COIN EXAMINATION REPORT

1727 Rouble - Catherine I

KM#177.1 · Numista #26984 · 1726–1727



Obverse — Bust of Empress Catherine I to the right, the legend around. Photograph, even light.



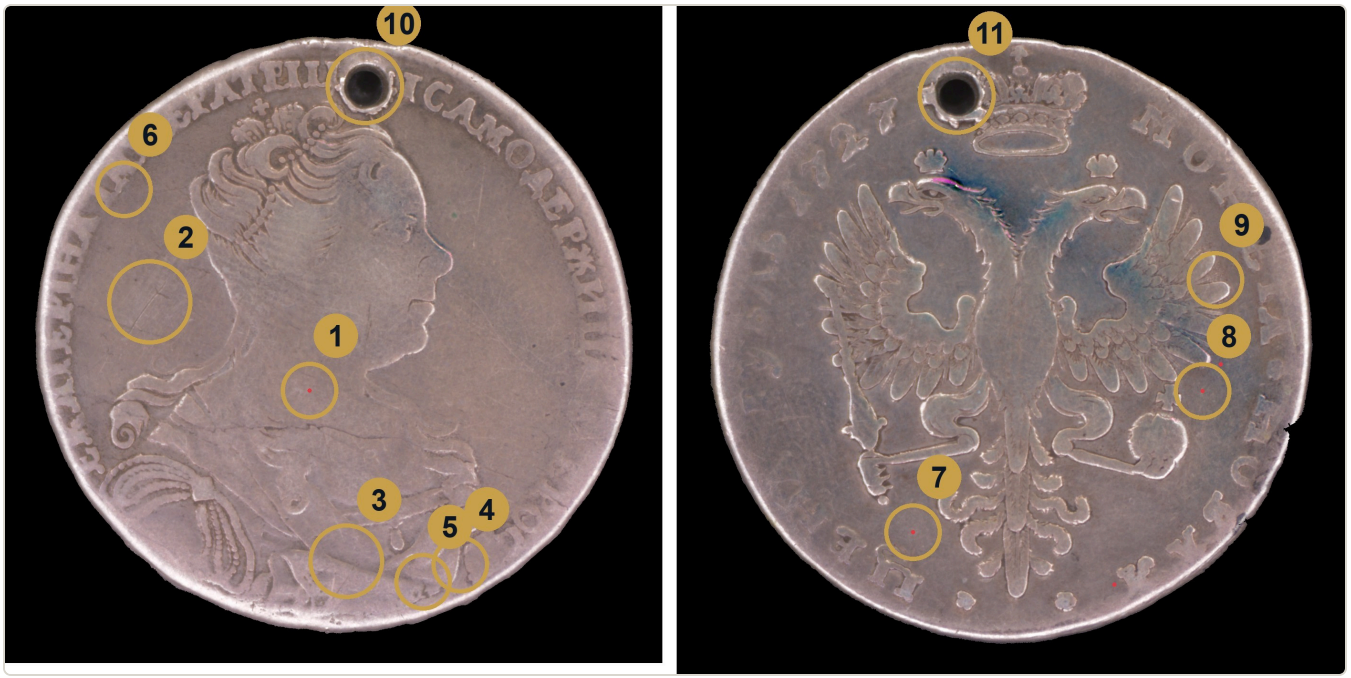
Reverse — Crowned double-headed eagle holding sceptre and orb; the legend with value and date around. Photograph, even light.

CONDITION	OUTLINE	WEIGHT	DIE AXIS	RELIEF
≈ VF	39.4–39.8 mm	26.99 g	5°	354 µm
an AI reading of the photographs, not a certified grade; the coin is holed	the outline's ellipse axes · nominal 40.5 mm	customer's balance · nominal 28.44 g (−5.1 %)	by the hole through the coin; 0° medal, 180° coin; the type is medal-aligned	the bust above the obverse field

IDENTITY	The catalogue type Rouble - Catherine I (KM#177.1), 1726–1727; the date 1727 read on the coin, no mint mark (the Krasny mint, Moscow).
HOLE	A round hole through the coin near the top, 2.4 mm across and 16.7 mm from the centre on both faces (§01).
DIE AXIS	Measured by the hole through the coin, which marks the same point on both faces: the reverse die stands 5° from the obverse's (0° medal, 180° coin alignment), +5° from the medal alignment the catalogue gives this type.
MARKS	4 linear marks in the open field of the obverse and 1 on the reverse (§01).

