



Designation: F 508 – 77 (Reapproved 2002)

## Standard Practice for Specifying Thick-Film Pastes<sup>1</sup>

This standard is issued under the fixed designation F 508; 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 approval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This practice covers the writing of specifications for thick-film pastes for electronics.

1.2 The practice provides a guide for the routine procedure to be followed in specifying for procurement thick-film pastes for use in manufactured circuits. Specific requirements, intended applications, and test methods should be included or identified in each paste specification. In addition, each specification should include basic information to facilitate procurement, preparation, quality control, lot shipment identifications, and shipping of such pastes.

1.3 The practice covers the development of specifications for fireable, thick-film pastes, including resistor, conductor, dielectric, and overglaze pastes.

### 2. Specification Form and Content

2.1 *Form*—Each specification should be prepared in conformance with *Form and Style for ASTM Standards*.<sup>2</sup>

2.2 *Procurement Information*—Information pertinent to procurement should include the procuring organization's name, location, address, telephone number, and the name of the procurement agent, or anyone else involved in procurement or with the technical details of the specifications.

2.3 *Technical Information*—Each specification should cover the specific technical details, the performance requirements, and the precision or accuracy of measurements necessary for the producer to supply the thick-film paste specified.

#### 2.3.1 *Processing Characteristics*:

2.3.1.1 *Screen Selection*—The particular paste specifications should identify the required screen by the mesh count, the wire size, and the emulsion thickness. Where metal masks are to be used, the cavity thickness and the cavity-aperture tolerances should be specified. The specification should also state the recommended nominal deposit thickness.

2.3.1.2 *Drying and Leveling Characteristics*—The specification should state the range of drying time, the range of drying temperature, and the dried film (leveling) characteristics. The dried film characteristics may be specified by visual examination, for such defects as lifting or pinholes, and by a thickness profile across the surface of the dried film.

2.3.1.3 *Firing Profile*—The specification profile for each specific style of paste.

2.3.1.4 *Firing Atmosphere*—For each style of paste and firing profile, the specification should define the firing atmosphere.

2.3.1.5 *Test Substrate*—The specification should specify and identify the composition of the test substrate and the surface on which the paste is to be deposited.

2.3.2 *Test Pattern*—Where applicable, the specification should include a layout and description of a suitable test pattern for evaluating printed and fired pastes. The specification should also include a list and functions of other materials required to perform the specified tests, that is, terminations, leads, etc. Consideration should be given to compatibility requirements for all materials used.

2.4 *Quality Control*—The specification should identify the quality control procedures to be employed. Such procedures should include: a sampling plan, a sequence for each examination and test specified, and corresponding requirements for each method of examination or test.

2.5 *Handling and Storing*—Each specification should include the method of handling and storing the pastes.

#### 2.6 *Performance Tests*:

2.6.1 Individual procurement specifications should include requirements for each selected applicable test, inspection, and examination listed in **Table 1** and **Table 2** for the given type of thick-film paste. The specification should include any other pertinent tests and inspections to cover special or specific applications.

2.6.1.1 The test and inspection equipment specified should be of sufficient accuracy and quality to permit the required tests and inspections to be carried out.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee F01 on Electronics and is the direct responsibility of Subcommittee F01.03 on Metallic Materials.

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<sup>2</sup> Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, Pa. 19428.