properties that make it an ideal choice. It has a high degree of chemical inertness and yet can be readily fabricated into a wide variety of articles.

This catalogue provides a comprehensive guide to the products available from Analytical Platinum Supplies and their use in the laboratory. Some of the items listed are available from stock and we will be pleased to provide price and delivery information very quickly for any item. We will also readily quote for non-standard items, providing assistance with design where required.

Materials

The six platinum group metals are platinum, palladium, iridium, rhodium, osmium and ruthenium. The following is a brief description of some of these plus gold.

Platinum (Pt) is a white, very ductile metal that remains bright in air at all temperatures. At room temperature platinum resists practically all reagents except aqua regia and possibly bromide. Platinum forms alloys with many metals. The most useful platinum alloys are made with the addition of other platinum group metals which impart hardness to the platinum without sacrificing its inherent corrosion resistance and ability to withstand high temperatures.

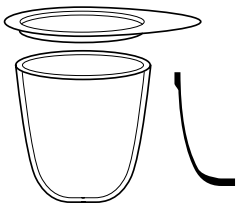
Palladium (Pd) a white, very ductile metal with properties similar in many aspects to Platinum. Palladium resists tarnish in ordinary atmospheres, but does sulphur contaminated environment. When palladium is heated in air to 400-800°C, a thin oxide film is formed. This film decomposes at higher temperatures, leaving the metal bright. Hydrochloric and sulphuric acid attack palladium slightly; nitric acid ferric chloride and moist halogens attach readily. Palladium absorbs hydrogen which will diffuse at a relatively rapid rate when the metal is heated.

Iridium (Ir) is a white metal of limited malleability at room temperature. It can be worked at elevated temperatures. Iridium oxidises visibly when heated in air to 600-1000°C, but remains bright at higher temperatures. Acids of aqua regia do not attack it; molten salts do. Iridium is used as a hardening agent for other noble metals and for fabricating vessels to operate at high temperature.

Rhodium (Rh) is a hard, white metal. It is fairly ductile when cold and quite ductile when hot. Rhodium is the whitest platinum metal and remains bright under all atmospheric conditions at ordinary temperatures. It resists most common acid, even at moderate temperatures. It resists hot aqua regia. The high oxidation resistance and melting point of rhodium permits it's use for fabricating items with high temperature applications.

Gold (Au) is bright yellow, soft and very malleable metal. It resists oxidation and common single acids. It is attacked by aqua regia and the halogens.

COMPARISON OF PROPERTIES	PT	PT-10RH	PT-5AU	AU
Density gcm-3	21.45	19.99	21.33	19.32
Melting Point°C	1770	1850	1660	1064
Electrical Resistivity (0°C)μΩcm	9.85	18.40	18.50	2.06
Temp Coeff of Resistance (0-100°C)°C-1	0.0039	0.0017	0.0021	0.004
Anneald Hardness Hv	40	90	90	26
Ultimate Tensile Strength (20°C) Nmm-2	125	300	345	120
Tensile Elongation (20°C) %	40	35	24	42
Glass Wetting Resistance (Equilibrium				
Contact Angle of "E" Glass at 1200°C)	26	45	83	-

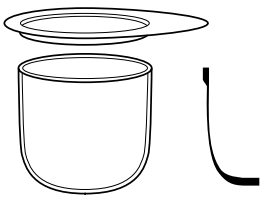


Standard Form Crucibles

Available Capacity:
2.5-700cc (larger sizes made to order)
Options:
Lids, reinforced rims and/or bases.

