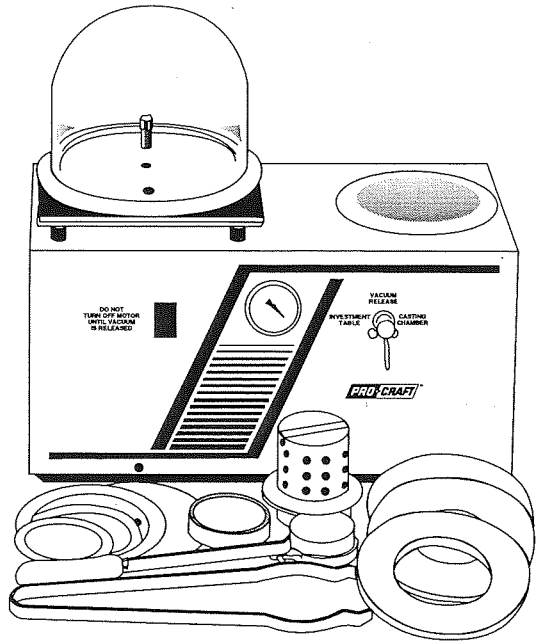
PRO-CRAFT®

by Grobet

VACUUM MACHINE

No. 21.800G – 110 volt
No. 21.800GX – 220 volt

OPERATING INSTRUCTIONS



IS21800

SET-UP AND OPERATION

The vacuum machine consists of a self-contained metal cabinet which houses a precision-built vacuum pump.

1. UNPACKING VACUUM MACHINE

Remove the corrugated shipping cover, then place the vacuum machine on a convenient work surface.

IMPORTANT NOTE: The specific vacuum pump may vary depending on voltage-use the instructions packed with the pump.

2. OPERATING THE VACUUM PUMP

When the pump is ready for use, uncoil the electrical cord and plug into suitable outlet (110 volts or 220 volts). Place the vacuum control knob (No. 21800030) in the "VACUUM RELEASE" position. Push the rocker switch (No. 21800004) to the "ON" position.

SET-UP AND OPERATION

4. TESTING THE VACUUM INVESTING TABLE

Place the black rubber pad (No. 21.810) on the vacuum table so that the hole in the pad aligns with the vacuum table intake. Place the bell jar (No. 21.818) on the rubber pad, making sure that the vacuum table intake is inside the bell jar. Push the toggle switch to "ON", which activates the vacuum pump. Turn the vacuum control knob to the "INVESTMENT TABLE" position to check vacuum pump gauge. The vacuum gauge needle should begin to rise immediately and, in less than one minute, should reach 29 inches plus at sea level (See "VACUUM GAUGE" chart.) If this does not happen, press firmly on the flange of the bell jar to assure a good seal between the bell jar and the rubber pad. Moistening the rubber pad may help in attaining a good seal.

CAUTION: Never push down on the top of the bell jar. Excess pressure to this point may cause plastic to break. After desired vacuum is achieved, release vacuum by turning vacuum control knob (No. 21800030) to "RELEASE" position.

5.TESTING THE VACUUM CASTING CHAMBER

Make sure the 5" adapter seal (No. 21.817) is properly aligned on the vacuum chamber. Add the vacuum-assist flask adapter (No. 21.801), and, with the vacuum pump running, place the silicon rubber seal (No. 21.812) off-centered over the hole in the center of the plate so that it will form a seal. Turn the vacuum control knob (No. 21800030) to the "CASTING TABLE" setting, and observe the vacuum gauge needle to make certain 25 inches of vacuum (at sea level) is attained. This indicates that the hoses are connected tightly and that the silicon rubber pad is seated properly. If a full vacuum is not attained, check all seals for air leakage, then repeat test. If all checks are good, machine is ready for use.

CAUTION

Always return the vacuum control knob to the "VACUUM RELEASE" position before turning off the electric motor.

SET-UP AND OPERATION

6. PREPARATION OF THE CRUCIBLE

A ceramic melting dish with handle is supplied with the unit. This crucible is an expendable item and must be replaced from time to time. To improve its useable life and pourability, it is suggested that the crucible be lined by making up a thin paste of borax and burning out with a torch. This will form a hard glazed lining inside the crucible. It is further recommended that separate crucibles be used for silver, yellow gold, white gold or other metals being cast.

