NICKEL PLATING

FOR DECORATIVE OR FULL PROTECTION

ON
STEEL COPPER BRASS

THE SOLUTION

The solution is made up in the tank, this must be of plastic or polythene or stainless steel. If stainless steel is used it is important that the support clips are electrically isolated from the tank, this can be arranged by folding a plastic insulator over the edge of the tank where the clips are arranged or by using plastic clips.
The nickel salts are dissolved into the tank using warm water **one kg** per each **5 litre** of water. It is most important that protective gloves, eye glasses and mask are worn during this operation. The salts contain *nickel sulphate, which is hazardous*.
The solution has been designed to operate best between 20 and 50 degrees C. The heater supplied is automatically controlled to maintain this temperature. Top up losses of solution with clean water and drain and filter as required to remove sediment which may build up in use. When not in use the solution must be stored in a sealed plastic or polythene container, clearly marked as to its contents.

HEALTH & SAFETY

Please read and observe all safety warnings within this booklet and contained on labels attached to some products supplied.
Wear gloves if coming into contact with the salts or solution.
Wear a mask, particularly when dealing with the dry salts which can produce hazardous dust. Do not eat, drink or smoke whilst operating the system. Do not allow children near to any of the materials or equipment. Please wash your hands after handling any of the equipment or chemicals Please use a circuit breaker in the mains supply to the heater employed within the tank, if the glass housing becomes damaged then dangerous voltages may be exposed to the user.

GENERAL DESCRIPTION

The system has been designed from scratch to provide an easy and safe method for the amateur to achieve high quality plating at low cost. All the latest developments in chemicals and electronics have been integrated into the design
to produce excellent results. The system utilises modern electronic control of the plating current to the tank, there is no danger of electric shock as the voltages and currents involved are extremely low. The plating currents calculated and included in the TABLE are applicable only to the provided nickel salts. These salts have been specially designed for this system. To protect the system from damage, under fault conditions a special electronic cut-out circuit has been employed. Under fault-conditions, or where too high a voltage has been selected for plating the supply to the tank will be automatically interrupted. This situation will be indicated by the red indicator, on the current regulator unit, beginning to flash. See the list of faults below. The circuit is easily re-set to normal working by dis-connecting the supply to the tank for a few seconds then re-connecting. The most convenient place to disconnect is at the plug into the current regulator unit.

FAULTS CAUSING AUTOTRIP.

Too high a selected voltage for the area to be plated (refer to table).
Items to be plated in contact with anodes or anode bar, (rearrange).
Wrongly connected supply to tank. Check that RED positive to anode bar,
BLACK negative to cathode bar.
Short circuit between anode bar and cathode bar.

PLATING METHOD

When the plating tank has been assembled as shown and described on the next page, the Items to be plated **MUST** be thoroughly cleaned and degreased, followed by washing in hot soapy water. All traces of soap must then be removed by rinsing in clean water. Finally the parts **MUST** be treated with **BARVIC** cleaner / scourer / preparer, (**see preparation of parts**). The voltage selection must now be calculated and set with reference to the **TABLE** inside rear cover of this booklet. A croc clip lead should now be attached to the item to be plated and the other end of this lead clipped to the cathode bar. The item can now be lowered into the plating solution. This **order is important** as it will allow the current to flow immediately in the plating tank as the part is lowered preventing the item from sitting in the plating solution without plating taking place.

ASSEMBLY OF THE TANK.

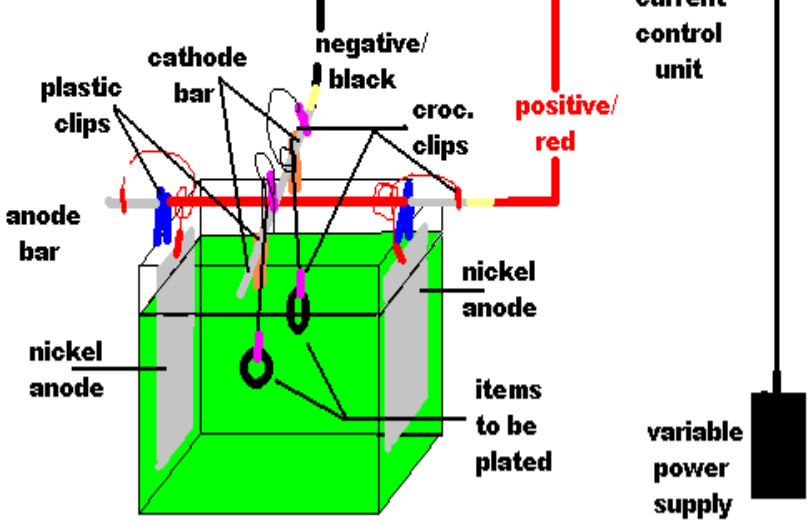
There are two bars supplied together with four support clips which are used to support the anodes and the items to be plated.

THE ANODE BAR RED POSITIVE

The anode bar is installed first and fits across the centre of the tank. It is installed in such a way that the whole of the centre section is sleeved against any electrical contact. There is a support clip at each end clipped onto the tank edges and the **sleeving is between the two support clips, covering the whole of the bar between the two clips**.
Each nickel anode is now attached to a croc clip lead and suspended into the solution by tying the lead onto the anode bar at the required length, one at each end of the anode bar as close as possible to the support clips. **It is vital that these anodes do not come into contact with the items to be plated**.
The anodes are suspended into the solution as far as possible, **but the croc clips must not contact the solution.**
The two croc clips now remaining which are in electrical contact with the anodes are now clipped onto the metal part of the anode bar which overhang the **outside** of the tank, close to each support clip.
The anodes will be supplied with a **POSITIVE** supply.