Standard Form

				ESTIMATED WEIGHT (g)				
CODE NUMBER	CAPACITY cc	DIAMETER mm	DEPTH mm	STANDARD FORM	REINFORCED RIM ONLY	REINFORCED BASE ONLY	REINFORCED RIM & BASE	STANDARD LID ONLY
GCS2.5	2.5	12	15	3	4	4	5	1.5
GCS5	5	2.0	2.2	4	5	5	6	1.5
GCS8	8	2.5	2.4	6	7	7	8	1.5
GCS10	10	2.5	2.8	7	7.5	8	9	2
GCS15	15	3.0	3.1	11	12	13	14	3
GCS20	20	3.3	3.5	15	16	17	18	4
GCS25	25	3.6	3.4	19	20	21	23	4
GCS30	30	4.0	3.6	22	24	26	27	6
GCS35	35	4.1	3.8	25	26	27	32	6
GCS40	40	4.2	4.2	30	32	34	36	7
GCS50	50	4.5	4.4	38	40	42	45	8
GCS60	60	4.5	4.7	46	48	50	54	9
GCS70	70	4.9	5.3	50	52	54	63	12
GCS80	80	5.1	5.3	51	54	63	72	14
GCS90	90	5.4	5.7	52	59	71	81	15
GCS100	100	5.6	5.7	59	68	73	90	17
GCS110	110	5.6	6.0	68	71	81	95	19
GCS120	120	6.4	6.6	84	88	90	98	22
GCS150	150	6.5	6.9	100	104	107	114	27
GCS200	200	8.0	6.5	150	159	165	180	30
GCS250	250	8.1	7.3	175	179	183	190	32
GCS700	700	105	10.5	300	305	315	320	50



Low Profile Crucibles

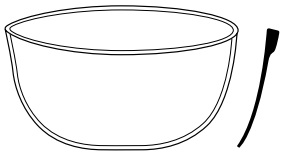
Available Capacity:
8-125cc (larger sizes made to order)
Options:
Lids, reinforced rims and/or bases.

Low Profile Form

				ESTIMATED WEIGHT (g)				
CODE NUMBER	CAPACITY cc	DIAMETER cm	DEPTH cm	STANDARD FORM	REINFORCED RIM ONLY	REINFORCED BASE ONLY	REINFORCED RIM & BASE	STANDARD LID ONLY
GCL8	8	2.5	2.1	6	7	7	8	1.5
GCL10	10	2.7	2.3	7	7.5	8	9	2
GCL15	15	3.0	2.7	11	12	13	14	3
GCL20	20	3.3	2.8	15	16	17	18	4
GCL25	25	3.6	3.0	19	20	21	23	4
GCL30	30	4.0	3.2	22	24	26	27	6
GCL35	35	4.2	3.3	25	26	27	32	6
GCL40	40	4.3	3.4	30	32	34	36	7
GCL50	50	4.6	3.7	38	40	42	45	8
GCL60	60	4.8	3.9	46	48	50	54	9
GCL70	70	5.2	4.1	50	52	54	63	12
GCL75	75	5.2	4.4	50	52	54	63	13
GCL80	80	5.2	4.7	51	54	63	72	14
GCL90	90	5.7	4.8	52	59	71	81	15
GCL100	100	5.7	5.1	59	68	73	90	17
GCL110	110	5.7	5.4	68	71	81	95	19
GCL120	120	5.7	5.7	84	88	90	98	22
GCL125	125	5.8	5.9	97	101	105	114	25

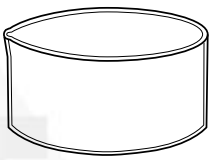
Reinforcing of the rim gives the crucible a more robust character enabling regular handling and reducing rim deformation.

Evaporating dishes may be ordered also with reinforced rim and heavy bottom. The additional cost for reinforcement is far outweighed by longer life and ease of handling. If covers are required, please specify.



