

## Simple Step-by-Step Guide to Chrome Plating (Beginner-Friendly)

This guide has been technically reviewed and updated to current best practice and is equally suitable for bath plating and brush/tampon (pen) plating using modern trivalent chromium (Chromium III) electrolytes. Differences between the two methods are clearly marked.

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### 1. Basic Principle – valid for bath and brush plating

In chrome plating, a very thin layer of metallic chromium is deposited electrochemically onto a conductive workpiece.

- The workpiece is always the cathode (negative pole)
- The electrode is the anode (positive pole)
- Chromium-III electrolytes are the current state of the art for workshop, repair, and hobby use

→ **Important:** Chromium is not a build-up or leveling metal. Surface quality and gloss come entirely from preparation and intermediate layers.

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### 2. Suitable Materials

Well suited:

- Steel, iron
- Copper
- Brass
- Nickel

Not suitable or only conditionally suitable:

- Aluminum (depends on alloy)
- Zinc die casting without barrier layers
- Titanium

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### 3. Safety (identical for both methods)

Even Chromium-III electrolytes are chemicals:

- Wear chemical-resistant gloves
- Wear safety goggles
- Ensure good ventilation
- Avoid skin and eye contact

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### 4. Preparation – critical for success

#### 4.1 Polishing

- Polish the workpiece to a high gloss
- Chrome reproduces every scratch exactly

#### 4.2 Cleaning & Activation

- Completely remove grease, oil, and oxides
- Thoroughly degrease with a suitable cleaner
- After cleaning, handle only with gloves

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### 5. Technically Required Intermediate Layers

Steel / Iron

1. Thick alkaline copper plating – corrosion protection
2. Lightly polish the copper layer
3. Nickel plating – barrier and gloss layer

## Brass / Copper Alloys

- Direct nickel plating (or palladium / white bronze)
- Never chrome directly onto brass or copper

→ These layers are mandatory regardless of plating method.

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## 6. Nickel Plating (concise but correct)

- Heat nickel electrolyte to approx. 40 °C (104 °F)
- Voltage typically 3–6 V (current-controlled if possible)
- Plate evenly
- Rinse with distilled water
- Polish

⚠ Nickel oxidizes quickly → activate immediately before chrome plating (cleaner or ~10 % sulfuric acid)

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## 7. Chrome Plating – General Parameters

Valid for bath and brush plating:

- Electrolyte temperature: 30–35 °C (86–95 °F)
- Voltage: approx. 3–5 V (depends on surface area)
- Chromium layer is very thin (decorative)

A dark deposit at the beginning is normal and becomes bright as parameters stabilize.

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## 8. Chrome Plating in a Bath

Additional points:

- Suitable anodes: aluminum, graphite, or platinized anodes
- Never use steel anodes (contamination risk)
- Use multiple anodes for even current distribution
- Gentle bath movement improves results

Procedure:

1. Suspend the workpiece centrally in the bath
2. Arrange anodes evenly around it
3. Slowly increase voltage
4. Plate for several minutes
5. Remove and rinse

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## 9. Chrome Plating with Brush / Tampon Method

Typical use: repairs, small areas, edges, spot plating

Additional points:

- Thoroughly rinse the fabric pad (no metal residues)
- Clean the electrode to bare metal before use
- Keep the movement even; do not hold in one spot

Procedure:

1. Soak the pad with warm chrome electrolyte
2. Connect workpiece to negative, electrode to positive
3. Move evenly across the surface with light pressure
4. Deposit starts dark and becomes brighter with time

→ In brush plating, final gloss depends mainly on the nickel base layer.

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## 10. Post-Treatment (both methods)

- Immediately rinse with distilled water
- Dry gently
- Polish softly with cotton or buffing wheel

Chrome does not tarnish and normally requires no additional sealing.

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## 11. Common Problems – independent of method

### No chrome deposit:

- Surface inactive → re-clean and re-activate

### Spots or dull areas:

- Electrolyte too cold
- Nickel layer insufficiently polished
- Voltage too high or too low

### Dark streaks:

- Metallic contamination
- Incorrect anode material

### Rust under chrome (steel):

- Copper layer missing or too thin

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## 12. Professional Tip for Beginners

### A thin gold flash before chrome plating:

- does not oxidize
- greatly simplifies both bath and brush plating
- highly recommended for repairs and small parts

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### Key takeaway:

The shine comes from mechanical polishing, durability from copper and nickel – chrome is only the final finish.