

PART I

**Equipment,
Chemicals
and
Supplies**

PLATING AND PROCESSING TANKS

The tanks used for processing work through the plating cycle may be constructed of a variety of materials. Both the type of chemical used and the operating temperature must be considered. Tanks may be constructed of wood, steel, stainless steel, fiberglass, polypropylene, polyethylene and other plastics. The wood tanks should have a suitable lining and all tanks must be suitably braced to be self supporting. The various types of tanks and their uses are listed below.

I. WOOD TANKS:

Wood tanks were, at one time, made of cypress because of its waterproof property. However, marine plywood which uses a water proof glue is very satisfactory providing the plywood is thick enough. A tank made of plywood may be coated with a waterproof varnish and be provided with a flexible plastic liner. Another method commonly used is to make a wood tank and coat the inside and outside with fiberglass in which case no varnish is necessary.

Probably, the simplest tank to home-fabricate would be varnished marine plywood. This must be supported with a frame stiffener around the rim and in the case of fairly large tanks (over 30" deep or long) an additional brace around the middle as a supporting girth. See the attached drawing for suggested construction. We would suggest 1/2" thick plywood for small tanks up to 30" longest dimension and thicker plywood for larger tanks.

Tanks made of plywood with flexible vinyl liners can be used for most all acid and alkaline solutions. Although vinyl liners are, supposedly, limited to 160° F., in this case higher temperature may be tolerated since the liner is supported by the wood tank. Wood tanks coated with fiberglass can not be used for alkaline solutions such as alkaline cleaners or cyanide type plating solutions.

Wood tanks are not recommended for the rinse tanks because of the difficulty of installing the outlets needed for a running rinse.

II. STEEL TANKS:

Welded steel tanks may be used up to 200° F. for all alkaline cleaner solutions and cyanide type plating solutions. However, bright plating solutions such as silver or copper solutions generally require plastic lined tanks because the bright finish may be impaired by minute traces of iron contamination. Rinse tanks following the foregoing alkaline type solutions can be constructed of steel.

III. STAINLESS STEEL TANKS:

Stainless steel tanks can be used up to 200° F. for all alkaline solutions such as recommended for plain steel above. This type construction is much higher priced than plain steel but longer tank life will be realized. In addition stainless steel can be used to contain nitric acid solutions. It is not satisfactory for muriatic or sulfuric acids.

IV. STEEL TANKS LINED WITH PVC:

These tanks have a lining of PVC on the inside which will resist common acids (except nitric acid) and alkalies but are limited to a maximum temperature of 150° F. They may be used for common acid type plating solutions, for acid dip tanks and for rinse tanks.

V. FIBERGLASS TANKS:

These tanks can be used for rinse tanks, muriatic and sulfuric acid dip tanks, and acid type plating solutions up to 180° F. (Not recommended for chrome plating solution.) Fiberglass tanks are not suitable for alkaline cleaner solutions nor cyanide plating solutions.

VI. POLYPROPYLENE TANKS:

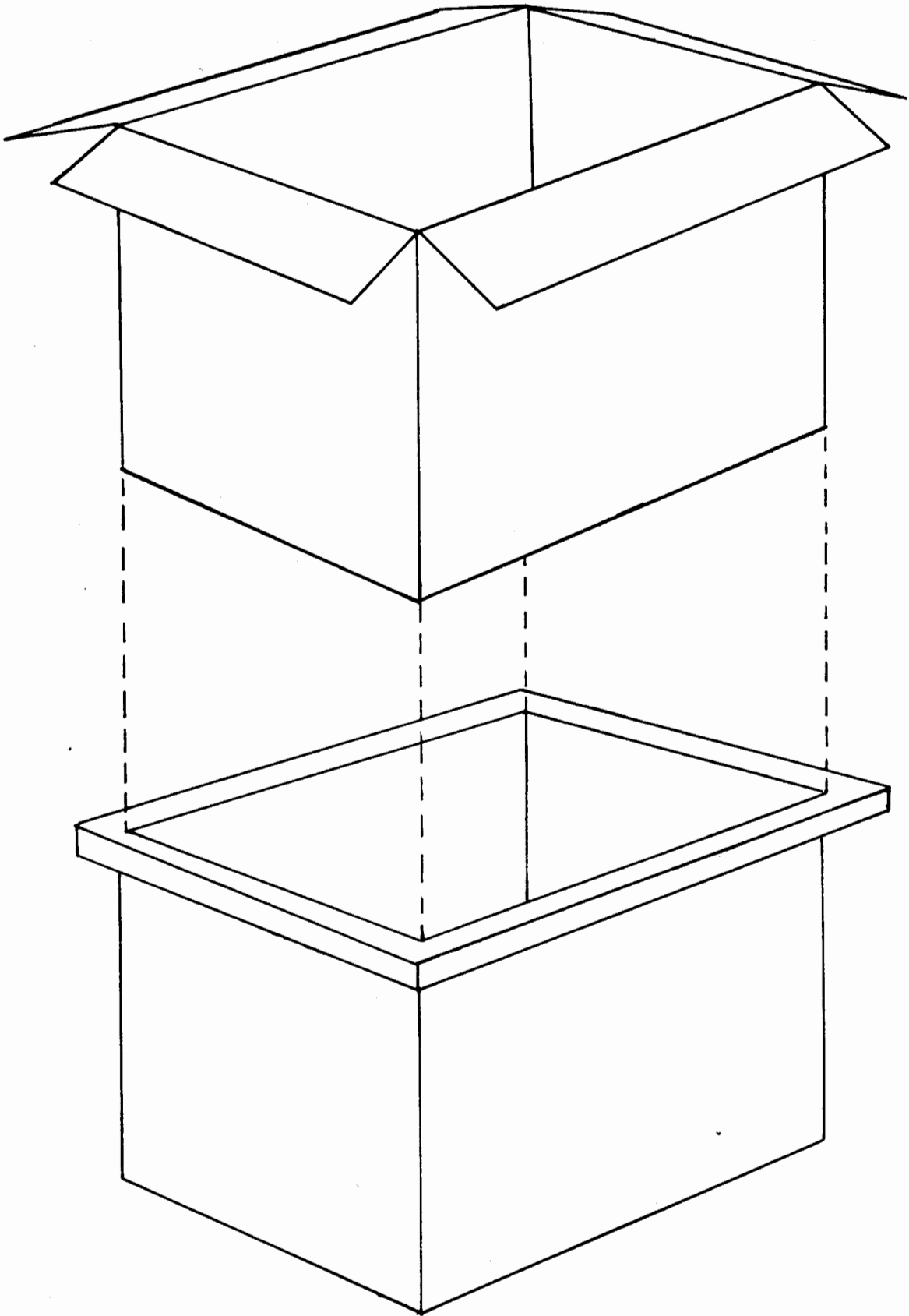
Polypropylene is the ideal tank material since it is not affected by acids or alkalies and can withstand temperatures of 180° F. As a consequence these tanks are satisfactory for all common plating solutions (except chrome) as well as for rinse tanks. It is not affected by the corrosive fumes in the plating room and chemical stains on the exterior surface are easily rinsed off. These tanks are plastic welded and hence can be made up in any specified size.