01 Condition map

Both faces photographed in even light. **Red circles**: each pit the detector found in the open field (away from the design; method in §04). **Numbered circles**: the densest pitting, the deepest pits and the longest cuts, scratches and hairlines on each face and a round hole through the coin, in the legend at the top and the same hole seen from the reverse, beside the crown. Close-ups follow.



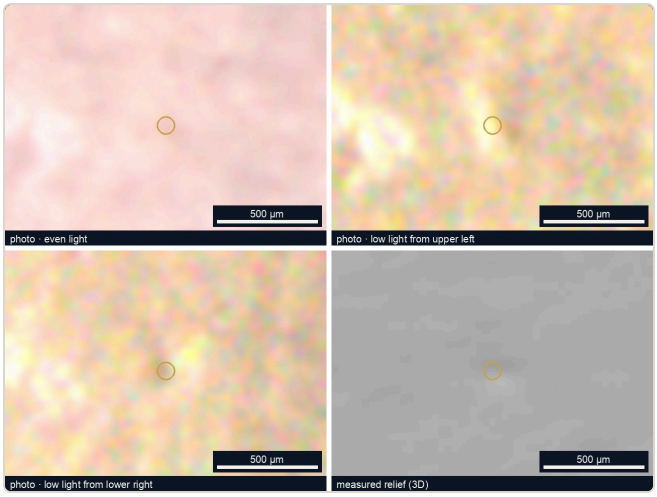
Obverse (left) and reverse (right), upright, at matching scale.

NO.	FACE	LOCATION	FINDING	MEASURED
1	Obverse	5 o'clock	Pit in the open field	0.13 mm across and 9 µm deep
2	Obverse	9 o'clock	Hairline scratch in the field	3.67 mm long, 8 µm deep
3	Obverse	5 o'clock	Hairline scratch in the field	3.13 mm long, 8 µm deep
4	Obverse	5 o'clock	Linear mark in the field (a cut or scratch)	1.97 mm long, 0.43 mm wide, 22 µm below the field
5	Obverse	5 o'clock	Linear mark in the field (a cut or scratch)	1.42 mm long, 0.39 mm wide, 22 µm below the field
6	Obverse	10 o'clock	Linear mark in the field (a cut or scratch)	1.47 mm long, 0.29 mm wide, 18 µm below the field
7	Reverse	6 o'clock	Pit in the open field	0.15 mm across and 11 µm deep
8	Reverse	3 o'clock	Pit in the open field	0.14 mm across and 9 µm deep
9	Reverse	2 o'clock	Linear mark in the field (a cut or scratch)	1.92 mm long, 0.38 mm wide, 31 µm below the field

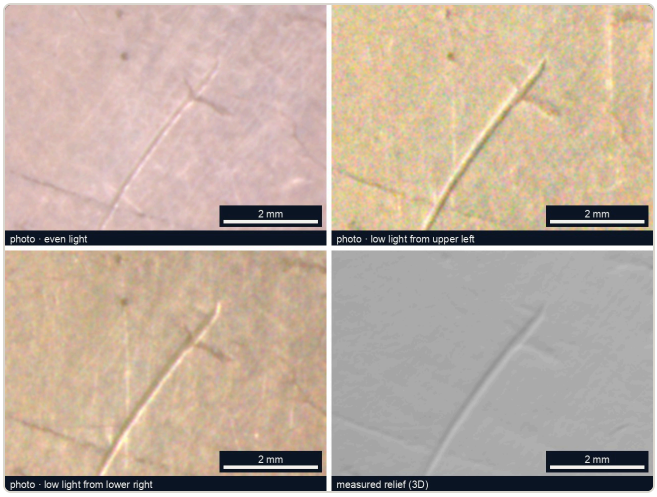
NO.	FACE	LOCATION	FINDING	MEASURED
10	Obverse	12 o'clock, in the legend	A round hole through the coin, in the legend at the top	four views: even light, opposite low lights, measured relief
11	Reverse	11 o'clock, beside the crown	The same hole seen from the reverse, beside the crown	four views: even light, opposite low lights, measured relief

