

Black Ruthenium 279

Operating Instructions

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Electrolyte for selective decorative pencil ruthenium plating (brush ruthenium plating)

- Abrasion-resistant, dark and bright coatings
- Operating temperature 20 °C to 40 °C
- Deposition speed up to 0.01 µm/min
- Ready for use with 2 g Ru/100 ml
- High covering power

Bath Characteristics

Pencil plating is a special type of brush plating. With pencil ruthenium plating, small area elements of parts are selectively plated with black ruthenium by means of direct current through a wiping touch with a tampon tip soaked with the respective ruthenium bath.

The process mainly serves for applying decorative patterns on e. g. jewellery, spectacles, tableware and the like.

Black Ruthenium 279 deposits bright, anthracite to black coatings. Very dark surfaces can be achieved with extremely thin layers. Usually layer thicknesses of 0.02 - 0.05 µm are applied. The electrolyte is characterized by thin, abrasion-resistant coatings.

Bath type:	Pencil ruthenium plating bath, black
Ruthenium content:	2 g Ru/100 ml
pH-value:	< 1, strongly acidic
Temperature:	Room temperature (20 - 40 °C)
Voltage:	10 volts (8 - 12 volts)
Deposition speed:	Up to 0.01 µm/min

Coating Characteristics

Coating:	Ruthenium
Colour:	Anthracite - black

Basic Equipment

The basic equipment required for pencil ruthenium plating consists of:

- A tampon pencil including a supply of tampon tips.

This pencil is normally a plastic holder with a connection to the rectifier. The absorbent and exchangeable tampon tips are inserted into a suitable contact socket at the front end of the holder.

- Pencil ruthenium plating bath Black Ruthenium 279.
- Rectifier with adjustable and readable voltage up to at least 10 volts.

We recommend our rectifiers

TG 511	(10 V/10 A)
TG 2011	(10 V/20 A) or
TG 5050	(20 V/50 A).

Form of Supply

- Black Ruthenium 279, ready for use (2 g Ru/100 ml).
Delivered in 100 ml units.
Storage stability: min. 2 years

Special replenishments and corrections are not necessary since the solution is used up during application.

Operating Conditions

Ruthenium content:	2 g Ru/100 ml
Operating temperature:	Room temperature (20 - 40 °C)
pH-value:	< 1, strongly acidic
Voltage:	10 volts (8 - 12 volts)
Deposition speed:	Approx. 0.01 µm can be reached if 1 cm ² is treated for about 1 minute with constant movement.

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In addition the voltage can be increased to maximally 12 volts and the bath temperature to 40 °C. Higher voltages must not be applied since then the tampon tips will be rendered unusable due to melting.

In any case take care that the tampon tip is always well soaked with the electrolyte. It is usually sufficient to dip the pencil into the bath approx. 2 - 3 times per minute.

The specified speed may only serve as a rough approximate value since the deposition speed is influenced by the individual way of working (movement, pressure, dipping frequency).

Special Process Hints

Procedure: Connect the cable fixed to the tampon pencil to the positive pole of the rectifier. Connect the negative pole to the workpiece to be treated by means of a second cable and e.g. a crocodile clip.

Suitable are rectifiers supplying at least 8 - 10 volts. The voltage should be adjustable and measurable, e. g. rectifier TG 511 (up to 10 V).

The tampon tip should always be well soaked with the electrolyte. If the tip is dry, remove it from the holder and dip both ends into the bath, one after the other, until it is completely saturated. Then insert the tip again deeply into the contact socket of the holder.

Caution: The bath is strongly acidic! Handle the tips with tweezers and rubber gloves! Always use different tips for different types of baths!

Pretreatment: As with any other plating treatment, the parts first have to be cleaned thoroughly. This is done in the usual way by soak cleaning or ultrasonic pre-degreasing and electrolytic degreasing. After intermediate rinsing, briefly dip in 5 % sulphuric acid and rinse again. Afterwards, rinse in deionized water.

If fine structures with borders as exact as possible are to be applied, the surface of the part should be dried rapidly or the adhering water film should at least be spun off. If the surface of the part is wet, the electrolyte film will easily run during the treatment and thus lead to blurred borders.

Pencil ruthenium plating:

Make the connections to the part (cathode, negative pole) and to the pencil (anode, positive pole). Turn on the rectifier and adjust the voltage. After dipping the tampon tip into the bath again, move the tampon tip back and forth or in small circles on the area to be ruthenium plated, applying very slight pressure. The article will be ruthenium plated as long as the sufficiently soaked tampon tip is in contact with the article.

Metal depletion in the contact area is avoided by:

- the special composition of the electrolyte
- good movement of the tip on the part
- occasional renewed dipping of the tip into the bath supply (approx. 2 - 3 times per minute)

Deformed and blunt tampon tips can be resharpened. Occasionally change the tip. A high consumption of tips results from a too high operating voltage because then the tips melt together due to overheating and the current passage is impeded.

Seal the tip with a cap prior to idle periods to prevent drying up.

Posttreatment: Post-dip in sodium hydroxide solution (50 g/l NaOH, 50 °C, 15-20 sec). Then rinse the parts in deionized water and dry.

Note

Our information relating to the storage stability refers to storage in closed original storage containers under the conditions stated on the label.

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Precautionary Measures/Safety Hints

For information on safety, please see the corresponding Safety Data Sheets!

The valid accident prevention regulations and safety instructions must be observed.

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