VII. POLYETHYLENE TANKS:

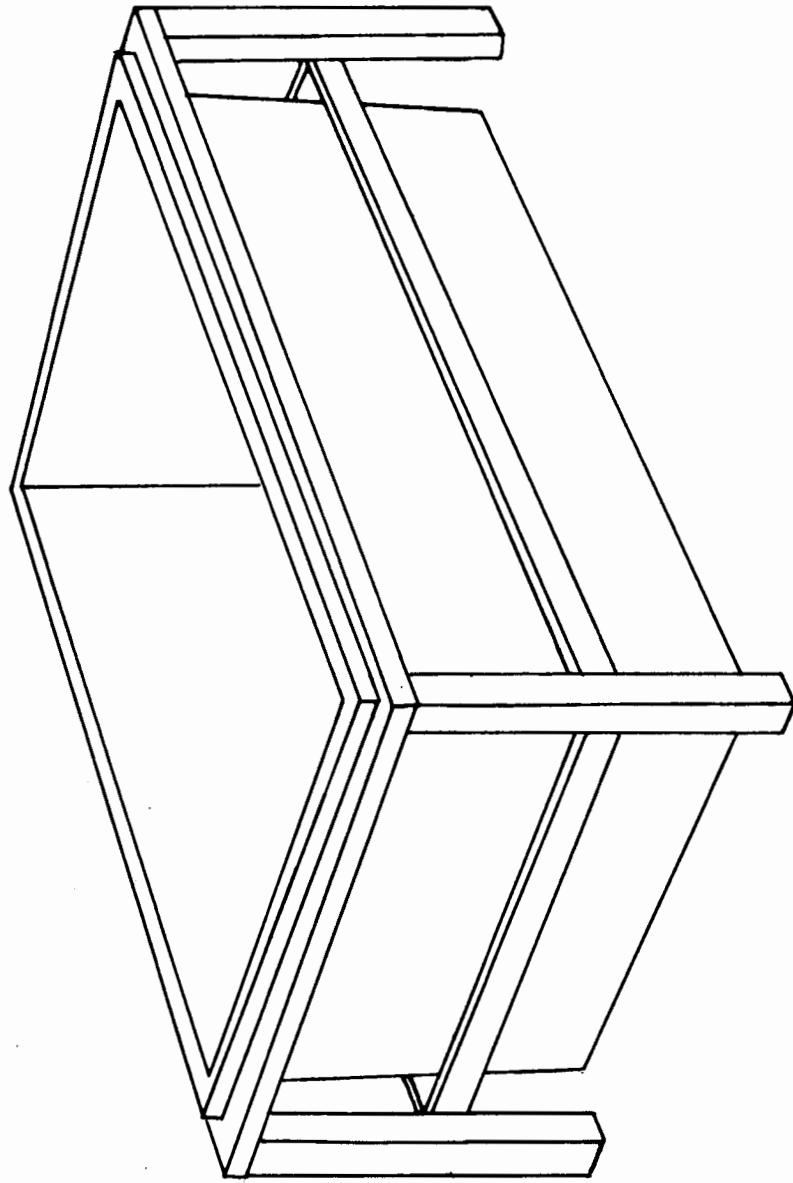
Tanks made of polyethylene are molded tanks and consequently are available in standard sizes only. They are resistant to all alkaline and acid solutions the same as the polypropylene tanks in Paragraph VI. However, they are limited to temperatures of 140° F.

GENERAL:

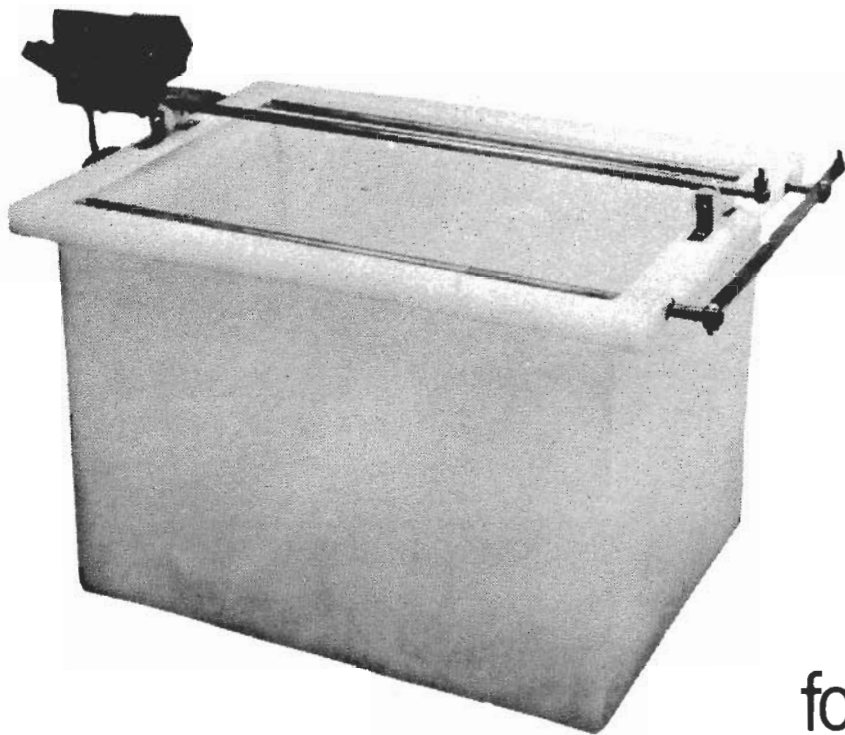
Probably the easiest "do-it-yourself" tank is the wood tank with the flexible plastic liner. If the capability of welding steel tanks is available these, of course, are preferable where they can be used. The same might be said for stainless steel tanks. The fiberglass tanks, polypropylene tanks and polyethylene tanks all require fabrication experience and facilities that puts them out of the "do-it-yourself" category.



Schematic Drawing of Wood Tank Showing Flexible Insert Liner.



Schematic Drawing Showing How to Reinforce a Tank with a Stand.



PLACO Heavy Duty PLASTIC TANKS

for Plating, Acid Dipping,
Rinsing and Chemical Treatments

NO.	SIZE	GALS.	THICK- NESS	PRICE TANK ONLY	TANK W/3 COPPER RODS	TANK W/3 COPPER RODS AND AGITATOR	TANK W/3 COPPER RODS, AGITATOR, HEATER w/THERMOSTAT
PL10	18x14x12DP	10	1/4"	\$30.00	\$ 60.00	\$120.00	\$200.00
PL20	23x15x18DP	20	5/16"	60.00	95.00	155.00	245.00
PL30	23x18x24DP	30	5/16"	79.00	130.00	190.00	290.00

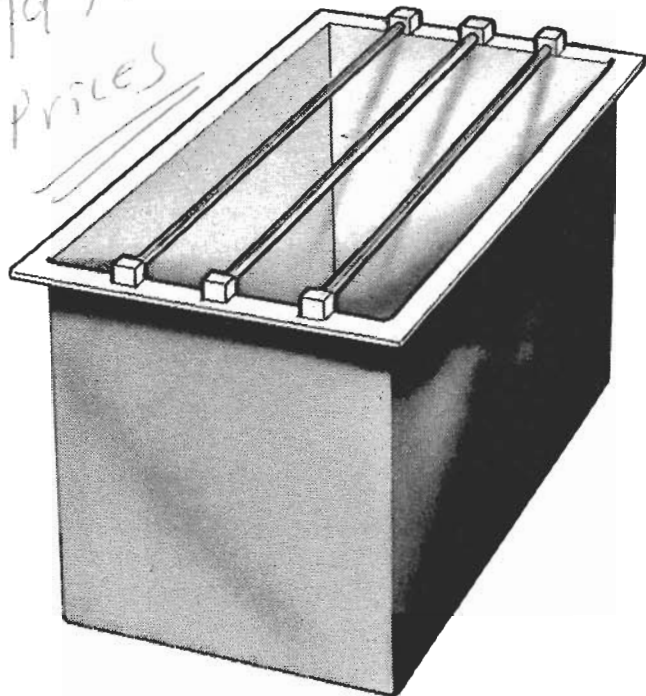
* PL10 and PL20 have 1000 Watt, 115 V. Heater; PL30 has 2000 Watt, 230 V. Heater.
Specify SS Heater for Alkaline solutions; Quartz Heater for Acid Type solutions.

OUTSTANDING FEATURES:

1. Heavy wall. Model PL10 and PL20 are self-supporting. Model PL30 should have a supporting frame.
2. No welded seams. Absolutely leak proof.
3. Exclusive square channel type rim for base of mounting accessories.
4. Recommended for continuous use up to 140° F. maximum or intermittent use to 160° F. maximum.

Platers Service Company, 1511 Esperanza Street, Los Angeles, California 90023

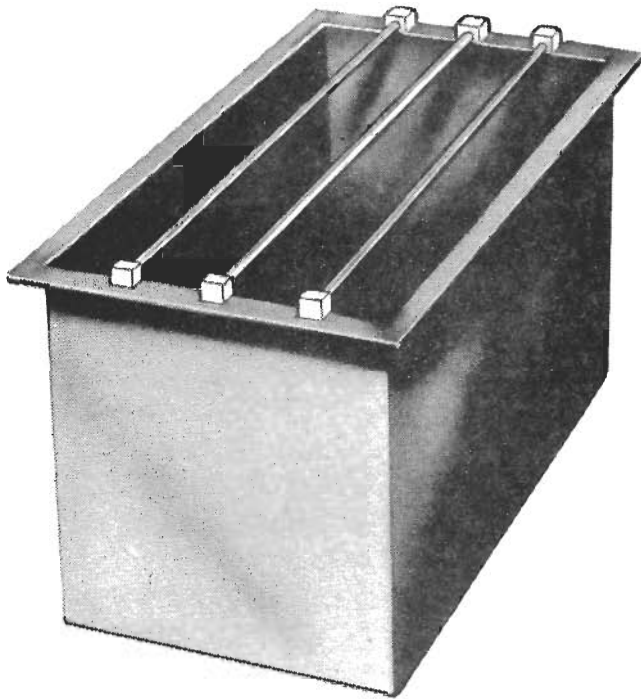
1979
Prices



PLACO PVC LINED STEEL TANKS

Recommended for acid pickling solutions up to 150° F, ammonium persulphate solutions and all plating solutions up to 150° F.