CLOSE-UPS IN CAPTURED LIGHT

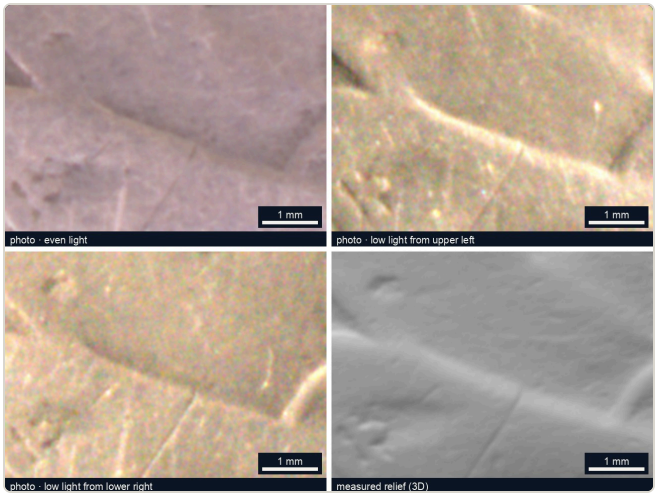
Each item four ways: a photograph in even light, photographs lit low from opposite sides (relief casts shadows, a pit shows a dark and a bright wall), and the measured relief. The photographs are captured frames from this examination, not retouched; each tile carries a scale bar.



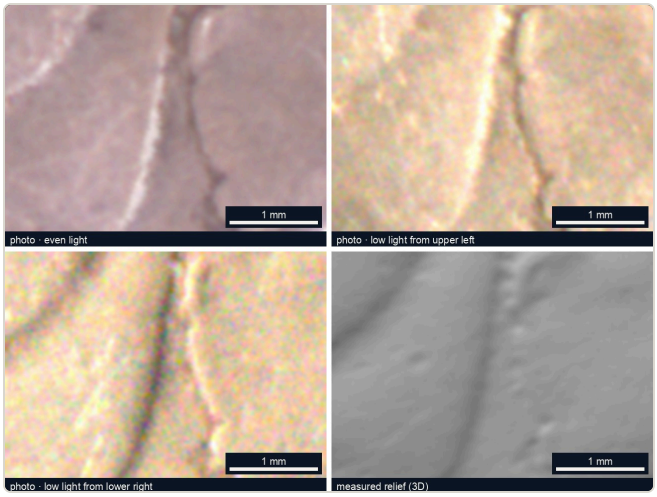
ITEM 1 Pit, obverse field at 5 o'clock (circled).



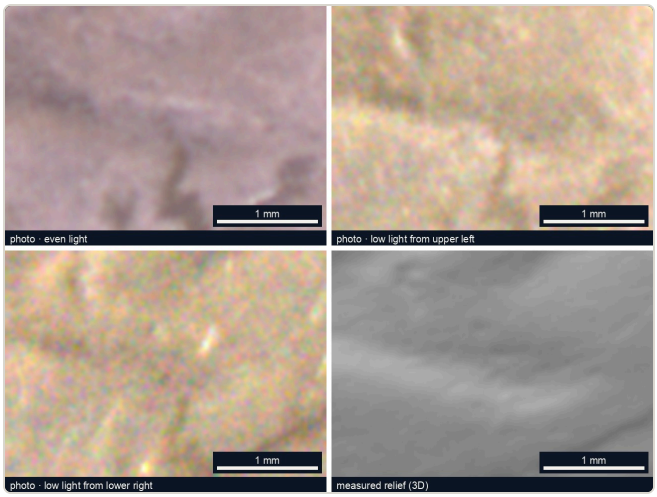
ITEM 2 Hairline scratch, obverse field at 9 o'clock (boxed).



