GDCS

A STANDARD OF THE ASSOCIATION FOR INTELLIGENT DIAMOND INTERNATIONAL

GDCS TESTING STANDARD

GDCS Enamel Identification and Classification Standard

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Same full text as the web page gdcs.ai/standard/enamel/
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Foreword

This standard is published by GDCS and written to the principles common to all GDCS standards: identity, substrate, harmful elements, craft classification and naming are each evidenced and concluded separately, and no conclusion stands in for another.

For the identification features of enamel, the dimensions of craft classification, the naming rules, and the limits and dissolution test for specified harmful elements, this standard makes normative reference to DZ/T 0413—2022 Enamel — Testing and classification, an industry standard issued by the Ministry of Natural Resources of the People's Republic of China, and does not repeat its clauses. DZ/T 0413—2022 is published by Geological Publishing House; obtain the full text from the publisher. On that basis this standard sets the evidence levels, sample status, records, certificate fields and prohibited statements a GDCS certificate requires.

Relation to DZ/T 0413—2022: where the two conflict, test methods and limits follow DZ/T 0413—2022, and the wording of evidence and limitations on a certificate follows this standard. When DZ/T 0413—2022 is revised, GDCS reviews the change and issues a version note; new clauses are not adopted automatically.

1 Scope

1.1 This standard sets requirements for the identification, classification, naming, certification and quality control of enamel articles under GDCS.

1.2 It applies to jewellery, ornaments and their parts in which vitreous enamel is fused to a metal substrate.

1.3 A coloured coating made mainly of organic resin and cured at room or raised temperature (known in the trade as "瓷彩", coloured organic coating) is not enamel. This standard only sets out how to tell it apart from enamel and gives no enamel conclusion for it.

1.4 "Classification" in this standard describes craft and form. It says nothing about commercial value, origin, period, maker or collectable grade.

2 Normative references

The following documents are referred to in the text so that they constitute requirements of this standard. For dated references only the edition cited applies; for undated references the latest edition applies.

- DZ/T 0413—2022 Enamel — Testing and classification
- GB/T 16552 Gems — Nomenclature
- GB/T 16553 Gems — Testing
- GB 11887 Jewellery — Fineness of precious metal alloys and designation
- GB/T 23994 Limit of specific harmful elements in coatings for consumer products in contact with the human body
- GB 28480 Ornaments — Specification of limits for harmful elements
- GB/T 28020 Ornaments — Determination of harmful elements — X-ray fluorescence spectrometry
- GB/T 32022 Precious metal coated ornaments
- QB/T 1689 Terminology of precious metal jewellery

3 Terms

The terms defined in DZ/T 0413—2022 and GB/T 16552 apply. This standard also uses:

3.1 Enamel layer The vitreous part of an article, fused to its metal substrate.

3.2 Substrate The metal part that carries the enamel layer: precious metal, a precious metal coating, or another metal.

3.3 Contact area The surface of the enamel layer that is in prolonged contact with the skin in normal wear or use.

3.4 Evidence level The class of an observation or measurement by reliability, independence and verifiability: A, B, C or D (see 5.2).

4 Principles

4.1 **Separate evidence.** Identity of the enamel layer, substrate material and fineness, harmful elements, craft classification and naming are five independent conclusions.

4.2 **Non-destructive first.** Separating enamel from substrate, or any destructive method, needs the client's written consent and a record of location, extent and reason.

4.3 **Appearance does not decide.** Lustre, colour, feel or "it looks like cloisonné" is never enough on its own to conclude identity or craft.

4.4 **Screening does not decide limits.** X-ray fluorescence screening can show whether a specified element is present. Whether a limit is exceeded can only come from the dissolution test.

4.5 **Traceable.** Every conclusion traces back to the sample, location, equipment, method version, raw data, tester and reviewer.

5 Identification

5.1 Identity of the enamel layer

5.1.1 Identity of the enamel layer is concluded from the methods and features in Clause 4 and 5.1 of DZ/T 0413—2022 taken together, including at least magnification, hardness and lustre, and one spectroscopic method (infrared or laser Raman).

5.1.2 Enamel is told apart from coloured organic coating mainly by spectroscopic evidence. "Enamel" may be concluded only when the spectrum shows vitreous features and magnification and hardness do not contradict it. Where the spectrum shows organic resin features, the conclusion is "not enamel (organic coloured coating)".

5.1.3 Enamel on different parts of one article may be different materials. The certificate states where the evidence was taken; evidence from one place is not extended to the whole article.