MODEL NO.	SIZE L W D	MATERIAL THICKNESS MILD STEEL	TOP RIM	CAPACITY IN GALLONS	PRICE OF TANK ONLY	ROD DIA.	PRICE OF TANK WITH RODS & MOUNTS
LT-55	24x24x24"	14 ga	1½"	55 gal	\$230.00	1/2"	\$288.00
LT-68	30x24x24"	12 ga	1½"	68 gal	270.00	5/8"	334.00
LT-87	30x24x30"	11 ga	1½"	87 gal	304.00	5/8"	368.00
LT-109	30x30x30"	11 ga	1½"	109 gal	356.00	5/8"	420.00
LT-60	36x18x24"	11 ga	1½"	60 gal	280.00	5/8"	374.00
LT-80	36x24x24"	11 ga	1½"	80 gal	304.00	5/8"	398.00
LT-126	36x30x30"	3/16"	1½"	126 gal	460.00	5/8"	554.00
LT-150	36x36x30"	3/16"	1½"	150 gal	512.00	5/8"	606.00
LT-92	42x24x24"	3/16"	2"	92 gal	400.00	3/4"	499.00
LT-147	42x30x30"	3/16"	2"	147 gal	512.00	3/4"	611.00
LT-216	42x36x36"	3/16"	2"	216 gal	630.00	3/4"	729.00
LT-206	48x30x36"	3/16"	2"	206 gal	660.00	3/4"	766.00
LT-247	48x36x36"	3/16"	2"	247 gal	700.00	3/4"	806.00
LT-231	54x30x36"	3/16"	2"	231 gal	700.00	3/4"	849.00
LT-278	54x36x36"	3/16"	2"	278 gal	770.00	1"	919.00
LT-310	60x36x36"	3/16"	2"	310 gal	910.00	1"	1069.00
LT-370	72x36x36"	3/16"	2"	370 gal	1040.00	1"	1339.00
LT-438	72x36x42"	3/16"	2"	438 gal	1140.00	1"	1439.00



PLACO UNLINED STEEL TANKS

Recommended for soak cleaning, electro-cleaning, alkaline plating solutions and other non-corrosive applications.

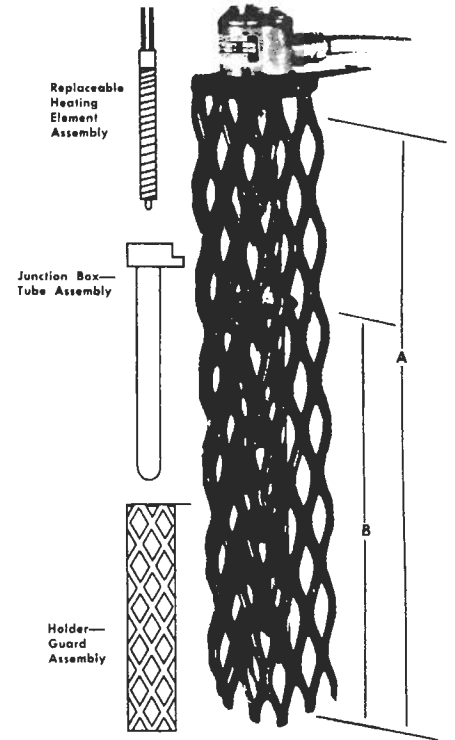
MODEL NO.	SIZE L W D	MATERIAL THICKNESS MILD STEEL	TOP RIM	CAPACITY IN GALLONS	PRICE OF TANK ONLY	ROD DIA.	PRICE OF TANK WITH RODS & MOUNTS
T-55	24x24x24"	14 ga	1½"	55 gal	\$ 70.00	1/2"	\$ 128.00
T-68	30x24x24"	12 ga	1½"	68 gal	80.00	5/8"	144.00
T-87	30x24x30"	11 ga	1½"	87 gal	92.00	5/8"	156.00
T-109	30x30x30"	11 ga	1½"	109 gal	108.00	5/8"	172.00
T-60	36x18x24"	11 ga	1½"	60 gal	80.00	5/8"	174.00
T-80	36x24x24"	11 ga	1½"	80 gal	92.00	5/8"	186.00
T-126	36x30x30"	3/16"	1½"	126 gal	210.00	5/8"	304.00
T-150	36x36x30"	3/16"	1½"	150 gal	230.00	5/8"	324.00
T-92	42x24x24"	3/16"	2"	92 gal	150.00	3/4"	249.00
T-147	42x30x30"	3/16"	2"	147 gal	230.00	3/4"	329.00
T-216	42x36x36"	3/16"	2"	216 gal	284.00	3/4"	383.00
T-206	48x30x36"	3/16"	2"	206 gal	284.00	3/4"	390.00
T-247	48x36x36"	3/16"	2"	247 gal	316.00	3/4"	422.00
T-231	54x30x36"	3/16"	2"	231 gal	316.00	3/4"	465.00
T-278	54x36x36"	3/16	2"	278 gal	344.00	1"	493.00
T-310	60x36x36"	3/16	2"	310 gal	454.00	1"	613.00
T-370	72x36x36"	3/16	2"	370 gal	540.00	1"	839.00
T-438	72x36x42"	3/16	2"	438 gal	612.00	1"	911.00

PLACO ELECTRICAL IMMERSION HEATERS

HEATERS FOR DIFFICULT ACID BATHS

FEATURES:

- Sealing cap filled with compound prevents the entrance of liquids and vapor.
- Portable, light-weight.
- Totally inert to all acid finishing and plating solutions (except HF and phosphatizing).



