Instruction manual TIFOO Barrel plating equipment

Please read the instruction manual before use!

Proper use
Barrel plating equipment for use by consumers and industry. The barrel plating equipment serves as a device for plating objects (jewellery, screws, etc.) with metals in liquid electrolyte solutions of the corresponding metals.

Safety
Please read all of the instructions and pieces of advice included in the supply thoroughly and keep the instructions for further use. Only use the device in the described way for the described purpose (proper use). Improper use and especially abuse can cause material- and personal damage by dangerous electric tension, fire and mobile components. Only realize those kinds of work with the device that are described in this manual.

This manual is an important component of the device. Don’t give the equipment to others without this instruction manual. Repair works and technical maintenance must only be done by authorised workshops. If you have questions about the device, please turn to: MARAWE GmbH & Co. KG, Donaustaufer-Str. 378, D-93055 Regensburg, telephone: (0049)941 29020439.

General safety instructions
• Please absolutely wear protection glasses and gloves when using the equipment, as the used electrolytes can be corrosive.
• Only for use in interior spaces and for household and industry. Don’t use nor store the equipment outside or in humid or wet areas.
• Only use components, supply and spare parts for the equipment designed and recommended for this purpose by the producer, in order to avoid danger by overheating, fire, electricity or movable components. Damaged or inappropriate components and supply can break, melt, deform and cause overheating and material- and personal damage during use. Don’t use the device anymore when it or its components are damaged.

ADVICE:
• Never leave the device unattended while it’s running.
• Never use fragile receptacles (e.g. thin glass or fine porcelain) for the work with the device. Receptacles made of unbreakable synthetic material are perfect. Make sure that while running, there is no friction of the barrel and the receptacle’s edge and that it can rotate freely in the receptacle.
• Don’t let your children play with the equipment or the components.
Keep the equipment always at a dry, clean space and unreachable for children.
• **Never** dip or put the power supply (E) in water or other liquids, nor pour liquids on it. Dry spilled liquids immediately.

• **Never** dip the equipment completely in water when cleaning it. Water must never get into the engine compartment (C), otherwise the engine can be damaged and corrode. The warranty claim loses its validity for such damages!

• Don’t connect the device to the power supply until the equipment is fully assembled according to the instructions in the chapter “Operations”.

• **Never** lift, move or carry the device by its power cable or power supply unit.

**Important safety indications- electricity**

• Run the device near a suited wall socket and plug the device directly into it. The device must only be plugged into a properly secured Schuko socket of a suited power supply (AC; 220/240 V, 50/60 Hz) with protective conductor. Power supply systems outside Germany might not fulfil the mentioned conditions.

As other countries have differing norms for power supply, we can’t construct nor test the device for every possible power supply. If you want to use it abroad, please first make sure that it can be run without any danger.

• **Never** leave the device unattended when it is plugged in. Hold the casing of the mains plug when pulling it out.

• **Never** pull the cable, nor tear nor bent, clamp, squeeze nor knot the cable. Make sure that nobody can keep stuck in the cable loop or tear the device from the work surface by the cable. Make sure that the cable doesn’t hang from the table’s edge.

**Possible threats from movable components**

• The barrel and gears are moving when the equipment is running. Never touch the gears or the barrel when the equipment is running! Always unplug the power adaptor first and interrupt the power supply.

**Technical data**

**Model:** Art.-nr. 01-92-00000 Barrel plating equipment  
**Power supply of the power adaptor:** 220 – 240 V AC, 50/60 Hz  
**Voltage for running the engine:** 12 V DC  
**Power consumption of the electric engine:** 1.5 watts (max.); 0.4 watts (normal operation with charge)  
**Rotation speed:** 10 – 11 r.p.m. (when charged)  
**Torque:** 0.2 N/m  
**Transmission ratio (gears):** 1 : 2  
**Length of the power cable:** about 1.2 m  
**Weight:** engine with casing and barrel: about 850 grams  
**Maximum filling weight for goods (big barrel top):** 400 grams  
**Measurements (without barrel top):** about 7cm x 10cm x 17cm (w x d x h)  
**Volume (big barrel):** about 200 cm³  
**Volume (small barrel):** about 80 cm³
Operation

Before the first use: Installation of the barrel

Put the gear F on the corresponding barrel A (picture 1) and turn the gear until the drill holes are situated precisely to those of the barrel. Screw the two stainless steel screws into the gear’s drill holes (picture 2). Now put the fixed barrel on the machine holder B (picture 3). Now put the banjo bolt G (stainless steel or plastic) from the opposite side into the casting (picture 4, 5). Now use a pair of pliers to fix the banjo bolt.

Removal / Exchange of the barrel

Follow the steps of the chapter “installation of the barrel” – in reverse order. Then change the barrel and continue as described in “installation of the barrel” in the indicated order.

