



WS700 (Sn63/Pb37)  
WATER SOLUBLE  
DELTA<sup>®</sup> SOLDER  
WIRE

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**Description**

**Flux Core**

Delta® Solder Wire WS700 is a water soluble cored solder wire designed for both leaded and lead-free electronic applications. WS700 has rapid wetting action and flux residues are easily removed with water rinse or in-line cleaning systems. WS700 cored solder wire will not decompose or carbonize under prolonged heat. WS700 meets IPC-J-STD-004B specifications.

Main Features

- Rapid wetting action
- Residues easily removed with water

**Technical Data (Flux Extract)**

	<b>Specification</b>	<b>Test Method</b>
<b>Color &amp; Appearance</b>	Lt. Opaque Solid	Visual
<b>Flux Classification</b>	ORH1	J-STD-004
<b>Copper Mirror</b>	Complete removal of copper film	IPC-TM-650 2.3.32
<b>Corrosion</b>	Pass (cleaned coupons)	IPC-TM-650 2.6.15
<b>SIR</b>		
J-STD-004, Pattern Down	2.54 x 10 <sup>10</sup>	IPC-TM-650 2.6.3.3
<b>Post Reflow Flux Residue</b>	65%	TGA Analysis
<b>Acid Value</b>	160 - 180	IPC-TM-650 2.3.13
<b>Solder Spread</b>	180 mm <sup>2</sup>	IPC-TM-650 2.4.46

**Wire Diameter**

Sn63/Pb37 WS700 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	+/-0.003	+/-0.003	+/-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**

**Solder Composition**

Qualitek has developed a water soluble organic based core flux with alloy composition, Sn63/Pb37, which is eutectic alloy. Qualitek Sn63/Pb37 alloy conforms to and exceeds the impurity requirements of IPC-J-STD-006C.

<b>Typical Analysis</b>													
<b>Sn</b>	<b>Ag</b>	<b>Cu</b>	<b>Pb</b>	<b>Sb</b>	<b>Bi</b>	<b>In</b>	<b>As</b>	<b>Fe</b>	<b>Ni</b>	<b>Cd</b>	<b>Al</b>	<b>Zn</b>	<b>Au</b>
<b>62.5</b> <b>-63.5</b>	0.100 Max	0.080 Max	Bal	0.200 Max	0.100 Max	0.100 Max	0.030 Max	0.020 Max	0.010 Max	0.002 Max	0.005 Max	0.003 Max	0.050 Max

	<b>Sn63/Pb37</b>		<b>Sn63/Pb37</b>
Melting Point, °C	183 E	Yield Strength, psi	3950
Hardness, Brinell	14 HB	Total Elongation,%	48
Coefficient of Thermal Expansion	24.7	Joint Shear Strength, at 0.1mm/min 20 °C	23
Tensile Strength, psi	4442	Joint Shear Strength, at 0.1mm/min 100 °C	14
Density, g/cm <sup>3</sup>	8.42	Creep Strength, N/mm <sup>2</sup> at 0.1mm/min 20 °C	3.3
Electrical Resistivity, (μΩ-cm)	14.5	Creep Strength, N/mm <sup>2</sup> at 0.1mm/min 100 °C	1
Electrical Conductivity, 10 <sup>4</sup> /ohm-cm	6.9	Joint Fatigue Cycle, 15N/mm <sup>2</sup> 20 °C	1100
		10N/mm <sup>2</sup> 100 °C	900

**Flux Residues & Cleaning**

Sn63/Pb37 WS700 is water-soluble formulation; therefore, the residues need to be removed. Residue removal is easily achieved, with the use of hot 60 °C (140 °F) de-ionized water in either a batch or conveyor cleaner system.

## **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**

Sn63/Pb37 WS700 leaded solder should be disposed of in accordance with federal, state & local authority requirements.