WATTS	VOLTS	DIMENSIONS		CATALOG NO.	PRICE COMPLETE	COMPLETE HEATER LESS GUARD	ELEMENT ONLY
		A	B				
1000	120/1 phase	12"	6"	Q1-112	\$51.00	\$40.00	\$27.00
	240/1 phase			Q1-212			
2000	240/1 phase	19"	11"	Q2-219	72.00	59.00	34.00
	480/1 phase			Q2-419			
3000	240/1 phase	22"	14"	Q3-222	84.00	62.00	38.00
	480/1 phase			Q3-422			
4000	240/1 phase	28"	19"	Q4-228	95.00	73.00	42.00
	480/1 phase			Q4-428			
5000	240/1 phase	34"	26"	Q5-234	106.00	84.00	48.00
	480/1 phase			Q5-434			
6000	240/1 phase	40"	31"	Q6-240	117.00	95.00	53.00
	480/1 phase			Q6-440			
7500	240/1 phase	47"	35"	Q75-247	139.00	101.00	58.00
	480/1 phase			Q75-447			
9000	240/1 phase	52"	38"	Q9-252	150.00	106.00	61.00
	480/1 phase			Q9-452			
12000	240/1 phase	70"	57"	Q12-270	172.00	117.00	66.00
	480/1 phase			Q12-470			

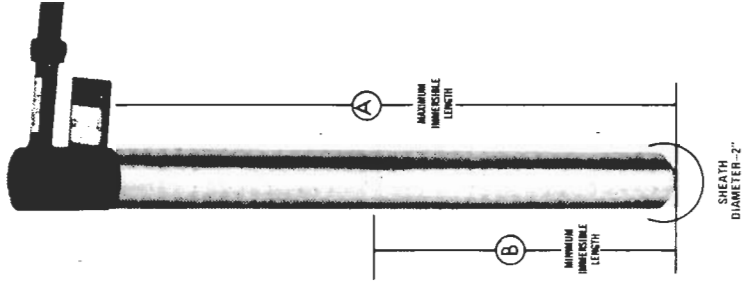
PLACO HEATERS FOR ALKALINE BATHS

FEATURES:

- A vapor proof junction box prevents entrance of vapors and liquids.
- Long life. The heaters are conservatively designed for safe operating temperatures with high grade resistance wire being used.
- Easily installed. Hang the heater over side of the tank and make electrical connection.
- Efficient operation. Heaters immersed directly into the liquid provide heat only where it is needed keeping heat cost to a minimum.

THERMOSTAT

CAT. NO.	TEMP. RANGE	VOLTS (SPECIFY)	AMPS	MAX. HTR. CAPACITY	PRICE
H-4	50° - 250° F	115 or 240	15	2Kw/120V	\$27.50



WATTS	VOLTS	DIMENSION		PLAIN STEEL		STAINLESS		316 STAINLESS		TITANIUM	
		A	B	PRICE	NO.	PRICE	NO.	PRICE	NO.	PRICE	NO.
1000	120/1 240/1 ph	14"	7"	\$ 37.00	PS1-114S PS1-214S	\$ 47.00	PS1-114-S4 PS1-214-S4	\$ 52.00	PS1-114-S6 PS1-214-S6	\$ 72.00	PS1-114-T PS1-214-T
2000	240/1 ph 480/1 ph	21"	9"	47.00	PS2-221S PS2-421S	64.00	PS2-221-S4 PS2-421-S4	67.00	PS2-221-S6 PS2-421-S6	91.00	PS2-221-T PS2-421-T
3000	240/1 ph 480/1 ph	26"	14"	51.00	PS3-226S PS3-426S	66.00	PS3-226-S4 PS3-426-S4	73.00	PS3-226-S6 PS3-426-S6	101.00	PS3-226-T PS3-426-T
4000	240/1 ph 480/1 ph	30"	18"	54.00	PS4-230S PS4-430S	70.00	PS4-230-S4 PS4-430-S4	79.00	PS4-230-S6 PS4-430-S6	108.00	PS4-230-T PS4-430-T
5000	240/1 ph 480/1 ph	35"	23"	60.00	PS5-235S PS5-435S	80.00	PS5-235-S4 PS5-435-S4	90.00	PS5-235-S6 PS5-435-S6	119.00	PS5-235-T PS5-435-T
6000	240/1 ph 480/1 ph	40"	28"	68.00	PS6-240S PS6-440S	89.00	PS6-240-S4 PS6-440-S4	99.00	PS6-240-S6 PS6-440-S6	131.00	PS6-240-T PS6-440-T
9000	240/1 ph 480/1 ph	54"	42"	88.00	PS9-254S PS9-454S	115.00	PS9-254-S4 PS9-454-S4	128.00	PS9-254-S6 PS9-454-S6	145.00	PS9-254-T PS9-454-T
12000	240/1 ph 480/1 ph	86"	56"	118.00	PS12-268S PS12-468S	157.00	PS12-268-S4 PS12-468-S4	175.00	PS12-268-S6 PS12-468-S6	224.00	PS12-268-T PS12-468-T

LABORATORY UNITS

STEEL AND STAINLESS STEEL

WATTS	VOLTS	DIA.	OVERALL LENGTH	MIN. IMMER. DEPTH	PLAIN STEEL		STAINLESS STEEL	
					PRICE	NO.	PRICE	NO.
1000	120	1 1/4"	12"	7"	\$34.00	C-1000S	\$40.00	C-1000S4
500	120	1 1/4"	8"	4"	29.00	C-500S	35.00	C-500S4
250	120	5/8"	6"	2"	22.00	C-250S	26.00	C-250S4

QUARTZ

WATTS	VOLTS	DIA.	OVERALL LENGTH	MIN. IMMER. DEPTH	PRICE	CAT. NO.
1000	120	1	13"	7"	\$29.00	M-1000
500	120	1	10"	5"	26.00	M-500
250	120	5/8	7"	3"	23.00	M-250

CHOOSING YOUR D.C. POWER SUPPLY

The D.C. power supply is undoubtedly the most important single piece of equipment in a plating facility.