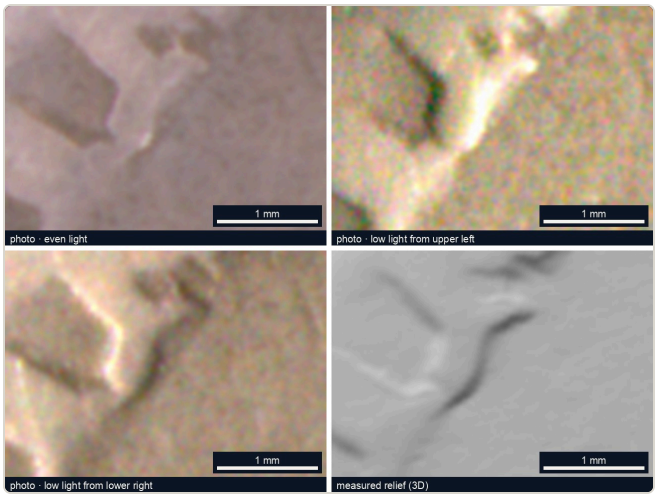
ITEM 3 Hairline scratch, obverse field at 5 o'clock (boxed).



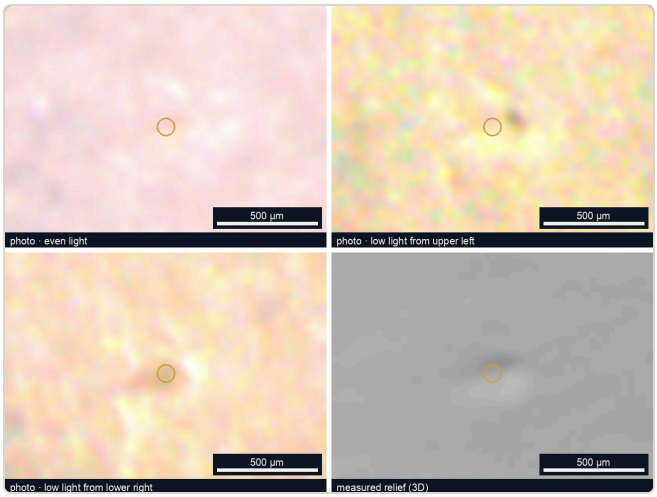
ITEM 4 Linear mark, obverse field at 5 o'clock (boxed).



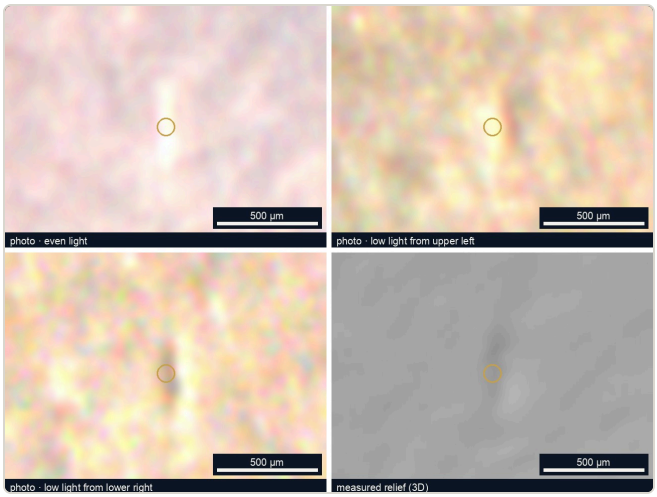
ITEM 5 Linear mark, obverse field at 5 o'clock (boxed).