7. UNDERSTANDING VACUUM GAUGE

The vacuum gauge indicates vacuum in inches of mercury being pulled by the pump. This type of gauge depends on atmospheric pressure of 29.9 inches of mercury or 14.7 pounds per square inch, which is sea level pressure. If the surrounding altitude is increased, the ultimate vacuum reading will be proportionally that much lower. The following chart provides the common equivalents to various altitudes:

Altitude Feet	Pressure of Mercury	Pounds per Square Inch
0	30.0	14.7
2500	27.3	13.4
5000	24.9	12.2
7500	22.7	11.1
10000	20.6	10.1
15000	16.9	8.3

To read the correct vacuum in inches of mercury on your gauge, subtract the normal pressure for your altitude from 30.0, then add the figure to your gauge reading. The result will be the corrected gauge vacuum. An easy, quick check of your vacuum system can be made by placing a glass half filled with water (temperature between 70°F and 80°F) under the bell jar and applying vacuum. The water should "boil" (bubble violently) within 40 to 60 seconds.

CARE OF PUMP

Run the pump occasionally if idle for long periods.

PUMP TROUBLE-SHOOTING

With reasonable care, your vacuum pump will provide years of good service. Usually, failure to perform satisfactorily can be corrected easily by a few simple checks.

1. Pump won't start

Be sure the plug is in securely, the unit switch is "ON" and the receptacle is live. Line voltage must be equal to the motor name plate ±10%.

2. Pump or motor runs hot

Normal operating temperature is approximately 160°F, which is hot to the touch. Line voltage and ambient conditions will affect this somewhat.

If you have checked these points and your pump still does not operate properly, follow the following instructions:

- **Returning a Unit**

If it is necessary to return an inoperative unit:

(a) pack carefully, since claims for damage during transportation are virtually impossible to prove on "used machinery"

(b) return entire unit to your dealer

(c) on your return order, simply stating the unit is "defective" is not enough; **YOU MUST BE AS SPECIFIC AS POSSIBLE:** (1) pump stuck, will not turn over
(2) motor will not start
(3) accidentally dropped
(4) any other possible reasons for inoperative condition