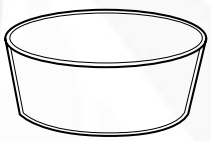
Flat Bottom Dish

				ESTIMATED WEIGHT (g)				
CODE NUMBER	CAPACITY cc	DIAMETER mm	DEPTH mm	STANDARD FORM	REINFORCED RIM ONLY	REINFORCED BASE ONLY	REINFORCED RIM & BASE	STANDARD LID ONLY
GD20	20	4.1	2.0	6	7	8	9	6
GD25	25	4.2	2.3	8	9	10	12	10
GD35	35	4.9	2.5	12	13	14	16	13
GD40	40	5.1	2.6	15	17	18	120	14
GD50	50	5.3	2.9	17	19	21	25	15
GD60	60	5.8	3.0	20	21	23	27	19
GD75	75	6.5	3.0	25	27	30	33	22
GD100	100	7.0	3.3	33	35	37	40	25
GD125	125	7.4	3.4	42	44	45	48	28
GD150	150	7.7	4.1	50	53	55	60	33
GD175	175	8.4	4.0	55	59	64	68	41
GD200	200	9.0	4.3	67	71	75	80	44
GD250	250	9.4	4.2	80	82	83	88	51
GD300	300	11.0	4.5	94	98	100	105	55
GD400	400	11.8	4.8	133	137	140	148	58
GD500	500	12.4	5.0	170	179	185	200	61
GD750	750	12.4	7.5	270	290	310	350	61



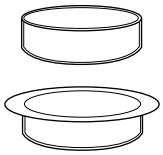
Evaporation Dish

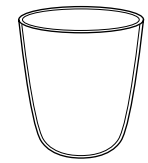
CODE NUMBER	CAPACITY cc	DIAMETER mm	DEPTH mm	ESTIMATED WEIGHT (g)
GED55	55	59	22	28
GED80	80	59	30	32
GED100	100	67	28	40
GED125	125	69	32	42
GED150	150	69	40	50



Milk Analysis Dish

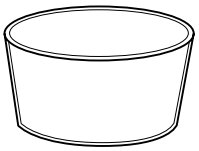
CODE NUMBER	CAPACITY cc	TOP DIAMETER mm	BOTTOM DIAMETER mm	DEPTH mm	ESTIMATED WEIGHT (g)
GMD13	13	42	32	12	12
GMD30	30	50	40	17	16
GMD45	45	55	40	25	22





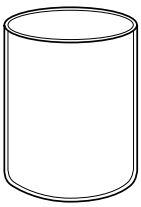
Volatile Matter Crucible

	DIMENSIONS mm			ESTIMATED WEIGHT (g)	
CODE NUMBER	CAPACITY	TOP DIAMETER	HEIGHT	CRUCIBLE	COVER, FLANGED OR CAPSULE
GVM10	10	25	28	7	6
GVM15	15	31	31	11	8
GVM20	20	33	35	15	9
GVM25	25	36	35	19	10
GVM30	30	40	36	22	11
GVM40	40	42	42	30	13
GVM50	50	45	44	38	14



Capsule-Kawin Crucible

	DIMENSIONS mm			ESTIMATED WEIGHT (g)	
CODE NUMBER	CAPACITY cc	TOP DIAMETER	HEIGHT	CRUCIBLE	COVER, FLANGED OR CAPSULE
GCK8	8	28	20	15	9
GCK16	16	33	20	30	23
GCK19	19	34	20	35	25



Beaker

CODE NUMBER	CAPACITY cc	TOP DIAMETER	HEIGHT	ESTIMATED WEIGHT (g)
GB110	110	45	70	170
GB220A	220	68	60	200
GB220B	220	59	80	230

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Analytical Platinum Supplies (APS) is a manufacturer and supplier of quality platinum products for the Fusion Process . . .

Spectroscopic analysis is becoming an increasingly valued tool in the modern laboratory. Fusion is used to prepare a wide range of samples for analysis by x-ray fluorescence, atomic absorption inductively coupled plasma-atomic emission and a variety of classical chemical techniques. The sample types include oxides, sulphides and silicates that comprise many of the ores and concentrates in the mining and metallurgy industry.

