QUALITEK Technical Bulletin

Delta WS700 63/37 Water Soluble Solder Wire

DESCRIPTION

WS700 is a Sn63/Pb37 water soluble cored solder wire designed for 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.

FEATURES AND BENEFITS

- Rapid wetting action
- Residues easily removed with water

FEATURES AND BENEFITS

	Specification	**Test Method**
Colour & Appearance	Lt. Opaque Solid	Visual
Flux Classification	ORH1	J-STD-004
Copper Mirror	Complete removal of copper film	IPC-TM-650 2.3.32
Corrosion	Pass (cleaned coupons)	IPC-TM-650 2.6.15
SIR		
JSTD-004, Pattern Down	2.54×10^{10}	IPC-TM-650 2.6.3.3
Post Reflow Flux Residue	65%	TGA Analysis
Acid Value	160 - 180	IPC-TM-650 2.3.13
Solder Spread	180 mm^2	IPC-TM-650 2.4.46

WIRE DIAMETER

Delta Solder Wire WS700 63/37 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.

Diamter/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

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%.

PHYSCIAL PROPERTIES

A no clean resin based core flux with alloy composition Sn63/Pb37, which is a eutectic alloy. 63/37 alloys conform to and exceed the impurity requirements of IPC-J-STD-006C.

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TYPICAL ANALYSIS

Typical Analysis													
Sn	Ag	Cu	Pb	Sb	Bi	In	As	Fe	Ni	Cd	Al	Zn	Au
62.5 –63.5	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

	Sn63/Pb37
Melting Point, ℃	183 E
Hardness, Brinell	14 HB
Coefficient of Thermal Expansion	24.7
Tensile Strength, psi	4442
Density, g/cm^3	8.42
Electrical Resistivity, (μΩ-cm)	14.5
Electrical Conductivity, 10^4/ohm-cm	6.9

	Sn63/Pb37
Yield Strength, psi	3950
Total Elongation,%	48
Joint Shear Strength, at 0.1mm/min 20 ℃	23
Joint Shear Strength, at 0.1mm/min 100 ℃	14
Creep Strength, N/mm^2 at 0.1mm/min 20 ℃	3.3
Creep Strength, N/mm^2 at 0.1mm/min 100 ℃	1
Joint Fatigue Cycle, 15N/mm^2 20 ℃ 10N/mm^2 100 ℃	1100 900

FLUX RESIDUES & CLEANING

WS700 is a 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.

DISPOSAL

WS700 63/37 solder should be disposed of in accordance with federal, state & local authority requirements.