



NC601E (Sn60/Pb40)  
NO CLEAN DELTA®  
SOLDER WIRE

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**Description**

**Flux Core**

Delta® Solder Wire NC601E is a no clean, organic-based, cored solder wire that is available with both lead-containing alloys and lead-free alloys. NC601E contains purely organic acid activators so spreads rapidly and leaves minimal residue. NC601E exhibits virtually no spattering and conforms to IPC-J-STD-004B.

Main Features

- Excellent wettability
- Non-tacky residue
- Low spattering
- Available with both leaded and lead-free alloys

**Technical Data (Flux Extract)**

|                                      | <b>Specification</b>      | <b>Test Method</b> |
|--------------------------------------|---------------------------|--------------------|
| <b>Color &amp; Appearance</b>        | Light yellow solid        | Visual             |
| <b>Flux Classification</b>           | ORL0                      | IPC-J-STD-004B     |
| <b>Copper Mirror</b>                 | No removal of copper film | IPC-TM-650 2.3.32  |
| <b>Corrosion</b>                     | Pass                      | IPC-TM-650 2.6.15  |
| <b>SIR</b>                           | >1 x 10 <sup>8</sup> ohms | IPC-TM-650 2.6.3.3 |
| <b>Post Reflow Flux Residue</b>      | 55%                       | TGA Analysis       |
| <b>Acid Value</b>                    | 280 - 320                 | IPC-TM-650 2.3.13  |
| <b>Flux Residue Dryness</b>          | Pass                      | IPC-TM-650 2.4.47  |
| <b>Spitting of Flux-Cored Solder</b> | 0.3%                      | IPC-TM-650 2.4.48  |
| <b>Solder Spread</b>                 | 100 mm <sup>2</sup>       | IPC-TM-650 2.4.46  |

**Wire Diameter**

Sn60/Pb40 NC601E Delta Solder Wire is available in a variety of diameters. The chosen diameter is based on application methods, pad size, and desired solder joint volume. Generally, the diameter of the wire should be slightly larger than the width/diameter of the joint or connection to be soldered. Below is a list of standard diameters.

**Standard wire diameters**

|                |          |          |          |          |          |          |          |          |          |          |
|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Diameter/Inch  | 0.125    | 0.092    | 0.062    | 0.050    | 0.040    | 0.032    | 0.028    | 0.025    | 0.020    | 0.015    |
| Diameter/mm    | 3.18     | 2.33     | 1.57     | 1.27     | 1.01     | 0.81     | 0.71     | 0.63     | 0.51     | 0.38     |
| Std.Wire Gauge | 11       | 13       | 16       | 18       | 19       | 21       | 22       | 23       | 25       | 28       |
| Tolerance, in. | +/-0.006 | +/-0.005 | +/-0.002 | +/-0.002 | +/-0.002 | +/-0.002 | +/-0.002 | +/-0.002 | +/-0.002 | +/-0.002 |

**Flux Percentage**

Qualitek utilizes a state-of-the-art automatic wire extrusion and wire drawing machines to manufacture consistent solder. The introduction of flux core in the wire extrusion process involves continual monitoring of flux percentage to ensure minimal flux voids and irregular wire. Typical flux percentage for leaded solder is **1.1 – 3.3%**.

**Physical Properties**

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**Solder Composition**

Qualitek® has developed an organic-based core flux with alloy composition, Sn60/Pb40. Qualitek Sn60/Pb40 alloy conforms to and exceeds the impurity requirements of IPC-J-STD-006C.

| <b>Typical Analysis</b> |           |              |              |              |              |              |              |              |              |              |              |              |              |
|-------------------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>Sn</b>               | <b>Pb</b> | <b>Ag</b>    | <b>Al</b>    | <b>As</b>    | <b>Au</b>    | <b>Bi</b>    | <b>Cd</b>    | <b>Cu</b>    | <b>Fe</b>    | <b>In</b>    | <b>Ni</b>    | <b>Sb</b>    | <b>Zn</b>    |
| <b>59.5<br/>-60.5</b>   | Bal       | 0.100<br>Max | 0.005<br>Max | 0.030<br>Max | 0.050<br>Max | 0.100<br>Max | 0.002<br>Max | 0.080<br>Max | 0.020<br>Max | 0.100<br>Max | 0.010<br>Max | 0.200<br>Max | 0.003<br>Max |

|                                       | <b>Sn60/Pb40</b> |
|---------------------------------------|------------------|
| Melting Point, °C                     | 183 - 188        |
| Hardness, Brinell                     | 16 HB            |
| Coefficient of Thermal Expansion      | 23.9             |
| Tensile Strength, kgf/cm <sup>2</sup> | 535              |
| Tensile Elongation, %                 | 40               |
| Density, g/cm <sup>3</sup>            | 8.50             |
| Electrical Resistivity, (μΩ-cm)       | 15.3             |
| Thermal Conductivity, W/m-K           | 49               |

**Flux Residues & Cleaning**

NC601E is a no clean formulation; therefore, the residues do not need to be removed for typical applications. If residue removal is desired, the use of Everkleen 1005 Buffered Saponifier with a 5-15% concentration in hot 60 °C (140 °F) de-ionized water will aid in residue removal.

## **Storage & Shelf Life**

Solder wire storage should be in a 65-80 °F environment away from direct heat. We recommend using gloves when handling solder wire directly. Solder wire has an indefinite shelf life.

## **Packaging**

Qualitek flux-core wire and solid wire are packed in

12.5lb -box of ½ lb spools  
25 lb -box of 1 lb spools  
12.5kg -box of ½ kg spools  
8 kg -box of 1kg spools  
40 lb -box of 5 lb spools  
20 lb -box of 20 lb spools

## **Disposal**

Sn60/Pb40 NC601E leaded solder wire should be disposed of according to all local, regional, national and international regulations.

Qualitek® and Delta® are brands of Qualitek International, Inc. For Health and Safety information refer to Safety Data Sheet.