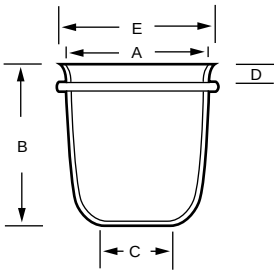
Samples are dissolved and mixed into a lithium borate flux at temperatures ranging from 700 to 1250 degrees Celcius. (Typical fusion temperature in automatic machines is 1050 degrees Celcius). The molten sample is poured into pre-heated molds then cooled. Precise control of cooling is essential to produce flat beads and to avoid cracking or crystallisation.

Fusion is used in a wide variety of industries:

- The glass and ceramics industry
- The steel industry, analysing iron ores, blast furnace slag's and even magnesites
- Bauxite/alumina
- Base metal (Ph, Zn, Cu, Ni) for the analysis of sulphides concentrates, silicate slag's, mattes sinters, etc.
- The mineral sands industry
- The cement industry, analysing sand, limestone, kiln feed, clinker, milled meal, etc.
- University's and research organisations.

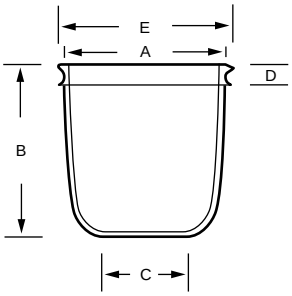
APS manufactures a range of products for automatic fusion equipment: Phoenix, Leco, Perl-X, Claisse, Herzog, etc. This brochure gives examples of some of our products. Non standard or special items can be manufactured on request. Ongoing developments in analytical processes results in constant changes to laboratory equipment. If a product is not shown contact APS direct or your nearest supplier for more detailed information or quotation.

Phoenix



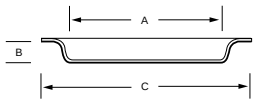
Ring Type Crucible

CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
AC1	36	36	20	8	37.5	40
AC2	36	43	20	12	37.5	40
AC3	34	36.5	20	9	40	40



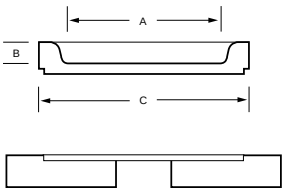
Rolled Lip Type Crucible

CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
AC4	33	38	21	7	39	40
AC5	33	30	20	7	38	30
AC6	40	35	22	4	50	36



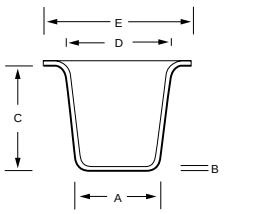
Casting Dish

CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
AM1	29/31	3	42	60-100
AM2	30/32	3	42	60-100
AM3	30/32	4	42	60-100
AM4	30/32	3	46	60-100
AM5	32/34	3	46	60-100
AM6	33/35	3	46	60-100
AM7	39/41	3	52	60-100
AM8	39/41	3	56	60-100



Mould Furnace Type and Plate

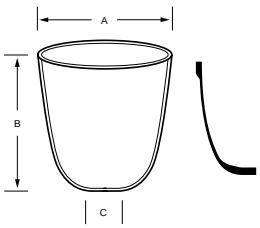
CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
AM9	39/41	3.5	44	93
AMH10	41.5	-	54	27



Mouldable

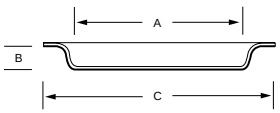
CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
AM10	39/41	3	25	44	56	80-120
AM11	29/31	3	25	44	56	80-120

Bradway



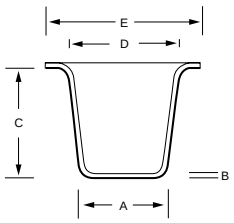
Crucible

CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
BC1	33.5	31.5	26	25
BC2	34.5	36	26	30
BC3	40	39	26	35