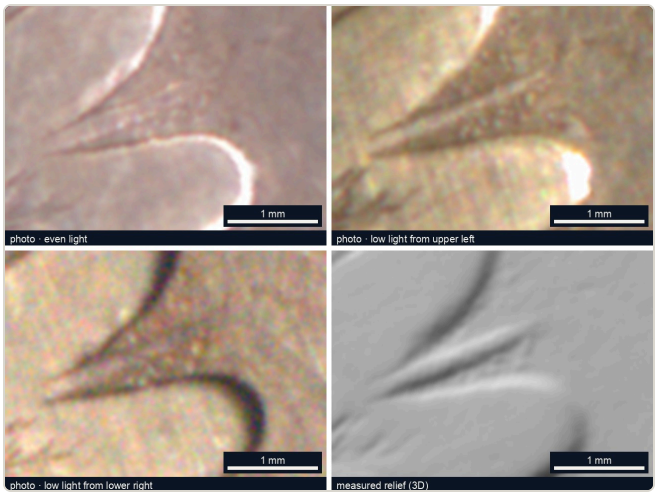
ITEM 6 Linear mark, obverse field at 10 o'clock (boxed).



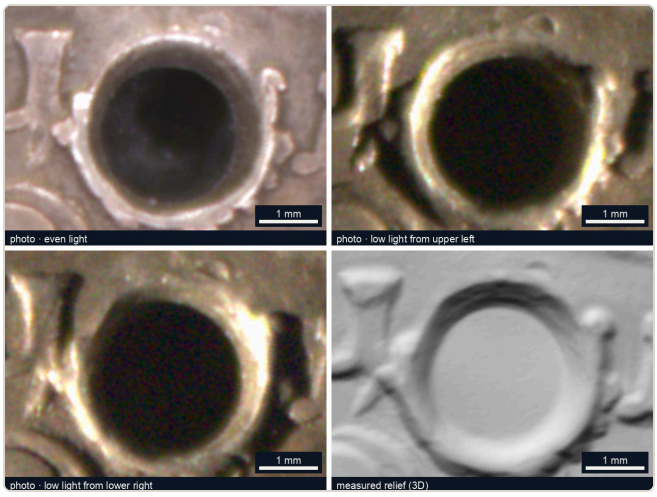
ITEM 7 Pit, reverse field at 6 o'clock (circled).



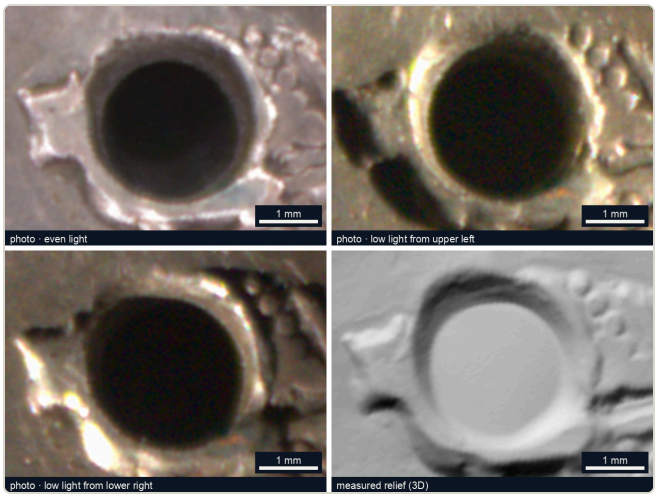
ITEM 8 Pit, reverse field at 3 o'clock (circled).



ITEM 9 Linear mark, reverse field at 2 o'clock (boxed).



ITEM 10 The hole through the coin, obverse side, four ways.



ITEM 11 The hole through the coin, reverse side, four ways.

02 Identification

Legends, marks and dimensions read from the measured surface, compared against the catalogue type.