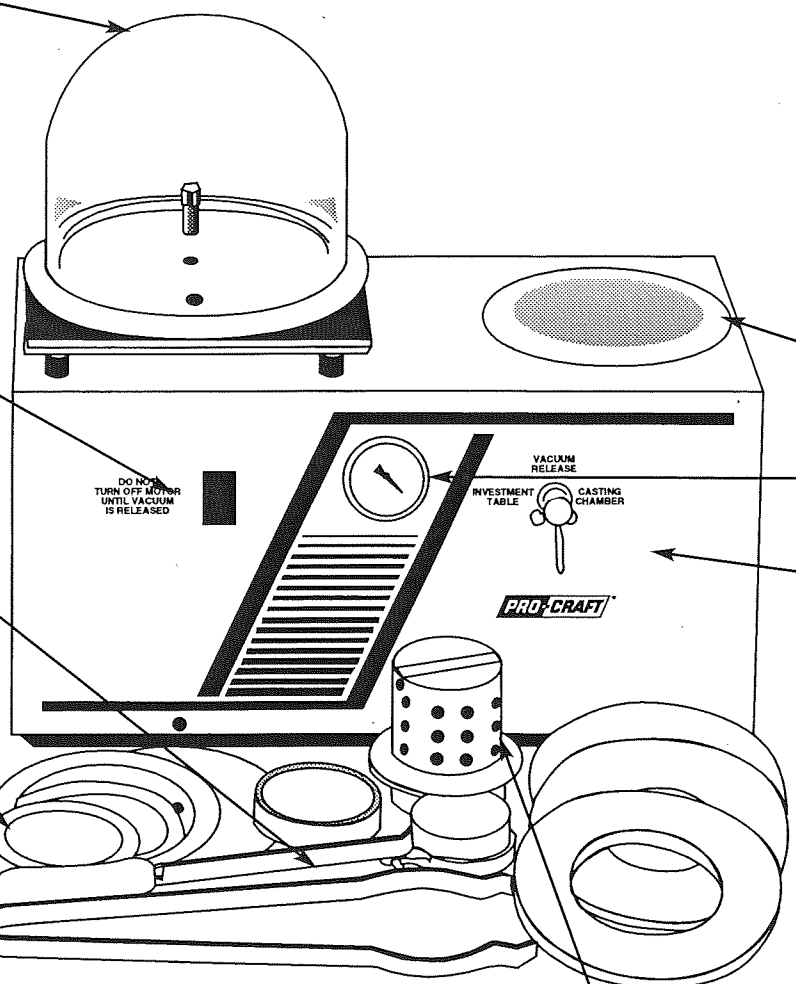
PUMP WARRANTY

Our vacuum pumps are warranted against defects in materials and workmanship for 1 year. These products are guaranteed when used in accordance with our directions and recommendations, and we limit this warranty to the repair, replacement, or credit at invoice (our option) of products which in our opinion are defective due to defects in workmanship and/or materials. In no case will we allow charges for labor, expense or consequential damage. Repairs performed on items out of warranty will be invoiced on a nominal basis.

ACCESSORIES AND REPLACEMENT PARTS

THESE ITEMS ARE NOT SHOWN IN THIS PICTURE.

STOCK NO.	DESCRIPTION
21.703	4" x 4" perforated flask
21.706	4" x 6" perforated flask
21.707	4" x 7" perforated flask
21.70401	4" x 8 1/2" perforated flask
21.829	4" sprue base
21.819	Vacuum pump and motor 110 volt
21819X	Vacuum pump and motor 220 volt
21800005	Replacement vacuum pump filter
1701605	Replacement 1/4" ID plastic tubing (ft)
22.793	Replacement crucible 7 1/2 oz.
22.815	Crucible for platinum 8 oz.



No. 21.818
Bell Jar
9" diameter x 8" high

No. 21.810
Vacuum Black
Rubber Pad

No. 21800004
Rocker Switch

No. 21.882
3 3/8" Flask Sprue Base

No. 21.812
7" Red Silicon
Rubber Seal

No. 21.817
5" Adapter Seal

No. 21.814
4" Adapter Seal

No. 21.813
3 3/8" Adapter Seal

No. 22.791
Special Handled
Crucible

No. 57.068
Perforated Flask
Tongs

No. 21.705
Perforated Flask
3 3/8" x 4"

Vacuum Chamber

No. 21.820
Vacuum Pump Gauge

No. 21800030
Vacuum Control Knob

No. 21.801
Vacuum-Assist
Adapter Plate

No. 21.802
3 3/8" Adapter Plate

No. 21.803
4" Adapter Plate

INVESTING PROCEDURE

1. Following manufacturer's recommendations, measure the correct amount of water and pour into mixing bowl. Weigh correct amount of investment material and introduce investment into the water. Stir the water and investment for 2 to 3 minutes, making certain that the investment slurry is very smooth in texture and free of lumps.

2. Place the mixing bowl containing this slurry on the vacuum table and cover with plastic bell jar. Flip rocker switch (No. 21800004) to "ON" position. Turn vacuum control knob (No. 21800030) so that it points to the "INVESTMENT TABLE" position. The reduced air pressure under the bell jar causes the entrapped air in the investment to be released and rise to the surface. As this happens, the investment slurry will also rise. If it appears that this is happening, tap the corner of the vacuum table sharply several times, and slurry level should drop. At the end of approximately 90 seconds, release the vacuum by turning the vacuum control knob (No. 21800030) to the "VACUUM RELEASE" setting, then turn pump off.

IMPORTANT: Never allow the black rubber pad to cover the hole on the casting table while the investment table is in use.

3. Pour investment mix into the flask. When using conventional, solid-wall flask and vacuum assist, it is recommended that a flask extender made of preformed rubber be placed around the top of the flask to prevent overflow of investment during vacuuming. This allows pouring investment to the top of flask. When using perforated flask, it is necessary to cover flask perforations (or holes). It is recommended that you use flask jackets of preformed rubber for this purpose. Place filled flask under bell jar, and activate the pump. Turn the vacuum control knob (No. 21800030) to the "INVESTING TABLE" setting and secure the seal between the bell jar and rubber pad. Now, vacuum the invested flask for approximately 1 1/2 minutes at full vacuum (29 inches at sea level). Care should be taken not to over vacuum investment, since this can remove too much water from the slurry. Lightly tapping the spring supported vacuum table with the hand will help to release bubbles from the flask during the vacuuming process.

