



## Technical Requirements for UL DAP Client Submittal of Infrared Analysis Data for Fast Track QMFZ2 Generic Type Assignment

### *Scope*

This document describes the requirements for UL DAP participant submittal of infrared data for Fast Track QMFZ2 generic type assignment, pending completion of the normal UL analytical testing. Deviations from the requirements described herein may be acceptable upon review on a case-by-case basis.

### *Data File Format*

The Fourier transform infrared spectrophotometer instrument generated “data-file” shall be submitted electronically in a JCAMP (.dx or .jdx) format.

### *Test Apparatus*

- a. Fourier Transform Infrared Spectrophotometer (FT-IR)
- b. Attenuated Total Reflectance (ATR) Accessory (Single Bounce, Diamond Surface, KRS-5 Crystal Configuration)

### *FTIR Instrument Parameters*

#### General

The analysis is to be performed with a Fourier Transform Infrared (FTIR) Spectrophotometer equipped with an Attenuated Total Reflectance (ATR) accessory. The results are to be recorded as a plot of the percent transmittance of the infrared radiation through the specimen versus the reciprocal wavelength (cm<sup>-1</sup>) or “wavenumber” of the radiation. Percent transmittance will be expressed on the ordinate and wavenumber on the abscissa.

The infrared spectra obtained by the methods described herein shall consist of a minimum wavenumber range of 4000 – 400 reciprocal centimeters. An ATR scan range of 4000 – 400 cm<sup>-1</sup> can be accomplished using an accessory configured with a KRS-5 crystal. For the purpose of “Fast Track” generic type assignment however, the use of an ATR accessory configured (e.g. ZnSe crystal) to achieve a minimum spectral range of 4000-650 cm<sup>-1</sup> is acceptable.

#### Spectral Conditions

The following basic table indicates the recommended and required instrumental conditions for sample testing. Background scanning is to be performed at least daily.

Parameter	Condition
Number Of Scans	≥ 16
Number Of Background Scans	≥ The Number Of Scans Is Required
Scan Speed	≤ 0.2 cm/second Is Required
Scan Range <sup>1</sup>	4000 – 400 cm <sup>-1</sup> Is Required
Resolution	4 cm <sup>-1</sup> Is Required
Apodization	Medium Or Strong

<sup>1</sup> An ATR scan range of 4000 – 400 cm<sup>-1</sup> can be accomplished using an accessory configured with a KRS-5 crystal. For the purpose of “Fast Track” generic type assignment however, the use of an ATR accessory configured (e.g. ZnSe crystal) to achieve a spectral range of 4000-650 cm<sup>-1</sup> is acceptable.

#### *Transmittance Limits*

Ideally, the most desirable spectra are those with upper limits rising between 95 and 80 percent and lower limits falling between 20 and 5 percent transmittance. Due to the composition of many samples however, this transmittance range is not achievable. Spectra with total optimized transmittance ranges of ≥ 50% are desirable and usually achievable. Samples with total optimized transmittance ranges of ≤5% are not desirable and are not to be recorded.

#### *Report*

The individual spectra shall include the following:

- a. The complete identification of the material tested - including material designation, specimen form and color.
- b. Manufacturer's name or tradename, or assigned code (file number).
- c. Test apparatus and sample preparation procedure.
- d. Spectral conditions.
- e. Test date and operator identification.

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