

Conducting Color Comparisons Using Automotive Refinisher Color Chips

1 Introduction

The FBI Laboratory maintains a collection of automotive paint refinisher color chips. These color standards are provided by automotive paint manufacturers and represent the original factory color available on most imported and domestic vehicles marketed in North America. Although this collection does not contain actual paint samples, it can be utilized to determine potential manufacturer(s), model(s), and year(s) information about automotive paint evidence based on its top coat color and appearance. These refinisher chips can be used in conjunction with other resources such as the National Automotive Paint File (NAPF) and Paint Data Query (PDQ).

2 Scope

This procedure applies to Chemistry Unit caseworking personnel who use automotive paint refinisher color chips for motor vehicle make-model-year searches.

3 Equipment/Materials/Reagents

- a. Automotive paint manufacturer refinish color standards, available as plastic chips or paper swatches (e.g., BASF, Axalta, PPG)
- b. Stereo microscope (~6X to ~100X) with two different lighting conditions (ring light oriented at ~180° and fiber optic light oriented ~45° from sample surface)

4 Standards and Controls

Not applicable.

5 Sampling or Sample Selection

Not applicable.

6 Procedure

1. Utilizing Paints and Polymers Standard Operating Procedure(s) (P&P SOP) *Visual, Microscopical, and Microchemical Examinations of Paint and Coating Evidence* and Fourier transform infrared spectroscopy (*FTIR Analysis of Paints, Tapes, and Polymers*), determine if a paint specimen is a factory-applied, original equipment manufacturer's (OEM) automotive finish.
2. Using the data obtained from Paint Data Query (PDQ) searches and/or National Automotive Paint File (NAPF) searches (following P&P SOPs for *Conducting Motor Vehicle Make-Model-Year Searches Using the Paint Data Query (PDQ) Databases* and *Conducting Motor Vehicle Make-Model-Year Searches Using the National Automotive Paint File (NAPF) Database*), record any trends in automotive manufacturer, assembly plant, and/or year(s) of production.
 - a. If trends such as a particular manufacturer and/or production year exist, refer to the corresponding repaint pages for direct color comparisons.
 - b. If no trends exist, search for color chips on repaint pages for model years that coincide with the incident date(s), as well as relevant previous model years.
3. Record potential color matches from the color standards in the repaint pages and compare the color and appearance of observed candidates to the sample using a stereo microscope. For details, refer to the P&P SOP *Visual, Microscopical, and Microchemical Examination of Paint and Coating Evidence*.
 - a. Conduct color comparisons at low power magnification (~6X to ~100X) using two different lighting conditions.
 - b. Record the results of the comparisons.
4. A second qualified P&P examiner evaluates and records their results for any possible candidates that compare favorably in color and appearance.
5. If a particular color is considered a candidate, contact the manufacturer to obtain or to verify model and year information printed on the refinisher pages for a given color.

7 Decision Criteria

- a. If the paint refinisher standard compares favorably in color and appearance to the sample, record it as a candidate.
- b. Determine if a particular manufacturer's color is predominant.

8 Calculations

Not applicable.

9 Measurement Uncertainty

Not applicable.

10 Limitations

- a. A factory-applied, OEM automotive finish is required for a possible motor vehicle make-model-year determination.
- b. Color assessment and comparison can be affected by sample size and/or condition.

11 Precautionary Statements

- a. Paint color standards on paper or plastic substrates can differ slightly from the appearance of a specimen from an automobile.
- b. Some data entry errors may exist in the refinisher pages. Verify search results using orthogonal resources when practicable.
- c. Automotive manufacturer color names can change for a given color between model years. Refer to the paint manufacturer codes to determine if colors issued in different model years are intended to be the same color.

12 Safety

Not applicable.

13 References

BASF Customer Assistance Call Center: 800-825-3000

Conducting Motor Vehicle Make-Model-Year Searches Using the Paint Data Query (PDQ) Databases, FBI Laboratory, Chemistry Unit - Paints and Polymers SOP

Conducting Motor Vehicle Make-Model-Year Searches Using the National Automotive Paint

File (NAPF) Database, FBI Laboratory, Chemistry Unit - Paints and Polymers SOP

Axalta (DuPont) Refinish Group: 800-338-7668

FTIR Analysis of Paints, Tapes, and Polymers, FBI Laboratory, Chemistry Unit - Paints and Polymers SOP

Visual, Microscopical, and Microchemical Examinations of Paint and Coating Evidence, FBI Laboratory, Chemistry Unit - Paints and Polymers SOP

PPG: 800-848-2683 or, Color Library/Code/Formula: 440-572-6100

Wright, D.M. A Make-Model-Year Case Involving Unusual Primer Chemistry and Good Resources, *J Amer. Soc. Trace Evid. Examiners*, 2010, 2(2): 137-148.

Wright, D.M. Sourcing Paint Smears: A Hate Crime Highlights the Utility of the Paint Data Query (PDQ) Database. *Can. Soc. Forensic Sci. J.*, 2012, 45(2): 79-88.8.

Rev. #	Issue Date	History
0	06/21/06	New document that replaces previous document also titled <i>Conducting Color Comparisons Using Automotive Refinishers Color Chips</i> .
1	09/30/09	Clarified introduction.
2	03/14/12	Changed macroscopic and microscopic to macroscopical and microscopical as appropriate throughout document. Updated references in section 15.
3	02/03/14	Changed “macroscopical” to “visual” throughout to simplify terminology, made minor editorial changes, and added a reference
4	09/18/18	Modified scope and deleted sections to comply with LOM changes, minor grammatical changes (document to record); minor grammatical edits throughout.

Approval

Redacted - Signatures on File

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