



# IPC-TM-650 TEST METHODS MANUAL

**1.0 Scope** A method for determining whether or not the powder in a solder paste complies with the relevant powder type. The ASTM B-214 standard screen powder size distribution method has been found to be acceptable.

## 2.0 Applicable Documents

ASTM E11

BS.410

DIN 4188

ISO 565

ISO 3310

## 3.0 Test Specimen

Approximately 150 grams of solder paste

## 4.0 Equipment/Apparatus

Vibratory test sieving machine

Test sieves to BS.410, ASTM E11, DIN 4188, or ISO 565 and ISO 3310 with mesh openings of 150, 75, 45, 38, 25 and 20 micrometers

Sieve bottom receiver and lid

Balance (scale) with an accuracy of 0.01 g

Beaker 400–600 ml

Watch glass

Solvent

Acetone

Spatula

## 5.0 Procedure

### 5.1 Preparation

**5.1.1** Wait, if necessary, until the solder paste is at room temperature.

### 5.2 Test

**5.2.1** Homogenize the paste by stirring with the spatula.

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Originating Task Group <b>Solder Paste Task Group (5-24b)</b>	

**5.2.2** Weigh paste containing approximately 110 g of solder alloy into the carefully cleaned beaker.

**5.2.3** Add approximately 50 ml solvent.

**5.2.4** Stir the mixture with the spatula so that the flux in the paste can dissolve in the solvent.

**5.2.5** Cover the beaker with the watch glass.

**5.2.6** Let the beaker with the watch glass stand until the solder powder settles.

**5.2.7** Decant, carefully, as much as possible of the fluid without losing any of the solder powder.

**5.2.8** Repeat the extraction procedure five times, using 50 ml solvent for each extraction.

**5.2.9** Add approximately 50 ml acetone to the washed solder powder and stir with the spatula to assist in drying.

**5.2.10** Let the solder powder settle.

**5.2.11** Decant, carefully, as much as possible of the acetone.

**5.2.12** Repeat the acetone wash 2 additional times.

**5.2.13** Allow the powder to dry at ambient temperature until the weight is constant.

**5.2.14** Weigh test sieves, with mesh opening sizes appropriate for the type of powder being tested, and the sieve bottom receiver. Typical sieves required are shown in Table 1.

**Table 1 Screen Opening**

Type 1	150	75	20
Type 2	75	45	20
Type 3	45	25	20
Type 4		38	20

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**5.2.15** Place the sieves on the receiver with the sieve with the smallest opening on the receiver and processing sequentially upward to the largest opening screen.

**5.2.16** Weigh the powder and put this in the top sieve.

**5.2.17** Place the lid on the sieve combination and transfer this to the sieving machine.

**5.2.18** Run the machine for approximately 40 minutes.

**5.2.19** Reweigh the sieves and the receiver.

**5.2.20** Subtract the original weights of the sieves and the receiver to obtain the weights of powder with sizes greater than, within, and less than the nominal size range from Table 2A and 2B.

**Table 2A % of Sample by Weight—Nominal Sizes**

	<b>Less Than 1% Larger Than</b>	<b>80% Minimum Between</b>	<b>10% Maximum Less Than</b>
Type 1	150 Microns	150–75 Microns	20 Microns
Type 2	75 Microns	75–45 Microns	20 Microns
Type 3	45 Microns	45–25 Microns	20 Microns

**Table 2B % of Sample by Weight—Nominal Sizes**

	<b>Less Than 1% Larger Than</b>	<b>90% Minimum Between</b>	<b>10% Maximum Less Than</b>
Type 4	38 Microns	38–20 Microns	20 Microns

**5.3 Evaluation** Express the masses of the powder above, within, and below the nominal size range as percentages of the mass of the original sample. Enter data in Table 3.

**Table 3**

Type 1	+150µm _____	+75 µm _____	+20 µm _____	–20 µm _____
Type 2	+ 75 µm _____	+45 µm _____	+20 µm _____	–20 µm _____
Type 3	+ 45 µm _____	+25 µm _____	+20 µm _____	–20 µm _____
Type 4	+ 38 µm _____	+20 µm _____	–20 µm _____	