THE CATHODE BAR BLACK NEGATIVE

The cathode bar is suspended in a similar manner and can lie in the same direction or at 90 degrees to the anode bar.
The purpose of the cathode bar is to provide a suspension point for the items to be plated and to carry the electric current to those items. This bar is suspended across the tank using two support clips, one at each end, and each item to be plated is suspended into the solution using a croc clip lead for each item, tying off each croc clip lead to a sufficient length to ensure full submersion of the item. It is quite acceptable for the croc clips to enter the solution. It is important that the various items do not touch each other and **VITAL THAT THEY DO NOT TOUCH THE ANODES.**
Each item to be plated will be supported in the solution by tying off the croc clip lead onto the cathode bar at the required length and connecting the free end of each croc clip lead to the cathode bar at any point along its length.This will ensure that each item to be plated
is connected to the **NEGATIVE** supply.



ELECTRICAL CONNECTIONS.

The red and black wires from the current control unit are now connected to their respective bars. RED to RED sleeved anode bar which has the nickel anodes connected. BLACK to the cathode bar which is supporting the items to be plated. The connectors are supplied fitted to the wires and should be attached to the bars using a small terminal screwdriver. All that remains now is to plug the connector from the variable power supply into the regulator box and plug the variable power supply into the mains supply.

PREPARATION OF THE PARTS.

All previous plating needs to be removed before attempting to plate.
All rust needs to be removed along with all traces of oil, grease and other surface contaminants..

As with all decorative finishes the final results depend on the preparation. Plating will not cover any scratches or imperfections on the surface of items to be plated. It is important to be completely satisfied with the finish of the surface before starting the plating process. After finishing and polishing to the desired level it is important to prepare the surface with BARVIC cleaner / scourer to ensure satisfactory adhesion of the nickel to the surface. Make up a paste using clean water and using a lint free cloth rub all over the surface to be plated, use a toothbrush on areas which are recessed or are difficult to reach. Finally rinse and attach to a croc. clip lead, check for a continuous film of water over the areas to be plated and lower into the solution whilst still wet.

BLASTING

Blasting is a commonly used process to prepare items for further treatments, but it is not the best process if the item is intended for plating for the following reasons.

1. Old plating is not always successfully removed by the blasting process, despite the appearance of the metal surface after blasting is complete. It can appear as if the uniform surface that results is the base metal, usually steel, but plating can be very resistant to blasting, often needing many hours to remove it fully.
2. Even if blasting is successful at removing the rust or old plating it will often leave the resulting surface passive, (resistant to accepting new plating.)

Wherever possible other methods of removing rust or plating should be employed such as mechanically on a wire wheel, or chemically using an electrolytic stripping kit, or a chemical dip stripping solution suitable for the plated metal to be removed. If blasting is employed in the preparation process then the surface should be further treated with a wire wheel or an acid activation dip prior to scouring and plating. To ensure an active surface. FROST can supply equipment suitable for these procedures.

TABLE OF PARTS TO BE PLATED

AREA OF PARTS TO BE PLATED		SWITCH **POSITION**
SQUARE INCHES	SQUARE CENTIMETRES	D.C. VOLTS
5	35	1.5 or 3 v
15	100	3 v
20	140	4.5 v
30	200	6 v
40	280	6 v
50	350	6 v
OVER 50	OVER 350	See below.
Always run the system at a lower, rather than higher voltage for best results. For areas in excess of those stated in the table allow longer periods of plating (up to 8 hours). If the plating needs to be heavier then re- scour, and re-plate for a further period. Attempting to plate at too high a voltage will result in a dull finish.		

PLEASE !

Observe all safety warnings in this booklet and on labels attached to some products used in this system.
Check that the **red** wire is connected to the **anode bar.**
Check the **black wire** is connected to the **cathode bar.**
Check that the **anodes** are connected to the **anode bar.** And that the croc. clips holding the anodes are not in contact with the solution.
Check that the **items to be plated** are connected via the croc. Clip leads to the **cathode bar.**

WHEN PLATING IS COMPLETED.

Remove items from the tank using the croc. clip leads, do not handle. Wash thoroughly in hot water to remove all traces of solution. Most items will need no further attention and are ready for use.
Remove the anodes in the same way, wash in hot water and store for future use.
Remove and wash all other components, anode and cathode bars, clip leads etc..
Store the solution for future use in a sealed plastic or polythene container, clearly marked as to its contents.

DO.

Mask Observe all safety warnings in this booklet and as labelled on the various products.
Wear and gloves when handling the salts or the solution.

Check that the wiring to the anode and cathode bars is the correct way round.
Check that the anode croc. clips are not in contact with the solution.
Check that the items to be plated are connected via their croc. clip leads to the cathode bar only.
Check that the cut-out has not operated (see General Description)
Check after 10 mins. That plating is taking place,(lift an item momentarily from the solution using the croc. clip lead, **do no handle the item or the solution**)

DON'T

Eat, smoke or drink whilst operating the system.

Attempt to plate Zinc, Aluminium, Stainless steel or Lead.
Plate at too high a voltage, a dull mat finish will result, always choose a lower rather than a higher setting. It will take longer but the finish will be far superior.
Allow children near to the system at any time.
Store or use in other than plastic, polythene or stainless steel containers.**Allow the Heater unit to suffer damage. It is glass and it has a dangerous voltage within. It is highly reccomended that a mains circuit breaker is employed in the supply.**

ALWAYS

Observe all labels & warnings
Wear a mask eye glasses and gloves provided when handling the salts or the resultant solution.
Wash you hands after using the system.
Ensure that the heater unit is fully submerged in the solution whilst connected to the supply and protected against damage.
Disconnect the heater from the supply when not in use.