ELEMENT	READ ON THE COIN	CATALOGUE (NUMISTA #26984)
Obverse legend	ЕКАТЕРІНА ІМПЕРАТРІЦА ІСАМОДЕРЖИЦА ВСЕРОС	✓ ЕКАТЕРІНА•ІМПЕРАТРІЦА•ІСАМОДЕРЖИЦА•ВСЕРОС:
Reverse legend	МОНЕТА НОВАЯ ЦЕНА РУБЛЬ	✓ МОНЕТА * НОВАЯ * ЦЕНА * РУБЛЬ • 1726
Date	1727	✓ issued 1726–1727 (the type's range; the catalogue's example dates are not this coin's)

The legends and types read on the coin agree with the catalogue type **KM#177.1** (Numista #26984, 1726–1727).

PHYSICAL

MEASURE	THIS COIN	TYPE STANDARD	Δ
Diameter	39.4 × 39.8 mm (outline's ellipse axes, obverse) · 39.8 × 40.2 mm (reverse) · caliper 39.69 mm	40.5 mm, nominal	−2.2 % (equivalent circle)
Weight	26.99 g (customer's balance; the coin is holed)	28.44 g	−5.1 %
Die axis	5° by the hole through the coin	0° (medal alignment, the type's)	+5°
Composition	—	Silver (.728)	—

03 Condition

ELEMENT	DETAIL VISIBLE	SOFTER AREAS
Bust (obverse)	The face in profile, the curls and pearls of the hair, the drapery folds and the ermine at the shoulder.	The cheek and the highest curls.
Obverse legend	ЕКАТЕРІНА, ІСАМОДЕРЖИЦА and ВСЕРОС clear; the hole falls between ІМПЕРАТРІЦА and ІСАМОДЕРЖИЦА.	The first letters of ІМПЕРАТРІЦА.
Eagle (reverse)	Both crowned heads, the wing feathers, the sceptre and the orb.	The eagle's breast.
Crown and date	The crown above the eagle and the date 1727, clear.	—
Hole	A round hole through the coin near the top, beside the crown on the reverse and in the legend on the obverse.	—

ASSESSMENT

Detail comparable to Very Fine (VF), provisional

Detail comparable to Very Fine (VF), provisional: The portrait keeps the curls and pearls of the hair and the drapery folds; the eagle keeps its wing feathers, both crowns, the sceptre and the orb. The cheek and the eagle's breast are worn smooth. The coin is holed near the top. Relief of the bust and of the eagle above the field around them: 354 µm on the obverse and 278 µm on the reverse. Recorded for comparison with later scans; not calibrated against graded coins.

Hole. Items 11 and the one before it on the condition map: the same round hole seen from each side, near the top of the coin — the kind made to wear a coin as a pendant.

Surfaces. Depressions in the open fields: 1 on the obverse and 4 on the reverse (§04). Their cause is not decided by the detector.

Scope. The table is an AI reading of the photographs and close-ups (§01, §06) for the elements listed; elements not listed were not individually inspected.

04 Surfaces: depressions

The depressions the instrument detected in the open fields: where they are, how large, how deep, and — where the measurements are comparable — how they compare with other coins.

PITS IN THE OPEN FIELD

	OBVERSE	REVERSE
Pits found	1	4
Open field examined	299 mm²	342 mm²
Density	0.3 per cm²	1.2 per cm²
Size across (median · p90 · max)	0.13 · 0.13 · 0.13 mm	0.14 · 0.15 · 0.15 mm
Depth (median · p90 · max)	9 · 9 · 9 µm	9 · 10 · 11 µm
Nearest-pit distance (median)	— mm	— mm
Nearest-neighbour ratio (descriptive)	—	—
Pits on the raised design (less reliable)	38	83

Face: the coin inside its own outline (the framecheck's min-over-lights outline). Open field: field pixels at least 0.2 mm from raised design, outside the holes the design encloses (letter counters, windows) and away from the rim band. A counted depression is at least 6 µm on the obverse and 6 µm on the reverse below its filled surroundings (each face's own threshold: the larger of a fixed floor and four robust sigmas of its field) and at least 0.006 mm² in area. These are detected depressions; their cause (corrosion, porosity, a strike or planchet flaw) is not decided by the detector.