Using the barrel plating equipment

Putting the equipment into service

Only operate the barrel plating equipment in this order. Attention: Non-observance can lead to injuries or to damages of the equipment!

1.) Pull the contact cable E through the banjo bolt in the middle of the barrel (picture 7) and connect the jack plug to the negative pole of an adjustable power supply. The latter has to
deliver direct current (DC). The power supply should deliver up to 15 volts and a current of at least 2 amperes. You will find the definite requirements in the corresponding manuals of the electrolytes.

2.) Fill the barrel with 1/3 until ½ (max.) of the barrel’s volume (picture 8)

3.) Close the barrel with the corresponding plug K (picture 9)

4.) Put the equipment in the tank as described in the chapter “overview of the components“ on top on the right – only the front foot of the equipment should stand in the electrolyte.

5.) Put the anode sheet L in the tank and follow the indications in the manuals of the corresponding electrolytes in order to choose the appropriate anode material.

6.) Connect the anode sheet with a clamp and a red jack cable to the positive pole of the adjustable power supply. The latter still has to be turned off.

7.) Now fill the electrolyte in the tank and make sure that it fills out at least half of the barrel’s volume. The maximum filling with electrolyte is the point where the barrel is completely covered – on no account more. The tank’s volume mustn’t be filled higher than 80% of its height, otherwise the electrolyte will spill out because of the barrel’s rotation! It is recommended to use high receptacles in order to minimize the risk.

8.) Plug the power supply D into a socket. The barrel starts to turn.

9.) Adjust the power supply to zero (turn the regulator completely to the left).

10.) Turn the current regulator (amperes) completely to the right.

11.) Now turn on the power supply.

12.) Turn the voltage regulator carefully and slowly to the right. The tension will increase and the ampere-display should now show a value higher than “0”.

13.) Adjust the needed voltage – you’ll find it in the data sheet of the corresponding electrolyte.

14.) The equipment now runs properly. Make sure that the object’s movement is enough and that the barrel turns without hindrance. If that’s the case, you can leave the device running.
Turning the equipment off

Turn off the barrel plating equipment in this order. **Attention:** non-observance can cause injuries or damages to the device!

1.) Turn off the power supply

2.) Pull the power adaptor **D** out of the socket – the barrel now stops

3.) Pull the contact cable **E** out of the power supply’s socket.

4.) Prepare a receptacle with water for rinsing.

5.) Take the equipment out of the electrolyte and let the electrolyte drip from the barrel back into the receptacle (hold the device at a slant) in order to avoid a following contamination of the rinsing water or to at least minimize it.

6.) Put the device into the receptacle with rinsing water. **Attention:** The rinsing water must never be higher than half of the height of gear **I**, as otherwise, the engine compartment can be flooded! This leads to corrosion of the engine and therefore to a shorter lifespan of the whole equipment. **We won’t assume any liability for these kinds of damage!**

7.) Now you can open the lid and take out the object.

<table>
<thead>
<tr>
<th>electrolyte</th>
<th>suited for barrel plating</th>
<th>needed voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>bright copper electrolyte</td>
<td>yes</td>
<td>1.0 – 1.5</td>
</tr>
<tr>
<td>nickel electrolyte</td>
<td>yes</td>
<td>2.3 – 2.8</td>
</tr>
<tr>
<td>gold electrolyte (Chamaeleon)</td>
<td>yes</td>
<td>3.0 – 4.0</td>
</tr>
<tr>
<td>gold electrolyte (Midas)</td>
<td>yes</td>
<td>3.0 – 4.0</td>
</tr>
<tr>
<td>gold electrolyte (Flash)</td>
<td>yes*</td>
<td>5.0 – 6.0</td>
</tr>
<tr>
<td>silver electrolyte</td>
<td>yes</td>
<td>1.0 – 1.5</td>
</tr>
<tr>
<td>copper (alkaline)</td>
<td>yes</td>
<td>2.0 – 2.5</td>
</tr>
<tr>
<td>zinc electrolyte</td>
<td>yes</td>
<td>2.0 – 3.0</td>
</tr>
<tr>
<td>bronze electrolyte</td>
<td>yes</td>
<td>2.0 – 3.0**</td>
</tr>
<tr>
<td>rhodium electrolyte</td>
<td>yes</td>
<td>3.0</td>
</tr>
<tr>
<td>palladium electrolyte</td>
<td>partly***</td>
<td>1.0 – 1.5</td>
</tr>
<tr>
<td>chrome electrolyte</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>tin electrolyte</td>
<td>no</td>
<td></td>
</tr>
</tbody>
</table>

* never contaminate with copper residues! Contact alone with copper or a brass wire can render the electrolytes useless! The tension can vary according to the amount of filling.