Equipment manufacturers may refer to the D.C. power supply as a "plater" or a "rectifier" but its basic function is the same: to change the alternating current (AC) into direct current (DC) and reduce the voltage from 115 or 230 or 460 to the low level, that is required for various processes.

Small bench models are usually operated from 110/115 volt, single phase lines -- as available from ordinary household circuits. A unit of 150 amperes, 6 volt output should be about the highest rating for this AC line.

Units to 500 amperes may be operated from a 220V, single phase line, available in most areas.

Above limits are not an absolute formula but only listed as a general guideline.

Units of high current output (over 500 amperes) should be operated from a 220/240 volt, 3 phase service or 440/480 volt, 3 phase service.

This (3) phase electrical service is available in industrial/manufacturing areas; hardly ever in residential areas.

Choosing the most efficient and economical D.C. power supply will depend on these factors:

1. Process(es) involved.
2. Total area in square inches or feet to be processed per tank load.

As an example: if you want to silver plate some parts that would never exceed 1 square foot of area; a 15 amp, 0-4 volt D.C. power supply would be ample.

Conversely -- if you should try to hard chrome plate a part having 1 square foot of area; then you will need a 300 or 400 amp, 0 to 6 volt power supply and it should have low ripple D.C. output.

Above are the extreme examples. Silver requiring only 10 to 20 amps per square foot and hard chrome 250 to 350 amps per square foot.

Other important features in choosing a power supply would involve:

3. Voltage Control.
4. Type of rectification.
5. Accuracy of meters.
6. Maximum D.C. current (amperes).
7. Maximum D. C. volts.
8. Ripple (Filtered or Unfiltered).

Let's examine these features in some detail.

Voltage Control:

Controlling the D.C. volt/amperes to your plating tank is absolutely necessary. As voltage is raised, the amperage is also raised and vice versa. This may be accomplished by a stepless autotransformer or a tap switch in conjunction with tapped leads from the isolation main transformer.

The stepless control is preferred for small single phase units and even for large 3 phase units. As the power factor increases, a stepless autotransformer may become inadvisable because of cost and/or size.

The tap switch method is less costly on larger units and is entirely satisfactory for most processes. Some exceptions would be precision plating of electronic or other small parts.

Rectification:

The two most efficient rectifiers are selenium and silicon.

Silicon is the newest method and has no 'aging' factor, however, many manufactureres still use selenium.

Maximum D.C. Current:

Your D.C. power supply should be capable of at least 25% more D.C. output than your maximum requirements.

As an example: if you expect to have loads requiring 75 amps then a 100 amps unit should be considered. Operating at 75% to 80% of rated capacity will insure many extra years of trouble free service.

Maximum D.C. Volts:

Some percentage of extra D.C. volts is advisable -- but too much extra voltage can be detrimental, as well as costing more for the unit.

This is especially true of stepless autotransformer controlled units assuming the requirement is for operating copper plating tank -- 2 to 4 volts average requirement. A 0-6 volt D.C. power unit would be excellent -- but a 0-12 volt could cause problems, because your voltage control will be set at 1/3 to 1/2 of total winding causing premature wear and overheating of the carbon brushes.

Ripple:

The most controversial subject in the plating industry is the effectiveness of low ripple D.C. power output. (Filtered vs. Unfiltered.)

All of our solutions with the single exception of PLACO Hard Chrome, will operate with any power supply regardless of ripple.

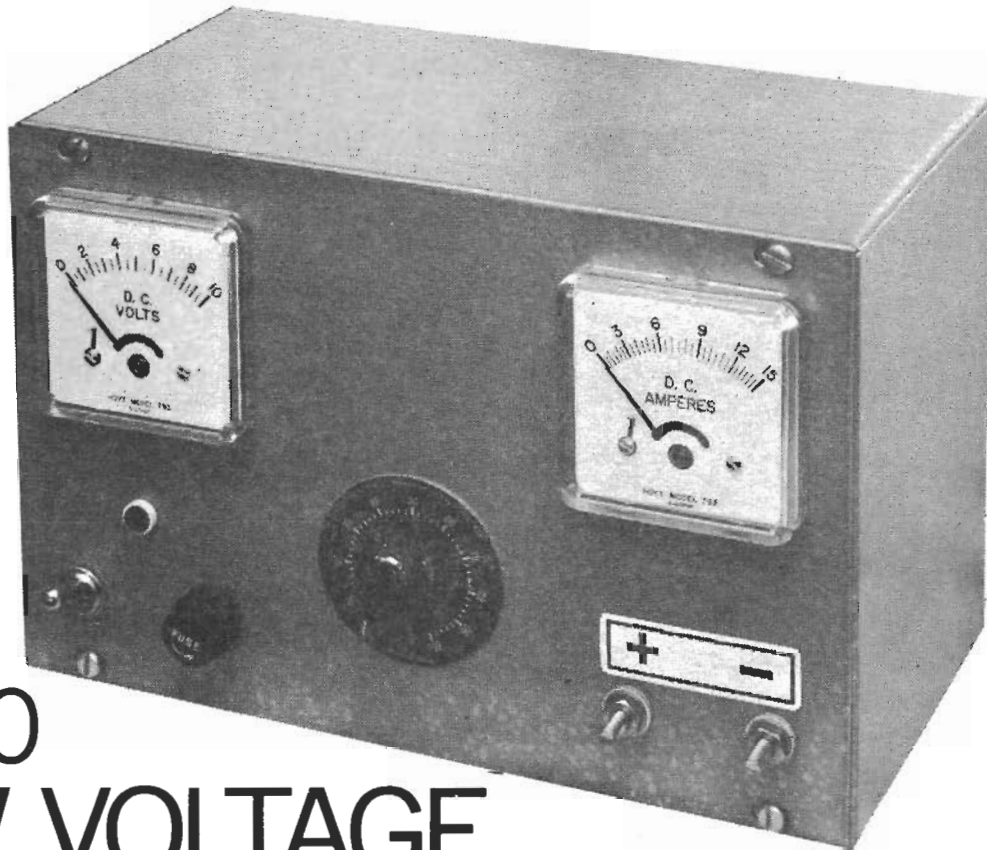
For hard chrome plating our LRI single phase or our B3 Series must be used.