Casting Dish

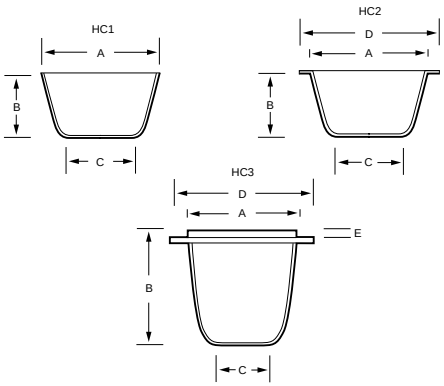
CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
BM1	32/34	3	44	60/100
BM2	38/40	3	54	60/100
BM3	39/41	3	54	60/100



Mouldable

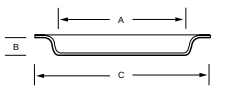
CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
BM4	39/41	3	30	45	55	50
BM5	39/41	3	30	45	55	150

Herzog



Crucible

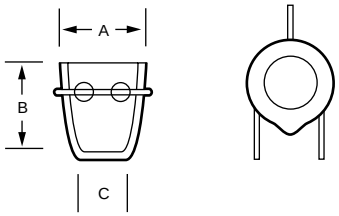
CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
HC1	49	30	37	-	-	90
HC2	49	30	40	56	-	110
HC3	36	36.5	22	44	5	40



Casting Dish

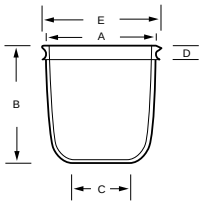
CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
HM1	29/31	3	44	40
HM2	38/41	3	52	100
HM3	39/41	4	52	50

Schoeps



Three Pin Crucible

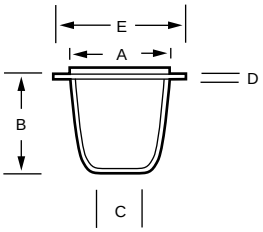
CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
SC1	35	38	20	31
SC2	44	38	26	50
SC3	39	43	22	38



Rolled Lip Type

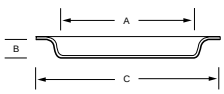
CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
SC4	33	38	22	7	39	40

Leco



Crucible

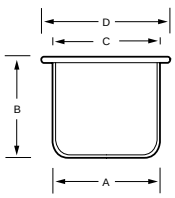
CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
LC1	37	35	20	5	44	45
LC2	35	38	21	5	44	45
LC3	37	35	30	5	44	45



Casting Dish

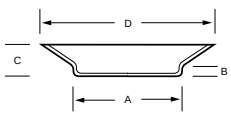
CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
LM1	35/36	7.2	44	35
LM2	35/38.5	7.2	44	45
LM3	39/41	4.2	47	40
LM4	39/41	5	47	40

Perlx



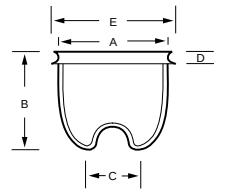
Crucible

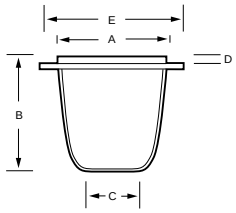
CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
PC1	41	40	41	-	49	116
PC2	41	40	41	-	49	80
PC3	44	40	44	-	52	90

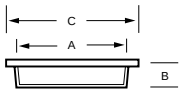


Casting Dish

CODE NUMBER	DIMENSIONS mm A	B	C	D	ESTIMATED WEIGHT (g)
PM1	30/32	3	5	55	25
PM2	30/32	3	5	55	40
PM3	30/32	3.5	11.5	65	50
PM4	39/41	3.5	11.5	65	58







Claisse

Dimple Crucible

CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
CC1	37	32	20	5	43	26
CC2	37	32	20	5	43	30