OTHER COINS MEASURED WITH THE SAME CODE (PITS PER CM² OF OPEN FIELD, WHERE COMPARABLE)

COIN	OBVERSE	REVERSE	MEDIAN DEPTH
This coin	0.3	1.2	9 µm
8 reales, chopmarked, circulated	not comparable: 69 px/mm sampling	not comparable: 69 px/mm sampling	—
Reference specimen: Silver Eagle 2001, uncirculated (one coin)	—	not comparable: 67 px/mm sampling	—

The comparison coins are examples, not a population baseline.

Cuts and scratches. Linear marks at least 12 µm below the field and about a millimetre long: 4 in the open field of the obverse and 1 of the reverse; the longest are numbered on the condition map (§01).

Hairlines. Thin straight scratches found in the curvature of the measured surface: 7 in the open field of the obverse (13.9 mm together) and 4 of the reverse (4.9 mm); the longest are numbered on the condition map (§01). Lines on the design are counted separately: an engraved line and a scratch across it are not told apart by shape alone.

Resolution. This run used the standard solve at 31 pixels per mm; depressions narrower than about a tenth of a millimetre are not resolved, so the counts are lower bounds.

Appearance. Light grey silver with a pale golden tone; blue toning across the eagle's heads; a small dark spot at the reverse rim near 1 o'clock. (photographs with grey-card colour balance; cover). Hairlines and reflectivity are not systematically assessed.

05 Consistency checks

Each measured fact set beside the catalogue's nominal or a working tolerance chosen for this examination. These checks can raise questions; they cannot establish authenticity, and no score is formed.

INDICATORS

No check fell outside its working tolerance. These checks can raise questions; they cannot establish authenticity.

CHECK	MEASURED	REFERENCE	READING
Weight against the type's nominal	26.99 g (−5.1 %)	28.44	within the working tolerance
Diameter	39.77 mm	39.3-41.7 mm	within the working tolerance
Outline axes against the customer's caliper	39.4–39.8 mm (+0.7 %)	39.7-39.7 mm	within the working tolerance

CHECK	MEASURED	REFERENCE	READING
Die axis against the type's alignment	5 deg	0 deg (medal alignment)	within the working tolerance
Specific gravity	—	about 10.3 for silver of this fineness	not tested

No reference coin. No coin of this type has been measured on this instrument; the figures are reported for the record and for the next coin of the series.

Next measurement. A specific-gravity measurement is the recommended next test; it constrains the alloy but cannot by itself establish identity or authenticity.

06 Detail evidence

Photographs from this examination: the coin lit low from the upper left (three captured frames averaged), shown upright, colour balanced against a grey card, each with a scale bar. Crops are at instrument resolution (31.4 pixels per mm).

OBVERSE



FIG 1 The empress's face and the curls of her hair.



FIG 2 The drapery and the ermine at the shoulder.

REVERSE



FIG 3 The imperial crown above the eagle, and the hole beside it.



FIG 4 The date 1727 at the end of the legend.



FIG 5 The eagle's heads and breast, and the feathers of the wings.

LEGENDS, AS READ



FIG 6 The obverse legend unrolled from the measured relief, each of the catalogue's letters boxed where it stands: green, read by OCR at that place (13 of 38); amber, placed between the letters read.

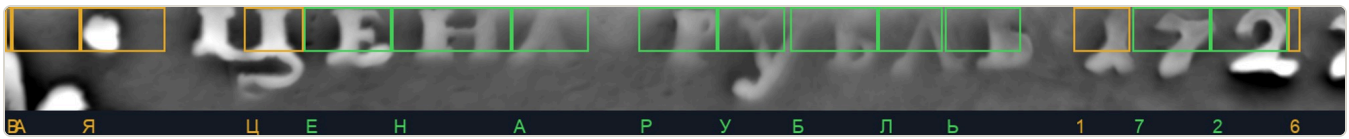


FIG 7 The reverse legend unrolled from the measured relief, each of the catalogue's letters boxed where it stands: green, read by OCR at that place (10 of 24); amber, placed between the letters read.

