

# Black Ruthenium 479

## Troubleshooting Table

Edition: 29 February 2008

### Troubleshooting Table

Problem	Cause	Correction
1. Coatings too light	Content of blackening agent too low	Add blackening agent in steps of 2 ml/l
	Metallic impurities, e.g. copper	Selective purification <sup>1)</sup> (dummy plating) or precipitation of the impurities (contact supplier)
	pH-value too low	Raise pH-value with ammonia solution
	Temperature too low	Increase temperature to specified value
2. Coatings too dark	Content of blackening agent too high	Dummy plate Add 2-5 ml/l of sulphuric acid, conc. In the case of a considerable overdose, add iron (steel wool, purified), 20-25 mg/l of iron will bind 1 ml/l of blackening agent. Then readjust the content of blackening agent to specified value.
3. Coatings iridescent, shimmering in all colours	Current density too low	Increase current density
	Coating thickness too low	Increase plating time
	Content of blackening agent too high	Dummy plate Add 2-5 ml/l of sulphuric acid, conc. In the case of a considerable overdose, add iron (steel wool, purified), 20-25 mg/l of iron will bind 1 ml/l of blackening agent. Then readjust the content of blackening agent to specified value.
4. Brownish or reddish deposits	Contamination with copper	Selective purification <sup>1)</sup> (dummy plating) or precipitation of the impurities (contact supplier)
	Bath density too high	Dilute bath or make up a new bath
5. Light deposits with bluish stains in high current density area	Contamination with lead	Selective purification <sup>1)</sup> (dummy plating) or precipitation of the impurities (contact supplier)

# Black Ruthenium 479

	<b>Problem</b>	<b>Cause</b>	<b>Correction</b>
6.	Pores circular spots	Adhering hydrogen bubbles	Increase agitation (e. g. air agitation) Knock off the hydrogen bubbles Use Wetting Agent 16 (addition in 0.5 ml/l steps up to max. 2 ml/l)
7.	Bluish hazes after post-treatment	Spent post-treatment solution	Make up new post-treatment solution
8.	Very dark coatings are matt and hazy after post-dip	Post-dipping time too long Post-dip solution too aggressive	Reduce post-dipping time Dilute post-dip solution, reduce temperature of post-dip solution, or reduce post-dipping time
9.	Coatings stained or discoloured after storage (brown, blue, iridescent)	Insufficient post-treatment	Make up new post-treatment solution Carry out post-treatment according to operating instructions
10.	Parts not uniformly covered	Throwing power too low	Add 2-5 ml/l of sulphuric acid, conc.
11.	Very dark coatings hazy and/or chipping off	Temperature too high Coating thickness too high	Reduce temperature to specified value Reduce plating time
12.	High consumption of blackening agent	Electrolyte new, not dummy-plated	Dummy-plate

<sup>1)</sup> Selective purification (dummy plating) should be carried out at a bath temperature of max. 30 - 40 °C. Use cathodes made of corrugated stainless steel, previously plated with at least 10 µm Ni and 1-2 µm Pd-Ni/Au. The current density should be about 0.1 - 0.2 A/dm<sup>2</sup>.

The information and statements contained herein are provided free of charge. They are believed to be accurate at the time of publication, but we make no warranty with respect thereto, including but not limited to any results to be obtained or the infringement of any proprietary rights.

Use or application of such information or statements is at the user's sole discretion, without any liability on our part. Nothing herein shall be construed as a license of or recommendation for use which infringes upon any proprietary rights. All sales are subject to our General Conditions of Sale and Delivery.

## Umicore Galvanotechnik GmbH

P.O. Box 12 40 • D-73502 Schwaebisch Gmuend

### Delivery address:

Klarenbergstraße 53-79 • D-73525 Schwaebisch Gmuend  
GERMANY

Telephone +49 (0) 71 71 / 6 07 - 01

Fax +49 (0) 71 71 / 6 07 - 2 88

e-mail: [galvano@eu.umicore.com](mailto:galvano@eu.umicore.com)

[www.umicore-galvano.com](http://www.umicore-galvano.com)