Flat Base Crucible

CODE NUMBER	DIMENSIONS mm A	B	C	D	E	ESTIMATED WEIGHT (g)
CC3	33	35	17	3.5	40	21
CC4	35	35	21	3.5	44	26

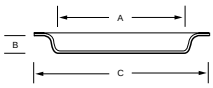
Casting Dish

CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
CM1	30/31	6	39	18 or 30
CM2	31/33	6	41	19 or 32
CM3	32/34	6	41	21 or 36
CM4	32/38	6	45	22 or 36
CM5	35/37	6	44	25 or 48
CM6	38/41	6	49	29 or 48
CM7	40/42	6	49	34 or 48

Platinum (Pt) and many of its alloys are highly resistant to chemical attack. To get the greatest use and life out of your Pt ware you should observe the following:

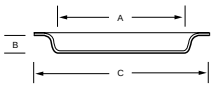
- Avoid thermal and physical shock.
- Cleaning: Boiling with dilute hydrochloric acid (HCl) or fusing with potassium bisulphate prior to boiling with water normally suffices. There are procedures set out for specific material types in various standards e.g. ISO 9516 - 1992 for fusion XRF analysis of iron ores. For a more aggressive clean, boil in nitric acid (HNO3 chlorine free). For a less aggressive, routine operation, place Pt ware into a beaker of 20% w/v citric acid, maintained at 80°C. Whatever cleaning method is used, rinse thoroughly with clean water and dry thoroughly.
- Polish and reshape your Pt ware after use.
- Always maintain oxidising condition.
- When performing borate fusion on reducible matter, pre-oxidise first before fusing. In most cases, this can be done insitu e.g. using an oxidant such as sodium nitrate and sintering at 700°C for the analysis of base metal sulphides. Organic material must be fully ashed before fusing.
- Avoid contact with most metals, e.g. Fe, Cr, Ni, Cu, Zn, Pb – particularly at elevated temperatures. If the metal particles are fine enough, they can be pre-oxidised as above.
- Do not carry out direct fusions with caustic alkalis, nitrates, cyanides or nitrides in Pt ware.
- Barium and lithium hydroxides react at red heat with platinum and fused alkali oxides and peroxides dissolve platinum.
- In general, reduce handling as much as possible. Ideally the Pt ware should only come in contact with tongs (titanium or Pt tipped steel tongs), balance pan and cradle used to hold the Pt ware. e.g. preheated/conditioned inconel cradles for fusion work and teflon cradles for cleaning/washing. Never place Pt ware on bench tops.

Contact APS about particular applications of platinum and its alloys.



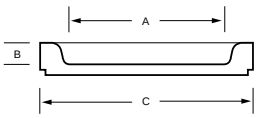
Spun Type

CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
XM1	29/31	5	42	20-40
XM2	30/31	6	37	20-40
XM3	38/40	3.5	52	30-50
XM4	38/40	8	48	30-50
XM5	39/41	5	47	30-50



Pressed Type

CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
XM6	29/31	3	42	45-100
XM7	30/32	2.4	42	45-100
XM8	30/32	3	42	45-100
XM9	30/32	4	42	50-100
XM10	32/34	3	46	50-100
XM11	33/34	2.4	46	50-100
XM12	38/40	3	52	60-100
XM13	38/40	4.5	52	60-100
XM14	39/41	3	52	60-100
XM15	39/41	4	52	80-100



Furnace Type

CODE NUMBER	DIMENSIONS mm A	B	C	ESTIMATED WEIGHT (g)
XM16	30/32	2.5	33	60-100
XM17	30/32	2.5	39	80-100
XM18	30/32	3	40	80-100
XM19	32/35	2	39	80-100
XM20	33/35	2.5	37	80-100
XM21	33/35	2.5	39	80-100
XM22	38/40	2.5	44	100
XM23	39/41	2	44	100
XM24	39/41	2.5	44	100
XM25	39/41	3	44	100
XM26	39/41	3.5	44	100

For further details check the APS website:

www.aps-labware.com