



**NC611 (Ecolloy™)  
NO CLEAN LEAD-FREE  
DELTA® SOLDER WIRE**

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**Description**

Qualitek has developed new NC611, which is a no clean solder, specifically designed for lead-free applications. NC611 has improved activity over other no clean solder wire for fast spreading action. NC611 has a clear residue and is shown to have virtually no spattering. NC611 is available with a new patented lead free alloy, Ecolloy™ that performs better than SAC305 in the drop test. Ecolloy has a melting point range in between SAC305 and Sn/Cu alloys for better solderability performance.

Main Features

- ❑ Designed for lead-free applications
- ❑ Improved activity
- ❑ Clear residue
- ❑ Low spattering

**Technical Data (Flux Extract)**

Flux Classification	Specification	Test Method
	RELO	J-STD-004
<b>Copper Mirror</b>	No removal of copper film	IPC-TM-650 2.3.32
<b>Silver Chromate</b>	Pass	IPC-TM-650 2.3.33
<b>Corrosion</b>	Pass	IPC-TM-650 2.6.15
<b>SIR</b>		
JSTD-004, Pattern Down	4.21 x 10 <sup>10</sup>	IPC-TM-650 2.6.3.3
<b>Post Reflow Flux Residue</b>	55%	TGA Analysis
<b>Acid Value</b>	190-210	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>	0.2%	IPC-TM-650 2.4.48
<b>Solder Spread</b>	120 mm <sup>2</sup>	IPC-TM-650 2.4.46

**Wire Diameter**

Ecolloy™ alloy 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
Diameter/mm	3.18	2.33	1.57	1.27	1.01	0.81	0.71	0.63	0.51
Std.Wire Gauge	11	13	16	18	19	21	22	23	25
Tolerance, in.	+/-0.006	+/-0.005	+/-0.003	+/-0.003	+/-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 lead free solder is 1.1-3.3%.

**Physical Properties**

**Solder Composition**

Ecolloy™ conforms and exceeds the impurity requirements of IPC-J-STD-006C and all other relevant international standards.

<b>Typical Analysis</b>														
	Sn	Ag	Cu	Pb	Sb	Bi	In	As	Fe	Ni	Cd	Al	Zn	Au
<b>Ecolloy™</b>	Bal	0.100 Max	0..1-1	0.070 Max	0.200 Max	<6.0	0.100 Max	0.030 Max	0.020 Max	0-0.1	0.002 Max	0.005 Max	0.003 Max	0.050 Max

	<b>Ecolloy™</b>	<b>SAC305</b>
Melting Point, °C	221 - 227	217 - 221
Hardness, Brinell, HV	23	14.1
Coefficient of Thermal Expansion, ppm/ °C	23	23
Tensile Strength, MPa	63	49
Density, g/cc	7.4	7.4
Electrical Resistivity (μohm-cm)	12	12
Electrical Conductivity, %IACS	14.3	14.3
Elongation, %	50	63
Specific Heat, J/g.K	0.23	0.23

**Flux Residues & Cleaning**

NC611 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**

Delta® Solder Wire should be stored in a dry environment away from direct heat. We recommend using gloves when handling solder wire directly. Solder wire has an indefinite shelf life.

## **Disposal**

Ecolloy™ NC611 lead-free solder should be disposed of in accordance with federal, state & local authority requirements.

## **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