5.2 Evidence levels

Level	Meaning	Conclusion allowed
A	Spectroscopic evidence from a validated method, compared against a controlled reference	May support an identity conclusion directly
B	Two or more independent observations or measurements in agreement	May conclude together with A, or support a conclusion
C	A single cue such as lustre, hardness, bubble form or colour distribution	For forming hypotheses and choosing methods only; never decides on its own
D	Product descriptions, client statements, earlier certificates, photographs	Leads only; never enters a factual conclusion

5.3 Substrate

5.3.1 A precious metal substrate is tested and named for material and fineness under GB 11887; a precious metal coating is named under GB/T 32022.

5.3.2 Substrate testing avoids the enamel layer and records its location. Where that is not possible or the substrate is fully covered, the certificate states "substrate not tested" and nothing is inferred.

5.4 Harmful elements

5.4.1 Dissolution of specified harmful elements from the enamel layer at contact areas, and the limits for enamel articles for children, follow Annex C (normative) of DZ/T 0413—2022.

5.4.2 Harmful elements in the substrate follow GB 28480.

5.4.3 A certificate may state only one of three conclusions: "within the limits of DZ/T 0413—2022 Annex C", "not within the limits", or "not tested". Without a dissolution test, the words "lead-free", "non-toxic", "eco-friendly", "safe" or their equivalents may not appear.

6 Classification

6.1 Craft is recorded separately along the three dimensions of Clause 6 of DZ/T 0413—2022: artistic form, method of making the substrate, and method of applying the enamel.

6.2 The three dimensions are independent. Where one cannot be determined it is recorded as "not determined"; nothing is guessed to complete a classification.

6.3 An article combining several crafts lists them all and states the basis for identifying the main one.

6.4 Classification names carry no origin, period, school or maker unless documents supplied by the client have been verified and the certificate cites them.

7 Naming

7.1 Articles are named under Clause 7 of DZ/T 0413—2022 and the standards it refers to (GB/T 16552, GB 11887, GB/T 32022, QB/T 1689): a material name followed by an item name.

7.2 A part concluded to be "not enamel (organic coloured coating)" may not carry the word "enamel" in its name.

8 Sample status codes

Code	Status	Limitation
E0	Normal	Full testing
E1	Enamel cracked, lifted or repaired	Assess non-destructiveness first; record repairs separately
E2	Substrate fully covered or hidden by setting	Substrate conclusion limited; state "not tested"
E3	Surface coating, wax or contamination	Clean only with the client's consent, under an approved procedure, and record it
E4	Sample does not match the order	Stop and confirm in writing
E5	Identification only, no classification	Identity and naming only

9 Certificate

9.1 A certificate contains at least:

1. The title "GDCS Enamel Identification and Classification Certificate" and a certificate number
2. Name and contact details of the issuing body, and name, address and contact details of the testing laboratory
3. Sample number, photograph, total mass and status code
4. Test date and report date
5. Basis: the name and version of this standard, and DZ/T 0413—2022
6. Identity of the enamel layer, with its evidence level and where it was taken
7. Substrate material and fineness, or "not tested"
8. Harmful elements (within limits / not within limits / not tested), with location and method
9. Craft classification on the three dimensions, or "not determined"
10. Name of the article
11. Items not tested or not evaluated, and limitations
12. Tester, reviewer and approver, with signatures; the reviewer is never the tester
13. How to verify the certificate, complain and request a re-test

9.2 A certificate may not contain:

1. Organic coloured coating described as enamel
2. "Lead-free", "non-toxic", "eco-friendly" or "safe" without a dissolution test
3. Origin, period, maker or "antique" inferred from appearance
4. Commercial value, investment value or collectable grade
5. An X-ray fluorescence screening result in place of a dissolution result

10 Quality control

10.1 The laboratory keeps controlled reference spectra and magnified images of enamel, coloured organic coatings and common imitations, with their source, method and review status.

10.2 Key equipment has an identifier, operating procedure, check plan and calibration traceability. The detection limit of the dissolution test meets Annex C of DZ/T 0413—2022.

10.3 Changes to raw records keep the original value and are signed, dated and explained.

10.4 Complaint re-tests are done by someone other than the original tester, after confirming that the sample is the same one.

11 Versions

11.1 This is a trial edition. Until the trial ends, certificates state "under the GDCS Enamel Identification and Classification Standard (trial edition)".

11.2 Each revision is published with a version note stating its effective date, the clauses changed and how they relate to the referenced standards.

Note: this standard does not reproduce the clauses, tables or spectra of DZ/T 0413—2022. A laboratory applying this standard holds the official text of DZ/T 0413—2022.