Experiments in Techniques in Metal Enameling

Ethel M. Hooper

Fort Hays Kansas State College

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EXPERIMENTS IN TECHNIQUES
FOR METAL ENAMELING

being

A Thesis Abstract Presented to the Graduate Faculty
of the Fort Hays Kansas State College in
Partial Fulfillment of the Requirements for
the Degree of Master of Science

by

Ethel M. Hooper, B. S.
Kansas State Teachers College
Emporia, Kansas

Date 7-30-63
Approved  
Major Professor

Approved
Chairman, Graduate Council
EXPERIMENTS IN TECHNIQUES FOR METAL ENAMELING

STATEMENT OF PROBLEM

Metal enameling has been in practice since antiquity in many areas of the world. There are several basic processes for ornamentation which developed many years ago. These old processes may be applied today, as previously, or in a contemporary manner. There are, also, new processes for developing form and ornamentation. It was the purpose of the writer to study, discover, and then develop through experimentation, some processes which were new in approach.

Therefore, this thesis consists of a series of experimental enameling processes applied to forms which were cut and shaped from sixteen gauge sheet copper. Transparent enamels were used almost exclusively as a coating and ornamental surface finish for the copper forms. In a few instances, opaque enamels were desired and used for accent purposes.

METHODS OF PROCEDURE

The base forms were planned and then cut from sheet copper. The writer then proceeded to shape the piece by annealing and hammering until the desired form was raised. The copper form was cleaned by a combination of pickling and polishing with a wire brush or steel wool.
Following the cleaning process, the piece was enameled by using the basic enameling process and applying various enameling techniques as sgraffito, wet charging, painting, dusting, stenciling, use of firecoat, cloisonne, separation enamel, etching, imbedding and various combinations.

The copper pieces required numerous firings at a temperature of approximately fifteen hundred degrees Fahrenheit. The pieces were fired from two to five minutes depending upon size of piece, temperature of kiln and degree of fusing desired.

CONCLUSIONS

The writer has come to the following conclusions:

1. Counter-enameling was necessary on light and medium gauge copper to keep the pieces from wilting while firing.

2. Pieces to be enameled should be simple in form. Free forms were found to be the most successful for the writer.

3. There are many techniques which will aid in producing beautiful ornamentation. The writer found that all techniques tried worked quite successfully. The firescale process was not always possible as a satisfactory firescale pattern was not always forthcoming.

4. Transparent enamels will produce a richness, depth, and luminosity of color which are beautiful and jewel-like in appearance.

5. The writer will continue enameling as an experimental process in order to discover new ways of working and to perfect known processes.
**Techniques:**

- Dusting
- Separation enamel
- Painting

**Size:** 8 3/4 inches by 5 3/4 inches

*Not counter-enameled*
Techniques:

Dusting over firecoat
Dusting over squeegee oil

Size: 9 3/4 inches by 7 1/2 inches

Counter-enameled

Techniques:

Etching on bare copper
Enamel rubbed into etched lines
Dusting

Size: 9 inches by 6 1/2 inches

Counter-enameled
Techniques:

Hairnet stencil over bare metal
Dusting
Painting

Size: 8 inches by 8 1/2 inches
Counter-enameled

Techniques:

Squeegee oil dusted with enamel over bare metal
Dusting
Painting

Size: 9 1/4 inches by 5 1/2 inches
Counter-enameled

Techniques:

Dusting
Imbeddings

Size: 7 inches by 5 inches
Counter-enameled
Techniques:

Dusting

Separation enamel

Size: 8 1/2 inches by 5 inches

Counter-enameled
Techniques:

Firecoat

Dusting

Size: 9 1/2 inches by 9 1/4 inches

Counter-enamed
Techniques:

Dusting

Cloisonne

Size: 9 inches by 7 1/2 inches

Counter-enamed