Should a unit of other manufacture be considered, then make certain the ripple is certified at less than 5% for hard industrial chrome processing.

All PLACO three phase input D.C. power units will have less than 5% ripple.

Should you require a D.C. power unit of different capacity or other specifications than listed -- be assured that we can supply you with minimum delay and at competitive prices.

We can also supply components for D.C. power units of any specification or rating. Electrical experience is strongly recommended for proper assembly of D.C. power equipment.



PLACO LOW VOLTAGE DC POWER SUPPLIES

For special processing requiring 1-4 volts; Electroforming, plating plaster, plastics, baby shoes and flowers. Precious metal recovery electrowinning from ore and silver recovery from photo solution. Ideal for silver, gold plating, etc.

MODEL B14

A.C. Input 110/120 V., 1 ph, 60 cycles,
1 Amp.

D.C. Output 15 Amps, 0-4 V.

Complete with 2" volt ammeters, stepless
voltage control, full wave silicon
rectifier, 5' line cord, switch, fuse
and pilot lite.

Shipping weight 24 lbs. Price \$145.00

MODEL B34

A.C. Input 110/120 V., 1 ph, 60 cycles,
2 Amps.

D.C. Output 30 Amps, 0-4 V.

Shipping weight 40 lbs. Price \$180.00

MODEL B54

A.C. Input 110/120 V., 1 ph, 60 cycles,
5 Amps.

D.C. Output 75 Amps, 0-4 V.

Shipping weight 60 lbs. Price \$305.00

MODEL B104

A.C. Input 110/120 V., 1 ph, 60 cycles,
10 Amps.

D.C. Output, 150 Amps, 0-4 V.

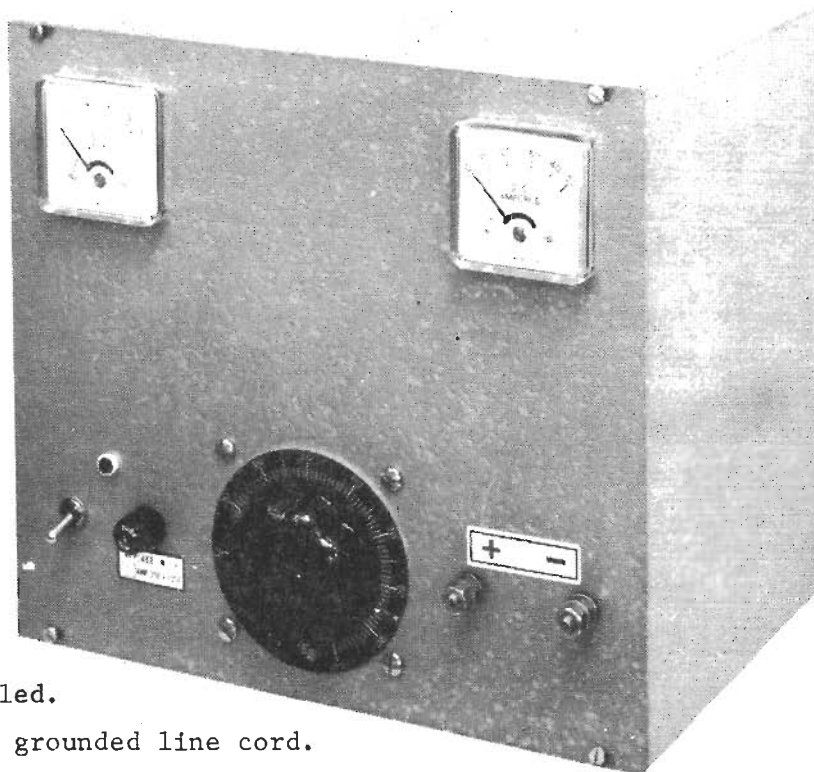
Shipping weight 110 lbs. Price \$385.00

Other sizes to your requirements. Write for prices stating needed specifications.

Platers Service Company, 1511 Esperanza Street, Los Angeles, California 90023

PLACO DC POWER SUPPLIES

for All Plating
Applications*



Silicon rectification - convection cooled.

Voltmeter and Ammeter complete with 5' grounded line cord.

Stepless, single knob control from 0-6 V. for precision processing.

MODEL B1-26

A.C. Input 110/120 V., 1 ph, 60 cycles,
3 Amps.

D.C. Output 0-25 Amps, 0-6 V.

Size 10"x7"x8" high.

Net weight 25 lbs. Shipping weight 35 lbs.

Price 185.00

MODEL B1-56

A.C. Input 110/120 V., 1 ph, 60 cycles,
5 Amps.

D.C. Output 0-50 Amps, 0-6 V.

Size 12"x8"x11" high.

Net weight 35 lbs. Shipping weight 45 lbs.