07 Design element maps

The design elements identified on the measured surface, shown in colour on the photograph. The outer rim lies outside the measured surface and is shown uncoloured.

Obverse (bust) — identified design elements



DESIGN ELEMENTS

- Bust

Reverse (eagle) — identified design elements



DESIGN ELEMENTS

- Crown
- Eagle

08 Method and limitations

METHOD	Each face was photographed 120 times, each frame lit by one light from a known direction; the photographs here are those frames, colour balanced against a grey card. The same frames were reconstructed by photometric stereo into a measured surface at 31.4 pixels per mm (about 32 µm per pixel), on which depressions, relief and design elements are measured. Design elements were segmented automatically from the measured surface; readings and the condition assessment are AI-assisted and checked against the catalogue; the figures are generated from the examination record.
ORIENTATION	Each face was turned upright by registering it against the catalogue's photograph of the type: the design's edges compared over the whole face through a full turn, refined to a quarter of a degree, the photograph and the measured relief agreeing. The die axis rests on these uprights.
SCALE	Set by the instrument: the rig's optics are calibrated to 31.38 pixels per mm on the sensor, checked against a calipered coin; this coin's outline measures 39.77 mm (obverse) and 40.11 mm (reverse) at that scale. Lateral lengths carry about ±1 % (see Uncertainty). Provisional: the comparison coins' scales rest on diameters whose source is not recorded, which moves their pit densities by a few per cent.
NOT DECIDED	Capture repeatability of the figures: not characterised — one capture per face in this run. It would be settled by a re-seated repeat capture of each face.
NOT SYSTEMATICALLY ASSESSED	Hairlines (noted only where a close-up shows them), reflectivity and lustre; the edge.
NOT A CERTIFICATION	This is an instrument-based examination, not a third-party grading service opinion (NGC, PCGS).
UNCERTAINTY	Lateral lengths (diameters, offsets, areas) rest on the rig's scale, calibrated against a calipered coin: about ±1 %. Heights — relief, depression depths, steps — are relative measurements within one capture, referred to the surface around each feature; their repeatability between captures has been measured on one coin only, and absolute height accuracy is not certified. The long-range shape of a face (bowing, warp) is known less well than local relief; this solve corrects the LEDs' emission lobe with the fit measured for silver, which a flat target showed removes most of the instrument's bowl. A saddle fixed in the camera frame, measured on a flat target, is not corrected and is part of that long-range uncertainty. The solve grid is a sampling grid, not a demonstrated optical resolution.

DIGITAL SUPPLEMENT

In the delivery bundle AZR-1R-1727-CAT1-revC-bundle.zip, beside this PDF: the clean face photographs and animations of the captured frames (one light at a time, going round the coin).

AZR-1R-1727-CAT1-REVC-OBVERSE.JPG	The obverse, photographed in even light, without annotations.
AZR-1R-1727-CAT1-REVC-REVERSE.JPG	The reverse, photographed in even light, without annotations.
AZR-1R-1727-CAT1-REVC-OBVERSE_LIGHT_SWEEP.GIF	The whole obverse under each of the 60 low lights in turn.
AZR-1R-1727-CAT1-REVC-REVERSE_LIGHT_SWEEP.GIF	The whole reverse under each of the 60 low lights in turn.

REFERENCES

Numista #26984 (KM#177.1).

PREPARED BY

Anton Zalutsky
Principal Examiner · AZ Robotics LLC

Automated examination; no reviewer sign-off is recorded for this revision.

REPORT

AZR-1R-1727-CAT1
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This report is complete only with all pages present.

This report describes the surface of the specimen as measured on the date of issue. It is not a guarantee of authenticity, grade or value, and is not transferable to any other specimen. Findings depend on the instrument, method and reference material described above. © AZ Robotics LLC. Reproduction in part is not permitted without the complete report.