4. Allow the invested flask to set for approximately 2 hours before beginning burnout procedure.

VACUUM CHAMBER CASTING PROCEDURE

Casting in a vacuum chamber requires the use of specially designed perforated flasks. Select the appropriate flask adapter to match the perforated flask. (There is an adapter ring for 3 3/8" diameter flask and an adapter ring for 4" diameter flasks. The 5" diameter flask does not require an adapter ring.) Prepare the chamber for the flask as follows:

1. Place the 5" adapter seal (No. 21.817) on top of the recessed casting chamber.
2. Firmly seat the adapter plate (if using a 3 3/8" or 4" flask) over the seal.
3. Carefully align the appropriate silicon rubber ring on the adapter; this will form a tight vacuum seal. Flask will be placed through the hole in the adapter ring with flange resting on the silicon seal.

NOTE: The sprue end must face up!

The flask should be cast at a temperature between 700°F and 1000°F, depending primarily on the configuration of the object being cast. Then follow these procedures:

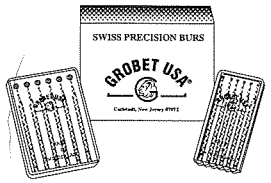
1. Turn on the vacuum pump and turn the vacuum control knob (No. 21800030) to the "CASTING TABLE" position. Within a few seconds, the vacuum gauge needle should indicate a vacuum of 20 inches (at sea level) or more, which shows a good seal between the flask and pad.
2. Melt metal in the handled crucible, fluxing as needed. When the metal is ready to cast, pour it quickly from the crucible directly into the mold.

NOTE: Vacuum pump must be running during this period. Do not attempt a pour unless a good seal is achieved. After pouring, allow the flame of the torch to play on the bottom of the button of the metal formed by the pour. This requires only a few seconds, and assures progressive solidification of the metal in the casting.

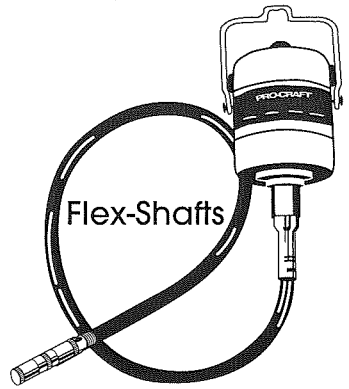
3. After completion of the cast, release the vacuum by, first, turning the vacuum control knob (No. 21800030) to the "VACUUM RELEASE" position, and second, turning off the pump. Once all the vacuum is released, allow the flask to cool approximately 2 minutes before removing it from the pad. The cast piece can then be removed by quenching (or allowing flask to cool) and knocking it out with a rawhide mallet. If you prefer to knock out the piece, care should be taken that the flask is not damaged to the point that a good seal cannot be formed on the next cast.

NOTE: Before burnout, be sure the investment has been scraped even and level with the edges of the bottom of the flask so that the flask will seat firmly on the silicon rubber pad. It is practical to hollow or cup the investment slightly to further ensure the seal.

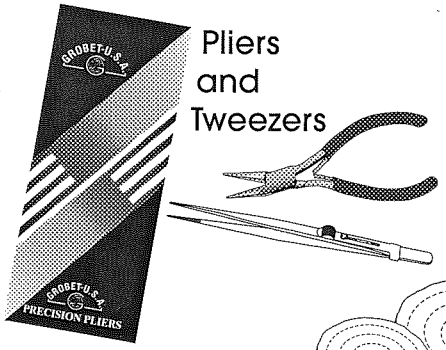
LOOK FOR THESE PRODUCTS



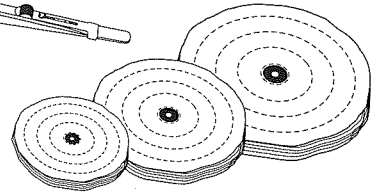
Swiss Burs



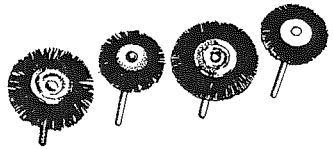
Flex-Shafts

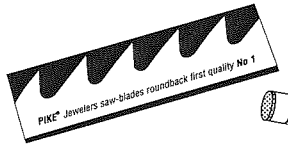


Pliers
and
Tweezers



Dixcel® Brushes and Buffs





Swiss Saw Blades

ASK YOUR LOCAL JEWELERS SUPPLY DEALER FOR MORE INFORMATION ON OTHER PRODUCTS BY GROBET USA™

GROBET USA®

Carlstadt, NJ 07072