Price 250.00

MODEL B1-106 (Illustrated on next page.)

A.C. Input 110/120 V., 1 ph, 60 cycles,
10 Amps.

D.C. Output 0-100 Amps, 0-6 V.

Sloping Front Cabinet Size 18"x12"x12½"
high.

Net weight 60 lbs. Shipping weight 90 lbs.

Price 345.00

MODEL B1-156 (Illustrated on next page.)

A.C. Input 110/120 V., 1 ph, 60 cycles,
13 Amps.

D.C. Output 0-150 Amps, 0-6 V.

Sloping Front Cabinet Size 18"x12"x12½"
high.

Net weight 70 lbs. Shipping weight 100 lbs.

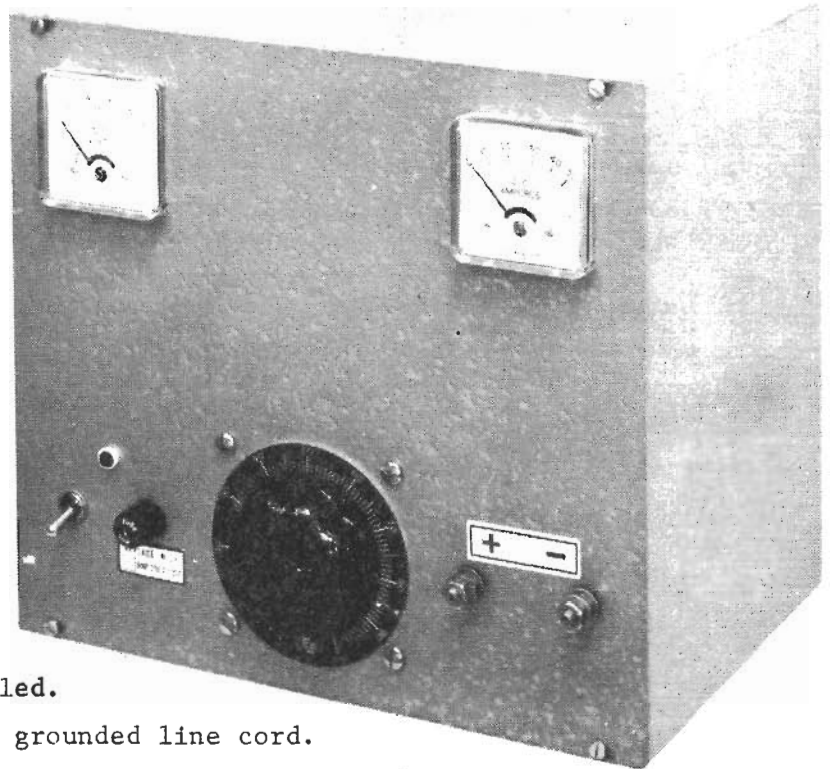
Price \$435.00

* Hard chrome plating requires low ripple D.C. Output, less than 5%. See Special Processing Units LR Series and P3, and P.D.

Platers Service Company, 1511 Esperanza Street, Los Angeles, California 90023

PLACO DC POWER SUPPLIES

for All Plating
Applications*



Silicon rectification - convection cooled.

Voltmeter and Ammeter complete with 5' grounded line cord.

Stepless, single knob control from 0-6 V. for precision processing.

MODEL B1-26

A.C. Input 110/120 V., 1 ph, 60 cycles,
3 Amps.

D.C. Output 0-25 Amps, 0-6 V.

Size 10"x7"x8" high.

Net weight 25 lbs. Shipping weight 35 lbs.

Price 185.00

MODEL B1-56

A.C. Input 110/120 V., 1 ph, 60 cycles,
5 Amps.

D.C. Output 0-50 Amps, 0-6 V.

Size 12"x8"x11" high.

Net weight 35 lbs. Shipping weight 45 lbs.

Price 250.00

MODEL B1-106 (Illustrated on next page.)

A.C. Input 110/120 V., 1 ph, 60 cycles,
10 Amps.

D.C. Output 0-100 Amps, 0-6 V.

Sloping Front Cabinet Size 18"x12"x12½"
high.

Net weight 60 lbs. Shipping weight 90 lbs.

Price 345.00

MODEL B1-156 (Illustrated on next page.)

A.C. Input 110/120 V., 1 ph, 60 cycles,
13 Amps.

D.C. Output 0-150 Amps, 0-6 V.

Sloping Front Cabinet Size 18"x12"x12½"
high.

Net weight 70 lbs. Shipping weight 100 lbs.

Price \$435.00

* Hard chrome plating requires low ripple D.C. Output, less than 5%. See Special Processing Units LR Series and P3, and P.D.

Platers Service Company, 1511 Esperanza Street, Los Angeles, California 90023



PLACO

FILTERED DC POWER UNITS

For Hard Industrial Chrome and other processes requiring low ripple D.C.

MODEL LR 1-57

A.C. Input 110/120 V., 1 ph, 60 cycles, 6 Amps.

D.C. Output 0-50 Amps, 0-6 V. less than 5% ripple.

Large 4-1/2" meters.

Cabinet Size: 22"x9"x15"

Price \$345.00

MODEL LR1-107

A.C. Input 110/120 V., 1 ph, 60 cycles, 12 Amps.

D.C. Output 0-100 Amps, 0-6 V. less than 5% ripple.

Large 4-1/2" Meters.

Cabinet Size: 22"x11"x15"

Price \$435.00

MODEL LR1-157

A.C. Input 110/120 V., 1 ph, 60 cycles, 18 Amps.

D.C. Output 0-150 Amps, 0-6 V. less than 5% ripple.

Large 4-1/2" Meters.

Cabinet Size: 22"x14"x15"

Price \$575.00

Platers Service Company, 1511 Esperanza Street, Los Angeles, California 90023