** at a lower tension (2.0 volts) rather copper-coloured

*** can damage the barrel material at when used longer (> 10 minutes)
Suitable and unsuitable objects for barrel plating

The best results are achieved when the pieces are round and have few edges. Spheres, small screws, rings and so on are very suitable – nails, long rods and shapeless objects that don’t turn well or tilt are less suitable. Coins, e.g. 1-eurocent-coins, tend to stick together and are therefore unevenly plated. This is especially the case when the barrel is overfilled! Tilting causes the goods to be plated unevenly. In this case, the barrel works like a Faraday cage: in the case of nails, the head and tip will be plated more than the shaft. The pieces have to endure a certain mechanical charge – thin copper rings can e.g. bend due to the charge inside the barrel. We won’t assume any liability for such damages! Generally speaking – the more the object is on the inside of the barrel, the less is the deposition. That’s why it is important that the objects are always mixed permanently. This has to be kept in mind when filling the barrel. Edgy objects covered in conductive varnish (e.g. shells, Lego pieces, etc.) are also not suited. Those have to be copper-plated by immersion, as the edges damage the conductive varnish and cause everything to peel off. Small plastic balls in conductive varnish can however be plated directly in the barrel.

Maintenance and cleaning

Rinse the barrel and the gears after every use thoroughly with water. After using the barrel, lay it in water for at least 5 minutes, as the material can absorb (save) a small amount of chemicals. After using it for a longer time, there might be salt crystals between the gears which can block the engine until the barrel comes to a halt of stops turning. So please rinse the gears at least after 2 hours running with water. Clean it with a sprinkler. The barrel and the gears are rinsed under the shower while making sure that the engine compartment isn’t hit by the water jet in order to prevent the water from penetrating.

The banjo bolt made of stainless steel can be plated by contact with the goods (except plastic). If there are thick layers on it, you can clean the banjo bolt with an iron(III) nitrate solution or diluted nitric acid. To do so, put the bolt into the solution and wait until all of the coating is detached. The stainless steel bolt won’t be affected. Do not use other acids for cleaning! Hydrochloric acid for example can attack stainless steel. If the bolt can’t be removed with the Allen key anymore because the internal thread is electroplated, you can unscrew the bolt carefully with flat pliers and then clean it. Tip: For better protection of the banjo bolt, the bolt’s head can be protected from auto-plating by a piece of shrinking tube or clear varnish after installing it again into the device.

Changing expendable materials

The contact cable will also be plated while electroplating. If the layer on the copper strand becomes too thick, the cable might break or becomes incompatible because of getting unflexible. Change the contact cable then or shorten the cable by cutting the bare strand off and by isolating a further part of the cable.
The barrel’s material A can be affected with time by frequent use. If you see damages on the material, please exchange the barrel. The same applies especially for gear F. Spare parts can be ordered on demand from MARAWE GmbH & Co. KG.

**Storage**

Keep the device and all of the components in a dry, clean and frost-free place where the components are protected from direct sunlight and kept out of the reach of children. Store the device on a clean and solid pad from where it can’t fall off; don’t put heavy and hard objects on the device.

**Disposal information**

The device and its packaging have to be disposed off according to local regulations for disposal of electronic waste and package material. If there are any doubts, you can get informed at your local disposal centre. Don’t throw electronic devices into domestic refuse, use the collecting points of your municipality. Ask your municipal administration about the position of the collecting points. When electronic devices are disposed of without control, hazardous substances can get into the groundwater and therefore into the food chain or poison flora and fauna.

**Information and service**

Further information can be obtained on [www.tifoo.de](http://www.tifoo.de). If there are problems, questions and wishes, please turn to: MARAWE GmbH & Co. KG, tel.: (0049) 941 29020439 or via e-mail: sales@tifoo.de.
**Warranty**

We guarantee that the Tifoo Barrel plating equipment is flawless at the moment of purchase. Proven fabrication- or material flaws are replaced or repaired for free – excluding further claims and when it happens in the statutory period. Warranty claims of the buyer don’t apply when the damage is due to improper use, overcharging or wrong installing. Without our written consent, technical operations by third parties render the warranty claims invalid immediately. In order to claim valid warranty, the buyer has to provide the proof of purchase and has to bear the costs and risks of transportation.

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Overview of the components

A  Plating barrel made of plastic
B  Machine holder with electric engine housing (polypropylene)
C  Electric engine (inside the housing)
D  Power adaptor and cable feed
E  Contact cable (4mm) with jack plug
F  Gear with drill holes
G  Banjo bolt made of stainless steel or plastic
H  Screws
I  Gear
J  Gear
K  Rubber lid (lid can differ from the image)
L  Anode sheet (not included)
M  Plastic tank