



Designation: D7588 – 11 (Reapproved 2018)

Standard Guide for FT-IR Fingerprinting of a Non-Aqueous Liquid Paint as Supplied in the Manufacturer's Container¹

This standard is issued under the fixed designation D7588; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers the FT-IR fingerprinting of a liquid paint as supplied in the container without the need to separate components. Spectra collected using this technique have been found useful for paint manufacturers' quality control, trouble shooting and to verify that the paint being used is the same as the paint sample tested. This technique has been found useful for both single and multi-component coatings, the latter of which, where each component is analyzed separately (for example, amine cured epoxies and polyol/isocyanate urethanes).

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D2621 Test Method for Infrared Identification of Vehicle Solids From Solvent-Reducible Paints

E131 Terminology Relating to Molecular Spectroscopy

E168 Practices for General Techniques of Infrared Quantitative Analysis

¹ This guide is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.21 on Chemical Analysis of Paints and Paint Materials.

Current edition approved June 1, 2018. Published June 2018. Originally approved in 2011. Last previous edition approved in 2001 as D7588 – 11. DOI: 10.1520/D7588-11R18.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

E204 Practices for Identification of Material by Infrared Absorption Spectroscopy, Using the ASTM Coded Band and Chemical Classification Index (Withdrawn 2014)³

3. Terminology

3.1 *Definitions*—For definitions of terms and symbols, refer to terminology in Terminology **E131**.

4. Summary of Guide

4.1 Infrared spectra are collected using an FT-IR spectrophotometer fitted with an ATR crystal, multi or single bounce. Samples are taken directly from the paint container as supplied by the manufacturer.

5. Significance and Use

5.1 The ability to collect an infrared spectrum of a liquid paint as supplied in the container from the manufacturer is of significant importance when performing qualification testing. Historically, fingerprinting a material for such purpose involved separating the components of the paint and collecting an infrared spectrum of one or more of these components (vehicle, pigments, solvent, etc.) with Test Method **D2621** being used for the identification of the vehicle. This unfortunately provides information only on the portion of the liquid paint analyzed whereas the technique shown in this practice provides a more complete picture of what is in the container provided. In addition, user expertise and time required to collect a spectrum is minimal versus traditional standards.

6. Apparatus

6.1 *Spectrophotometer*—An FT-IR spectrophotometer with a wavelength range of at least 600 to 4000 cm^{-1} and a resolution no less than 4 cm^{-1} .

6.2 *Multi or Single Bounce Horizontal Attenuated Total Reflectance (ATR) Trough*—For many paint samples, a 45 degree single bounce Fresnel-type ZnSe crystal has been found to provide satisfactory results for most liquid paints. Paint samples unsuitable for this setup will exhibit many 100 % absorptions not to be confused with the 100 % absorptions

³ The last approved version of this historical standard is referenced on www.astm.org.